Editing and Publication

A training manual

Ian Montagnes

International Rice Research Institute
International Development Research Centre

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Editing and Publication

A training manual

Especially for editors and publication officers
at research institutes and extension agencies
in the Third World

Ian Montagnes

International Rice Research Institute
PO Box 933, 1099 Manila, Philippines

International Development Research Centre
PO Box 8500, Ottawa, Canada K1G 3H9

The International Rice Research Institute (IRRI) was established in 1960 by the Ford and Rockefeller Foundations with the help and approval of the Government of the Philippines. Today IRRI is one of the 13 nonprofit international research and training centers supported by the Consultative Group on International Agricultural Research (CGIAR). The CGIAR is sponsored by the Food and Agriculture Organization of the United Nations, the International Bank for Reconstruction and Development (World Bank), and the United Nations Development Programme (UNDP). The CGIAR consists of 50 donor countries, international and regional organizations, and private foundations.

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The responsibility for this publication rests with the International Rice Research Institute.

Contents

Foreword

Too little of the scientific work done in the national agricultural research systems of developing countries reaches the people who can use it. Scientists build on the advances made by others; extension and health-care workers, teachers, farmers, and others turn new knowledge into increased productivity and better lives for the people with whom they work.

Among the reasons for the continuing lag in knowledge transfer from discovery to user is a shortage of men and women trained in the techniques of scientific reporting or skilled in the art of simplifying research results for greater understanding by a broad public. More trained editors are needed.

That was the reason IRRI offered the Editing and Publication Training Course 1985-1988, in collaboration with the International Development Research Centre (IDRC) of Canada. We were fortunate that Ian Montagnes undertook to develop the course, and in the process write this manual and its companion *A handbook for trainers of editing and publication.* Their publication will, we hope, expand the availability of the writing and editing expertise needed for wider dissemination and application of new knowledge in science.

Klaus Lampe
Director General

Preface

Much good research is done in the Third World, but more of it needs to reach the people who can use it. These are, on the one hand, the scientists who will build further upon the advances of research. On the other, they are the extension and health care workers, teachers, farmers, and others who can turn new knowledge into fuller bellies and fitter bodies.

There are many reasons for failure in communication. One is a shortage of men and women trained in the techniques of scientific reporting or skilled in the art of simplifying research results for a broader public. The Third World needs more trained editors.

That is the premise underlying the program that led to this manual. The contents, and the teaching methods on which they are based, were developed during three years at the International Rice Research Institute (IRRI) in the Philippines. There, an Editing and Publication Training Course was sponsored jointly by IRRI and the International Development Research Centre of Canada in collaboration with the University of Toronto Press.

The course was designed specifically to help editors attached to research institutes and extension agencies in Asia, Africa, and Latin America. Many of them work in small departments or on their own. The course therefore extended beyond editing to other publishing functions — not exhaustively but at a level an editor might find useful.

We ran five intensive courses at IRRI, never more than 10 trainees at a time, working together for 14 weeks. By the end, 45 men and women had attended from 21 countries girdling the globe: Ecuador, Brazil, Barbados, Liberia, Nigeria, Botswana, Malawi, Tanzania, Kenya, Ethiopia, India, Sri Lanka, Bangladesh, China, Thailand, Vietnam, Malaysia, Indonesia, the Philippines, Korea, and Papua New Guinea.

No textbook existed for a course which had to relate to different languages, different cultures, different types of readership, different conventions in publishing. Handouts had to be prepared to reinforce discussions and exercises. From those handouts has come *Editing and Publication: A Training Manual.*

The graduates of the IRRI course have carried their new knowledge and their handouts home and have shared them with colleagues. They have run seminars and workshops in their own organizations. They have translated some of the materials into their own languages.

Graduates assisted in two-week editorial courses which my wife and I led in Beijing and Nairobi, and in further courses in Kuala Lumpur and Bangkok. Graduates were also involved in a series of courses, based on the IRRI concept and materials, given in Indonesia by local editors in their country's national language. Other graduates have sparked the creation of the Editing and Publication Association of Bangladesh, a body devoted to professional development. Recently, still another graduate has been appointed executive officer of a regional organization in the Caribbean that is concerned with training publishers.

This manual has been prepared to extend that process. It can be used by other organizations to run their own training programs. It can be read by individual editors. Much of its information should also be useful to authors.

The contents are organized in 11 modules or chapters, divided into 86 units or subchapters. In their order they follow the logic of a book. In training, however, individual units can be selected to meet particular needs and arranged in any effective order. This is discussed further in the companion *Manual for Trainers*. The units, moreover, may and should be adapted to meet local needs and conditions. They can be translated. This is meant to be a fluid resource rather than a crystallized textbook.

Contents may be reproduced without charge for training by nonprofit organizations in the less developed countries, provided permission is first obtained from the International Rice Research Institute under conditions set out on the copyright page. Page format, illustrations, and binding have all been planned so that units can be photocopied economically for distribution to trainees.

Because this is not designed as a book to be read from cover to cover, there is some duplication of information. Much more duplication has been avoided by cross-references. The units go beyond editing to the technical processes of design, print production, and photography: editors who have to work with designers, typesetters, printers, and photographers will do so more effectively if they understand the processes involved and the problems their partners in publishing face. The units also look briefly ai production management, finances, promotion, and distribution, in the belief that no editor should be truly innocent of these aspects of publishing.

The units carry a few recurrent themes.

One is the role of the editor: to bring author and reader into the most effective possible communication. Almost every editorial decision can be reached by asking first: "What did the author intend? What will best help the reader understand?"

Another is the importance of asking questions and of checking details. Editing is a creative profession, and print is one of the most satisfying of products. Editing is also a craft of endless concern and detail. No editor should accept a manuscript unquestioningly.

A third is summed up in an acronym developed during one IRRI course: KIS MII. The letters mean: "Keep it simple! Make it interesting!" That is sound advice for content and form in publication. Communication should be efficient as well as effective.

The manual does not offer answers to every editorial problem, in the nature of a style guide. More often it suggests the questions an editor should ask. Its goal is to provide an analytical framework within which to approach almost any editorial problem.

That goal was summed up by one graduate who, like most of us, had learned his editing on the job. At the end of an IRRI course he said, "I used to edit by instinct. Now I have a logic."

To him, and to the 44 other graduates of the course at IRRI who suffered through its growing pains, as well as to all those other editors who may find its pages helpful, this manual is dedicated.

Ian Montagnes
Los Baños, Philippines
May 1988

Acknowledgments

This manual was developed during a three-year training project co-sponsored by the International Rice Research Institute and the International Development Research Centre of Canada. in collaboration with the University of Toronto Press.

Many people had a part in the project. Tom Hargrove, editor and head of the Communication and Publications Department of IRRI, had the idea of a training course for editors. Reg MacIntyre, then director of the Communications Division at IDRC, grasped its potential. Bill Smith of IRRI, editor, and Michael Graham of IDRC, program officer in Singapore and now in Ottawa, worked on the details of the plan and grant proposal. From their discussions came the idea of a practical project which was so crucial in the subsequent training. George Connell, president of the University of Toronto, and Harald Bohne, director of the University of Toronto Press, approved the collaboration of the Press in the project and granted me an unusual three-year leave to lead it. My colleagues in the Editorial Department of the University of Toronto Press, in particular Ron Schoeffel and Virgil Duff, carried my responsibilities as well as their own while I was away.

The project had the enthusiastic support of several dozen staff members of IRRI's Communication and Publications Department. Many of them took part in the teaching in practical workshops and demonstrations of illustration, photography, design, typesetting, printing, binding, and audiovisual production. They and others produced the trainees' printed and audiovisual projects, always under tight deadlines despite an already busy schedule. During three years, Ram Cabrera proved himself a quintessentially unflappable production manager. The editors of the department gave freely of advice and support.

IDRC showed itself a responsive and flexible funding agency. In Singapore, the project enjoyed the continuing support of Michael Graham's successor there, Chin Saik Yoon.

Laurie Lewis and Will Rueter of the University of Toronto Press gave week-long workshops in design during each of the five courses. Their contribution, supported by the Press and IDRC, was vital to the project.

So was the work of Maureen Lago, the project secretary and assistant course coordinator. Maureen worked countless hours at night and on weekends keeping up with the secretarial pressures of intensive courses and many revisions of the teaching materials. She also welcomed each

successive group of trainees on their arrival, led them on field trips, helped deal with their personal problems while they were here, and orchestrated their graduations at the end—always with a brilliant smile, a friendly warmth, and a readiness to meet new challenges.

Many people contributed to the writing of this manual. Laurie Lewis and Will Rueter prepared the original materials for Module 7 and commented on the final version. Elizabeth Wilson drafted several units in Module 5 and reviewed the entire final draft; she also taught parts of the course at IRRI and was a partner in courses we gave in Beijing and Nairobi.

A number of people read a penultimate draft. Two dear friends and colleagues, Naomi Pascal and Datus Smith, commented in particularly great detail on its contents. Valuable advice came also from Herbert S. Bailey, Steve Banta, Marie Assunta Carigma, Gil Croome, Letty Dizon, August Frugé, Michael Graham, Elly and Bob Huke, Reg MacIntyre, Jay MacLean, Dan Minnick, Paul Stapleton, Marie Sol Sadorra, Ron Schoeffel, Veronica Seyd, Tejeshwar Singh, and Susan Stockwell. Hans Zell provided a most useful bibliography of publishing in Africa.

Lloyd Bostian, LaRue Pollard, and Gloria Argosino edited the manuscript at IRRI, Ram Cabrera designed the book, and Marie1 Dayrit and Pat Mamon illustrated it.

The examples in Modules 2 and 5 come from many sources. Most were found in manuscripts or publications. Among them, *IDRC Reports* proved a particularly rich fund of effective writing. Early in the course, much helpful material came also from Lex Librero, Remy Orozco, and Dada Ramos of the Institute of Development Communication, University of the Philippines at Los Baños.

Material in unit 2.6 was excerpted from *How to Write, Speak and Think More Effectively* by Rudolf Flesch (New York: Harper & Row, 1963).

Some of the illustrations in unit 6.5 were suggested by slides in the Kodak publication *The beginnings of photographic composition.*

The passages used to illustrate elements of typographic design in Module 7 come from *Design with Type* by Carl Dair, an outstanding Canadian typographer. They are reprinted with the permission of the book's publisher, the University of Toronto Press.

To all these many people and institutions I am deeply indebted. Any errors, omissions, idiosyncracies, and biases in the manual are my own.

I.M.

1
Author, editor, reader

Editors exist to help authors communicate with readers. That is their function.

Editing is more than a craft. Editors must understand the process of communication and understand the limitations of print. They must actively seek good manuscripts. They must respect and work closely with authors. They must also know the readers they are trying to reach and study how to reach them most effectively,

This module examines questions basic to all editing.

1 What does an editor do? and why?
2 Communicating
3 Planning for publication: the first five questions
4 Planning for publication: deciding how
5 The right words for the reader
6 Knowing the reader
7 Asking authors about readers
8 Finding good manuscripts
9 Being an editor

1.1
What does an editor do? and why?

These pages have been written for editors who work in research organizations and extension agencies in the developing countries of Asia, Africa, and Latin America.

If you are one of those editors, you know that you have a special and important job. You are part of the struggle to give people more to eat, better health, higher incomes — better lives.

Editors in research organizations and extension agencies may work in large departments with several other editors. More often they work in small departments, and often they work alone.

Different publications

They may be involved in many kinds of publications. These can include

- posters
- newsletters
- bulletins
- magazines
- journals
- booklets
- books
- manuals

Different responsibilities

Editors can have various responsibilities.

Some may decide what will appear in their publications. The editor of a newsletter, for example, must plan well in advance what will be reported in each issue. In deciding what to publish, editors often seek the advice of subject specialists. They may also be guided by administrators.

Some editors ask specialists to write material for publication. An editor may be the first to recognize that people need information that can be explained in a booklet, or a folder, or an article. The next step is to find an author. Here again, the editor may seek help from colleagues who are experts in the subject.

But few editors at research organizations and extension agencies spend many hours a week in these activities. They spend most of their time looking at words and numbers on paper — preparing manuscripts for publication. This takes great care, time, and effort. And in this job the *editor* is the specialist, the person who gives others advice and guidance.

Different relationships

Preparing manuscripts for publication may involve working with several other people:

- authors
- subject specialists
- photographers
- illustrators
- designers
- typesetters
- printers
- administrators

Different tasks

Preparing a manuscript can involve many different tasks. Some of the most important of these are to

- make sure the manuscript is complete
- suggest ways the author can reorganize the text to make the communication more effective
- question possible errors of fact
- ask questions when the text is unclear
- suggest ways to improve the wording so that it is easier to read and understand
- check and correct spelling, grammar, and punctuation;
- indicate levels of headings
- check accuracy and style of notes and references
- make sure that abbreviations and units of measurement are used appropriately and consistently
- check that tables, charts, and graphs agree with the text
- watch for bias or unlawful material
- make sure illustrations are suitable for reproduction
- help select photographs and use them effectively
- plan how the publication will look
- look for ways to save money in typesetting and printing
- watch that printer and author keep to the production schedule
- proofread
- check the quality of work at all stages of production
- OK final proofs for printing
- assist in promotion and distribution

One purpose

Why do editors do all this?

An author has something to say.

It may be a new treatment for dysentery, a better way to plant sorghum, an improved model of a hand pump, new insights into the problems of the landless poor. Whatever the subject, it is knowledge that will help other people.

There art: people who want that knowledge.

They may be health care workers, extension agents, farmers, teachers, manufacturers, economists, policymakers. They are the people who can take the results of research and apply them.

The editor helps the author reach those people.

Communicating in print is never easy. It takes special skills and understanding. Good editors understand how to do it. They try to make sure that the author's message is as clear and effective as possible. That is the purpose of editing. It is the reason for all that careful work.

Two people in mind

Good editors always have two people in mind: the author and the intended reader. At every step in editing, at every editorial difficulty, they ask themselves:

- What did the author intend? Have I understood the author clearly? What can I do to help achieve the author's goal? How can I make the author's message more effective?

- Will the reader understand this? What can I do to make the manuscript easier to understand? Will the reader want to read this? What can I do to make it more interesting for the reader?

Editors are nearly always aware of the author. Often the author works in the same organization, perhaps in a superior position. The author wrote the manuscript, and doesn't usually let the editor forget it.

The intended readers, on the other hand, are usually outside the organization. They rarely know that the editor exists and is working to help them. They are not in a position to complain—at least, not until after the editor's work is done. But good editors don't forget the intended reader.

A good editor always remembers the reader.

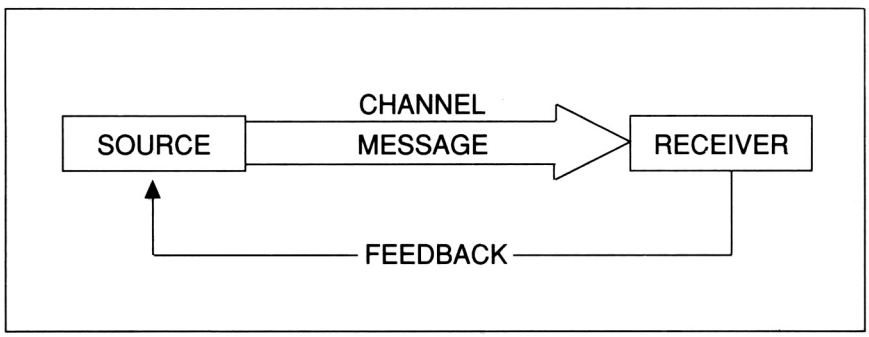
That is the first lesson in editing. It is the basis for almost everything that follows.

1.2 Communicating

Every time we publish something, we are trying to communicate. We are trying to carry the author's message to people who can be helped by that message.

Communication

The process of communication can be described in a simple diagram. (Students of communication have designed more complicated models, but this is enough for our purpose.)



Any message must have a *source* and a *receiver*. In print, these are the author and the reader.

The message is carried over a *channel*. There are many kinds of channels. For example, a message may be communicated on a printed page, or over a radio broadcast, or in a photograph, or by the shrug of the shoulders. The channel may be a bouquet of flowers that says: "I admire you" or the shape of a church or mosque that says "Here is where you come to pray."

But the process does not stop there. Communication is not really complete until the receiver has shown by *feedback* that the message has been received and understood. Feedback also can take many forms. It may be a nod of the head or a smile. It may be a second message in reply to the first one. It may be doing something the author has suggested.

Non-verbal and verbal communication

Some messages do not depend on words. These *non-verbal* messages may involve any of the five senses. We send a message when we wear attractive clothes (sight), use perfume (smell), laugh (hearing), embrace (touch), or offer someone a candy (taste). We may even do all these things at once.

Other messages depend entirely on words. Such *verbal* communication usually involves only two senses: sight and hearing. With words, we write or we talk.

When we talk, we have certain advantages. We can change the speed, tone, and volume of our voice. We can emphasize a sentence by talking loudly. We can make the words sound happy or sad. If the receiver can see us, we can use gestures or change the expression on our faces. If we can see the receiver, we can get instant feedback and, if necessary, change our message to make sure we are understood.

Limits of writing

In writing, we have to depend on words (sometimes reinforced with pictures) sitting on paper. We are limited to one sense: sight. *That is all we have.* And there is no instant feedback.

Communicating in writing is hard work. It demands special skills.

The printed message will not be communicated clearly if the words are

- inaccurate
- difficult to understand
- organized poorly
- spelled incorrectly, or arranged ungrammatically
- too general or too vague
- too numerous
- inconsistent in what they say or in their form
- uninteresting or unsuitable for the reader.

All these faults interfere with the message. They act like the electrical *static* that sometimes interrupts broadcasts on the radio.

Eliminating static

Editors must be watching for static all the time. The only way to do that is to think always of the reader—and to think as much as possible *like* the reader.

The editor's job is to eliminate static.

Editors make sure that the author's message reaches the intended readers clearly and effectively. This may involve more than words. Editors also are concerned that

- the words are supported when necessary by illustrations (photographs, drawings, graphs)
- the appearance of the publication supports the message (design)
- the typesetting and printing are clear, clean, and economical (production management)
- the message reaches the potential reader (distribution and promotion)

Editors help to shape the publication for the particular reader the author wants to reach.

1.3
Planning for publication: the first five questions

I keep six honest serving men.
(They taught me all I knew);
Their names are What? and Why? and When?
And How? and Where? and Who? — Rudyard Kipling

Kipling's six questions are powerful tools for analyzing almost any problem.

Editors will find them most obviously helpful in planning a new publication. They can also be asked usefully any time an editor starts working on a publication that is already established: when taking over the manuscript editing of a journal, for example, or when given the manuscript for a new title in a series. In such continuing publications, an editor might ask the questions again every few years to see whether there have been any changes in the publishing environment.

Too often, editors do their job a certain way "because that is the way it has always been done." Asking and answering these six questions may suggest ways to improve an established journal or series. At the very least, asking and answering them will make an editor more aware of why a publication has taken its present form, thus providing a logic in editing it. That in turn should make the job more interesting as well as the editing more effective.

Sometimes the answers are obvious. Other times they are not. Then the best person to ask is the author (or, in the case of a journal, the editor-in-chief). That way you will be sure you know what was intended.

Occasionally you may find that an author has not thought about the questions either. Some authors are so anxious to start writing that they do not take the time to decide, for example, just who it is they want to reach.

Five questions should be answered before deciding *how* a manuscript can best be published. These five questions are Who? Where? What? Why? and When? They are considered in this unit. The sixth question How? is discussed in unit 1.4.

Who? *Who has the material been written for?*

- scientists?
- technicians?
- extension workers?
- farmers or fishermen?
- health care workers?
- nutritionists?
- business people?
- social scientists?
- news media?
- general public?
- policymakers?
- donors?
- teachers?
- students?
- children?
- institutional staff?
- visitors?
- others?

This may be the most important single question asked an author, because so many editorial decisions follow from the answer.

Sometimes the author (or the editor, or the publishing organization) wants to reach two or three different kinds of readers. The answer to "Who?" may be "This was written for extension workers with university degrees, but farmers should like it too" or "I wrote this mainly for other specialists, but the subject is so important that the general public will want to read it and so should policymakers." It is dangerous to try to reach too many different kinds of readers. A publication that has been planned for one kind of reader may not appeal to a reader in another group, who may not even be able to understand it. Sometimes it is better to plan separate publications for each group of readers. It may cost more, but it is more effective.

It helps if the author and editor can imagine a single person who is typical of the readers they want to reach:

- age?
- sex?
- occupation?
- level of education?
- interests?
- religion or beliefs?
- experience?
- language(s)?

It is also useful to ask these questions:

- How will the readers use the publication we are planning?
- Under what conditions will they read it?
- How much can they afford to pay for it?
- What else do they read and what are these publications like?

Where? *Where do the intended readers live? Where will they use the publication?*

- rural areas?
- urban areas?
- worldwide?
- continental?
- in school?
- at home?
- in the library?
- regional?
- national?
- provincial?
- local?
- in the field?
- in the office?
- in a lab?

What?

What is being said?

The editor must know what the author is trying to say. The editor may not have the expert knowledge to follow all the technical details of a specialized article, but should understand the author's message in general. Sometimes authors have trouble saying what they mean. Sometimes they are so concerned about details that they never get around to writing the main message, which to them is obvious. I have even known authors who accidentally said exactly the opposite of what they meant.

Never be afraid to ask questions. Editors should start worrying if they are not asking the author questions. Some authors write very clearly. But most people can use help from another pair of eyes—the editor's.

Sometimes it is useful to ask an author: "Tell me in one sentence what you are trying to say." This forces the author to think more simply and concentrate on essentials. It is also a useful guide to the editor, who may have to decide what in the manuscript is important and what is secondary or even unnecessary.

Why?

Why is the material being published?

- to report?
- to teach?
- to record?
- to announce?
- to persuade?
- to warn?
- to entertain?
- to increase prestige?
- for personal advancement?
- to please the boss?
- other reasons?

- What response is wanted from the reader?
- What feedback should we expect?

When?

When is the material going to be used?

- Will it be of value for only a short time? for many years?
- Is it needed at once? If not, when?

With answers to those five questions, it is possible to begin planning, to answer *how* to proceed.

1.4 Planning for pu-blication: deciding how

How?

How should the manuscript be published? Many different forms of printed publication can be used to report the results of research. Some of the most important are

- scientific books
- scientific journals
- scientific articles
- bibliographies
- manuals for technicians
- newsletters
- textbooks
- manuals for teachers
- internal reports
- general books
- general magazines
- general articles
- pamphlets
- posters
- comic books
- press releases
- letters
- microfilm, microfiche

Editors help to choose the most suitable form of publication for every manuscript they receive. Often the choice is easy to make. It will be decided largely by the answers to the first five questions in planning.

Even then, other choices may follow. A pamphlet can take many forms, for example.So can a newsletter or a magazine or a book. The editor must help to plan the exact form that will communicate the author's message most effectively.

The author will have ideas about how the material should be published. Ask for suggestions. They need not always be followed, however. (An author might want an expensive booklet when a pamphlet would be more effective and cost less.)

Here are some more questions to consider in planning how to publish a manuscript.

Best medium?

What is the best medium for communicating this message? There are many ways to make the results of research available to the people who can use them. Print is an important medium. But so are radio, television, slide shows, overhead transparencies, lectures, seminars, and even personal letters. Radio can be particularly useful in reaching rural people who may have difficulty reading or who have little time to read.

This manual is concerned only with printed publication. But editors should be aware that print is not the only way to communicate, and for some audiences it is not even the best way.

Primary or secondary?

Is this important new information that should appear in a primary publication? Would it serve the author's purpose better in another kind of publication? Primary publications contain material that is new and has not been published before. Usually it has been checked by experts to make sure that it is accurate and is a significant addition to knowledge in its field. A primary publication may be a journal, a book, or a research bulletin. It reports research for the first time, and is written by researchers to be read by other researchers and specialists.

Primary publications are available worldwide to anyone with the money to buy them. Because their information has been judged to be important, libraries order them and keep them for many years. The publications and their contents are indexed in bibliographic references. Primary publications are the "official" record of who said or discovered something first. Publication in them is therefore important to a researcher's career: it may lead to a new job or a promotion.

For all these reasons, researchers are anxious to have their work appear in primary publications. For these reasons, too, research institutes often sponsor journals and other primary publications. In this way an institute spreads the results of research; it can also make its own name better known and enhance its reputation.

But not every research report is new enough or important enough to be accepted for primary publication. Often another channel should be used to meet the author's purpose.

Primary publications are written by specialists for other specialists. If the information in them is to reach less expert readers, it usually must be revised for publication in another, *secondary* form. This is the way the results of research reach beyond the research community to the general public. Secondary forms of publication include textbooks, general books and magazines, newsletters, reference books, newspaper and magazine articles, posters, and press releases.

Usually the question *why?* (the author's purpose) and *who?* (the intended readership) will decide whether a manuscript should appear in a primary or secondary publication. Occasionally, however, authors are so anxious for primary publication that they submit manuscripts that are not really suitable for such publications. More often, an editor may read a manuscript that belongs first in a primary journal but which could be revised for secondary publication. If the author can be persuaded to rewrite the article, or to let someone else rewrite it, the information will reach readers (farmers, health care workers, etc.) who can apply the research in their daily work.

How formal?

Should this publication be formal or informal in style? An article written for a primary scientific journal must closely follow certain rules of organization and language; otherwise, it will not be accepted. A book-length report of research must follow somewhat similar rules, or it

will get bad reviews. A report for government officers or other bureaucrats should also follow certain rules of organization and language, or its recommendations may not be followed. These are examples of publications which are formal in style. They are expected to follow certain standard rules. These rules did not just happen. They have been developed over many years to communicate information quickly and effectively to people who need it, and who know they need it.

Other publications can be less formal. They may follow different patterns of organization. The text can be simple. Illustrations and headlines may be planned to attract attention as well as to inform. The attitude may be lighthearted, even humorous. There may be lots of colored ink. These publications are designed to do more than inform. They are designed to interest readers who might not otherwise read them and maybe to persuade those readers to act in a certain way.

In this sense, publications are like clothes. They can be formal or informal. Casual clothes would be wrong at a formal reception. Formal clothes, on the other hand, would look foolish in a farmer's field. People normally choose the right clothing for any occasion. Editors help choose the right style of publication to fit the subject, the purpose, and the readership.

How long?

How much information must be communicated? There may be so much information that it needs a fat book. There may be so little information that a pamphlet will be enough. The size of the publication depends partly on what is being said. But editors should always think of the readers as well: what they would like and what they need. Sometimes the author wants to write more or less than the readers want or need.

What format?

What is the most suitable size and shape? Is this a large reference book that will be used for several years in the library? Then it had better be printed on a large page so that much information can be seen at one time, and it should be bound in hard covers that will protect it. Is this a handbook that will be used in the field? Then it should be short enough to carry easily and the pages should be small enough to fit easily in a pocket or purse. Is this something that will be read once and and thrown away? Then it might as well be printed on a single sheet if possible, and on cheap paper.

Publications can take many sizes and shapes. Some are more economical than others. Some are more suitable for a particular purpose than others. Here, as in other decisions, the editor can help plan what is most appropriate for the reader and the purpose.

How many?

How many people do we want to reach? How many copies should we print? The number of copies that are needed can affect the appearance of the publication. A leaflet that will be sent to tens of thousands of

people may have to be printed on low-cost paper in one or two colors of ink. A prestige publication going to a small but important group of people may be printed on expensive paper with full-color photographs.

How costly?

How much money is available? Some forms of publication cost more than others. Often money decides what form a publication will take. How much does the editor have to spend? How much can the reader afford to pay?

How much illustration?

What is the right balance of text and pictures? Some manuscripts need no illustration: the words can stand on their own. Some manuscripts require a few illustrations, perhaps a graph or a drawing. Other manuscripts require many illustrations: for example, a guide to the insects that attack crops must show a picture of each kind of pest so that farmers can recognize them.

In other manuscripts, illustrations may not be essential but will help to attract and keep readers. And in some publications (especially those going to people who do not read easily) more space may be given to pictures than to words.

The balance of text to illustration will depend on several factors. Among them are the type of publication, the subject matter and the message. the type of person who will be reading the publication, the number of illustrations available, the amount of money available, and the type of printing being used.

What words?

What is the appropriate language for these readers? The level of language is usually decided by the type of publication, the reason why the material is being published, and the type of reader the author wants to reach.

Most of these questions will be considered in more detail in later modules. The question of language is discussed in the next few pages.

Do research

One of the best ways to find answers to these questions is to study successful publications and find out how other editors answered them. Good editors spend time in bookstores and libraries and browsing through magazine racks. They are not just reading for content. They are analyzing publications, studying strengths and weaknesses and techniques. Editors need to do research just as much as other specialists.

1.5
The right words for the readers

A good editor never forgets the limits of written communication. The words have to do the work. There is no instant feedback to warn if the words fail.

The words of any publication must therefore be ones that will carry the message clearly. They must be words the reader will understand.

Editors should ask:

What language?

What language should be used? Should this publication appear in an international language (English, Russian, etc.)? a national language (Bahasa Indonesia, Vietnamese, etc.)? a local language (Cebuano, Gujarati, etc.)?

An article for a scientific journal with worldwide readership might best appear in English. A technical report to be distributed across one country might best be in the national language. A pamphlet for a farmer in the Philippine province of Cebu might best be in the local language.

How specialized?

How specialized can the words be? Should the language be technical, for professionals? Or should it use more common words, for non-specialists?

For example, will the intended readers understand, without explanation, if the text refers to *Plasmodium falciparum ?*

Should the readers be told that *Plasmodium falciparum* is the most common and most dangerous species of malaria parasite?

Should the Latin name be omitted entirely, because the intended readers might find it so difficult that they will stop reading? For such readers, it may be best simply to refer to “the tiny creature that causes malaria.”

How formal?

Should the language be formal? Would the readers feel more comfortable with writing that seems less formal, even friendly?

Publications for professionals are usually formal in tone. Publications for non-specialists may be written closer to the way people speak. Unfortunately, many people seem to think that writing must be completely different from speech. Perhaps they have been taught that in school. Or maybe they hope that long words and complicated sentences

will impress their readers. But long words and complicated sentences are more likely to confuse readers. Then they may give up and put down the publication. A simple, friendly, conversational style is often more effective.

Informal publications may even address the reader directly by the second-person pronoun, "you." After all, a printed page is a direct communication between the author and the reader.

Using "you" may present difficulties in some languages, especially those that have different forms of address to show different levels of respect. In such languages, the editor may be able to find other ways of involving the reader, perhaps by using the first-person plural: "We do . . . " or "Let us do . . . "

How learned?

Is the vocabulary appropriate for the intended readers? Have the readers had enough education to understand all the words that are being used, including the non-specialized ones? Will they be able to recognize the words and ideas from their own experience or knowledge?

A scientist may write that the wolf spider *(Lycosa pseudoannulata)* is "an effective predator of certain rice pests." A farmer is likely to understand the message better if the editor changes the words to: "Wolf spiders are friends. They hunt and kill the insects that harm your rice."

In answering this question, it is sometimes useful to think of two sets of people: those who will first read the publication, and those who may then benefit from the knowledge. In preparing extension publications, for example, it is tempting to say "The extension worker is trained in this subject; it can be written in specialized language." Extension workers sometimes do have university degrees in their discipline, but not always; and even if they do, they have to interpret the information for people who do not have that background. Extension workers may not be skilled in such interpretation. They need specialized information for their own purposes, and that should be provided in the appropriate technical form. But their job should be easier, and perhaps more effective, if at least some information is written in language they can use directly with the people they are helping. Then, too, they can distribute copies for. the farmers to keep.

It is especially important to use words the reader will recognize if the author wants a specific response. Some scientists in Zimbabwe learned this the hard way. They put together a questionnaire about crops and sent copies to a sample of farmers. The questions were written with measurements scientists use: kilos, tons, and hectares. The farmers did not understand; they use local units of measurement. As a result, the survey failed.

How emotional?

Should the words be purely informative? Should they carry an emotional message? If they carry an emotional message, is the emotion the one that is intended?

Consider the difference between saying “He is really ignorant!” and saying “Poor man, he never had much chance to go to school.” Both are emotional statements. A purely informative statement might be: “He went to school for two years.”

Words often have emotion built into them in subtle ways. For example, in English “He said” is informative, but “He claimed” suggests that what was said may be untrue.

Every language also has words that must be avoided because they are offensive. Some words may not only be socially unacceptable; using them may break the law of your country.

Think of a reader

There is a simple way to find the answers to all these questions. Think of someone you know who might be typical of the intended reader. Then ask yourself, as the editor, if the text is appropriate for that person. Imagine you are writing a report or a letter to that person. If necessary, write a sample paragraph. Show it to a typical reader. You will then have an idea of how the publication should be written, and will be able to explain what is needed to the author.

An example

On the following page are two versions of the same report. One has been written for policymakers and other well-educated non-specialists. It was published in the newsletter of the International Rice Research Institute (IRRI). The other was written for farmers, and for extension workers to use in explaining about integrated pest management to farmers.

The first uses technical terms and is fairly formal in tone. Its words require several years of education. It is informative rather than emotional.

The second avoids technical terms like “predator,” “parasite,” “insecticide,” and “susceptible.” Instead it defines terms or uses more common words. It is less formal in tone: farmers are addressed directly as “you” and Nature is made into a helpful person. Control of insect pests is described as a war in which there are friends and enemies. The report is informative, but it is also emotional, intended to persuade the farmer to depend on helpful insects and reduce spraying. Some important points are repeated for emphasis. It is longer than the first, but that is because it has more to do.

Natural enemies often control rice insect pests better than insecticides.

Natural enemies are predators, parasites, and diseases that attack pests and keep them in check in natural and agricultural ecosystems. When natural enemies are eliminated, pest populations increase until they destroy the crops or native plants on which they feed.

Not one of the 115 Philippine fields surveyed for insect populations needed insecticides to reduce pests below an economic threshold. Insect-resistant varieties sometimes may have been responsible for the low pest populations; however, many of the fields were planted to susceptible rices.

Spraying may even give pests an advantage over natural enemies. On fields that were severely damaged by brown planthopper (BPH), the infestations were induced by early and repeated applications of insecticides as insurance sprays.

When the chemicals were applied, both BPH and natural enemies died. BPH populations recovered rapidly, but natural enemies took longer to increase, and therefore a valuable pest control agent was lost.

In many rice-growing areas, more than 50% of the rice area probably never needs insecticides. Unfortunately, many farmers apply them three or four times during a crop season.

You can use Nature's own methods to fight the insects that harm your rice plants. Nature often does a better job than chemicals can.

In fact, if you spray your rice plants with chemicals, you may do more harm than good. Chemicals kill helpful insects as well as the enemies of rice.

Yet some farmers spray insect-killing chemicals three or even four times a season.

Farmers have three kinds of natural friends in their war to protect rice.

1. Some insects and spiders hunt and eat harmful insects.
2. Other insects use harmful insects as food for their own young. They lay eggs in the bodies or eggs of harmful insects, and so destroy them.
3. Diseases attack harmful insects, and kill or weaken them.

Recently IRRI checked more than 100 Philippine rice fields. In all of them, nature alone was controlling harmful insects. Not one of the fields needed spraying. If the farmers had sprayed the fields, they would have lost money. The chemicals would have cost more than the value of the rice they would have saved.

(Some of those farmers were growing rice that resists harmful insects—another way to avoid having to use chemicals. But some were growing rice that can be easily attacked, and even they didn't need to spray.)

Not every farm can manage without spraying. But in many rice-growing areas, probably half the fields don't need chemicals to protect them from harmful insects.

Spraying can even help the enemy. We studied many field where the rice had been severely damaged by small insects called brown planthoppers. In all those fields the farmers had sprayed early in the season, and two or three times afterwards.

The farmers thought that by spraying so many times they would protect their crops. But they killed all the friendly insects as well as the brown planthoppers. The hoppers returned faster then their enemies. Then they simply took over the fields.

1.6
Knowing the reader

The editor represents the reader. The editor is always asking:

- Will the reader understand this word? this sentence? this idea?
- Will this interest the reader?
- Is this what the reader needs to know?
- Is there more the reader should be told?
- Can this be changed to improve communication with the reader?
- How can this be published most effectively for this particular reader?

To answer these questions, the editor must have a fairly clear and accurate understanding of the intended readers. To obtain this knowledge takes time and effort. It must be built up through experience.

There are various ways to find out about readers. Not all are useful to every editor or for every publication, but here are some of the most important.

Meet readers

Go out and meet typical readers. This is by far the best way. Visit them at work. Attend meetings, conferences, and book fairs where they will be present. Talk to them. Listen to them. Ask them about their interests and needs. Ask them about your publications: what is valuable in them and how can they be improved?

Ask colleagues

If you cannot meet the readers yourself, find colleagues who are typical of the readers or who work with them directly, and ask them about the readers. If your publications are distributed by extension agents, ask the agents. If they are sold in bookstores, ask the booksellers.

Ask authors

Ask authors about the readers they want to reach. (See unit 1.7.)

Ask editors

If you are editing research publications, consult your editorial board. (If you do not have an editorial board, perhaps you should try to have one appointed.) The members of the editorial board will be respected experts in their disciplines. and will help to ensure the quality of what you publish. They will also know what other people in their disciplines (your readers) want to find in your publication.

Ask organizations

Find out if any other organizations have conducted surveys or collected information about the people who are your readers. Perhaps a government agency can provide statistics, or a professional society can give information about its members.

Conduct surveys

Conduct readership surveys. You may send a questionnaire with your publication or even print one as part of the publication. However, you will probably get better results if you mail the questionnaire separately, with a return envelope. Questionnaires can be mailed to a sample of the readership or all of it. You can ask the readers:

- where they live
- the kind of organization they work for
- their present position
- how long they have held it
- their previous experience
- their age and sex
- their educational background
- their primary fields of professional interest
- other fields of interest
- other relevant questions

Some institutions send a card asking for this information the first time anyone orders or asks about their publications. They file the answers. That way they keep a current record of their readership. They also use the information to tell readers about new publications that will interest those readers. A sample of such a card appears on pages 21–22.

If you edit a journal or a continuing series of books or booklets, you may want to ask how readers use your publications and how you can make them better. Especially in the case of a journal with several types of contents (articles, notes, letters, book reviews, association news, etc.) you may ask readers:

- What parts do they read?
- What parts do they read most regularly?
- What parts do they read first?
- What parts do they read rarely or never?
- What kind of material interests them most?
- How do they use the material you publish?
- How do they receive the publication?
- Does it arrive quickly?
- Does it appear often enough?
- If not, how often would they like it to appear?
- Does it meet their needs?
- Do they want to continue receiving it?
- Where else do they obtain information in this field?

You can also ask what they like and dislike in the publication and what changes they would like to see made. However, the answers to these questions should not be given great weight, because people everywhere are apt to answer them by telling you what they think you want to hear, not what they really feel.

Experiment

Experiment with your publication. Large commercial publishers will sometimes split theirprint runs and publish the same book with two different covers, or the same magazine article written and designed in two different ways, to find out what readers prefer. This is impossible for most of us, but within certain limits it may be possible to modify the design, or contents, or writing style of a journal or series and see what

effect the change has on readers. The greatest difficulty is to measure the readers' response.

Invite readers

Invite groups of readers to visit your institution. This is good public relations, and gives you a chance to meet readers.

Get letters

Encourage letters to the editor. This will tell you what readers are interested in.

Ask non-readers

Try to find out why people are *not* reading what you are publishing. For example, a journal can send a questionnaire to a group of people who should be reading it but have never subscribed. Do they know about the journal? If they don't, the first problem is marketing. If they do know the journal but don't want to subscribe, the main problem may be editorial: the journal is not giving them what they need or want, or is not giving it when they need it, or is charging too much for what it provides. Ask non-readers why they don't subscribe. Ask the same questions when you go to meetings. Ask colleagues to inquire when they go to meetings.

Does it matter?

Does it really help to know the reader?

Here is one answer, from a small country in Africa. There, extension booklets for farmers are produced in the headquarters of the department of agriculture and also in regional extension offices. The booklets published from the capital have not always been successful. Those published because of the initiative of extension agents succeed. Why? The people in the central office aren't in touch with the readers they want to reach. The extension agents know their readers because they work with them every day.

From: _____

_____

_____

_____

STAMP

To: **Information Center**
International Rice Research Institute
P.O. Box 933, 1099 Manila, Philippines

airmail

MAILING LIST ACCESS CARD. The information requested below will allow us to PLACE your name in our computer mailing list files. Incomplete or improperly filled-out forms leave us no alternative but to send you minimum information or none at all. Please read directions and COMPLETE BOTH SIDES OF THIS CARD.

A. My main discipline is (check one):

- ☐ 1. Agronomy
- ☐ 2. Chemistry
- ☐ 3. Communication
- ☐ 4. Crop Management
- ☐ 5. Economics
- ☐ 6. Engineering
- ☐ 7. Entomology
- ☐ 8. Genetics
- ☐ 9. Plant Breeding
- ☐ 10. Plant Nutrition
- ☐ 11. Plant Pathology
- ☐ 12. Plant Physiology
- ☐ 13. Social Science (except econ. & comm.)
- ☐ 14. Soil Science
- ☐ 99. Other

B. Languages spoken (no dialects)

- ☐ 1. native
- ☐ 2. 2nd

Check one: ☐ Dr. ☐ Mr. ☐ Ms. Sex: ☐ Male ☐ Female ☐ Write the first letter of your family name in this box.

Name

Title

Organization

Street Address

City State

Country Postcode

Type of Address: ☐ Residence ☐ Office ☐ Library ☐ Press

(If Library or Press, only fill out name and address.)

I am a new subscriber: ☐ Yes ☐ No

International Rice Research Institute
P.O. Box 933, 1099 Manila, Philippines

STAMP

airmail

C. Highest degree (check one):

☐ 1. Ph D (Doctorate)
☐ 2. MA/MS (Masters)
☐ 3. BA/BS (Bachelors)
☐ 4. High School or vocational diploma
☐ 99. Other _____

D. Percentages of time spent working in the following areas (sum must equal 100)

___ % 1. Policy-making
___ % 2. Program planning/administration
___ % 3. Research
___ % 4. Teaching/training
___ % 5. Extension
___ % 6. Farming (all types)
___ 99. Other (specify) _____

E. Please rank the following IRRI publications in terms of their usefulness to you (1 = most useful; 8 = least useful):

___ International Rice Research Newsletter
___ IRRI Research Paper Series
___ IRRI Reporter
___ IRRI Program Report
___ IRRI Highlights
___ Conference Proceedings (specify) _____
___ Monographs (specify) _____

F. Environmental condition working on (check one)

☐ 1. Overall
☐ 2. Irrigated
☐ 3. Rainfed lowland
☐ 4. Upland
☐ 5. Deep water
☐ 6. Tidal wetlands
☐ 99. Other

G. Rice research at IRRI concentrates on the following problem areas:

1. Genetic resources
2. Genetics
3. Breeding methods
4. Yield potential
5. Grain quality
6. Pest resistance, diseases
7. Pest resistance, insects
8. Pest resistance, other pests
9. Drought tolerance
10. Excess water tolerance
11. Adverse temperature tolerance
12. Adverse soils tolerance
13. Integrated germplasm improvement, irrigated
14. Integrated germplasm improvement, rainfed lowland
15. Integrated germplasm improvement, upland
16. Integrated germplasm improvement, deepwater
17. Integrated germplasm improvement, tidal wetlands
18. Seed technology
19. Soils
20. Soil microbiology
21. Physiology and plant nutrition
22. Fertilizer management, inorganic sources
23. Fertilizer management, organic sources
24. Crop management
25. Integratd pest management, diseases
26. Integrated pest management, insects
27. Integrated pest management, weeds
28. Integrated pest management, other pests
29. Water management
30. Farming systems
31. Farm machinery
32. Postharvest technology
33. Economic analysis
34. Environment
35. Socioeconomic impact
36. Education and communication
37. Research methodology

Within our budget limitations, we hope to supply you with publications or announcements of publications relevant to your needs. Please write below the letters from the list above that correspond to the TWO problem areas that interest you most.

☐ 1st choice ☐ 2nd choice

1.7
Asking authors about readers

Authors usually know something about the people they are trying to reach. Often they work with the intended readers, or know people like them. Authors may be the best, as well as the most convenient, source of information about the intended readers. But editors must ask for that informal ion.

Asking questions

It takes skill and care to ask questions that will produce useful information. Here are five rules that will help in planning questions.

- Don't ask questions that can be answered simply "yes" or "no." You don't get much information from such questions.

- Don't ask questions that are too general. The answers may be too general to be useful.

- Don't ask the author to judge whether the manuscript is interesting, or well written, or too technical, or too long. After working on a manuscript for a long time, few authors can judge it objectively. They have done their best. You must help them to evaluate it now.

- Don't ask the author questions that you, as an expert in communication, should be able to answer. You shouldn't have to ask the author whether the tone should be formal or informal. the words informative or emotional, the language technical or non-technical. These are questions *you* should decide, based on the nature of the manuscript and your understanding of the readership. Ask the author for the information you need to reach those decisions.

- Plan the wording of the questions carefully, in order to get as much information as possible. If you ask the author "Why do you want this published?" the answer might be "To help people" or (occasionally more truthfully) "To get a promotion." Neither answer is of much use to you. You will learn more if you ask: "How will the reader benefit from this publication?" If you ask, "Are you an expert in this subject," the author may be insulted or may just answer "Yes." Again, you have not obtained the information you need. It is better to ask: "Have you written on this subject previously? Please give details." That will tell you how much of an expert the author is.

Questions for authors

The letter reproduced on p. 25 asks some questions you might wish to ask authors about their intended readers. Although the questions have been written as a letter, the best way to get information of this kind is in a face-to-face conversation. But unfortunately, that is not always possible.

From this list you can choose the questions that will be most useful for your purposes. You may wish to revise some of them so they will apply more specifically to your own country or publishing program.

Some authors do not need to be asked every question. An author who has written a paper for a research journal should not be asked questions 4–13 because the nature of the journal will define the readership. An author who has submitted a section to the annual report of a research institute probably does not need to be asked any of the questions. On the other hand, an author who has written a book, a booklet, or a pamphlet could be asked most of the questions — unless the editor should know the answers from previous experience. Even then, it may be useful to ask.

A SAMPLE LETTER

Dear (Author):

We can do a better job of publishing your manuscript if we have a clear idea of why you have written it and of the readers you want to reach. It will be a great help if you would answer the following questions as fully as possible. We recognize that this will take some time, but we believe the effort will make your publication more successful.

1. Please explain in one or two sentences the principal message(s) you wish to communicate.
2. What is new or different about this manuscript compared to others in the same field?
3. How do you hope readers will benefit from this publication?
4. Please tell us about the readers you want to reach. Be specific, giving examples if possible. Please tell us about the typical reader's a) occupation; b) educational background; c) place of residence; d) level of income, if relevant; e) religion or beliefs, if appropriate.
5. How large is the readership you want to reach? If there is more than one type of reader, please indicate how large each group may be.
6. Is your subject restricted to one geographical region or is it of more general use? Please be specific about the areas to which it might apply.
7. What response do you expect from your readers?
8. Are your readers likely to accept new ideas easily? For example, are they accustomed only to traditional ways of doing things, or have they had experience with extension agents or with new approaches?
9. Under what conditions will this manuscript be read? How and where do you imagine it will be read? How frequently will readers want to refer to it?
10. In what form have you imagined this manuscript will be published?
11. Can you provide examples of comparable publications you consider successful?
12. Have you found any special problems in other similar publications, which we should be careful to avoid?
13. Are the readers likely to have other publications on this topic? What are those publications like? For example, are they hardcover or paperback? Do they have large or small pages? Are they heavily illustrated or lightly illustrated, in color or black and white?
14. When is the publication needed? If it is not published by that time, what will be the consequences?
15. How long will this publication be useful?
16. Will a revised edition be necessary within five years? If so, when do you think the revision will be needed?
17. Must the readers have had special instruction if they are to understand your manuscript?
18. Do you feel this publication should be distributed without charge? If not, what do you suggest as a fair price for it?

Thank you for taking the time to answer these questions. We look forward to your answers and to working further with you.

Sincerely,

(signed)

Editor

1.8
Finding good manuscripts

Many people have a mistaken idea of editors. They think editors sit in their offices waiting for manuscripts to arrive so they can publish them. Good editors don't just wait. They actively seek the best manuscripts they can find.

They know that ink, paper, press time, editorial time, and money are all limited — and so is the time people have to read publications. They ask: "How can we make the best use of these limited resources? How can we be sure that we are publishing what is most useful or most interesting or most needed?"

All editors face this problem in one way or another, whether they are responsible for a newsletter, a journal, a series of training manuals, or a large book publishing program. It is never enough to sit back and wait for material to come into the office. The best material may not get there.

Some editors may feel they have no problem because they work for an institution where everything that is published must go through their office. Even then, some researchers may need encouragement and advice. Others must be made to feel that the administrative arrangements are in the interests of the author as well as the organization.

Here are 10 methods editors have found useful in the search for good material. Not all may be applicable in every organization. Most could be.

Be alert

Keep alert for ideas. Read widely. Visit the library regularly. See what interests people and what their current concerns are. Watch for newspaper stories or research reports that suggest an article for a newsletter, a booklet for extension workers, a journal article, or a major publication. Publications issued by an organization should meet the interests and concerns of the people that organization serves.

Listen actively and ask questions when talking with experts, authors, or readers. Find out what they are interested in, or what they are working on. Maybe they will mention a colleague's work that should be published.

A good editor has an alert mind and an active curiosity. These qualities can be developed. But they take effort.

Go hunting

Go out looking for ideas and manuscripts. An editor who sits and waits for manuscripts will receive some, but will they be the best? An organization may have brilliant researchers who never get around to writing the results of their work. The editor needs to know about that work and encourage the researchers to publish it. Another organization may want to convince its donors or the public about some issue (the importance of aquaculture, for example, or of clean drinking water). The material that arrives by itself on the editor's desk may not be the most effective way of delivering that message. Better examples may exist. They have to be found.

Good editors leave their offices. If they work in a research institute, they talk to researchers in their labs or offices. If they publish authors from outside their own organization, they visit local universities or research institutes or health services or extension agencies and find out what's happening there. They go to seminars and professional meetings. Editors need to talk to people.

Build networks

Build networks of advisers. Editors get advice and ideas from many sources: editorial boards, consultative boards, referees, authors, other scientists. All may be able to suggest ideas or report on manuscripts that are being prepared. Colleagues and other experts can also advise on what readers want or need. They may also recommend editors to authors who are looking for a publisher.

It takes time and work to build a network that will feed this kind of information. Good editors not only work on manuscripts. They build friendships with authors, colleagues, experts inside the organization, editorial boards, sales representatives, extension workers. These people are more likely to offer advice if they feel more than a business relationship with an editor. That means talking about personal interests. It means being friendly.

Build on strength

Build on established strengths. If an organization has published a number of books or booklets on a certain topic, authors who are writing in that field will think of it as the publisher they want. Each time the organization publishes another book or booklet in the field, it adds to that reputation.

Start a series

Start a series in a particular topic. This is one of the best ways to establish a reputation quickly. It says that a publishing organization is especially interested in a particular field. Moreover, the general editor for the series will help find manuscripts, and as an expert will help judge them too.

Each new item in the series should include a list of all other publications in the series. In that way, the whole series is advertised every time someone obtains a copy of one publication. That builds interest and reputation as well as sales.

Say “no” quickly

Reject unsuitable ideas or manuscripts quickly. Editors who say “no” quickly do a favor to the author, who won’t have to wait a long time only to receive a rejection. They also save time for themselves and so have more time to look for better manuscripts.

Advise authors

Prepare a folder for potential authors. This can be a small booklet or a leaflet that explains what subjects an organization is interested in as a publisher, and what authors can do to make manuscripts more publishable. It can explain the various ways in which an editor helps authors reach their intended readers.

The folder might suggest to the authors that they should discuss publishing projects with an editor early in the process. Ideally, authors can send a one-page or two-page synopsis even before they start writing. That way the editor can begin planning and will have a chance to make suggestions while the manuscript is still forming. This type of cooperation works especially well within an institution.

The folder can go on to explain how manuscripts should be submitted (physical specifications, clean copy, etc.) and outline what happens after that: refereeing (if any), editing, typesetting, proofreading, printing. promotion, and distribution. Few authors receive this kind of explanation; they appreciate getting it.

Hold seminars

Write a letter or speak to colleagues. Editors who work in larger organizations may need to persuade colleagues that they can publish work effectively, quickly, and professionally.

Some publishing departments hold seminars for authors and people who want to be authors. They explain how to organize a research report, how to write clearly, and what to expect in the process of publication. This is a service to their research colleagues. It is also good public relations.

Advertise

Advertise for suitable manuscripts. An advertisement in a journal or newspaper may attract manuscripts. Certainly it will remind authors that the publisher exists.

Keep a good name

Maintain a good personal and professional reputation. Remember that the best advertisement for good manuscripts is always the reputation of a publishing office and its staff. Keep up a reputation for professional and personal integrity.

1.9
Being an editor

Most editors spend most of their working time dealing with manuscripts—words and numbers and pictures on paper. Even then. they are always relating to people.

On the one hand, they are thinking of the intended readers. This may be the most important single rule in editing: *Remember the reader.* Almost every editorial question can be decided by asking: "What do these readers need? What will these readers understand? What will interest these readers? What will be best for these readers?"

That concern is mostly in the mind. Editors may spend little time with readers. With authors they have more direct and personal contact. It can develop into a fruitful collaboration based on mutual confidence and respect. It can blossom into close friendship.

Editors are constantly representing someone else. To authors, they explain the concerns of the publishing organization. To colleagues in the publishing organization, they speak on behalf of the authors. And to both authors and colleagues, they represent the needs and interests of the readers.

Editorial qualities

A good editor

- reads widely and has great curiosity
- can analyze a manuscript even when the subject is unfamiliar, spot difficulties, and suggest solutions
- is tactful and persuasive in working with authors
- is enthusiastic about work and can inspire enthusiasm in others
- has good judgment about what is important and what isn't
- has a sensitive understanding of language
- keeps secrets
- shows initiative
- is resourceful and enjoys solving problems
- cares about details
- does everything possible to meet schedules
- understands what happens to a manuscript after it leaves the editorial department: design, production, distribution

Editor and author

While good editors always remember the readers, they never forget that the manuscript belongs to the author. The editor's job is to make the message clear, but not to change it.

The publication will carry the author's name. The author will get the blame for any faults, even if they are made by the editor. The author's reputation, not the editor's, is at stake.

Good editors therefore are careful that any changes in the text

- do not introduce errors
- do not change the author's message
- are really improvements

There is rarely only one solution to an editorial problem. Editors are always looking for the best one. Good editors recognize that the author may have found it.

Editorial invisibility

A good editor's work is invisible.

Readers and reviewers complain about bad spelling, poor tables, sentences that are unclear, and errors of fact.

They do not notice if the spelling is correct, the tables are clean and simple, the sentences are easy to understand, and all the facts are correct. Readers expect such things. They will assume that the author did everything perfectly. Only the author will know the truth.

The editor must be prepared to be invisible. This is difficult. Many scientists and administrators working at the editor's institution will not understand what the editor does and why it is important. That is something editors have to accept. We know what we do.

2
Getting the most out of words

Editors spend their lives working with words. They can do a better job if they understand something about the characteristics of words.

We expect surgeons to know their way around the human body, and carpenters to understand the qualities of wood. All professionals and crafts people must be familiar with the tools and materials of their trade. That is true for editors as well.

This module is about words and how to use them effectively.
It is written in English and the examples are from English, but most of it is true for other languages. You must decide how much of it applies to the language in which you edit.

2.1
About words

Words are one of the world's most dazzling inventions. With them, we can transmit information over great distances and through time. We can use them to describe something as common as repairing a bicycle tire or as extraordinary as the birth of the universe. Without words we would have no international cooperation, no history, no religions, no way of communicating the results of research to make life better in the future.

We are not born with words. We must learn them and learn how to use them, just as we learn to use any other tool. Yet because they are so basic to everyday life, people too often take them for granted.

As editors, we work with men and women who have spent years developing their professional skills. They know the tools of their individual disciplines and use them precisely. Some know how to use language with the same precision. Others, unfortunately, are careless or untrained in the use of words. That is why they need editors. Editors know about words.

Looking at words

Here is one of the most useful ways for editors to look at words. *Are they general or specific? Are they abstract or concrete?*

"Food" is a *general* word. It refers to anything we eat. "Rice," "lotus root," "onions," "carp," and "chicken" are more *specific* words. They refer to particular kinds of food. Each of these foods can be cooked in different ways, so we can choose even more specific words: "steamed rice," "fried rice," "pilau," "biryani," and so on. Or we can be still more specific. You could, for example, make a detailed list of exactly what you ate for breakfast this morning. That is about as specific as we can get.

"Reputation" is an *abstract* word. You cannot feel or see a reputation. It is an opinion we have about someone. "Honorary degree," "Medal for Valor," or "Nobel Prize" refer to *concrete* evidence of a good reputation. You can touch or see those things.

General, abstract words for ideas and analysis

General and abstract words make it possible for us to plan and analyze.

For example, social scientists are concerned about employment. That is a general word: it gathers together all kinds of work. It is also an abstract word: there is no single activity you can see or touch that covers everything described by "employment."

If we did not have the general, abstract word "employment," economists would have to list, every time, all the kinds of work they intend the word to cover: farming, fishing, mining, forestry, smelting, toolmaking, bookkeeping, typing, editing, and so on. That would be impossible.

We need general and abstract words. Otherwise we couldn't talk about cattle as a group, or about work as a function, or about things we can't see like freedom or justice. We couldn't talk about editing as a subject of an entire course. We could only talk of individual objects, animals, or actions.

Groups and individuals

General and abstract words allow us to consider all the characteristics that are common to a group and to ignore all the differences.

For example, we may talk of mammals as a group.

We mean all animals with backbones that have hair, bear their young alive, and produce milk for their young. Those are characteristics common to all mammals.

We ignore the fact that some mammals have horns and some don't, some eat only meat and some eat only grass, some live in the sea and some live on land, some are big and some are small, and so on. We are interested only in what they have in common.

Or we can talk about one group of mammals that have horns and chew their food after they have already swallowed it once.

We have narrowed our focus, but we still ignore the fact that these animals may be Philippine water buffalo, Holstein cows, Brahman bulls, African buffalo, or North American bison.

We are still dealing in general words. We have a long way to go before we are talking only about one specific water buffalo plowing a field outside my office in the Philippines.

Ladders of abstraction

In science, animals and plants are ranked in a hierarchy of categories, from the most general to the individual. For example:

kingdom	Animalia	all animals
phylum	Chordata	all animals with backbones (vertebrates)
class	Mammalia	all vertebrates that produce milk for their young (mammals)
order	Pecora	all mammals with horns
tribe	Bovina	all mammals with horns that chew their food after swallowing it once
genus	*Bubalus*	all water buffalo
species	*carabanensis*	all of the kind of water buffalo most common in the Philippines
individual	Batugan	the name of one water buffalo plowing at IRRI

Questions for authors

The letter reproduced on p. 25 asks some questions you might wish to ask authors about their intended readers. Although the questions have been written as a letter, the best way to get information of this kind is in a face-to-face conversation. But unfortunately, that is not always possible.

From this list you can choose the questions that will be most useful for your purposes. You may wish to revise some of them so they will apply more specifically to your own country or publishing program.

Some authors do not need to be asked every question. An author who has written a paper for a research journal should not be asked questions 4–13 because the nature of the journal will define the readership. An author who has submitted a section to the annual report of a research institute probably does not need to be asked any of the questions. On the other hand, an author who has written a book, a booklet, or a pamphlet could be asked most of the questions—unless the editor should know the answers from previous experience. Even then, it may be useful to ask.

2.2
Words and meanings

A word can have different meanings.

Life would be simple if words always had the same meaning: if they were as constant as the value of pi or the speed of light. Unfortunately, they shift in meaning over time. They pick up new meanings. And the things they refer to change.

Different meanings

Take the English word “cute” as an example. It originally meant that someone was clever or ingenious. Now it has come to mean that a person is attractive or pretty.

“Pig” throughout the world means a four-legged animal of the family Suidae. But in many cultures and languages, the word may also refer to people, meaning they are dirty, fat, greedy, or selfish. For a few years in the United States, “pig” was also a rude word for a policeman.

In English, “shark” usually means a kind of fish. But people may be called sharks, meaning that they make money in dishonest or immoral ways. They may cheat, or lend money at high interest rates (“loan sharks”). Just to confuse things, the same word can have still another, almost opposite, meaning: bright students are sometimes called sharks.

Even when words seem quite specific, they do not necessarily mean the same thing each time they are used. In a large city there may be six people with exactly the same name. If only the name is used, which one is meant?

Language is full of traps.

Information or emotion

Some words have meanings that are strictly factual. Others have strong emotions connected with them.

"Centimeter,” “gram,” “inch,” “pound,” “H_2O’ are words with concrete, informational meanings.

“Coward,” “hero,” “liar,” “honest,” “clean,” “dirty” are words with subjective, emotional meanings.

Some statements are made up of words that are concrete and informational. Such statements are capable of proof. Other statements

contain words that express emotions or judgments. They cannot be proved or disproved.

"There are nine people in this room" is capable of proof. It may be correct or incorrect, but it can be checked against definite, concrete facts.

"All the men in this room are handsome" cannot be proved or disproved. We have no universally accepted standard by which to measure what is handsome in men.

"He is honest" cannot be proved. "He returned my lost purse, with all the money and personal possessions complete" is a statement that can be checked and that indicates honesty.

Double meanings

Many words have two kinds of meanings. One is a concrete, objective meaning. The other is an emotional meaning that has grown in people's minds.

C_2H_5OH is purely informational—the chemical formula for alcohol. The word "alcohol" can have exactly the same objective meaning. But the word "alcohol" also has emotions attached to it, good or bad depending on your beliefs and your experiences. Some people think alcohol is necessary for happiness, or for a good party; others think it is evil.

The dictionary defines "propaganda" as an organized plan to spread certain beliefs or practices and the beliefs and practices that are spread in this way. That is an objective description. In fact, for the last 40 or 50 years propaganda has had a second, subjective meaning of "spreading false or misleading information" or "information we don't like, spread by ways we don't like."

Choose with care

Great care must be taken in choosing words to avoid including a meaning that is not wanted.

Often, to avoid repeating a word, people use another word that they think means the same thing. Here, for example, are some of the many words which might be used instead of the verb "to state," as in "Smith and Jones (1987) state that . . . " or "most of the respondents stated that . . . " or "the Committee stated that . . . " Beside each is its precise meaning. Each is slightly different.

state	express fully or clearly
say	put into words, usually in a normal speaking voice
report	state facts that have been found out for certain
certify	declare formally, perhaps in a certificate
affirm	state strongly and positively; confirm
aver	assert; affirm (now rarely used)
declare	make known; state publicly, formally
assert	declare strongly; insist upon one's rights
describe	list the characteristics of

portray	describe clearly in a picture-like way
emphasize	lay stress upon a fact or idea; make it especially prominent
cite	quote in support of a position
announce	say that something is about to happen
propose	put something forward for consideration
recommend	suggest something as suitable for trial or use
maintain	assert as true
imply	suggest something without saying it in so many words
allege	state an argument or excuse, but not necessarily truly
profess	pretend; affirm one's faith; teach
claim	profess to have told the truth
confess	acknowledge; admit one's errors or sins
admit	accept as valid or true

Note that "profess" has in itself three different meanings. Words like that make it difficult to know just what someone means.

The safest words in this list are "state" and "say." They are objective. They are also common and inconspicuous. A reader can absorb them quickly. More unusual words may distract the reader from the main message.

Use a dictionary

Editors must watch words and statements carefully. Words must have suitable, correct meanings for their context. Otherwise they (and the statements formed of words) may carry messages that were not intended. They may interfere with the author's principal message.

In looking for words, writers and editors often use a thesaurus, a book that groups words in lists under various headings. (Most of the words in the list above, for example, might be found in *Roget's Thesaurus* under the heading "Affirmation.") A thesaurus can be a useful tool, but it must be used with caution, and always with a dictionary. Otherwise it is too easy to choose an unsuitable word, or one with a meaning quite different from what was intended.

A dictionary should be an editor's constant companion.

2.3
Using concrete words

Prefer the specific to the general, the definite to the vague, the concrete to the abstract. — William Strunk, Jr.

Every editor likes to work with authors who have a sense of language and a bright literary style. But such authors are rare. Fortunately, anyone's writing can be made more effective by following a number of simple rules and proved techniques. Authors can be encouraged to follow them. Editors can use them when suggesting changes in manuscripts.

Probably the most important rule was set out by Professor William Strunk of Cornell University many years ago. He said that the surest way to arouse and hold the attention of readers is to be specific, definite, and concrete. This is also the surest way to help the author and the reader communicate clearly and directly. Test words and sentences against this rule. Compare:

The radio didn't work.	Every couple of minutes the radio would squeal loudly. With that and the static, we couldn't understand the news at all.
Mussels are good for you.	Mussel meat is largely protein. It is about as valuable a food as beef or chicken.
The crop was poor because of unfavorable weather conditions.	Twenty percent of the crop was destroyed by typhoons and floods.

Which statements communicate more clearly?

Here are five rules that will help you suggest ways to make a manuscript more effective.

Be precise

Question imprecise words. Don't be satisfied with a description of something as fast, slow, good, bad, unusual, interesting, and so on. Words like these create a positive or negative emotion, but don't carry much information. Only the writer understands exactly what is meant. Use measures and quantities when possible. Say how fast or slow, or why something is good, bad, unusual, or interesting.

The sun is very hot.	The sun is hot — about 2200 ºC at its surface.
August rainfall is normally heavy.	The mean rainfall for August is 940 mm.
Per capita income rose slightly.	Per capita income rose 3% to $732.
Transplant the seedlings properly.	Transplant the seedlings in straight rows 20 or 25 cm apart. Place two seedlings in each hill, 2–3 cm deep.
This is an unusual book.	This book is well designed and well printed.

In particular, "very" should be studied closely every time it appears. Does it add any information? Strike it out when possible. Sometimes a single word is more effective than "very" followed by an adjective or adverb.

The patient was very fat.	The patient was obese.

Add details

Add details if necessary to make sure the reader understands clearly what is meant. When possible, use concrete words that will build pictures in the reader's mind.

Rural infrastructure development has the capacity to catalyze significant non-farm employment.	Building roads, schools, hospitals, dams, and other public works can provide many jobs off the farm for rural people.
Upper-atmosphere aerodynamics have unique characteristics.	On the edge of space, the air is thin. Its molecules are so far apart that flying up there is like flying though a sandstorm.

Be understandable

Use words the reader can understand. Consider the intended reader's educational level. Watch for words that are highly specialized.

The area has an annual surplus ofmoisture.	The area has more than enough water each year.
Female labor is particularly vulnerable to mismatch between skill structures and opportunity structures.	Women are especially likely to have trouble finding work that makes use of their skills.
Women are involved in the disposal of the output of rice production.	Women help sell the rice.

Employ a geotome.	Use a spade.
Long airplane trips may lead to transmeridianal dyschronism.	After a long airplane trip you may have jet lag.

Be direct

Use the simple, direct word rather than the longer word or expression. Here are some examples:

adequate	enough
assist	help
beneficial	helpful
commence	begin
close proximity to	near
despite the fact that	although
during the course of	during
employ	use
endeavor	try
exerts a lethal effect	kills
for the purpose of	to
frequently	often
hold a meeting	meet
in attendance at	attend
in the event that	if
in the initial instance	at first
in some cases	sometimes
in view of the fact that	because
initiate	begin
inquire	ask
inundate	flood
is equipped with	has
large number of	many
magnitude	size
obtain	get
pass away	die
prior to	before
purchase	buy
remunerate	Pay
request	ask
state of the art	most up to date, advanced
subsequent	next
subsequent to	after
sufficient	enough
the present paper	this paper
the present writer	I
until such time as	until
utilize	use
utilization	use
with a small amount of effort	easily
with reference to	about

Shorter, more direct words save paper, money, and time. They have fewer letters to typeset and print; they also have fewer to read, which saves readers' time. Just think: to change "utilization" (11 letters) to

"use" (3 letters) is an increase in efficiency of 267%. Any researcher would be delighted to obtain such high results in an experiment!

Remove jargon

Cut jargon ruthlessly. Jargon is a language that has grown up in government, business, science, and other bureaucracies—at least in the English-speaking world. It tries to make the message and its sender seem important. It uses long words that sound impressive when simpler words exist; it uses several words when one would do the job; it uses complex sentences when the same thought could be said more directly. Whether or not jargon makes the sender seem more important, it makes the message more difficult for the receiver to understand. Sometimes that may be the idea.

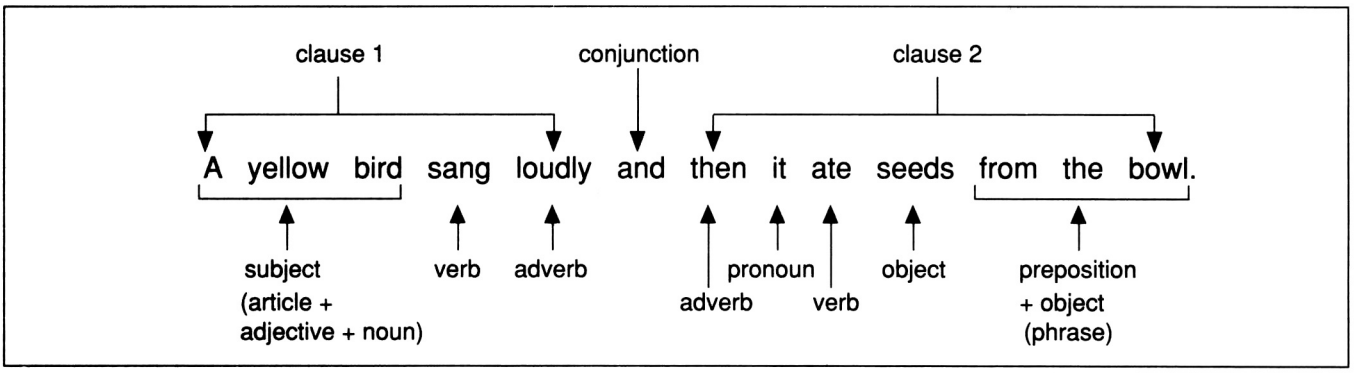
On average, among adults total food intake was higher for males than for females.	On average, men ate more than women.
The shift in production technology that takes the form of substituting machines for labor connotes the presence of prior changes in the traditional production mode.	Before farmers start using machinery, they usually have adopted other changes in the way they grow their crops.
I hope this project will initiate a mutually rewarding editor-author relationship.	I hope we will work well together.
It must be emphasized that nothing in this plan is self-fulfilling and the plan is as good as its implementation. Formulation of the plan is one thing and operationalization is another thing.	It is not enough to make this plan. It must be carried out.

2.4
Building forceful sentences

The building blocks of a sentence, in descending order of importance, are

verb
noun
pronoun
adjective
adverb
preposition
conjunction
article

They go together in this fashion:



Good writing combines these building blocks to give them force.

Push along the reader's eye

The reader's eye has to work hard. It must read across one line of words, then find the beginning of the next line of words and read that line, and keep on doing this until the reader stops. As editors, we can help the eye work by using type that is legible. We can also help it move along the line by giving it forceful words, words that carry the reader's eye and mind along by their own energy.

Think of the reader's eye as lazy. Forceful words push it along. Editors help authors by suggesting more forceful words.

Each language has its own rules for forceful writing. Here are six rules for forceful writing and editing in English. Many of them are true for other languages as well.

Use verbs and nouns

Make verbs, nouns, and pronouns—in that order—do most of the work. Verbs and nouns are the strongest parts of speech. Adjectives and adverbs are useful, as long as they are precise. Often, however, they can be changed into verbs or nouns, giving the sentence added force. Nouns also can be changed into verbs for greater force.

Deepwater rice copes efficiently with the rapid rise in water due to its quick growth habit and its floating characteristics.	Deepwater rice copes efficiently with the rapid rise in water because it grows quickly and it floats.
There is much anxiety on the part of the people with reference to the rising cost of food.	People worry because food prices are rising.
Development of varieties that utilize available nutrients more efficiently is one of our major breeding objectives.	Our breeders are trying to develop varieties that use available nutrients more efficiently.

Use active verbs

Use verbs in the active voice. Verbs can be active or passive. In the active voice, somebody does something; in the passive voice, something is done. The active voice carries the action; the passive voice has it carried.

Sentences with active verbs are more natural and have more force than sentences with passive verbs. Usually they need fewer words; their meaning is clearer; the subject is prominent; the object comes later, receiving the action.

Passive verbs may deaden the impact and add words; sometimes they may confuse the reader.

Tests were conducted to determine the rate of diffusion.	We ran tests to find the rate of diffusion.
The possible causes of the disease are now being looked into by the institute's specialists.	The institute's specialists are studying possible causes of the disease.
In this paper, the second approach is considered.	This paper considers the second approach.
The screening procedure is illustrated in Figure 5.	Figure 5 shows the screening procedure.
Table 3 shows that the incidence of disease was decreased 10%.	The incidence of disease decreased 10% (Table 3).

Nevertheless, there are times when passive verbs are preferable, especially when reporting research. Passive verbs may be used effectively when the person doing the action is unknown or unimportant, or is less important than the action itself.

Corn was cultivated five thousand years ago.

Any increase in the cost of production is inevitably passed on to consumers.

One bag containing 24 g of Abate 1% sand granules was suspended 10-15 cm in the water in a single site at the center of the pond.

The weeds were introduced as pre-germinated seeds, directly after transplanting the rice, and thinned to the required density later.

The passive is particularly useful. as in the last two examples, in describing materials and methods in a formal research report. Using the passive avoids repeated references to the person doing the research. (It would be boring to start every sentence: "We did this . . . Then we did that . . . And then we passed to the third stage . . ." and so on.) The passive can also make it easier to move from one sentence to the next. The following example mixes active and passive sentences for a smooth flow of ideas.

Brown leafhoppers are one of many pests attacking rice. Plants infected with these insects are also likely to be infected by sooty mold fungus or ragged stunt virus.

But the passive is also used for less acceptable reasons. Many researchers prefer the passive because it places the person doing the action at a distance. Often the person is not even mentioned. Reports in the passive voice sound impersonal and objective, and therefore may appear more reliable. The author, consciously or unconsciously, may see the passive as a way to avoid personal responsibility and hide the possibility of personal error.

It was found that the coliform levels were higher downstream.	We found that coliform levels were higher downstream.
It has not been possible to demonstrate conclusively the involvement of these plasmids in hydrocarbon degeneration.	I have not been able to show conclusively that these plasmids are involved in hydrocarbon degeneration.

Does it really matter what kind of verb is used? Professor Lloyd Bostian of the University of Wisconsin reports an experiment suggesting that it does. More than 1000 agricultural scientists were shown two texts, one written in the active voice, the other in the passive voice. In neither case was the author identified. The sample group split when it was asked which of the authors seemed more competent as a scientist: 33% chose the passive writer, 26% chose the active writer, and 42% had no opinion. But the majority (55%) of the same people said they preferred the writing in the active voice and thought it was appropriate for science; only 32% preferred the passive voice, and 13% had no opinion.

An active verb requires a subject, and that sometimes will be the author. Many people have been trained not to use "I" or "we" in scientific writing. But there is nothing wrong in using the first person pronouns "I" or "we" occasionally. They can make the writing clearer, and often more effective.

Not all verbs should be active. The passive is often preferable, if only for variety. Yet every passive verb is worth examining, to see whether the active voice would be more effective.

Find strong verbs

Use strong verbs and avoid weak ones. Especially avoid the verb "to be" in all its forms. It is the weakest and most passive of all verbs. It simply exists. It just sits there. Look for stronger verbs to take its place.

The farming of tilapia is a lucrative business in the Philippines.	Fish farmers in the Philippines are making profits growing tilapia.
The prime vector of DHF* is highly associated with human beings. Its breeding places are indoors where clean water is found.	The prime vector of DHF lives close to people. It breeds indoors in clean water.

* Dengue Hemorrhagic Fever

Other weak verbs are *get, take, do,* and *make.* Look for stronger substitutes.

I got the message to her.	I sent her the message.
Take the turn to the right	Turn right.

Break up noun strings

Make nouns work as nouns. Don't string them together as adjectives. We frequently make two nouns into a single expression —for example, "energy resources" or "Anopheles mosquito." This presents no problem.

Three or four nouns in a row are harder to read. Such strings of nouns seem impressive. and they do pack a great deal of information into a few words. But the density of information is so great that it can be almost impenetrable.

The following material substitution and process changes were effected.	We made the following changes in materials and processes.
Guidelines enforcement for laboratory worker safety is a management responsibility.	Management is responsible for enforcing guidelines for the safety of laboratory workers.
Clayey soil has maximum water retention ability.	Clayey soil can hold the most water.

There is a simple rule in editing such strings of nouns. Nearly always, one or more of the nouns is built from a verb. Find the action in the sentence. Find the buried verb.

From the last example, incidentally, we may be able to understand why researchers sometimes use language that is more complex than necessary. The soil physicist who wrote the original sentence probably had in mind, if not in hand, a table entitled "Water retention ability of different soils." The table listed types of soils in the order in which they retain water—sand, sandy loam, loam, silty loam, clay—perhaps with some quantitative measure. The title of the table followed scientific usage and was appropriate for its purpose: in analyzing the results of research, data must be set out under general headings. The author simply transferred the words of the title to the manuscript. But what is correct in a table may not be best in text. The two are read differently. They should be considered separately and often should be written differently.

Show relationships

Keep related words together. The reader must be able to see relationships between building blocks in a sentence. If two words or phrases are close together. the reader can tell easily that they are related to each other. If they are separated by other words, the reader may be confused.

In the following two sentences only one word has changed position, but the meaning has been completely altered.

The government must be able to estimate each year the amount of the crop that will be harvested early.	The government must be able to estimate early each year the amount of the crop that will be harvested.

Sometimes related words or phrases are separated by so many other words that the reader loses the message.

In this report I am going to describe how the human resources are utilized for tapping the skills of "women in technology," which so far had been only monopolized by men, to satisfy the basic needs of a supply of drinking water in the area where they live at the village level.	This report describes how women in the villages obtain drinking water, using technology which had been previously monopolized by men.

Sometimes the actual message is not what was intended.

All the insects were not killed by the spraying. (*That is, all survived.*)	Not all the insects were killed by the spraying. (*That is, some survived.*)

"Not" and "only" need special attention. "Only" in particular is often misplaced by English speakers. Often the meaning is clear no matter where it is placed; but consider the following examples, any one of which might be correct.

One percent only spoke English. *(They couldn't write it.)*	Only one percent spoke English. *(Very few people knew English.)*

One percent spoke only English.
(They had no second language.)

Tie agent and verb

Tie the agent to the verb. The agent is the person or thing that is responsible for the action in a sentence. Forceful, active sentences make the agent the subject of the sentence. Passive sentences often omit the agent entirely.

In editing a complicated sentence, it is often useful to ask: "Who does what?" Then bring the agent and action together.

Determination of institutional policy takes place at the directorial level.	The director decides institutional policy.
A need for reevaluation of the experimental results is seen to exist.	We need to reevaluate the results of our experiments.

Follow four steps

Here are four simple steps that will untangle most complex sentences.

1. Find the action.
2. If the action isn't already in a verb, make it a verb.
3. Find who/what did the action or (in a passive sentence) had it done to them.
4. Put that subject close to the verb.

2.5
Rules for readability

Good writers follow certain rules in order to help the reader. Editors follow them, too, in making an author's text more readable. Here are five more rules to remember when editing.

Keep sentences short

Follow a general rule of "Only one thought per sentence." Ordinarily, a sentence expresses one thought. When that thought is complete, the sentence ends with a period. Then a new sentence (and a new thought) begins.

The reader can absorb only a certain amount of information at one time. If the author's thoughts march in an orderly parade across the page, one at a time, sentence by sentence, the reader will find them easier to understand.

Sentences should not all be the same length: that would be boring. Some should be short, some long, for variety and emphasis. But no single sentence should contain more information than can be grasped easily in a single reading. Here is an extreme example, containing 70 words and five complete thoughts. Is it easier to understand in the revision?

Notable among the activities during the year was the convening of a National Workshop on Science and Technology policy which was a follow up of several previous recommendations at different scientific and political fora, including the recommendations of an UNCTAD mission in 1980 which at the invitation of the Government reviewed the framework of policies and institutions undertaking activities related to technology, and advised on future technology policies and planning.

A notable activity during the year was the convening of a National Workshop on Science and Technology Policy. Such a meeting had been recommended by several previous scientific and political gatherings. One of these was an UNCTAD mission which was invited by the Government in 1980 to undertake two tasks: first, to review policies and institutions active in areas related to technology; second, to advise on future technology policies and planning.

In English, according to several experts, a good average length for sentences is 20 words or slightly fewer. That is in writing for the general public. Scientific writing often averages 30 words or more per sentence, and is that much more difficult to read.

In this context a sentence is defined as a complete thought. Most sentences end with a period (full stop). But some end with a question mark or exclamation mark; and for this type of analysis a sentence is also considered to be a statement that ends with a semicolon or a colon. These last two paragraphs contain eight sentences, including this one, with an average of 14 words per sentence.

Seek simpler words

Keep looking for short, simple words. Short, simple words are usually easier to read and understand than long, complex ones.

In reporting or explaining scientific work, it is difficult to limit words to only one or two syllables. There is no need to avoid long words just because they are long, if they are technically accurate or communicate precisely. But many authors use long words when shorter ones are just as correct. This has already been discussed in unit 2.3, but it is worth repeating.

Short words tend to be concrete and vigorous. Long ones are often more abstract.

In particular, watch words that end in *-ize* or *-tion.* These are nearly always words that have been converted from other words: nouns turned into verbs, or verbs turned into nouns. Often, with a bit of thought, we can return to the more vigorous root.

This paper is an investigation into departmental organization.	This paper investigates the ways departments are organized.
The accident hospitalized four persons.	The accident sent four people to the hospital.
He has trouble verbalizing his thoughts.	He has trouble putting his thoughts into words.
Our goal is the maximization of yield.	We want to obtain the maximum yield.

The last example involves a double conversion, from a noun (maximum) to a verb (maximize, to make maximum) and back to a noun (maximization, the act of making maximum). The sentence might be even stronger if a simpler word were used: “We want to obtain the greatest possible yield.”

Does it matter? Professor Lloyd Bostian decided to find out. His experiments showed that texts written in “nominal style” (depending on nouns instead of verbs) are harder to read than the same passages changed into “verbal style” (with the nouns changed into verbs).

Professor Bostian found that university students read nominal passages 9% more slowly than verbal ones; they also considered them less familiar and less interesting. In other tests, university students found nominal texts 4 to 16% more difficult to understand than verbal ones. In another test, with high school students, nominal passages proved 20% more difficult to read. In still another test, students typed verbal texts 20% faster, with 22% fewer errors, than nominal passages. It does make a difference!

Prune

Remove unnecessary words. Every manuscript contains words that aren't working as hard as they should. Some of them aren't working at all. I have rarely met a manuscript that I couldn't cut by at least 10% without losing a single thought. Some can be cut much more than that.

At present, there are approximately 2,000,000 apple trees in Indonesia with the center of production in East Java. Leaves are hand-stripped off these trees every six months so they can enter a dormant period.	Indonesia has about two million apple trees, mainly in East Java. Their leaves are hand-stripped every six months so the trees can lie dormant.
In the majority of instances, an editorial worker exhibits the ability to fully eliminate most of the different varieties of unnecessary words.	Most editors can remove most types of unnecessary words.

It takes effort to write without waste. A man once apologized to a friend: "I am sorry to write such a long letter, but I don't have time to write a short one." The effort pays, however. It increases the efficiency of communication.

Watch especially phrases like "in terms of" (which can often be cut) or "up to the present time" (which becomes "till now"). "All of" can usually be reduced to ''all'' and "It is the intention of the present writer" shrinks to "I intend."

"It is very interesting that . . . " can nearly always be deleted: if a fact is interesting it should appear so on its own without the reader having to be told. "It will be obvious from the above brief comments . . . " can also be cut, especially if the fact really is obvious.

A good gardener prunes trees and plants to make them more efficient. In the same way, sentences can be made more efficient by pruning.

The opportunities for pruning are enormous. All that is needed is a little time, practice, a sharp eye, and a sharp pencil.

Be positive

Explain things in a positive way. Most readers, like people generally, prefer positive statements. There is an old saying in English: "You can catch more flies with honey than with vinegar." Readers are more likely to stick with an author who sounds positive. The same information can be reported in different ways, but one may sound gloomy, the other factual.

The rate of submission of articles is not changing very much.	Articles are being submitted at about the same rate.

It is especially important to be positive when giving instructions. It is usually more useful to know what to do rather than what not to do. I am indebted to some former trainees for this example:

Discard seeds that are improperly filled, chaffy, split or broken, shrivelled, or show signs of fungal infection.	Select good seeds. These should be whole, plump, and heavy, with a smooth and clean seed coat.

The first, negative, statement by itself is not enough. The readers have all the information they need only when the positive statement (what to look for) is added—preferably before what to discard.

Many researchers seem to fear straightforward statements. They pepper their writing with phrases like "It would seem that on occasion . . . " and " . . . at the time of writing, evidence suggests . . . " Editors must be careful not to make an author's qualified statement into an absolute statement. Yet with care it is often possible to remove some qualifying words without changing the overall meaning.

It is often prudent to revise a sentence to avoid using the word *not.* Such a change makes the sentence more positive. It also has a practical advantage. Readers sometimes skip over "not." Typesetters sometimes miss it too. Then the author's meaning is reversed. That can't happen if "not necessary" is changed to "optional" or "did not pay attention to" becomes "ignored."

Listen to the text

Bring the writing as close as possible to speaking. Written language is different from spoken language. Writing is more formal than speech. Scientific writing is more formal than general writing. Even so, it is always helpful to *listen* to what has been written.

One way to untangle a complex thought or a complex sentence is to ask: "How would I say this if I were explaining it to someone sitting in front of me?" Spoken language has the advantage of being fairly simple and straightforward. If a sentence sounds good, it will probably be easy to read.

A final word on language

Many of us were taught in school that writing should be complex, with long words and fancy phrases. That kind of writing is intended to impress as much as to communicate. That may be a good model for readers who have time to untangle a text. The results of research need to be communicated more efficiently.

An airplane pilot may show off his skill with loops and barrel rolls. I'll be thrilled as long as I'm on the ground. When I'm a passenger in an airplane, I want a smooth, straight flight.

The English that is taught in many countries is out of date. It is the style of English that was popular in the late 19th and early 20th centuries, when European colonialism was at its peak. In those days, everything European was fancy. Buildings were covered with decoration. Furniture was heavy wood and carved with flowers and fruit. Women wore long skirts, tight corsets, big hats, and lots of lace. In modem times we have streamlined the look of our buildings, our furniture, and our clothing. The only thing that too often has not been streamlined is our language. It needs to be simplified too. Good writers and good editors do that.

Truly readable publications are not full of "fine writing." They are simple, straightforward, and concise. They carry the message in a smooth, straight line from author to reader. The rules in units 2.3–2.5 will help smooth the way.

2.6
Testing for readability

The rules for effective writing are not just someone's ideas. They come from a good deal of research into how readers behave: what encourages people to read and what stops them from reading, what makes it easy for them to understand what they are reading and what blocks that understanding.

Researchers have invented a number of tests to measure the readability of any piece of writing in English. Some of these tests are complex. Others are fairly simple.

These tests can help an editor decide whether a piece of writing is appropriate for the intended readers. With experience, an editor may know the answer to that question without using a formula. Even then the test can be used as scientific evidence to help convince authors that their writing needs revision.

Flesch test

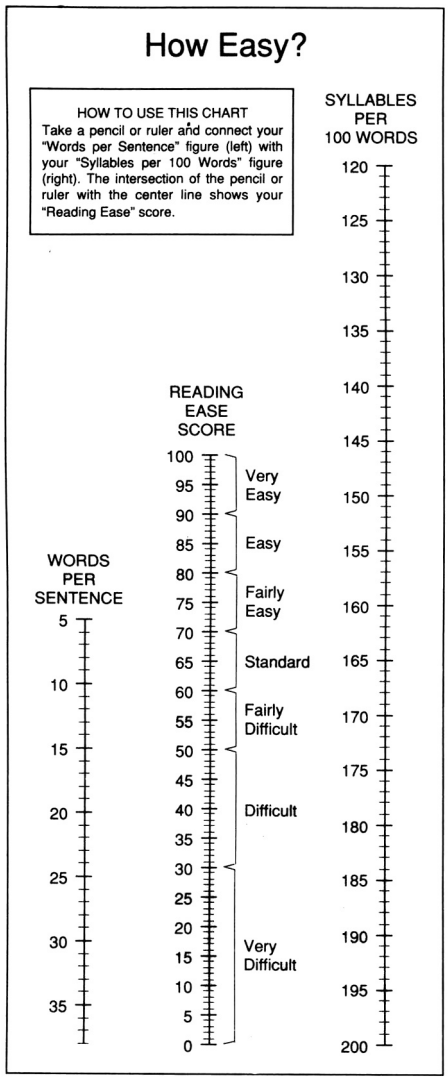
Here is one of the simpler tests of readability. It was developed by Rudolf Flesch, one of the leaders in this field. He has revised it several times since, making it more complex and more accurate, but this version is adequate for most practical editorial purposes. It is valid. of course, only for English, although the principle could be adapted for many other languages.

The test involves five steps:

1. *Choose 100-word samples of text at random.* For example, find your samples in every third paragraph in a short article or on every third page in a book. Don't choose material from the introduction, which has probably had extra attention. Choose a representative number of samples: Flesch suggests three to five in an article, 25 to 30 in a book. Start each sample at the beginning of a paragraph.

2. Count the words in the sample. Count as one word anything surrounded by white space. "100-word,'' "ASEAN," and "1988" are each one word.

3. Find the average length of the sentences in each 100-word sample. Count as a sentence each complete unit of thought if it ends with a period or full stop, question mark, exclamation mark, colon, or semi-colon. If the sample ends part way through a sentence, count that sentence only if more than half of it is in the sample; otherwise ignore it.



Find an overall average for all the samples. Round the number of sentences to the nearest full number.

4. *Count the number of syllables in each 100-word sample.* Count syllables the way you would pronounce them. "Asked" is one syllable but "tested" is two and "1988" is five. Find the overall average.

5. *Using the scale in the margin, find the "Reading ease score."* With a ruler or pencil, connect the average number of words per sentence (left-hand scale) with the average number of syllables per sample (right-hand scale). Where the line crosses the central scale, you will find an indication of how easy or difficult the text is to read.

On this page and the following are two examples. The first seems easy enough to read; but a 100-word sample taken from the beginning of the second paragraph shows it is not. The words themselves are straightforward (only 157 syllables) but the sentences (averaging 25 words) are too long. The readability score is 50, or fairly difficult.

In the second example the same text has been rewritten. Unnecessary words have been cut and sentences have been shortened. In a 100-word sample beginning at the same point, there are 10 sentences and 152 syllables. The readability score has risen to 69.5, or Flesch's desired standard.

Some tests use a different scale. They suggest how many years of education are needed to understand a text easily. One university president I know wrote text that needed 23 years of education. In theory, at least, no one without a Ph D could understand what he wrote.

Example

Aromatic or fragrant rice has a special place in world rice markets. It is generally the highest priced rice in the world. It is also the most difficult to mill, store, and maintain in terms of quality.

The most important aromatic rice in world trade is Basmati rice, produced in the Punjab area along both sides of the Indus River in Pakistan and India. It is mostly grown in Pakistan but India also has a major region.

Basmati is unusual in that it has an aroma that is noticeable and distinct as it grows in the field, as it is harvested and stored, as it is milled, and as it is cooked and consumed. The variety also is unique in that, when cooked, it elongates to almost double its original length as compared with only about a 50 per cent elongation for most other varieties. Its yields are low, its production costs high, and it is used mostly for special occasions such as festivals, weddings, and the like.

The variety is also unusual in that when it is grown in other areas of the world, the aroma is not present. The aroma is apparently a result of environment, the Punjab climate and/or soil, as well as genetic factors.

The most important aromatic rice in world trade is Basmati. It grows in the Punjab along both sides of the Indus River, mostly in Pakistan but also in India.

Basmati is unusual. It has a distinct aroma in the field, at harvest, in storage and milling, and in the cooking pot. Uniquely, it almost doubles in length when cooked: most other rices grow only about 50 percent. But its yields are low and costly. Thus it is saved for special occasions like festivals and weddings.

Basmati grown elsewhere lacks that aroma. It seems to come from the Punjab's climate or soil as well as genetic factors.

Example revised

3
The editor's many tasks

Good editing takes time. Veteran editors often say it takes nearly half a day to edit a normal article—one that is not too long, has been properly organized, follows the style of the journal concerned, and is competently written. They may need a day or more for a long article that involves major editing.

A book-length manuscript may take 100 hours of solid work to get ready for the printer, even if it is in good shape to begin with. Since no editor works without interruption, 100 working hours can spread over more than a month.

This module examines some of the concerns that take up so much time.

Units 3.3–3.5 should be read in close consultation with Module 2. Much of the editor's time is spent making language more effective.

Units 3.7–3.9 assume some knowledge of design and print production. If necessary, refer to the discussion of these subjects in Modules 7 and 8.

3.1
What to do first

A manuscript arrives on your desk. Your job, as editor, is to make sure that the author's message is carried to the reader as clearly and as effectively as possible. Before you start editing, there are a number of questions to be considered. They are discussed in the following pages.

You may not have to deal with all of them. Your responsibilities will depend on the size of the editorial office and your own seniority. The manuscript may be recorded by a departmental secretary or an administrative assistant. The amount of editing to be done may be decided by a superior; or perhaps the major editing will already have been done by a more experienced editor before you receive the manuscript; or there may simply be no time to do major editing because the material must be published in a rush. Some of the other questions may be decided by subject experts or senior officers. On the other hand, editors working on their own must consider all these questions themselves; in every editorial department, large or small, someone should consider each of them.

Is the manuscript recorded?

Make a record that the manuscript has been received. Most publishing houses keep a log book in which they enter every manuscript as soon as it is received. This is the only way they can be sure of knowing exactly what manuscripts they must deal with. They know that in a busy office manuscripts may get pushed to one side and be forgotten.

Publishers keep complete log books for their own protection as well. Manuscripts sometimes get lost in the mail. Occasionally an editor must be able to prove to an author that a manuscript lost in the mail was never received.

Entries in the log book usually record

- the date the manuscript was received
- how it came to the office (by mail? by hand? by courier?)
- how many copies were submitted
- the name(s) and address(es) of the author(s), or at least of the senior author or of the author who submitted the manuscript
- the title of the manuscript
- the number of manuscript pages
- the number of illustrations, and whether they are original
- any other materials received with the manuscript

Is there another copy?

Make sure there is more than one copy of the manuscript. Is this the only copy of the manuscript? Has the author kept a copy?

Manuscripts do get lost sometimes. They get lost on their way to or from expert referees, authors, or printers. They may even be lost in the office. In my own publishing house we once had one-third of a manuscript disappear off an editor's desk overnight. Since it was a complicated work in mathematics, we didn't think anyone wanted to steal it; perhaps it was accidentally pushed into the wastebasket. Luckily the author had a second copy.

If I receive a manuscript and suspect that the author has not kept a copy, I have one made immediately — for my protection as well as the author's.

Is it complete?

Make sure the manuscript is complete and is ready for editing and publication. Do you have the name(s) and address(es) of (all) the author(s)? If there are several authors, it is usually most convenient to direct all questions and correspondence to only one of them, but sometimes you may need to refer to one of the others. In any case, all authors will expect to have their names and organizations appear correctly in the final publication.

Are all parts of the text present? Are any pages missing? Are all the tables there? Do you have all the photographs, drawings, and graphs? Has the author left anything out? Sometimes the author says: "The manuscript is complete but I still have to give you the references" or "There are still a few drawings to be completed." You should have those missing items before starting the detailed editing. It is impossible to check references without a list of the publications cited; it is equally impossible to edit a text that refers to illustrations without the illustrations. To do a thorough job, an editor needs a complete manuscript.

Is the manuscript properly typed? If it is handwritten, is it easily readable? In some countries, handwritten manuscripts are common. This may be because the language (like Chinese) is difficult to type, or it may be because few accurate typists are available. In most countries, however, publishers expect manuscripts to be typewritten. The typing should be clear. The manuscript for editing should be the top copy or a good photocopy, not a carbon copy: weak or smudged copies are difficult to edit and typeset. It should be typed double-spaced, with margins of 2.5 cm or 1 inch, so that there is room to edit. If the manuscript has been typed single-spaced, the editor faces a difficult decision. Should it be returned for retyping? That will depend in part on how much editing is needed, how long the manuscript is, how urgently it must be published, and how easily the author can have it retyped. If it has been typed on a word processor, a revised copy can be produced with little effort.

Are all the pages numbered? Manuscripts sometimes get out of order while they are being edited. Or they blow off the desk or fall to the

floor. If the pages are not numbered, it may be difficult to get them in the right order again. If the author has not numbered them, the editor should.

Are all illustrations identified clearly by a number and the author's name? Even if they will not be numbered in the final publication, an office number makes them easy to identify in editing and production. Each illustration should have the name of the author on the back because it will likely be separated from the manuscript during production.

Are all the illustrations suitable for reproduction? Are the photographs technically acceptable? Do any of the figures or graphs need to be redrawn? (See units 6.2-6.5.) Do you have the original artwork or a clear photoprint of line art? Photocopies made on an office copier will not reproduce properly.

What will the reader encounter?

Read the manuscript once to become familiar with it and to understand its content and purpose. Don't try to edit at this point. Be a normal reader. But do make notes about any problems you spot or about the questions that follow. (Most of these questions are discussed in following units.)

Do all references and citations appear to be present? Has the author been consistent in their style?

Does any quoted material seem to need copyright clearance? Has the author secured permission to use that material?

Has the author provided a list of abbreviations, if one is needed?

Is spelling or grammar particularly bad?

Has the author been inconsistent in such matters as transliteration, units of measurement, underlining of key phrases, and other matters that will need special attention later?

Has the author used local terms for a species or variety or for units of measurement? Will most of the intended readers understand them? Should local terms be defined for a broader readership? Have they been used consistently? Should they be italicized?

Does this publication need an index?

If the manuscript has been refereed, review the comments of the expert readers. Has the author dealt with them adequately? (If the refereeing process is not yet complete, watch for questions you might wish an outside expert to consider.)

Before getting involved in any problems of detail you have identified in this reading, take time to consider some more general questions.

Who is the reader?

Consider the intended reader. Who are the intended readers? Is the audience clearly defined? What do you know about it? (See units 1.6–1.7.)

Why has the author written this manuscript? What response is expected from its readers?

In particular, consider the intended readers' likely interests and education, how and where they will use the publication, under what conditions they will likely read it, and what can be done to attract their attention.

To what extent has the author understood the intended readers and written with those readers in mind?

Who is the author?

Consider the author. If editing is to be successful, an editor must have a good working relationship with the author. It is worth spending time at this point thinking about the author and how the two of you can work best together. Every author is different; each needs to be treated a little differently.

Is this an experienced author, one who is used to being edited? Is this a beginning author who may need to be reassured and to have each stage in editing and publication carefully explained?

Is this an expert with many publications in the field? Is this author (even if experienced as a writer) dealing with an unfamiliar subject? In either case, the editor must check for accuracy. Any suggestions to the expert, however, may have to be specially carefully worded; the newcomer is more likely to welcome advice, especially if it comes from an editor who has worked with other manuscripts in the same subject.

Do you know the author already? Have you worked with the author on a manuscript before this, or do you know someone else who has? How has the author reacted to editorial suggestions in the past?

What relationship can you hope to develop with this author? a formal and distant working relationship? or a developing friendship?

How will you communicate with the author? face-to-face? by memo? by letter? by telephone?

Is your relationship with the author likely to be for one time only? Or is this someone you expect to work with in the future?

What can you tell about the author from the style of writing? What strengths in the writing style do you want to reinforce? What problems in the writing style do you want to correct?

How can you sell yourself to this author?

Can this be better organized?

Consider the organization of the text. Has the author set out the material as clearly and logically as possible? Would it help to reorganize the material?

At this point, some editors make an outline of what the author has written. They may then look for other ways to set out the material.

An outline helps the editor see more clearly if any information needs to be added, or if any can be omitted. Sometimes an author may forget an important section of text, just because the subject is so familiar. Sometimes an author includes material that is interesting but that is not relevant to the purpose of the manuscript.

Sometimes a long section that interrupts the argument can be set apart as an appendix.

How much editing is needed?

Decide how much editing is needed. Editing can take place at two levels. At one level (macro-editing), an editor is concerned with communication, making sure that the message is as clear and effective as possible. At the other level (micro-editing), an editor concentrates on details, making sure that all are correct. The same editor may operate at both levels, but it is difficult to do both kinds at the same time.

In *macro-editing* the editor uses a wide arsenal of tools. These may include all the techniques for effective writing discussed in the previous module. This is sometimes called *substantive editing*. It may involve a few small suggestions per page or almost total rewriting, depending on the manuscript, the author, and the intended readers. It may include

- reorganizing the manuscript
- improving connections between sentences and paragraphs
- eliminating wordiness
- providing headings, summaries, and other guideposts for the reader
- rewriting the introduction and ending
- checking logic
- reducing length
- changing the tone
- changing passive verbs to active ones
- finding concrete words for generalities
- replacing complex words with simple ones
- in other ways introducing into the text the rules for readability

One of the most important questions in this connection is: What shall I do about the author's style of writing? Does the author have a literary style that could be improved but should not be greatly changed? Is it possible to keep the flavor of the author's writing? This should be the editor's goal; it also makes authors happier. But sometimes an editor must carefully rewrite a manuscript in a style that is more suitabIe for the reader.

In deciding how much to do, an editor must consider the personality of the author. Some authors appreciate an editor's efforts and suggestions. Other authors consider them interference. If the second type of author is also a person in authority, the editor may as well suggest only the most necessary changes. Over time, however, even the most difficult author may come to accept and respect an editor's suggestions.

Regardless of the amount of macro-editing, a certain amount of detailed editing *(micro-editing)* is nearly always necessary. Few manuscripts are perfect. Most have some errors in grammar, spelling, or punctuation. Some have errors of fact. Most need an editor's eye to make sure the text is consistent in details of style, for example, whether numbers appear as digits or words ("11" or "eleven"), when and what abbreviations will be used ("BPH' or "brown planthopper"), forms of dates ("March 11, 1932" or "11 March 1932"). Errors and inconsistencies block communication. Correcting them is often called *copy editing or manuscript editing.*

Most decisions of this kind can be made easily if the editor can refer to an established house style or style manual. Even so, some decisions may have to be made during the first reading. If a manuscript is consistent throughout its length in using one style (for example, British spelling), is it necessary to change it to meet a normal house standard (for example, American spelling)? How much time will it take to make those changes, and at what cost? Will such changes make the manuscript more easily accepted by the intended readers?

The more an editor decides to make changes in a manuscript, the more likely it is that some changes will be missed. A few words will be left in the author's original spelling, a few abbreviations left in the author's preference. Such inconsistency may annoy the author, who probably thought the manuscript was all right as it was. And if the errors remain until the manuscript has been typeset, correcting them in proof will be expensive. In general, therefore, think twice before deciding to make changes that affect the entire manuscript. If you do decide to make them, be thorough. Go through the manuscript an extra time, if necessary, looking only for them.

In both macro-editing and micro-editing, therefore, editors should proceed with caution. Try to avoid making changes simply for the sake of change, or because that is the way *you* would have written it. Don't delete an unusual but effective figure of speech, or words the author has deliberately repeated to add emphasis to a statement. Remember that the rules of grammar and readability are not inflexible: good writers who have mastered those rules also know how to break them to get extra impact.

After nearly 40 years as an editor, I still use a soft black pencil, not a colored pen, and I always have an eraser close at hand. I use the eraser a lot because when I read over a manuscript one last time I often find that

my changes are not really improvements; the author's words are just as good, if not better.

If there is any doubt about whose choice of words is better — yours or the author's—use the author's. After all, it is the author's manuscript, not yours.

What shall I tell the author?

Decide what to tell the author at this point. If relatively little editing is required, you can sharpen the pencils and set to work. If more information is needed, you will have to ask the author for it, and explain why you feel it is needed.

If you plan a considerable amount of editing, it is wise to let the author know at this point. Then it won't come as a surprise. It may also save time if the author refuses to accept so much revision.

It may be wise to tell the author at this point, also, if your house style differs greatly from the manuscript. Some authors feel strongly, for example, about the use of capital letters. They want to refer always to the President or Director General, never to the president or the director general.

Face-to-face conversation with authors is good. At this point, however, it is often best to explain your suggestions in writing, even if the author is only a few offices away. In a memo or letter you have a chance to choose your words more carefully than you can in conversation. Also, the author does not need to react immediately, can consider your suggestions carefully, and may be more likely to accept them.

For more about relations with authors, see unit 3.6.

3.2 Improving organization

Sometimes a manuscript is hard to understand because the author has not considered the rules for readability. The words are difficult, the verbs are passive, the sentences are long and complex.

Other manuscripts are hard to understand for a more basic reason. The author has not organized the material in a logical way. A manuscript that is easy to understand usually moves in a straight line, one step after another, from beginning to end. Other manuscripts wander in circles or sidetracks; a few never reach the end.

The reader should be able to follow the author easily, point by point. One idea should follow directly from the last. A change of idea should be marked by a guidepost.

An author who writes a well-organized manuscript usually has made a careful pian in advance: an outline map showing each major section and where it fits in the overall structure. Other authors sit down to write without a careful plan, or sometimes without any plan at all. They just write. With such authors, the editor may have to help untangle the author's thoughts.

Examine the structure

If you think the manuscript is difficult to understand because the organization is unclear, there is only one thing to do. Try to make a better plan.

One way to begin is to outline what the author has written.

Write an outline in point form of the author's argument. Use headings and subheadings. Follow the author's text, section by section or (in short manuscripts) paragraph by paragraph. You will find an example on the next page: an outline of this unit.

Stripped down to only a few words, the author's plan should be easier to follow. You may at this point decide that it is a good plan, but needs more headings to help the reader follow the logic. Or you may decide that there must be a more effective way to present the material. You can then try to find it.

Questions to ask

Improving organization
1. Introduction
   – importance of good organization
   – value of planning
2. Examine the structure
   – when to do it
   – start by writing an outline
   – ask how it can be improved
   – a model structure
     – sometimes organization is rigid
     – normally, structure follows:
       a. introduction
       b. body (give 4 types)
       c. conclusion
3. Plan paragraphs
   – a model structure
     a. topic sentence
     b. supporting sentences
     c. concluding sentence (sometimes)
   – all sentences must be related
   – length can be determined by:
     a. logic
     b. readers
     c. sense
     d. appearance
   – advantages of short paragraphs
   – an acceptable way to edit
4. Create lists
   – break up complex statements
   – be consistent
   – use logical order
   – identify items - eg. number hierarchies
5. Put up signposts
   a. headings
     – how many?
     – identify levels by typeface or number
     – keep them short, meaningful, independent
     – be consistent
   b. words

You can ask these questions:

- What is the author's main purpose: to inform? to describe a process? to announce something new? to warn? to teach? Does the organization of the text make this purpose obvious and give it importance? Should the purpose be announced at the beginning?

- What is the single most important thing the author wants to say? Is it clearly most important?

- What other ideas does the author want to communicate? Is it clear from the organization of the text that these are of secondary importance? Is it clear how they relate to the most important idea?

- How has the author supported these ideas with details? Are there enough details to be convincing? Are there so many that they hide the message? Is it clear how all the details relate to the primary and secondary ideas? Are the details concrete or specific enough to communicate clearly?

- How long do you think the text should be, given what you know of the subject and of the intended readers?

- Would the author's ideas appear more effective or interesting if they were arranged in a different order? Would another order make the logic clearer? Sometimes all an editor needs to suggest is moving a key paragraph to another position.

- Is there material that does not fit into the main idea or any of the secondary ideas? If there is, should it be deleted? If it cannot be removed, can it be set aside in an appendix? (Once an author was asked to write a chapter on weed control in wetland rice for a volume with several contributors. He included six pages on weed control in dryland rice, a subject covered by another expert in another chapter. The editor cut the six pages.)

- How much do the illustrations or tables help? Would more illustrations or more tables make the message clearer? Should some be omitted?

- Is there a conclusion? Is it what the introduction promised?

A model structure

In organization, as in everything else, manuscripts have different needs. The editor must decide what organization is best for each particular manuscript.

The organization will be determined, in large part, by the subject, the intended readership, editorial policies, and the author. To some extent it will depend on how flexible the last two are.

Sometimes there is little chance to make changes in organization. For example, a report of experimental results in the physical or life sciences must follow a carefully defined plan (see units 4.2–4.4). Otherwise it is unlikely to be published in any established journal.

On the other hand, an annual report may take many forms. The choice may be decided entirely by the director. A new director may want a completely different style of report from what has been done in the past. In such cases, the editor may be able to make useful suggestions about organization.

Teachers of writing, nevertheless, suggest that there are some basic rules for good organization of most written material. Their model structure consists of

1. an *introduction* of one or more paragraphs. This explains the subject of the article or report and captures the reader's attention. It may also set out the plan of what will follow.

2. the *body* of the text. This consists of a number of paragraphs. Each paragraph deals with one section or sub-section of the subject. The body should be organized in a logical manner, and the reader should be able to spot the logic easily. Four common methods of organization are

- *chronological:* starting at the beginning and going to the end (e.g., the steps in transplanting rice; or the materials and methods section of a scientific study)

- *logical:* dividing a subject into analytical blocks (e.g., a study of methods of rice cultivation by environmental conditions: upland, rainfed lowland, irrigated, tidal wetlands, deepwater)

- *cause and effect:* discussing the reasons for doing something and then showing the results (e.g., examining the impact of genetic engineering on rice yields and resistance)

- *comparison and contrast:* showing how two or more related things are similar or different (e.g., a comparison of deepwater and dwarf rices as examples of adaptation to environment)

3. a *conclusion* that summarizes the main points and leaves the reader satisfied.

Plan paragraphs

The building blocks of a text are paragraphs. A sentence expresses one thought. A paragraph is a group of related sentences that express one main idea.

In good English writing, paragraphs are tightly organized building blocks, each consisting of

1. a *topic sentence,* which states the main idea of the paragraph. The topic sentence may also indicate the limits of discussion in that paragraph. It is usually the first sentence in the paragraph, but occasionally may be the last.

2. *supporting sentences,* which develop the topic sentence with examples, statistics, reasons, facts, quotations, and so on. There may be as many as necessary.

3. sometimes a *concluding sentence,* which sums up the paragraph and prepares the reader for what follows. Not every paragraph needs a concluding sentence, however. Once the supporting statements are made the discussion can often continue smoothly to the next paragraph without any summing up.

All the sentences in a paragraph should be related directly to the topic sentence and to each other. As an editor, be prepared to remove any sentence that is not connected in subject with the rest of the paragraph. Perhaps it belongs in another paragraph, or deserves to be developed into a paragraph of its own.

Paragraph length

A paragraph can be many sentences long. Or it can be a single short sentence. Paragraph length may be controlled by any one of several factors, among them

The owner of the mungbean noodle factory was worried. Ever since he had moved his factory to a new site close to Bangkok, he was having a problem with broken noodles. The packages of noodles were being returned by buyers, and his business was suffering.

Bankruptcy loomed.

He thought the water at his new site was responsible for the breakage, and approached the Thailand Institute of Scientific and Technological Research (TISTR) to help him solve his problem. TISTR showed him that the water was not to blame, but rather poor control over the key stages of noodle making.

- *logic.* A paragraph, as defined above, should contain one main idea. This is the formal definition in books about English composition. If that main idea is long or is discussed in detail, the paragraph may contain several hundred words.

- *readership.* A paragraph may be considered as the amount of information the intended reader can digest easily at one time. If the reader is not highly literate, paragraphs should be short. That way the reader can take in the information in small bites. Short paragraphs, like short sentences, make a text easier to read.

- *sense.* Short paragraphs give emphasis. Beware, however: this technique is not effective if it is used too often.

- *appearance.* Think how a page of type will look. Long paragraphs can appear as a solid wall of gray that may discourage readers.

Short paragraphs break up the text with white space. It is particularly important to use short paragraphs when the text is set in narrow columns. Consider how effective the short paragraphs are in the example in the margin on the opposite page.

Think of paragraphs as an extra form of punctuation.

You can alter the shape and length of paragraphs without changing the author's words. As a result, this is a kind of editing authors often will accept without complaint. It is easy to shorten paragraphs, and that simple change can make a manuscript much more readable.

Create lists

Complex statements can often be made simpler by breaking them down into lists of separate items. That way, each element in the statement stands on its own. The reader can consider each element separately and see how it relates to all the others in the list.

Compare the following two statements. Which is easier to read?

Macro-editing may include manuscript organization, improving transitions, wordiness, providing subheads and other guideposts, rewriting of the introduction and ending, checking logic, shortening, and changes in tone.

Macro-editing may include
- manuscript organization
- improving transitions
- wordiness
- providing subheads and other guideposts
- rewriting of the introduction and ending
- checking logic
- shortening
- changes in tone

The list on the right is still confusing, however, because it contains a mixture of items. Some are nouns followed by phrases, some are verbs.

Within any one list, the items should be similar. They should be related by their nature. They may all be the same kind of objects, or the various steps in a single process, or ideas at roughly the same level of abstraction. Whatever they are, they should be similar. They should also be similar in grammatical structure: they may be nouns, verbs, participial phrases, or sentences, but they should all be the same.

Macro-editing may include
- manuscript organization
- improving transitions
- wordiness
- providing subheads and other guideposts
- rewriting of the introduction and ending
- checking logic
- shortening
- changes in tone

Macro-editing may include
- reorganizing the manuscript
- improving transitions
- eliminating wordiness
- providing subheads and other guideposts
- rewriting the introduction and ending
- checking logic
- shortening the manuscript
- changing the tone

Within any list, as well, items should be roughly the same length. They may all be brief—one line each, or two or three lines—or they may each include several paragraphs of discussion. Both kinds can be found in this publication.

A list is usually easier to understand if the items are arranged in a logical order. They may be set out, for example, in order of importance, or in a recognized geographical arrangement, or in alphabetical or chronological order. Lists are especially useful in setting out, one step after the next, the stages in carrying out a process such as assembling a machine or editing a manuscript.

The separate items may be identified in various ways. If the order is not particularly important, the items may start with a typographic device, such as a dash (–) or a bullet (•). Other lists are better set out with numbers and letters. If there are many subdivisions, a complicated hierarchy may be needed to make the relationships clear. For example:

I. xxxxxxxxxxxxx
II. xxxxxxxxxxxxx
  A. xxxxxxxxxx
    1. xxxxxxxxxxx
    2. xxxxxxxxxxx
  B. xxxxxxxxxxx
    1. xxxxxxxxxxxx
      a. xxxxxxxxxx
      b. xxxxxxxxxxx
        (1) xxxxxxxx
          (a) xxxxxxxxx
          (b) xxxxxxxxxx
            i) xxxxxxxx
            ii) xxxxxxxxx
        (2) xxxxxxxx

Few editors, fortunately, need to deal with lists that complicated.

Put up guideposts

A driver on a highway needs guideposts every now and then to show the way. Similarly, a reader needs guideposts that show how the parts of a text are related and where the text is going next.

Titles and headings are basic guideposts.

The *title* of a book, article, booklet, or folder is usually the first thing read. It identifies the subject and should attract interest.

Headings

Headings (sometimes called *subheads)* identify the content and nature of parts or sub-parts of the larger unit. They are usually different typographically from the body of the publication. They may be set in slightly larger type, or in capitals, boldface, or italic.

Headings need special attention.

If there are too few, they may not serve their purpose. The reader may still feel lost, just as a driver may feel lost if there aren't enough signs along the road.

If there are too many, headings can be confusing. In general, don't use more than three levels: important, less important, least important. Otherwise, it will be hard to separate them typographically.

In some scientific publications, it may be useful to number headings, especially if more than three levels are needed. In that case different levels of numbering may be used: for example, 3.2.4: section 3, subsection 2, sub-subsection 4. Numbered subheads are especially useful if the manuscript contains many cross-references.

Headings should be short and meaningful. They should act as a short guide to the reader's eye. If they are too long or ambiguous, or do not stand out on the page, they will not help the reader.

Headings should stand on their own. They should contain enough information (even if only one word) to be useful. At the same time, readers should be able to follow the text without reading the heading. Never let the text refer back to the heading. (If the heading is "Printing," don't allow the following text to begin, "This can be done in two ways." Instead, repeat the subject: "There are two major types of printing, letterpress and offset.")

In any section, headings of the same level should be similar in grammatical structure. They may all be nouns, or adjectives and nouns, or prepositional phrases, or even short sentences, but they should all be the same. Sometimes the headings may be only slightly different from one another, as in the example in the margin.

✗	✔
Planting	Planting
Fertilizers	Fertilizing
Irrigation	Irrigating
Cropping	Cropping

Sometimes there may be no need to use words as guideposts. It may be enough to separate sections or points by numbers. It is even possible to use only a blank space—usually one line—but this kind of guidepost can be lost if it comes at the end of a page.

Words

Language also has guideposts: words that tell the reader the direction in which the author is moving. In English these include the following:

Here comes another fact or idea.	and, moreover, furthermore, or, as well, also
Here comes something opposite.	but, yet, still, although, on the other hand, still, in spite of, however, nevertheless
Here are a collection of points.	first, second, third . . . , first, next, last
There's a connection here.	as a result, because, owing to, for, since, thus, consequently. therefore
Here's more explanation.	for example, for instance, that is, in other words
We're comparing things.	similarly, in comparison, in contrast, relatively, both . . . and, not only . . . but also, different from, just as
This is the order in which things happen.	first, second, third ..., before, then, next, last, after that, since then, up till then
This happens at the same time.	while, meanwhile, at the same time
We're coming to the end.	finally, in conclusion

Good authors and editors use such words. But every sentence doesn't need so obvious a connection to the previous one.* In well-organized writing, connections are often evident without guideposts.

I once went through a book-length manuscript of my own cutting the word "however" whenever possible. I had used it dozens of times. The manuscript read much better with most of them gone.

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* Many people would object to this sentence because it begins with a conjunction. Yet "But" and "And" are excellent guideposts, and the best place for a guidepost is most often at the beginning. Rules of grammar may be broken occasionally if that makes the communication more effective. On the other hand, if a rule is broken too often the technique loses its effectiveness. An occasional sentence starting with "But" or "And" may strengthen the message. Too many sentences starting that way may become monotonous or even annoying.

3.3 Editing for detail

Most editors enjoy the more creative side of their work: suggesting new ways to organize the author's text to make it easier to follow, suggesting changes to the author's words to make them more effective. These are important parts of editing; but they are not the only ones. Sometimes editors get so involved in this substantive editing that they forget to pay attention to details.

Once the macro-editing is complete, careful editors read the manuscript one mort: time to examine details. This is the final stage in making sure that everything possible has been done to help the author reach the reader. It needs a separate reading because it demands a special kind of attention. it takes concentration and practice.

Micro-editing is often called *copy editing* or *manuscript editing*. It is a careful, thorough search through the manuscript for accuracy and consistency—line by line, word by word, number by number, even letter by letter. It is involved with details as small as the spot of ink that marks a decimal point, the tiny digit in a superscript, the single letter that changes the meaning of a word.

Micro-editing deserves just as much time as macro-editing. it may be more important. A readable text is of no use if it contains serious errors. The author's words should be clear, easy to understand, and effective; beyond that they must be accurate.

Check the facts

Details must, first of all, be correct. Check and double-check the manuscript for accuracy.

Has the author written "high" but meant "low"? It happens.

Has someone typed "now" instead of "not" and reversed the meaning? That happens too.

Sometimes an error of this kind does not bother readers, who know what the author intended. For example, *The Meaning of Relativity* by Albert Einstein had been published for almost 25 years and reprinted many times before an amateur mathematician spotted that a plus sign should have been negative. None of the experts in mathematics had mentioned the error because they knew what Einstein meant.

When a reader can spot an error easily and correct it mentally, no great harm is done. However, the reputations of the author and of the publisher suffer.

Other errors may have more serious results. A misplaced decimal point in an engineering manual could cause a bridge to collapse. The wrong unit of measurement in a leaflet setting out the dosages of a drug could poison thousands of people.

Less dramatically, a misplaced decimal point can create an entirely false impression. A recent report predicted that the population of one Asian country would increase by 46 million people in the next four years. The country had only 55 million people at the time. Fortunately, the annual rate of growth was also reported: just over 2 percent. The true increase was 4.6 million in four years, great enough to cause concern but not necessarily alarm.

A good editor cannot pass a column of figures without checking it, or a set of percentages without making sure they add up to 100. Tables should at least be spot-checked to make sure the data in them are consistent 2nd agree with the text.

Editors must also watch for superlatives and absolutes. Is something really the biggest or smallest, the first or last, the highest or lowest? Is such a statement provable? Has it been proved by the author? If you are uncertain, suggest a change to "one of the biggest," etc. Watch especially words like "never," "always," and "unique." It may be prudent to change these to "rarely," "usually," and "unusual." Remember that "unique" cannot be qualified: there is no such thing as "rather unique."

References to people and places demand special attention. The names must be spelled correctly. Sometimes the editor must make a choice, for example with names that have been transliterated from one alphabet into another or that have different forms in different languages. (The English call the capital of Austria Vienna, but the Austrians call it Wien.)

It takes great care to check the boundaries of countries involved in disputes over territory. Yet books have been banned from some countries because they contained a map that did not agree with those countries' policies about a border or the name of an area.

Editors must also watch for statements that are not only inaccurate but harmful. These can lead to lawsuits for libel or invasion of privacy.

But facts are not the copy editor's only concern.

Enforce the rules

Clear written communication depends on hundreds of rules. These are not like the law of gravity. They do not exist on their own. Over the years, however, people have agreed to follow them in order to overcome the limitations of writing and print.

For example, "book" might be spelled "buk" or "buc" or "booc" or "boock" and the word would sound just about the same. Four hundred years ago, there was no complete agreement on how words in English should be spelled. Later, people agreed on standard spellings to avoid confusion and make it easier for readers to recognize what the author intended to say.

In the same way, we could find several ways to indicate that a set of words identifies the title of a book or a journal. To simplify matters, many publications agree that, in the body of a text, titles of books and journals will be underlined or set in italic. Titles of articles are sometimes placed in quotation marks to distinguish them from the title of the journal in which they appeared.

The more complex a subject is, the more important it is to have rules, and to follow them. So long as everyone agrees that "N" means "nitrogen," "P" means "phosphorus," and "K" means "potassium," there is no need to spell out the entire words in every chemical equation or even on every bag of fertilizer. If we ever lost that agreement—if some people were to decide that "P" should mean "potassium"—the result would be chaos.

Copy editors must have a thorough knowledge of the rules and apply them thoroughly. This takes attention and a sharp eye. It also takes many hours. It goes faster with experience.

Impose consistency

The rules must also be applied consistently. The same word should be spelled the same way throughout a publication, even if the dictionary does recognize two forms of spelling it. The same form of citing references should be followed throughout. Punctuation should follow the same rules throughout, and so on.

Inconsistency is disturbing in any aspect of life. In print it can slow down, confuse, and even mislead the reader.

Check the editing

In suggesting changes to the manuscript, editors sometimes accidentally change the author's meaning. They may even create errors. At a final stage of detail editing, check any suggestions that you or others have made. Check your own micro-editing to make sure it is correct.

As an example, an editor encountered the text on the left and changed it to the one on the right.

Improper cargo handling of fruit results in spoilage by as much as 17%. Fruit containers, for instance, put near the ship's engine will compound spoilage.	Fruit placed next to the ship's engine room may be spoiled by as much as 17%.

The editor had the right idea: to simplify the statement and cut out unnecessary words. But he forgot that there are many ways of handling cargo improperly, and putting fruit near the engine room is only one of them. The editor took an example and made it into a general statement. He forgot the important words "for instance." A more accurate revision would be:

Improper cargo handling of fruit results in spoilage by as much as 17%. Fruit containers, for instance, put near the ship's engine will compound spoilage.	As much as 17% of the fruit may be spoiled by improper cargo handling — for instance, by storing it close to the ship's engines.

The new version, although passive, gives extra emphasis to the amount of spoilage by placing that figure first.

Many errors are created, as this one was, because editors ignore key words. Others are made because editors *think* they know what the author meant. If you are puzzled by a sentence — if it could have more than one meaning, if it has unfamiliar terms, if it is so tangled that it is impossible to understand — don't make a guess. Write a note to the author saying you don't understand. Ask the author to explain.

No matter how careful an editor is, some suggestions may be inappropriate or incorrect. It's a good idea, therefore, to show the author the manuscript after it has been edited, before typesetting begins. That way, any further changes can be made quickly and easily. Changes will be more expensive to make in proof.

Control your pencil

Authors are usually grateful when the editor finds errors and corrects them. They are generally happy when the editor can suggest ways to make the message more effective. They are less happy when the editor makes changes they think are unnecessary. They are likely to be annoyed if the editor changes their meaning. They will be angry if the editor creates errors.

One way to keep authors happy is to make as few changes as necessary. This is particularly important with authors who have a sense of language and who have worked hard on their text. They will resent it if the editor changes their structures and rhythms. Good writers need little editing. They often know more about writing than the editor does.

Such authors are, admittedly, rare. Every manuscript, however, is the author's work, and should be left as much as possible as the author wrote it.

Here are examples of the kind of micro-editing that annoys authors:

Original	Editor's change
like water	such as water
But the author said	The author said, however
for she argued	because they argued
in this printing	as of this printing
all right	alright
under way	underway
any more	anymore
consecutive	continuous
not different	indifferent

The first changes are not really improvements. The last five are plain wrong, in spelling or in meaning.

It is possible to prune the text too heavily. A little repetition may help the meaning. The occasional non-working word gives the reader a chance to draw a breath. As one scientist remarked: "Loss of redundancy gives the reader a headache."

In general, don't make changes you can't explain to the author. It is not good enough to say "It sounds better to me that way . . . " You should have a solid reason. It may be your organization's house style. It may be the spelling in a dictionary or a fact in an authoritative publication. It may be the proven rules of effective writing. You should always be ready to defend your editing to the author. If you can't give a reason, maybe the change shouldn't be made.

Ask questions

Instead of making changes, consider asking questions. Say to the author: "Could you add a little about this . . . ?" or "This has been said a few paragraphs earlier. Could we remove it here?" or "Is this correct?" or "Would you consider this possible rewording . . . ?"

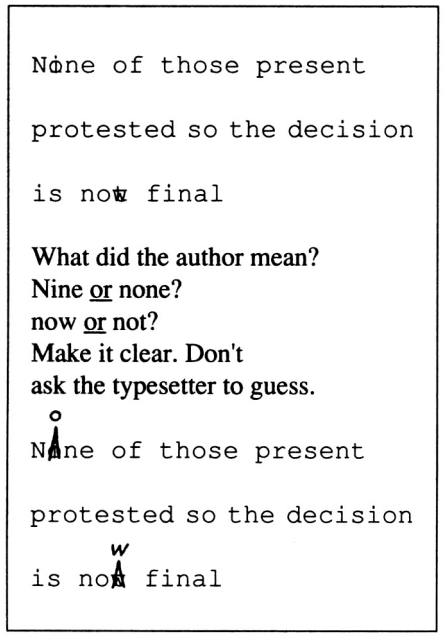
Most important, question any facts that seem inaccurate or incomplete. Ask if something isn't clear or puzzles you. Editors should keep asking questions. They act for the readers, who won't have a chance to ask for themselves.

As a general rule, don't write these questions in the margins of the manuscript. They are hard to read there, and they make the manuscript messy. Write them on labels which can be attached to the manuscript, or in a separate memo.

Be neat

All the time, the copy editor must remember that someone else will have to read the manuscript. That person is the typesetter.

A messy manuscript slows down the typesetter. So does handwriting that is too small, or unclear, or too light to be read easily. With that kind of manuscript, the typesetter is also more likely to make errors that will have to be corrected in proof.



Editing must be neat and readable. Any pencil marks must be clear.

Strike-overs in typing should be corrected so that the typesetter does not have to guess which letter is the right one.

Don't write sideways in the margin, or on the back of the typewritten page. Typesetters should not have to turn pages around. Don't expect them to read the back of a page.

If you are making several changes in one line, it may be neatest to write out the entire line.

If you are inserting more than one line, it may be possible to write the addition at the bottom of the page and draw a line to show where it should be inserted. Otherwise, type the insertion on a separate piece of paper. Cut the manuscript where the insertion is to go, and paste it in. Try to use good glue for pasting, or transparent tape. If you use transparent tape, keep it away from the text, unless it is the kind of tape that can be written on. Don't use pins or paper clips to insert material.

Alternatively, type the inserted material on a full page of paper (little slips are likely to get lost) and mark it clearly for what it is: for example, INSERT ◇A◇ ON PAGE 12. On the original page of the text, mark clearly where the insert is to go: INSERT ◇A◇ HERE. Put the insertion page immediately before the original page so the typesetter can find it easily.

Draw a circle around anything you don't want typeset. This includes manuscript page numbers, instructions to the printer, any questions you have asked the author, and any responses from the author. Editors who forget to draw circles around their own comments may find them in the proof.

Don't send half-pages with a manuscript. They can get lost. Paste or tape any short pages on to a full sheet of paper.

When you insert a new page, make sure it is numbered. If you don't want to renumber all the pages, you can mark the inserted page "13a" (or, if there are more, "13b," 13c," etc.). At the bottom of the preceding page (page 13), write "13a follows" so that the typesetter will know there is a page inserted outside the normal order. At the end of the insertion, write "page 14 follows" so the typesetter can be sure nothing is missing.

Of course, it is not only the editor's work that must be neat and easy to read. Authors sometimes provide messy manuscripts, covered with changes in difficult handwriting, or patched together with insertions. Often a copy editor can improve the physical appearance of such manuscripts and make them easier to read.

If a manuscript is so messy (because of the author, or because of the editor) that it cannot be read easily, it may have to be retyped. That creates another problem: the typist may make new errors. When a manuscript is retyped, the editor must go through it carefully one more time.

3.4
Things to watch

Micro-editing is a constant study of detail. Editors must be alert for dozens of kinds of inconsistencies and errors. This unit and the next deal with some of the most important kinds.

They contain a few examples under each heading, but do not answer all the questions that arise in editing even a short manuscript. A complete discussion would require another large volume.

Here then are some of the concerns the careful editor must keep in mind while reading through a manuscript.

Grammar

Nouns and verbs must agree in number. Nouns and pronouns must agree in number and gender. Pronouns and modifiers must be close to the words they refer to. These and other basic rules of grammar should be enforced. Otherwise the message may be confused. Even when the message is clear, such errors make the author and the publisher look foolish.

Here are some examples from actual manuscripts, with an editor's improvements.

The number of tunnels or cavities were lower in the detasseled corn plants.	The number of tunnels or cavities was lower in the detasseled corn plants.
The veterinary staff visits the farmers, inspects the calves and advises them on correct feeding and management practices.	The veterinary staff visits the farms, inspects the calves, and advises the farmers on correct feeding and management practices.
A doctor who allegedly declared a newly born baby dead but later turned out to be alive is now facing a charge of infanticide.	A doctor allegedly declared a newly born baby dead, but the baby later turned out to be alive. The doctor is now facing a charge of infanticide.
Rabbits were observed using 15-power binoculars.	Using 15-power binoculars, we observed the rabbits.

The first example is a Common error; the author was confused because two plural nouns came between the actual subject and the verb. In the second, the author forgot that another noun came between the pronoun and the noun it referred to. In the third, the writer mixed two possible subjects and tripped on the verbs. In the fourth, the author forgot to include the agent.

Editors should not feel superior when they deal with such errors. It is hard work to move ideas from the brain to paper. Authors usually concentrate on what they are trying to say. Sometimes they make mistakes in how they say it. Even the best writers sometimes make grammatical errors.

Good editors as well are reasonable in applying the rules. They are not unnecessarily strict or pedantic. They are sensitive to authors who bend the rules consciously and for good effect. But editors must clamp down on authors who either don't know or ignore the basic rules, just as traffic police must clamp down on drivers who break the rules of the road.

Words

As they struggle to write down their ideas, authors sometimes use the wrong word. Here is an extreme example:

He had been inadequately trained and showed a complete lack of ignorance.	Because of inadequate training, he knew nothing of the subject.

In this case, the author was so concerned about the person's ignorance that he used that word instead of what the person was really lacking, "knowledge." The editor's revision is somewhat neater.

English has many words that sound alike but have different meanings. Books of English usage distinguish, for example, between "imply" and "infer," "flout" and "flaunt," "gauntlet" and "gamut." Other languages have similar traps into which the author may fall.

Registered trademarks present a special concern. They should not be used as general words. The most frequent example is "xerox"; use "photocopy" instead.

If you are in any doubt, look the word up in a dictionary. Every editor should have a dictionary close at hand. Every editor should have the dictionary habit.

Spelling

Authors and typists do not always spell every word correctly. Editors must help. Editors may not know how to spell every word themselves, but good editors know when they are not sure about a spelling, Then they look the word up in a dictionary. No editor should work without a dictionary, or without using it.

The most common misspellings are simply errors in typing. Sometimes they are serious: "now" for "not," or "nine" instead of "none." More often the meaning is clear even if the spelling isn't, and these errors are easy to miss because they eye slides over the wrong letters. "Commerical," "behavorial," and "institite" (for "commercial," "behavioral," and "institute") are common errors.

Even then editors must be cautious: a word that looks like a typing error may be correct. One editor was about to change "categorial" to "categorical" when she had the good sense to check in the dictionary. She found that the original word was what the author meant; it is an unusual word, but it means "pertaining to categories."

Sometimes author and editor may disagree about how a word should be spelled. This may happen, for example, in languages that are still being formalized. The author may not agree with the standard spelling established by some central authority. Editors must decide how they will deal with each such case.

English has a special problem in that there are two styles of spelling: British and American. The difference began in the 19th century when Noah Webster prepared the first American dictionary and tried to make spelling resemble the way the words sound. American and British spelling can be quite different ("jail" and "gaol," "plow" and "plough"), or can differ over only one letter ("labor" and "labour," "analyze" and "analyse," "aluminum" and "aluminium") or the order of letters ("center" and "centre"). Even when the root word is spelled the same, spelling can vary as the word changes ("focussed" and "focused"). Editors must impose consistency in spelling. The easiest way is to adopt one dictionary and follow its preferences.

Editorial decisions should not change the spelling of words in the names of organizations, however. The Centre for Labour Studies keeps its own style of spelling even in a journal that regularly spells the same words as "center" and "labor."

For editors working in English, one of the most troublesome small problems in spelling concerns compound words. When should the words be separate, when joined by a hyphen, when made into one word? ("copy editing," "copy-editing,'' or "copyediting"? All three are used.) Several pages can be written on this question. A good dictionary is a useful guide.

Transliteration

Questions of spelling become more complex when the word was originally written in a non-Latin alphabet. Should the great Russian composer's name be spelled "Tchaikovsky" or "Tschaikovsky"? Both can be found in books, but the first seems to be growing more common. He himself wrote his name in the Cyrillic alphabet, which uses none of these letters. Should a community in Jordan be called "El Rabba" or "Er Rabba" or "AI-Rabbah"? All are used. The editor must choose one

style, be prepared to defend that decision, and make sure that the spelling is consistent throughout the manuscript.

Writing the words of one language in the letters of another language is called *transliteration.* Efforts have been made to create standard systems for various languages, but not all are universally accepted. Sometimes new systems are introduced.

For example, the Chinese adopted a new style of transliteration (pinyin) in 1979; they changed, among other things, the name of Mao Tse-tung to Mao Zedong. Editors working with manuscripts with Chinese words must be careful to distinguish between pinyin and earlier styles.

This is not always as straightforward as it may seem. One of China's great educational centers, Qinghua University, has adopted the pinyin spelling for its name but has kept the old spelling in the title of its publication *The Journal of Tsinghua University.* An editor who modernized that spelling in a list of references would be creating an error.

Punctuation

Punctuation marks are another form of guidepost for the reader. A *period* (full stop) reports that one thought is complete and another is about to begin. A *question mark* announces that a question has been asked. (The Spanish cleverly make the announcement before the question, with an upside-down question mark at the beginning of the sentence.) An *exclamation mark* says "This is important!" or "This is a command!"

Three other punctuation marks indicate a pause somewhat shorter than a period. The *colon* and *.semicolon* connect thoughts that can stand alone but are closely related; the colon may also be used to announce that a list of items will follow. The *comma* is a short pause that separates words, phrases, and descriptive clauses from the rest of the sentence. Thoughts separated by a comma do not stand alone: a comma should never be used in place of a period.

Some punctuation marks work in pairs. *Parentheses* enclose a minor thought inserted in a sentence or between sentences. A pair of *dashes* can do the same. *Quotation marks* enclose the actual words of a person or document. Occasionally one half of such pairs is lost in the typing. Editors must watch that both opening and closing marks are present.

Three other important punctuation marks (at least in English) are the dash, the hyphen, and ellipses. *Dashes* can be used individually to show an abrupt change of thought within a sentence. *Hyphens* connect closely related words. *Ellipses* (a series of three or four periods) indicate that words have been omitted in a quotation.

Punctuation marks not only show the reader how thoughts are related; they also give the reader a chance to pause between thoughts. A person

reading aloud needs to stop from time to time to draw breath. Punctuation gives the reader mental breathing time.

Some rules for using punctuation marks are generally accepted, and when these are broken the editor must be firm. But punctuation is also a matter of taste and judgment. An author may have used a semicolon where the editor would have preferred a period; the author may have added an exclamation mark to stress a statement the editor feels has already been sufficiently emphasized; the author may use more commas than the editor feels are necessary. Such decisions are part of the author's individual style. Editors should respect them, and be slow to change them.

Some punctuation may be decided by a publication's own rules. A journal may have a rule, for example, that periods and commas at the ends of quotations will always appear inside the quotation marks, not outside. (That style is followed in this publication.) An author may feel the style is grammatically illogical, and often it is; but if it is house style it should be followed without fail. (Most American publications follow this rule; many British publications place the period either inside or outside the quotation marks, depending on the logic of the sentence.)

3.5
More things to watch

The list of details in editing may seem endless. It isn't, but it is very long. Here are some more things to watch for. Near the end, you will learn about places where help can be found.

Abbreviations

It is rarely necessary to identify the abbreviations for common units of measurement (kg, km, m, °C, etc.). Nor is it necessary to spell out the full names of organizations or countries that are well known to the readers by their initials (ASEAN, UNESCO, OAS, USA, USSR, etc.)

In general, however, abbreviations should be identified clearly the first time they are used, and editors must take care that this happens. In a book, abbreviations should be identified the first time they appear in each chapter. The normal method is to put the abbreviations in parentheses: for example, "The brown planthopper (BPH) is probably the most serious insect threat to rice in Asia."

There is no need for an abbreviation if the term is not used again. Editors should delete unnecessary abbreviations, just as they prune all other unnecessary words.

If a publication contains a large number of abbreviations that appear frequently throughout the text, it may be most efficient to publish a list of all abbreviations at the beginning. Then the terms never need to be spelled out.

Should the abbreviations of names include periods? Should the International Rice Research Institute, for example, be known as "I.R.R.I." or "IRRI"? There has been a trend toward dropping periods. Most editors think the shorter form is neater and easier to read.

There has also been a trend toward dropping periods at the end of other abbreviations: "Mr." becomes "Mr" in this style. In some publications, periods are even omitted after initials in the names of authors in lists of references ("Ahmed, H S"). And periods are never used after SI (Système International) or metric units of measurement.

Dropping the period can cause confusion, however. Editors must watch for abbreviations that, without a period, look like words: "in" for "inches," "no" for "number," and "US" for United States."

Use of capitals

What words should begin with capital letters? “The Government of India” or “the government of India”? “The Director of the Institute” or “the director of the institute”? “The Department of Economics” or “the department of economics”? No one questions that a title should be capitalized in front of a name (“Prime Minister Tolango”), but after that should it be “the Prime Minister” or “the prime minister”?

There has been a trend toward “downstyle”—beginning fewer words with capitals—because capital letters slow reading. But many authors, and some editors, feel lowercase letters show disrespect. An extreme example of this was the author who insisted that the word “country” should always begin with a capital letter when it referred to his own country, though not when referring to other nations.

Whatever decision is reached, the editor must impose consistency.

Citation of references

There are at least three major systems of citing references, and many variations on each. Within any one of these systems (whichever is chosen), consistency is essential. So is accuracy. Especially when a manuscript has been heavily revised, citations and references do not always match. (Systems of citation are discussed in unit 4.4.)

Cross references

There is a chance for error every time an author refers to another part of the publication: to a table, a figure, a chapter, or another page. Every cross-reference must be checked. The author may have deleted a table since writing the text, or may have added an extra one, but didn’t change the numbers when referring to the tables in the text.

References to pages need to be watched especially carefully. The author is usually referring to pages in the manuscript, but in printed form the page numbers will probably be different. If the editor leaves the author’s original page reference, it may not get corrected in proof. Instead, this kind of cross-reference in the manuscript should be changed to “page 000”, a number that is obviously wrong. That error won’t be missed in proof. Better yet, since changes in proof are expensive, is to remove cross-references to specific pages.

Numbers

Numbers need to be edited as carefully as words. If anything, they must be edited more carefully, because typing errors in numbers are more difficult to spot.

Numbers must of course be accurate, and that has been discussed already. If they are supposed to add to a certain total, do they? Editors check. If a proportion is given, does it agree with the data already provided? (Five is not 23% of 20, even if by accident a manuscript says it is.)

Numbers must also be appropriate. They should not give more detail than is supported by the evidence. A series correct only to full numbers cannot produce averages correct to three decimal places. Nor should

numbers give more detail than the reader can use. Numbers with too many figures may be more baffling than informative. It is easier to understand "12 million" than "12,003,453" and in most contexts the difference (0.03%) is unimportant.

In this connection, special care needs to be taken when measurements are translated from one type of unit to another. A manual for coffee farmers told them to plant their bushes 2.74 meters apart. Now, no one working in a field is going to measure distances to within one centimeter. The manual was based on an earlier text that told farmers to plant their bushes three yards apart — a nice rough field measurement. The author, or the editor, had translated the distance exactly. One of them should have rounded it off to 270 or 280 cm, or even to just a little less than 3 meters.

Numbers may be presented in different ways. Should a large number appear as "12,003,453" or "12 003 453"? The answer depends on where the editor works and the rules of the house. When should numbers appear as digits and when should they be spelled out? Again, rules differ: one rule is to spell out all whole numbers below 10, except when they appear with units of measurement or in a series that includes numbers greater than nine ("5, 8, 12, 15," not "five, eight, 12, 15"). That is only one approach, however. There are others. The editor must establish a rule if one does not exist and then, as always, follow it.

Good editors are more than literate. They are also numerate. They understand numbers and can deal with them with the same skill and confidence as they deal with words.

Units of measurement

Units of measurement must be present, but authors sometimes leave them out. And they must be consistent: they should not jump back and forth between kilograms and tons, for example.

The units should be in common use and easy to understand. A scientific report will likely use SI units. A publication for general readers may use meters in some countries, yards in other countries. Sometimes the intended reader will understand the message only if the author uses national units like cavan, borong, jin, mu, ardeb, feddan, or rai.

The units should also be appropriate. Imagine, for example, that an author has analyzed work patterns by measuring the amount of time spent per. week on each activity. It still may be most appropriate to report the time spent on each activity in hours and fractions of hours, not in fractions of the week. Most people think of time in hours, not in fractions of a work week.

Styles for time

There are many choices here, from minutes to millennia. "20th century" or "twentieth century"? "World War II" or "second world war"? "February 25, 1986" or "February 25th, 1986" or "25 February 1986" or "25 Feb 1986"? "1600 hours" or "4 pm" or "four o'clock in the afternoon"? (But never "4 pm in the afternoon.")

As always, the editor must have a style firmly in mind and ensure that it is followed consistently.

Personal pronouns adjectives, nouns

Do the author's words include everyone who is intended? In English, and in some other languages, it has been common to use a masculine pronoun, adjective, or noun to refer to people generally—women as well as men. ("Every editor should do his best to eliminate errors" or "Better crops benefit mankind.")

If the author is referring to both men and women, an editor may suggest changing the words so that no single sex is implied. This can be done in various ways. One way is to change singular pronouns and adjectives into plural ones that have (at least in English) no gender. ("All editors should do their best to eliminate errors.") Another way is to change the offending word. ("Better crops benefit people.")

This is especially important if the words refer to the intended readers of the publication. Many editors are women. How would it seem to them if these pages always referred to the editor as "he"?

More and more publishers are adopting policies to remove this type of gender-specific language. That makes one more thing their copy editors must watch for.

Tables and illustrations

Tables, graphs, charts, drawings, and photographs must be checked against the text, and the text must be checked against them. Data in all places should be the same. Tables and illustrations present special editorial problems, discussed in separate units.

Help is available

Fortunately, a copy editor does not have to make every decision in isolation. There is much help, contained in manuals of style. These set out rules that have been found to work in the past and that have been accepted by groups of readers.

The Chicago Manual of Style, published by the University of Chicago Press, is probably the most complete manual of its kind. The latest edition, revised in 1982, has more than 700 pages of advice, recommendations, and examples, together with a great deal of other information about editing. Most copy editing questions can be answered by referring to its pages. It is used around the world.

Disciplines, however, have a habit of setting out rules of editorial style of their own, each different from that of others. Citations in a style common in biology might not be welcomed by scholars of literature, for example. A scientific or academic editor must know what style is acceptable to the intended readership, and follow it.

Many professional associations have published their own style guides, among them the Council of Biology Editors, the International Steering Committee of Medical Editors, and the American Institute of Physics.

Many institutions like IRRI have their own style guides, and so do many publishers. Hundreds of guides are available for different kinds of publications and different specialities.

An editor's closest working companions should be a dictionary and a style guide. Both are reference books. It takes time to learn how to use each of them efficiently, but the investment pays off quickly.

Build your own help

Every manuscript has its own problems. Some use specialized terms. Some have unusual spellings. Some have authors who insist on a particular style of capitalization or hyphenation. No style manual can deal with all the problems that arise.

Wise editors keep a list of words or styles for each manuscript. They enter unusual words the first time they appear. That way they can keep track of them, and of how they decided to deal with them.

An individual style sheet of this kind is especially important if an editor is working on more than one manuscript at the same time and the different manuscripts have some differences in style.

It is also important if the institution has no style guide. These style sheets can become the base for a guide in the future.

Rules in editing for detail

To sum up, here are 10 rules in editing for detail:

1. Read the manuscript more than once. The last time, concentrate on detail.
2. Check the facts. They should be accurate.
3. Enforce the rules. They are the basis of clear communication.
4. Impose consistency. It helps communication.
5. Be thorough.
6. Be neat.
7. Control your pencil. Remember the manuscript is the author's.
8. Check your editing. It may need editing itself.
9. If you aren't sure of anything, look it up. Build the dictionary habit.
10. Don't assume words and numbers are correct just because someone wrote them down.

3.6
Working with authors

Whenever editors get together to discuss their many tasks, someone usually asks a question that goes something like this: “What you’re saying is all very well. I agree about editorial standards. I know that most manuscripts can be improved by editing. But how can I get the authors to agree? How can I convince them that my changes are necessary?”

It may seem a difficult problem, and it is a common one. As we will see, part of the problem lies in the attitude of the editor who asks the question.

Let’s face it: tensions do sometimes build between authors and editors. Authors are people, and some are more difficult to work with than others. Some resent any changes made in their writing by an editor they consider their junior. Some men object to changes made by women, and some women object to changes made by men. Some authors reject any suggestions.

Editors are people too, and some of them are more difficult than others. Some lack tact. Some are so timid or hesitant that they fail to inspire confidence. Others are too confident in their own abilities. They wave the style guide or the grammar book or the dictionary and say, “This is the way it must be!” as if they were schoolteachers. Some editors make changes which are not truly improvements. Some lack experience or knowledge of the subject, but that doesn’t stop their pencils. Some make many small changes but miss major problems. Some change meanings and create errors.

Like all people, editors and authors are imperfect. They need to understand one another.

Good editors try to put themselves in the author’s place. They remember that the author has already worked hard to produce a manuscript. They recognize that finding faults in a piece of writing is relatively easy; writing it is much more difficult.

Most authors feel insecure and exposed when they submit a manuscript for editing. No matter how often a person has had work published, each manuscript is a new creation sent out for judgment. What will people say? Authors are understandably sensitive to criticism.

But most authors are reasonable people. They are glad to get help—if they understand that is the editor's purpose. They will consider suggestions carefully and positively—if they believe the editor is acting as a friend.' One author wrote to a good editor: "I am hungry for your editing." There are many authors like that.

If editors don't always understand authors, the opposite can also be true. Misunderstandings arise because authors don't understand how editors can help them. They may see editors as little more than clerks who push paper to the printer. Or they may be afraid that editors will destroy their words. More generally, authors may not understand all the processes involved in publishing. They may not know what is expected of them, and they may not realize that the system has safeguards to protect them.

Avoid misunderstandings

Editors should not assume that an author knows what is going to happen once a manuscript is submitted for consideration or approved for publication. It's a good idea to explain in some detail about referees, editing, the steps in manufacture, promotion, and distribution.

In particular, it's often useful to reassure authors that they will have a chance to read and approve the edited manuscript before it is set in type. Not all publishers follow that procedure, and even those who do follow it may not always be able to do so. An author may be difficult to reach by mail, for example, or there may be special urgency for publication. In general, however, this is a wise policy to follow because it reduces changes in proof. Authors should also be assured they will see proof, if that is the publisher's policy.

Authors who feel confident they are in control of their manuscript are more likely to accept suggestions. Authors who understand the process of publication are less likely to complain about delays and disappointments.

Prepare guidelines

One way to avoid misunderstandings is to explain clearly what authors are expected to do, and what the editor hopes they will do. In a general way, this may be set out in a letter of agreement or contract (see unit 10.2). In greater detail, it can be spelled out in advance in a series of guidelines for authors who are planning to submit manuscripts.

Guidelines may be only a few paragraphs long, or they may consist of several pages of detailed instructions. Samples of guidelines can be found in many journals. Guidelines are especially useful when many authors are involved in writing a single book: for example, a collection of papers or the proceedings of a conference.

Guidelines may set out general considerations such as the

- purpose and intended readership of the planned publication (especially in the case of a collection)
- physical specifications for the manuscript (clear, typewritten, double-spaced on standard bond paper with wide margins; author to keep one copy)
- expected length of contributions
- style guide to be followed for further advice
- dictionary followed for spelling
- deadlines for receipt of manuscript
- author's responsibility to secure necessary permissions
- author's responsibility to read proof
- publisher's offer to supply reprints

Guidelines may also give specific instructions about how to write or prepare the various parts of a manuscript, including:

- title (to be short and informative)
- key terms
- authorship (who is an author, and how identified)
- abstracts
- text
- levels of heading (how to type each level)
- notes (if they are allowed)
- references (style of citation)
- selected bibliography for further reading (if wanted)
- acknowledgments (how to handle)
- tables
- illustrations (how to prepare: see unit 6.2)
- abbreviations and symbols (styles)

It may not be necessary to deal with all these items, or more may be added. The guidelines will depend on the publication and the publisher.

Guidelines save authors time. With them, authors know what is wanted, and know they are not going to meet unpleasant surprises. (Imagine an author who has prepared all the references in one style and then is told—after all that work—another style should have been used. There is one unhappy author!) Guidelines also save editors time. If they are followed, the editor will not have to impose consistency of style.

Make suggestions

Editors may impose changes to follow a consistent house style in spelling, citation, capitalization, and similar details. When it comes to words, and even more to facts, they should be more cautious.
Editors who ask the question quoted at the beginning of this unit create problems for themselves with two words: "changes" and "necessary." They could avoid many difficulties by using two other words instead: "suggestions" and "desirable."

The second set of words recognizes that the manuscript is the author's. Editors sometimes seem to forget that. They get so involved in manuscripts that they make them into what they (the editors) would have written. They take over, and of course authors resent that.

An editor should not pass for publication anything that can be proved to be inaccurate. In that situation, the editor's responsibility is greater to the reader than to the author. But such conflicts are rare.

More often, editorial suggestions are matters of opinion. They are changes in words or organization the editor thinks would make the message more effective. At these times editors should remember that the author's name will appear on the publication, not the editor's. In questions of editorial judgment (as opposed to questions of fact or editorial style), the author should have final responsibility for what is published.

Be persuasive

The problem, then, is how to persuade an author to accept an editor's suggestions.

The first thing is to be absolutely clear yourself why you are editing. It is not to produce a manuscript that is perfect according to some editorial ideal, though that may be a secondary goal. The main reason is to help an author communicate with readers.

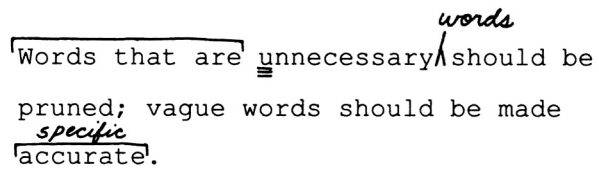
The next thing is to convince the author that is why you are editing. Authors then may not agree with everything you suggest, but at least they know that you are acting in good faith in what you believe are their interests.

After that, there are several ways to make editing easier to accept.

- Suggest changes; don't make them or tell the author to make them. Say "You might do this" or "It might be clearer if you said it this way . . . " or "You could move this . . . "' Do *not* say: "You should do this" or. even worse, "You must do this." I once lost an author by forgetting this simple rule.

- Make as few suggestions as possible. Ask yourself each time: "Would this really improve the manuscript? Is it really better than the author's solution? Is it just something I prefer for reasons I can't explain?

- Leave decisions to the author. One press does not strike out words on the manuscript. Editors there draw a line around words they suggest could be omitted or changed. Then they send the manuscript back to the author, who can either strike out the words or indicate that they should remain. Here is an example of this technique:



- Don't mark the manuscript more than necessary. The pages should be as clean as possible. Don't add typographic instructions before sending the manuscript to the author. If a manuscript is heavily edited, it may be worth having it retyped before sending it for approval.

- Ask the author questions instead of announcing errors. For example, if you think you have spotted a mistake, it is better to ask "Is this date correct?" than to write "This date is wrong!" No one likes being corrected. Most people will accept reasonable questions, and will be grateful for having them raised. Questions can be written on slips of paper you attach to the manuscript. Ask the author to leave the slips in place so you can check how the questions were answered. Remove the slips before sending the manuscript to the printer.

- Be prepared to compromise. Don't expect the author to accept every suggestion. Accept the author's decisions gracefully.

Be diplomatic

Any letters you write about a manuscript need special care. Here is a formula I often follow:

- Start positively. Compliment the author. Say something good about the manuscript. It is "valuable" or "important" or "informative" and "we are happy to be able to publish it."

- Make the letter sound friendly, concerned, and modest. Don't sound like a school teacher saying to the author "This is where you went wrong!" or "How could you be so stupid?"

- Explain, in a general way, the purpose of the changes. You may wish to explain that the changes are intended to help the author's message reach the reader as clearly and effectively as possible. You may say that with this goal you have suggested simpler or shorter ways of expressing the message. You may add that some changes have been made just to conform to the publication's rules for style. It can be useful to give a few examples of each kind of change and why you have suggested them.

- Emphasize that the editorial changes are only suggestions. Recognize that the manuscript belongs to the author, who must make the final decision. Say you hope the author will find your suggestions acceptable.

- Say you hope you have not created any errors or omitted any important information in making these suggestions. Ask the author to correct any errors since they were made unintentionally.

- End positively. Say you look forward to hearing from the author. (This implies you expect a positive response.) Maybe say again that this is a valuable manuscript and you are happy to have the chance to publish it.

People may say a letter like that manipulates the author. I suppose it does. Some people with whom I have worked for years have received several letters following this formula, and they joke about it. “Ian always starts by saying something nice,” they say, “and then he says BUT. . . ”

Every editor must find his or her own best way of working with authors. This is the final test. It is not enough to find ways to improve a manuscript. The author must be convinced that suggestions are made to be helpful and that they really are improvements. In addition to everything else, editors must be able to sell themselves and their ideas.

3.7
Instructing the typesetter

Once editing is complete, the manuscript usually goes to the author so that he or she can answer the editor's queries and review the editor's suggestions. When it returns, the editor reads it one more time to see how the author has responded and to tidy the manuscript for the typesetter.

Someone then must give the typesetter instructions. In large organizations this may be done by special production staff or designers. Elsewhere, editors do it.

The text in print will look very different from the manuscript. The editor's job at this point is to make sure that the printed page looks the way it should. That takes detailed instructions.

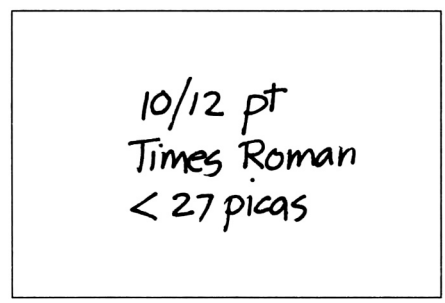
This unit assumes some knowledge of typefaces and type measures. If necessary, refer to units 8.3–8.5.

The typesetter needs to know the following:

Instructions

Basic instructions. Five basic instructions should go in the margin at the beginning of each major section of the manuscript. They are:

- size of type (in points)
- leading, or space between lines of text (in points); this is usually shown by reporting the sum of the type size + leading, so that 10 on 12 pt means 10 pt type with 2 pt space between lines
- name of the typeface
- length of typeset lines (in picas)
- nature of setting, spelled out or shown by symbols:
  justified (< >)
  flush left, ragged right (<)
  ragged left, flush right (>)
  centered (> <)



This describes the type used for text in this manual.

Any variations in type style. The typesetter will set exactly what is given. Normally typewritten copy is set in uppercase and lowercase roman. Special instructions must be given whenever the text is to be set in italic, boldface, level small capitals, all capitals (if the typing is in uppercase and lowercase), or uppercase and lowercase (if the typing is all capitals).

Use copy editing marks the typesetter understands. Some commonly used marks are given on page 98.

Important copy editing marks

insert something ∧ or ∧	Editors sometimes miss∧a word. But not often.
close up ⁀	Edit⁀ors are wonder⁀ful.
delete punctuation ℯ	I think, ℯhe really said that.
transpose ⁀	Authors do always not agree.
period ⊙	Some authors are difficult⊙
insert space #	They don't believe#in editing.
comma ↟	Some↟on the other hand, welcome suggestions.
add quotation mark ⅋/⅋	"Have you met any?⅋ she asked.
superscript V	I read about one once.V
subscript Λ	Maybe he was drinking CΛHΛOH.
em dash 1/M or M or em	Is that possible 1/M an author?
en dash 1/N or N or en	It happened in 1983 1/N 4.
spaced en dash # 1/N #	Maybe # 1/N # but let's pretend it didn't.
make words lowercase /	The /ditor has an interesting job.
make a line of capitals lowercase ⌐	But editors also /HAVE PROBLEMS.
full capitals ≡	Even at irri?
small capitals =	Editors don't stop work at 5 pm.
italic ——	They do get help from the Chicago Manual.
boldface and ~~~ 1-em space □	Training □ Editorial trainees have special problems.
delete underlining /////	Let's not go into that.
flush left ⊏	⊏ Let's start over.
open paragraph ¶	There is much to remember. ¶First, the ...
center ⊐⊏ or ><	>THE END<

Any special spacing within the lines. Extra space can be used to separate elements within a line, or to set apart special paragraphs. For example, the plan of the publication may call for third-level headings that are on the same line as the start of the text but separated from it by a 1-em space. In a list of numbered items, it may call for a l-en space between the number and the item, and a l-em indent on any further lines in that item. Or an entire paragraph (perhaps a quotation) may be indented 2-ems on either side. All these possibilities are shown in the sample manuscript on page 100.

Any extra space between lines. Space may be inserted above a heading or below it. A line of space may be added between sections simply to indicate a break. These should be marked each time, unless the typesetter is skilled and knows your publications well.

Spaces may be described in whole lines or half lines. If finer spacing is needed, it is described in points. A line of space includes the leading. For example, in 10/12 pt type, a one-line space is 12 pts.

Special vertical spacing. Chapters or sections may begin partway down the page. The typesetter must be told how much "drop" to leave. It is usually measured in picas.

Text set in a size different from the main text. A quotation of several lines is often set in a size smaller than the main text. Sometimes it is indented as well, or is set ragged right to make it look quite different from the main text. Examples may be set in a different face. Abstracts are commonly set in smaller type and indented.

Such passages should be clearly marked. The simplest way is to draw a line down the left-hand side and write the special instructions for those lines: typeface, size, leading, width, and nature of setting.

When there are many such passages, some editors take a shortcut. They draw the vertical line in the margin with a colored pencil or make a note in the margin that this is "A copy" or "B copy." Then they give the typesetter general instructions: "Every time you see a blue line, or a passage marked 'A copy,' set that text in such-and-such a way."

Any characters that are special. Type offers much more choice than a typewriter. The typewriter has only one short horizontal mark, the hyphen (-). In type, this can be translated into a hyphen, an en dash (slightly longer), or an em dash (longer still). The typesetter shouldn't have to guess which is wanted. Mark exactly what you want.

If a line in the typescript ends in a hyphen, does this mean only that a word has been broken in the middle? Or is this a hyphen that joins two words and must be typeset? The editor should say. The typesetter shouldn't have to decide, especially one not fluent in the language of the manuscript.

Special characters, such as Greek letters in formulas, should be marked.

A TRAINING COURSE FOR EDITORS (18 pt Helvetica bold u/lc)

(6 lines) →

(10/12 pt Times Roman <20 picas>)

National research programs are developing ways to produce better crops, better health, better quality of life. But research that is carried out in the Third world is not always efficiently ~~transmitted~~ ~~communicated~~ to the scientific community because ~~their~~ there are not enough skilled editors and publication officers. Nor does much of this vital information ~~ever~~ reach the extension agent, farmer, or health care worker because there are not enough men and women trained to interpret, simplify, and popularize the findings of research. To meet this need, the International Rice Research Institute and the International Development Research Center of Canada, in collaboration with the University of Toronto Press, sponsored in 1985 an Editing and Publication Training Course at IRRI.

In ~~fourteen~~ 14 intensive weeks, trainees explored the techniques of clear writing, effective design, and economical production of printed materials. They also learned about promotion and distribution, photography, and other illustration.

(1 line #) →

Objectives: At the end of the course, participants were expected to:

(indent 2 ems each side)

1 Understand the fundamental concepts and perform the basic steps in the organization and editing of research publications;

2 Have developed skills in interpreting, simplifying, and popularizing research findings and other technical information;

3 Demonstrate those abilities by planning, revising, editing, designing, and supervising production of a short publication.

... 2

Titles and headings to be set larger than the main text. These need to be marked with the basic instructions of size, face, and width of line. Often they will be set separately from the main text, perhaps even on a different machine. It helps the typesetter if they are typed on a separate page or pages from the main text. Then the typesetter doesn't have to go through the whole manuscript looking for them. The manuscript must still show where the headings are to appear.

Running heads and other non-text matter. These must also be provided, properly marked with the basic instructions for setting.

Guidelines

Here are some general rules to guide you in marking up manuscripts for the typesetter.

- Tell the typesetter how many sets of proof you will need. Usually you will want a master set, an editor's set, and a set for the author. If there is to be an index, you may wish to give the author a second set so he or she can begin working on it.

- Don't mark more than you need to. Too many marks can be confusing.

- On a manuscript, write changes in the text in the text. Don't add proofreading marks in the margin. They just clutter the page and can cause confusion.

- It helps to summarize all your instructions on a single style sheet for the typesetter. But mark up the manuscript as well. Not every typesetter reads a summary sheet. Make sure the instructions on the style sheet are the same as on the manuscript.

- It is not enough to mark instructions only at the beginning of the manuscript. The same person may not set the whole manuscript. Shifts change, or a manuscript may be divided among several operators. Continue the marking throughout the manuscript.

- Be clear in your instructions.

- Be thorough in your instructions.

- Remember Montagnes's rule: There are nearly always more than two ways of doing anything. If you don't give the typesetter clear, thorough instructions, the chances are better than two to one you won't get what you want.

3.8
Checking proof: first proof

The marked-up manuscript is sent to the typesetter. The next step in publishing is *proofreading:* checking what the typesetter produces. In some houses this is done by full time proofreaders, but in most organizations it is done by editors.

Even the most careful typesetter is likely to make a few errors. When typesetters are not well educated, or are not fluent in the language they are setting, the chances of error are much greater. Sometimes it is necessary to see several stages of proof before getting one accurate enough to show the author.

Authors should normally read proof, but it is a fact of life that few authors are good proofreaders. This is not unreasonable. Authors are concerned with content. At this point they are still checking the words and information. They are likely to miss spelling and other small typographic errors. Even trained editors miss details when reading proof of their own words. Proofreading takes a trained and objective eye. Here are some guidelines in reading proof.

Check three stages

Plan to check at least three stages of proof. New errors can creep in at each stage.

First proofs are usually *galley proofs:* long columns of type with wide margins. They are not broken into pages, but appear as they come from the typesetting machine. (A galley is a long tray which holds metal type. The name "galley proof" is still often used even when metal type is not involved.) Most correction should be done at this stage.

Page proofs show the type made up into pages, as it will appear in the publication. Page proofs may or may not show the illustrations in place; but they should show space allowed for illustrations and also the typeset captions.

Final pages (letterpress) or *blueprints* (offset) allow the editor to make a last check that everything is in place before printing. There should be no need for correction at this stage.

If there are many corrections, you may wish to see *revised* galley proofs before the type is made into pages, or *revised* page proofs before printing begins. Be sure that things are in good order before moving on to each new stage of proof.

Use the margin

Mark corrections in the margin of the proof, not in the type. Proof is different from copy that is to be set.

In copy that is to be set, changes should be written in the body of the text. Typesetters have to read every word, and it is easiest for them to have any changes written in the text.

Proofreader's Marks

Please read your proofs carefully and use these marks to indicate any corrections.

Style of Type

Write in margin	Mark on Typesetting	Corrected typesetting
U/lc	Set in UPPER & LOWER CASE	Set in Upper & Lower Case
lc	Set in LOWER CASE	Set in lower case
Caps	Set in capitals	Set in CAPITALS
SC	Set in small capitals	Set in SMALL CAPITALS
C+SC	Set in caps & small caps	Set in CAPS & SMALL CAPS
rom	Set in roman type	Set in roman type
ital	Set in italic type	Set in *italic* type
lf	Set in light face	Set in light face
bf	Set in bold face	Set in **bold** face
	Set superior character	Set superior character^{7}
	Set inferior character	Set inferior character$_{2}$
wf	Wrong font (size or style)	Wrong font (size or style)

Positioning

⊏	⊏ Move to the left	Move to the left
⊐	⊐ Move to the right	Move to the right
⊓	Move up	Move up
⊔	Move down	Move down
><	> Set in the centre <	Set in the centre
⊏ ⊐	[Square off or full measure]	Square off or full measure
//	Align horizontally	Align horizontally
‖	‖ Align vertically	Align vertically
tr	Transpose letter word or	Transpose letter or word

Spacing

#	Insert space or more space	Insert space or more space
eq #	Equalize the word spacing	Equalize the word spacing
⌣	Allow less space here	Allow less space - here
⊂	Close up entirely	Close up entirely
1	Indent one em	Indent one em
2	Indent two ems, etc	Indent two ems, etc
lett #	LETTER SPACE	LETTER SPACE

Paragraphing

Write in margin	Mark on typesetting	Corrected typesetting
¶	¶ Begin a paragraph	Begin a paragraph
no ¶	No paragraph. Run-in or run-on	No paragraph. Run-in or run-on

Punctuation

⊙	Insert a period	Insert a period
⋀	Insert a comma	Insert, a comma
⊙	Insert a colon	Insert: a colon
⋀	Insert a semi-colon	Insert: a semi-colon
‟/”	Quotation marks or quotes	Quotation marks or "quotes"
’ ‘/’	Apostrophe or single quotes	Apostrophe' or 'single quotes'
?	Question mark	Question mark?
!	Exclamation point	Exclamation point!
=	Insert hyphen	Insert-hyphen
\ en \	Insert one en dash	Insert one en dash –
\ em \	Insert one em dash	Insert one em dash —
(/)	Insert parentheses parens	Insert parentheses (parens)
[/]	Insert brackets	Insert [brackets]

Delete or Insert

!	Insert (see in margin)	Insert! (see in margin)
u	Left out, insert	Left out, insert
⌠	Delete, take out ~~out~~	Delete, take out
⌠	Delete and close up	Delete and close up
t	Correct (see in margin)	Correct (see in margin)
stet	Let it stand as is	Let it stand as is

Miscellaneous

X	Broken or imperfect type	Broken or imperfect type
9	Turn inverted letter	Turn inverted letter
⊥	Push down space or lead	Push down space or lead
⌡	Mark off or break	Mark off or break
sp	Spell out, not abr'v'd	Spell out, not abbreviated
osc	Out, see copy	Out, see customer's copy
lig	Use a ligature (first flight)	Use a ligature (first flight)

In proof, typesetters do not read every word. They look only for changes. The changes will be lost if they are written into the body of the text. So:

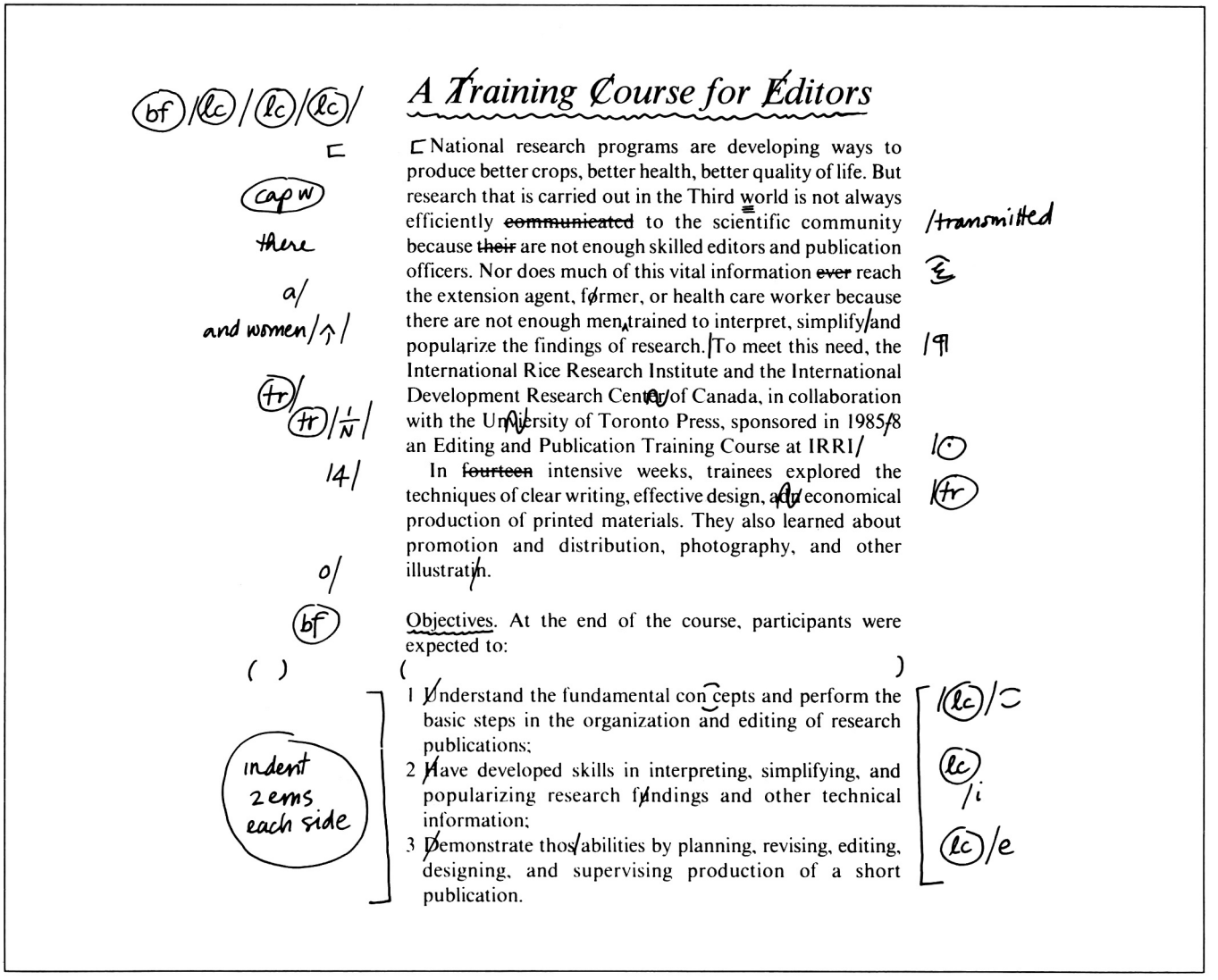
- show *where* the change is to be made *in the body* with a simple mark
- show *what* the change is to be *in the margin,* using standard marks.

Compare the proof below with the marked-up copy on page 100.

Use marks the typesetter will understand. The marks shown on the opposite page are in common use in North America. They may not be the ones your own typesetters recognize. Ask your typesetters for the marks they use. If they don't have any standard marks, suggest they use these or reach agreement on another set of easily recognized marks.

Be clear

Make things easy for the typesetter. Write clearly and legibly. If there are several corrections in a single line, write out the line.



If material is to be inserted, type it out, double-spaced, on a separate piece of paper, and attach it (with tape or glue) to the proof. Do the same thing if a whole paragraph has been seriously rewritten. Mark the slip of paper clearly (e.g., INSERT A, GALLEY 4).

Be careful

Proofread carefully. Many people won't accept one error in one thousand words. Reviewers complain about a book with 30 or 40 typographical errors.

Many kinds of errors can occur.

The most common are errors in spelling, when the typesetter hit the wrong key in the machine, or typed two letters in the wrong order, or left out a letter. They are easy to miss.

Check numbers carefully. An error in a number is less obvious than an error in spelling, and may be more serious. Check numbers in the text and numbers in tables.

Watch for words or lines that have been omitted or repeated. Sometimes a typesetter stops working for a minute, then starts again at what seems like the last word but isn't.

Watch for broken or damaged letters that should be replaced.

Sometimes the typesetter uses the wrong kind of type—a *wrong font.* The type may be the wrong face, or a size too small, or italic instead of roman, or bold instead of italic. The error may be in a single letter, a word, a paragraph, or (rarely) the entire text.

In handset type, letters sometimes are inserted upside down. With most letters it is obvious, but sometimes what looks like an n is an inverted u, and vice-versa. It may be hard to spot that an s or an o is upside down but usually the misplaced letter looks strange and does not align properly with the bottoms of other letters in the word.

In modern typesetting methods, a computer decides when and where words should be divided with hyphens at the ends of lines. The computer does not always make the most logical decision. Check the word breaks. Some may need to be changed.

Spacing may need to be corrected, especially if the design calls for complicated spacing, or for more spacing than the typesetter is used to. Check the space between letters, words, and lines. If the design calls for a quotation to have a 1-em indent, has that been done? Is line spacing around headings correct and consistent?

Watch also for errors in the text that should have been caught while editing the manuscript. They may be errors of fact, grammar, spelling, or consistency. There shouldn't be many, if the manuscript was edited carefully. They may appear now because the text looks different in print.

For one thing, everything looks neater, especially if the manuscript was particularly messy.

Read in teams

The best way to proofread is with two people. One holds the manuscript and reads it out loud, including punctuation, and spells out difficult words. The other person reads the proof and marks any errors.

Another way is to have one person read the manuscript into a tape recorder, Then the same person listens to the recording and checks the proof against it.

The least satisfactory way to proofread is with one person reading both the manuscript and the proof, side by side on a desk. It is tiring, and less accurate than other methods. If you have to do this, remember always to read from the manuscript to the proof, not the other way around. Mark your place in both copies with a ruler or sheet of paper so that you can concentrate on one line at a time. Rest your eyes from time to time.

Sometimes the typesetter or the typesetter's proofreader (if there is one) may write a question in the margin, asking whether a spelling or term is correct, or suggesting a change. Treat such questions with respect: they have saved many an editor and author from error.

Show the author

Send authors the manuscript with the proof. Ask authors to check the proof carefully against the manuscript. Tell them to make any changes *on the proof,* and show them how to do it. Tell them not to make any changes on the manuscript: it is a record of what was asked for, but it will not normally be read again. If they write on the manuscript, no one will likely see their corrections.

Warn them that changes in proof will delay publication and may be expensive. Ask them to make as few changes as possible, apart from correcting errors in typesetting. This is not a place for them to rewrite their prose. Even changes in fact may be unacceptable if they are not significant. (Some publishing houses charge the author for changes in proof, especially if there are many such changes and they are unimportant or unnecessary.)

Give authors a deadline to return the proof, with corrections marked, together with the manuscript. Tell them to sign and date the proof when they return it.

Correct the master proof

When the proof returns, check the corrections the author wants to make. Separate the author's changes into two classes: corrections in typesetting *(printer's errors)* and changes that are *author's alterations* (AAs). You may decide not to allow some AAs to be made, in order to save time or money.

On a master set of proof, mark the author's corrections and alterations. Add any corrections you have spotted or changes which you feel need to be made.

Use a colored pencil or marker to make it easier for the typesetter to spot changes. Some publishers mark corrections in two colors: in blue if they are printer's errors, in red if they are changes from the manuscript that was sent to the typesetter. The publisher will not expect to be charged for any corrections marked in blue.

Whenever possible, make changes that involve the least possible new typesetting. Ideally, the new typesetting should occupy the same space as the original. You can check this by counting characters. Sometimes an editor will rewrite an author's changes to make them fit.

If you have instructions or comments for the typesetter, be sure they are clearly identified as that. If they appear on the proof, draw a circle around them. Otherwise they may be set in type.

Send the printer the master set of proof and the manuscript. Keep the set the author marked in case there are disagreements later.

Sign and date

Sign (or initial) and date the top sheet of the master proof before sending it to the printer. Add instructions to the typesetter on what to do next: for example, "For correction" or "OK to page, with corrections."

This should be standard practice at each stage of proof. Sign, date, and instruct, right up to the final "OK to print."

3.9
Checking proof: later stages

Once galley proofs have been read, it should no longer be necessary to read the manuscript again. But proofreading is far from over. Each new stage of proof must be checked against the last set of proof that was sent to the printer.

Check carefully

Check the typesetter's corrections, one by one. Make sure that all the proofreading instructions were understood and all changes were made.

Check for any new errors made in the correcting process. A change in one line may require resetting the rest of the paragraph. Have any new errors been created? Proofread all text that has been reset. (Ask the typesetter to mark on the new proof all text that has been reset.)

With Linotype, any change will involve re-setting the entire line, and perhaps following lines. Make sure the corrected lines are in the right place.

With computerized photocomposition, corrections may be made in two ways:

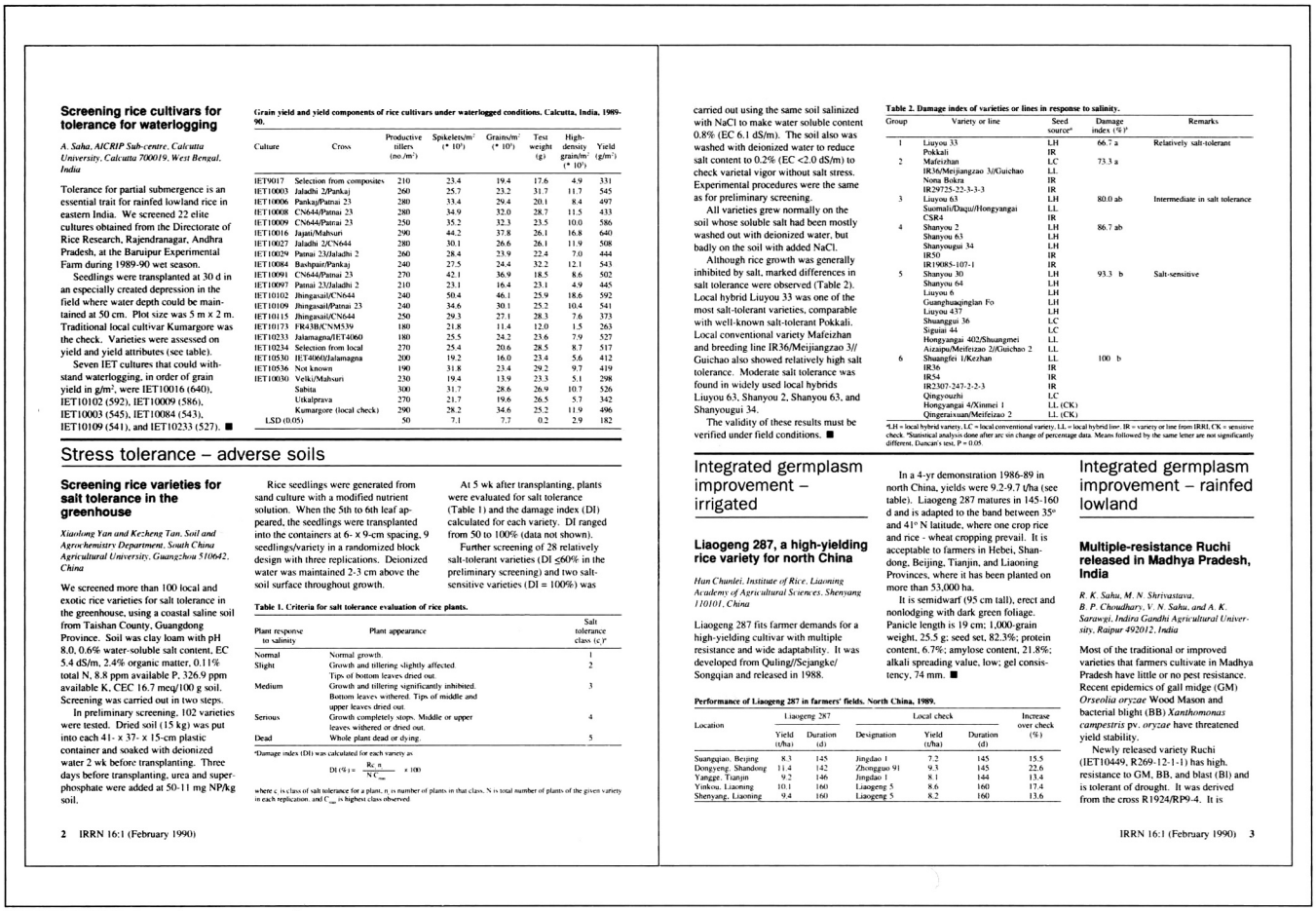
- The compositor may correct only the line that needs changing, and perhaps a line or two around it. These few lines will be pasted into the original camera-ready copy in place of the old lines. Ask the compositor to mark such *patch corrections* on the proof ***so*** that you can check all new setting.

- The compositor may insert all corrections into the disc or tape and run the entire publication, or a large portion of it, through the typesetter again. This creates an entirely new proof. It must all be checked carefully for random computer errors and for changes in word breaks at the ends of lines.

Page proofs

Page proofs show how the text will appear in the final publication. Normally, the text needs to be checked only against the last set of galleys. If there is time, or if it is house policy, careful editors read through the page proofs anyway. Errors do sometimes appear that were not in the galley proof.

If the typesetter is accurate and the manuscript in good shape, it is sometimes possible to go directly from manuscript into page proofs. In that case, page proofs should of course be read against the manuscript.



Screening rice cultivars for tolerance for waterlogging

A. Saha, AICRIP Sub-centre, Calcutta University, Calcutta 700019, West Bengal, India

Tolerance for partial submergence is an essential trait for rainfed lowland rice in eastern India. We screened 22 elite cultures obtained from the Directorate of Rice Research, Rajendranagar, Andhra Pradesh, at the Baruipur Experimental Farm during 1989-90 wet season.

Seedlings were transplanted at 30 d in an especially created depression in the field where water depth could be maintained at 50 cm. Plot size was 5 m x 2 m. Traditional local cultivar Kumargore was the check. Varieties were assessed on yield and yield attributes (see table).

Seven IET cultures that could withstand waterlogging, in order of grain yield in g/m², were IET10016 (640), IET10102 (592), IET10009 (586), IET10003 (545), IET10084 (543), IET10109 (541), and IET10233 (527). ■

Grain yield and yield components of rice cultivars under waterlogged conditions. Calcutta, India, 1989-90.

Culture	Cross	Productive tillers (no./m²)	Spikelets/m² (* 10³)	Grains/m² (* 10³)	Test weight (g)	High-density grain/m² (* 10³)	Yield (g/m²)
IET9017	Selection from composites	210	23.4	19.4	17.6	4.9	331
IET10003	Jaladhi 2/Pankaj	260	25.7	23.2	31.7	11.7	545
IET10006	Pankaj/Patnai 23	280	33.4	29.4	20.1	8.4	497
IET10008	CN644/Patnai 23	280	34.9	32.0	28.7	11.5	433
IET10009	CN644/Patnai 23	250	35.2	32.3	23.5	10.0	586
IET10016	Jagati/Mahsuri	290	44.2	37.8	26.1	16.8	640
IET10027	Jaladhi 2/CN644	280	30.1	26.6	26.1	11.9	508
IET10029	Patnai 23/Jaladhi 2	260	28.4	23.9	22.4	7.0	444
IET10084	Bashpair/Pankaj	240	27.5	24.4	32.2	12.1	543
IET10091	CN644/Patnai 23	270	42.1	36.9	18.5	8.6	502
IET10097	Patnai 23/Jaladhi 2	210	23.1	16.4	23.1	4.9	445
IET10102	Jhingasail/CN644	240	50.4	46.1	25.9	18.6	592
IET10109	Jhingasail/Patnai 23	240	34.6	30.1	25.2	10.4	541
IET10115	Jhingasail/CN644	250	29.3	27.1	28.3	7.6	373
IET10173	FR43B/CNM539	180	21.8	11.4	12.0	1.5	263
IET10233	Jalamagna/IET4060	180	25.5	24.2	23.6	7.9	527
IET10234	Selection from local	270	25.4	20.6	28.5	8.7	517
IET10530	IET4060/Jalamagna	200	19.2	16.0	23.4	5.6	412
IET10536	Not known	190	31.8	23.4	29.2	9.7	419
IET10030	Velki/Mahsuri	230	19.4	13.9	23.3	5.1	298
	Sabita	300	31.7	28.6	26.9	10.7	526
	Utkalprava	270	21.7	19.6	26.5	5.7	342
	Kumargore (local check)	290	28.2	34.6	25.2	11.9	496
LSD (0.05)		50	7.1	7.7	0.2	2.9	182

Stress tolerance – adverse soils

Screening rice varieties for salt tolerance in the greenhouse

Xiaolong Yan and Kezheng Tan, Soil and Agrochemistry Department, South China Agricultural University, Guangzhou 510642, China

We screened more than 100 local and exotic rice varieties for salt tolerance in the greenhouse, using a coastal saline soil from Taishan County, Guangdong Province. Soil was clay loam with pH 8.0, 0.6% water-soluble salt content, EC 5.4 dS/m, 2.4% organic matter, 0.11% total N, 8.8 ppm available P, 326.9 ppm available K, CEC 16.7 meq/100 g soil. Screening was carried out in two steps.

In preliminary screening, 102 varieties were tested. Dried soil (15 kg) was put into each 41- x 37- x 15-cm plastic container and soaked with deionized water 2 wk before transplanting. Three days before transplanting, urea and superphosphate were added at 50-11 mg NP/kg soil.

Rice seedlings were generated from sand culture with a modified nutrient solution. When the 5th to 6th leaf appeared, the seedlings were transplanted into the containers at 6- x 9-cm spacing, 9 seedlings/variety in a randomized block design with three replications. Deionized water was maintained 2-3 cm above the soil surface throughout growth.

At 5 wk after transplanting, plants were evaluated for salt tolerance (Table 1) and the damage index (DI) calculated for each variety. DI ranged from 50 to 100% (data not shown).

Further screening of 28 relatively salt-tolerant varieties (DI ≤60% in the preliminary screening) and two salt-sensitive varieties (DI = 100%) was carried out using the same soil salinized with NaCl to make water soluble content 0.8% (EC 6.1 dS/m). The soil also was washed with deionized water to reduce salt content to 0.2% (EC <2.0 dS/m) to check varietal vigor without salt stress. Experimental procedures were the same as for preliminary screening.

All varieties grew normally on the soil whose soluble salt had been mostly washed out with deionized water, but badly on the soil with added NaCl.

Although rice growth was generally inhibited by salt, marked differences in salt tolerance were observed (Table 2). Local hybrid Liuyou 33 was one of the most salt-tolerant varieties, comparable with well-known salt-tolerant Pokkali. Local conventional variety Mafeizhan and breeding line IR36/Meijiangzao 3// Guichao also showed relatively high salt tolerance. Moderate salt tolerance was found in widely used local hybrids Liuyou 63, Shanyou 2, Shanyou 63, and Shanyougui 34.

The validity of these results must be verified under field conditions. ■

Table 1. Criteria for salt tolerance evaluation of rice plants.

Plant response to salinity	Plant appearance	Salt tolerance class (c)*
Normal	Normal growth.	1
Slight	Growth and tillering slightly affected. Tips of bottom leaves dried out.	2
Medium	Growth and tillering significantly inhibited. Bottom leaves withered. Tips of middle and upper leaves dried out.	3
Serious	Growth completely stops. Middle or upper leaves withered or dried out.	4
Dead	Whole plant dead or dying.	5

*Damage index (DI) was calculated for each variety as

$$DI\,(\%) = \frac{\sum c_i \cdot n_i}{N \cdot C_{max}} \times 100$$

where c_i is class of salt tolerance for a plant, n_i is number of plants in that class, N is total number of plants of the given variety in each replication, and C_{max} is highest class observed.

Table 2. Damage index of varieties or lines in response to salinity.

Group	Variety or line	Seed source*	Damage index (%)*	Remarks
1	Liuyou 33	LH	66.7 a	Relatively salt-tolerant
	Pokkali	IR		
2	Mafeizhan	LC	73.3 a	
	IR36/Meijiangzao 3//Guichao	LL		
	Nona Bokra	IR		
	IR29725-22-3-3-3	IR		
3	Liuyou 63	LH	80.0 ab	Intermediate in salt tolerance
	Suomali/Daqui//Hongyangai	LL		
	CSR4	IR		
4	Shanyou 2	LH	86.7 ab	
	Shanyou 63	LH		
	Shanyougui 34	LH		
	IR50	IR		
	IR19085-107-1	IR		
5	Shanyou 30	LH	93.3 b	Salt-sensitive
	Shanyou 64	LH		
	Liuyou 6	LH		
	Guanghuaqinglan Fo	LH		
	Liuyou 437	LH		
	Shuanggui 36	LC		
	Siguiai 44	LC		
	Hongyangai 402/Shuangmei	LL		
	Aizaipu/Meifeizao 2//Guichao 2	LL		
6	Shuangfei 1/Kezhan	LL	100 b	
	IR36	IR		
	IR54	IR		
	IR2307-247-2-2-3	IR		
	Qingyouzhi	LC		
	Hongyangai 4/Xinmei 1	LL (CK)		
	Qingeraixuan/Meifeizao 2	LL (CK)		

*LH = local hybrid variety, LC = local conventional variety, LL = local hybrid line, IR = variety or line from IRRI, CK = sensitive check. *Statistical analysis done after arc sin change of percentage data. Means followed by the same letter are not significantly different, Duncan's test, P = 0.05.

Integrated germplasm improvement – irrigated

Liaogeng 287, a high-yielding rice variety for north China

Han Chunlei, Institute of Rice, Liaoning Academy of Agricultural Sciences, Shenyang 110101, China

Liaogeng 287 fits farmer demands for a high-yielding cultivar with multiple resistance and wide adaptability. It was developed from Quling//Scjangke/ Songqian and released in 1988.

In a 4-yr demonstration 1986-89 in north China, yields were 9.2-9.7 t/ha (see table). Liaogeng 287 matures in 145-160 d and is adapted to the band between 35° and 41° N latitude, where one crop rice and rice - wheat cropping prevail. It is acceptable to farmers in Hebei, Shandong, Beijing, Tianjin, and Liaoning Provinces, where it has been planted on more than 53,000 ha.

It is semidwarf (95 cm tall), erect and nonlodging with dark green foliage. Panicle length is 19 cm; 1,000-grain weight, 25.5 g; seed set, 82.3%; protein content, 6.7%; amylose content, 21.8%; alkali spreading value, low; gel consistency, 74 mm. ■

Performance of Liaogeng 287 in farmers' fields. North China, 1989.

Location	Liaogeng 287		Local check			Increase over check (%)
	Yield (t/ha)	Duration (d)	Designation	Yield (t/ha)	Duration (d)	
Suangqiao, Beijing	8.3	145	Jingdao 1	7.2	145	15.5
Dongyeng, Shandong	11.4	142	Zhongguo 91	9.3	145	22.6
Yangge, Tianjin	9.2	146	Jingdao 1	8.1	144	13.4
Yinkou, Liaoning	10.1	160	Liaogeng 5	8.6	160	17.4
Shenyang, Liaoning	9.4	160	Liaogeng 5	8.2	160	13.6

Integrated germplasm improvement – rainfed lowland

Multiple-resistance Ruchi released in Madhya Pradesh, India

R. K. Sahu, M. N. Shrivastava, B. P. Choudhary, V. N. Sahu, and A. K. Sarawgi, Indira Gandhi Agricultural University, Raipur 492012, India

Most of the traditional or improved varieties that farmers cultivate in Madhya Pradesh have little or no pest resistance. Recent epidemics of gall midge (GM) *Orseolia oryzae* Wood Mason and bacterial blight (BB) *Xanthomonas campestris* pv. *oryzae* have threatened yield stability.

Newly released variety Ruchi (IET10449, R269-12-1-1) has high resistance to GM, BB, and blast (Bl) and is tolerant of drought. It was derived from the cross R1924/RP9-4. It is

Apart from corrections and changes in the text, there are a number of new things to check in pages.

Check the beginning and end of each page to make sure that no lines have been dropped in making up pages. If the type has been set by hand or Monotype, check the sides of the type area to make sure no letters have been dropped.

Make sure that all tables, footnotes. figures, captions, minor text like quotations, and equations are in the right place. If halftones or other illustrations are not yet complete. make sure the proper amount of space has been left for them in the correct place. Check that small sections of type like authors' affiliations or photo credit lines are present.

Check display type carefully. This is a place where errors are easily missed. Make sure the right headings are over the right text. Make sure all the words in large type are spelled correctly.

Check that pages follow the design specifications: size of type, size of type area, line spacing around headings, and so on. Make sure that spacing is consistent, especially around headings.

Make sure that every page is numbered correctly. Check running heads, if these are being used. (It is normal to omit page numbers and running heads on the title page, copyright page, half-title and dedication page, the first pages of chapters, and other opening pages.) In a journal, check title/volume/issue/date if this information is to appear at the beginning of every article.

If the pages have been pasted up, make sure that all lines are straight on the page and align across facing pages.

Check that facing pages are of equal length.

Many publishers try to avoid widows-one short line at the top of a page. To avoid a widow, it may be necessary to make the preceding or following page one line longer or one line shorter than normal. If this happens, the typesetter should have continued adjusting the type so that pages facing each other are the same length. Make sure they are—unless, as in this manual, it has been decided to allow the bottom to be uneven.

This kind of adjustment in length may also be necessary to fit in a table or illustration, or to avoid having a page with only one or two lines at the end of a section or of a publication. A page with only a few lines is unattractive; it is also wasteful.

A page one line longer than normal should not follow a page one line shorter than normal, or vice versa: that is too big a difference.

Sometimes, to avoid widow lines or uneven pages, a typesetter will ask the editor to delete or add a line of type. It is usually possible to find a few words that can be deleted or added without changing the author's meaning. Look for a paragraph with a short final line and see if a couple of words can't be cut from that paragraph; or find a paragraph with an almost full final line and see if a word or two can't be added to that paragraph. Try to make the changes as close as possible to the end of the paragraph, so as to reduce the amount of re-setting.

Make any changes in page proof as economically as possible. Try to avoid *re-paging*—forcing the typesetter to move lines from one page to the next. Try to fit changes within the same line, or the same paragraph.

If that is impossible, try to contain changes within the same page or within that page and the facing page. If a change adds a line to one page, try to cut a line. If you can't cut a line from that page, try to cut one from the facing page; then by moving one line you will end up with two even pages the original length. Or try to add a line to one of the pages and end up with facing pages both one line long. In any case, try to contain changes within the fewest pages possible. Otherwise adding one line near the beginning of a paper or chapter will affect every page to the end.

If there is an index, it must be made from page proofs. It may be prepared by the author, a professional indexer, or (as a last resort) the editor. Before indexing begins, make sure that there are no further changes that will affect paging. Give the indexer a firm deadline for delivery of the finished copy. Indexes should be typed, double-spaced, like any other manuscript.

If there is a table of contents, insert the page numbers at this point. Unless there are changes on almost every page, list the pages where corrections are required. That will save the typesetter time and help to ensure that no corrections are missed. (Make the same kind of list in all following stages of proof as well.)

Illustrations

Ask for proof of all illustrations. They may come with the text proof (if they are line) or separately (if they are halftones).

Check that all illustrations have been scaled (reduced or enlarged to fit in the available space) and cropped correctly. (See unit 6.10.)

In line art, make sure that lines are strong and any text can be read easily. In halftones, make sure that details have not been lost, and that the halftone reproduces accurately the tones of gray, black, and white in the original.

Color proofs must be checked especially carefully. There are some cheaper ways to check color separations but the only way to do it properly is with proofs actually printed on a press. Do not try to correct color halftone proofs to get colors that are different from the original photograph.

Make sure that all illustrations are right side up. Check that they have not been *flopped* (reversed, so that they are a mirror image of the original).

Read the captions. Be sure they are correct and that what they say agrees with what the picture shows. (Are there three people in the picture and only two mentioned in the caption?) Make sure the right caption is under the right illustration.

Reproduction proofs

Reproduction or repro proofs demand special care. This is the actual camera copy that will be used in offset printing. Repro proofs may come directly from a photocomposition machine; or they may be printed on special paper, with special care, by letterpress.

Treat them as carefully as photographs. Never have drinks or food on the same table. If you have to write any corrections on them, do it in light blue pencil that will not show when photographed. If repro proofs are damaged or defaced in any way, it will be necessary to recreate them.

Changes at this point should be avoided if at all possible.

Final proof

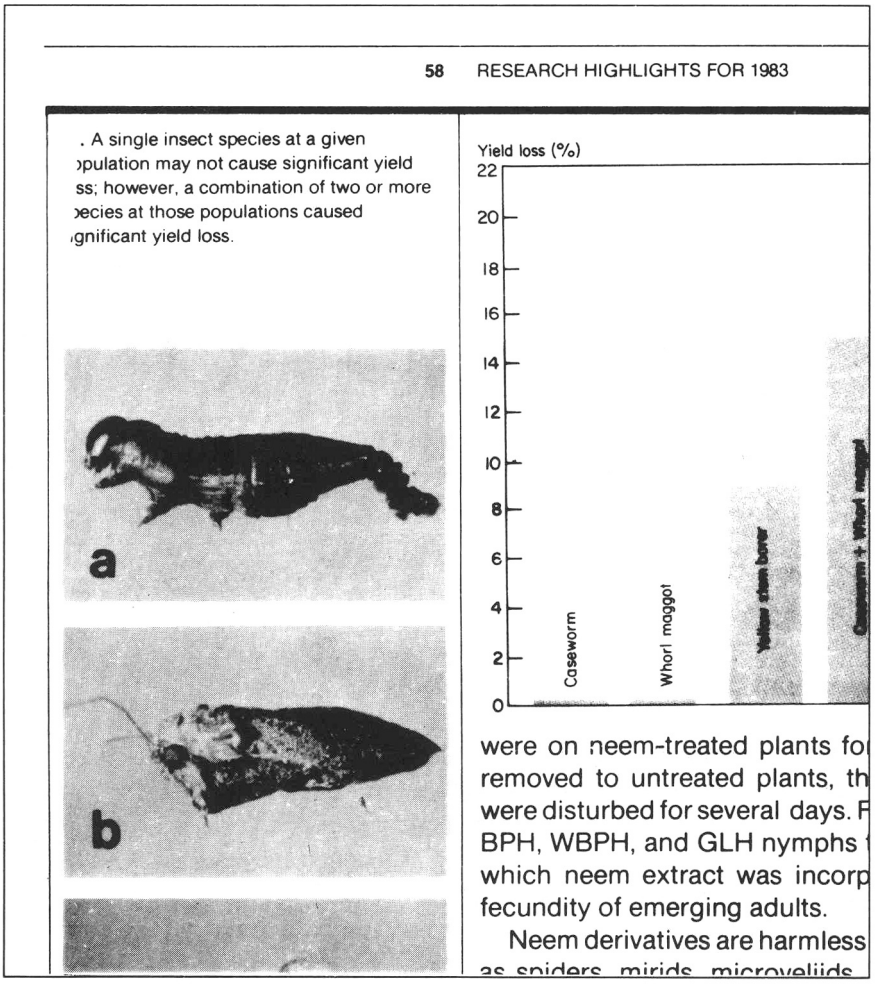
Make a last check of details when you reach the stage of final proof. That point does arrive eventually in every publication.

In letterpress, final proof will normally be in pages.

In offset, there may be a further stage. Blueprints (or similar kinds of prints that have other names—bluelines, ozalids, brownprints, Van Dykes, silverprints) are low-cost photographic prints made from the negative that will be used in making offset plates. Usually these prints are made after the negatives are stripped into flats ready for platemaking, so that they show the arrangement of the pages for folding. They do not show the quality of the future printing, because this is a cheap, fast process. Nor do they show the exact relationship of lines from one page to another. But they are a good guide.

Check one last time that all corrections have been made.

Check that no copy has been lost. Look especially carefully along margins and at corners, at page numbers and running heads. Note how some letters have been lost in this example.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. A single insect species at a given
›pulation may not cause significant yield
ss; however, a combination of two or more
›ecies at those populations caused
ıgnificant yield loss.

a

b

Yield loss (%)
22
20
18
16
14
12
10
8
6
4
2
0
Caseworm
Whorl maggot
Yellow stem borer

were on neem-treated plants fo
removed to untreated plants, th
were disturbed for several days. F
BPH, WBPH, and GLH nymphs
which neem extract was incorp
fecundity of emerging adults.

Neem derivatives are harmless
as spiders, mirids, microveliids

Check that all illustrations are in place, right side up, with the correct captions, and have not been flopped.

Check that the pages will appear in the right order.

In very complex illustrated books, it may be wise to have the author check all illustrations, to make sure they are placed correctly.

Remember: Blueprints should be checked quickly to save time and money. Changes at this point are very expensive.

Press sheets

Press sheets are samples of what is actually being printed. They are not proof. They are the printed result of all the work that went into editing and proofreading. By the time they reach an editor, the publication usually has been fully printed. But folded press sheets do give one last chance to check for errors.

Check them to make sure that all pages are present and in the right order, and that the quality of printing is satisfactory.

Sometimes an error is spotted in the text after the pages are printed. There are five ways to react to this problem.

1. If the error is minor and easily recognizable, ignore it at this point and correct it in any second printing.

2. If the error is more serious, print an erratum slip and paste it into the publication. Many publishers do not like to follow this solution because readers may not see the slip, and those that do see it may begin to question everything else in the publication.

3. Alternatively, print a label with the correction in type that matches the original, and paste it directly over the error.

4. If the error is truly serious, reprint the full sheet, or a part of it, with the correction made. This can be done even after a book is bound: a leaf (two pages, front and back) can be cut from the book and a corrected sheet pasted in so neatly that few readers will notice. Signatures or leaves should be replaced only for major errors that could cause harm: for example, if the wrong unit of measurement appears in a medical prescription or engineering instruction. (It may also be necessary if, as sometimes happens, the author's name is misspelled.)

5. Very occasionally, an error is so serious that none of these actions is enough. Imagine, for example, that an error crept into a formula in an experiment in a secondary-school chemistry textbook. Because of the error, the experiment has become highly dangerous: students who follow the book will be making a small bomb. If the book has been published, the publisher must immediately alert every school that may have the book, and then try to recall every copy.

Here is a true case. A book on sexual information discussed the natural method of contraception and told its readers: "The safe times are the week before and the week of ovulation." The second word should have been "unsafe." Those are the two weeks when women are most likely to conceive. The publisher recalled 115,000 copies of the book that were already in the stores and reprinted it with correct information and a new cover.

Fortunately, errors this serious are rare, thanks to careful editors.

3.10
Evaluating publications

Complete communication involves feedback. For the publisher, this means receiving enough information to judge the success of any publication and the publishing plan.

Feedback can come in many ways.

A commercial publisher may judge success by the profit made on any single title or publishing program.

A non-profit publisher may judge success by the number of copies sold, or the number of free copies requested.

By these means the publisher can measure how successful the publication was, but still may not know *why* it was successful.

Some of the reasons for success or failure can be found by talking to readers or potential readers, analyzing any letters they write, and reading reviews. But such informal, unstructured information gathering is rarely entirely satisfactory. It is a poor basis for planning future publications or publishing programs.

A formal survey gives more information and is more credible to management. Surveys are a precise science on which many books have been written. The subject cannot be covered in any detail in a short unit; but here are a few guidelines.

Decide goals

Decide exactly what you want to know. For example:

- Who exactly are the readers? (See unit 1.6.)
- How is the publication used? What parts are most used? What parts are least used?
- Does the publication meet the readers' needs? How can it do so better?
- How much of it do they actually read? What parts do they read first? What parts do they read last? Which parts do they never read?
- What is the readers' attitude toward the publication? What do they think of the publishing organization?

Plan a sample

Decide on the design and the size of a sample. It is possible to send a questionnaire to everyone who receives a publication, but it is usually inefficient or expensive. Unless the number is small, the cost is likely to be prohibitive.

For this reason, most readership surveys are made on a sample of the entire readership. Sampling readers is much like sampling any other universe. If you have not had training in this area, ask for help from a statistician or a researcher who is familiar with statistics and sampling.

Write

Write the questionnaire. This is more difficult than it sounds. Again, whole books have been written on the subject. Here are some further guidelines.

Make sure questions are short and easy to understand. Avoid words that can have two or more meanings. Be specific. Remember that people like to tell you what they think you will want to hear. Avoid loaded questions that beg for a particular answer, or are likely to produce answers that give little information. Do not ask questions like "Do you like our publication?" or "Could we do a better job?"

As much as possible, use multiple choice questions that can be answered quickly and tabulated easily and clearly.

Avoid "either/or" questions that cannot be answered "yes" or "no." ("Would you prefer a red cover or a green cover?")

Design questions that measure the intensity of an opinion. ("Which part of the newsletter do you read first? second? third?"; "How do you rate this publication: Excellent? Good? Fair? Poor? Not worth reading?"; "State preference on a scale of 1 to 5.")

In multiple choice questions, include a category of "Don't know" or "No opinion." This will produce more accurate results.

Do not assume the respondent knows your publication as intimately as you do. Make sure you spell out all details.

Limit the number of questions. One authority suggests that there should be no more than 20 questions, and they should be on only a few topics. Otherwise, answering them may look like too much work and discourage the response.

Test

Test the questionnaire on a small sample. Show it to some friends or a few typical readers. Make sure they understand all the questions clearly.

If possible, test the questionnaire on a small sample of the people who will eventually be surveyed.

Keep testing until you are satisfied. It may take three tests to get a good questionnaire.

Distribute

Send out the questionnaire. A questionnaire can be inserted in copies of a publication relatively cheaply. This method is unlikely to attract enough responses, however, and those that do arrive are likely to come

only from the most concerned readers. They will not be truly representative of the readers. Nor will you have reached another important group: members of the intended readership who have decided not to read the publication.

A questionnaire that is mailed separately is likely to attract more responses. In North America, at least, questionnaires sent by first-class mail attract more responses than questionnaires sent by cheaper means.

The questionnaire should be sent soon after the publication appears, preferably within two weeks. That way, impressions of the publication will still be fresh.

Include a letter explaining how important it is to get a reply from the person receiving the questionnaire. The letter need not be individually addressed; in fact, that may make readers suspicious that their replies will be checked for some hidden reason.

The letter can look like a form letter. But it helps if it is signed by someone with prestige, for example, a director rather than an editor.

Include a self-addressed envelope for the reply.

The best way to get responses is by personal interview: asking the questions directly, face-to-face. Sometimes this can be done cheaply by cooperating with university departments and sending out teams of student interviewers.

Follow up

Follow up with reminders. For useful results from a small sample, at least 50% of mailed questionnaires must be returned.

Some people send a postcard after three days to each person in the sample. The postcard reports that the questionnaire has been sent, hopes it has been received, and asks for a reply. If the sample is only 100 or 200 people, this is not overly expensive.

In any case, send a reminder and a second copy of the questionnaire after a reasonable time (weeks, not months) to everyone who has not replied. If the responses are meant to be anonymous, the reminder will have to be sent to all the people in the sample, asking them to be sure to return the questionnaire if they have not already done so. Sometimes a third request may be needed.

Analyze

Analyze the responses, and act on them. This is important. There is little reason to go to the trouble of a survey unless you are willing to use the information to improve your publications.

4
Editing for the specialist

A research experiment is not complete until the results are published. Every researcher builds upon the work of other researchers. Each new advance in knowledge adds to the total picture. If results are unpublished, or if they are published badly, the research has been wasted. If they are published slowly, further research suffers.

It is part of a researcher's job to report work fully, accurately, clearly, and promptly. Editors help in that process.

This module deals with some of the concerns in editing specialist publications. The first three units concentrate on journals and journal articles, because they are the most important means of communicating the results of research rapidly to other specialists. Much that is in those units will apply, however, to other forms of specialized publication.

This module should be read in close consultation with Modules 2 and 3. Graphs and charts are discussed in unit 6.3.

4.1 Journals

Researchers communicate with one another in many ways, including

- books (by a single author, or by several authors)
- journals
- conference proceedings
- bibliographies, indexes, and other reference works
- abstract journals (containing abstracts of articles and publications)
- synoptic journals (containing summaries longer than abstracts)
- reviews and review articles (reviewing new publications or trends in the literature)
- institutional publications (annual reports, books, research papers) including government publications
- technical bulletins
- papers given at conferences
- conference poster sessions
- letters
- conversations

With so many channels of communication, and so much research to be communicated, researchers need help. Otherwise they will be overwhelmed by the flood of information available and may miss reports that would help them in their work. They depend on personal networks to learn what is going on. They use bibliographies, and abstracting and indexing services, to learn what has been published. And, whether they recognize it or not, they depend on editors to see that the material they read is clear, concise, and accurate.

Editors may be involved in many ways. They may work closely with one author in preparing a book. They may edit the articles in a journal whose many authors are scattered in several countries; or they may help an author in their own institution meet the style and standards of a journal published elsewhere. Perhaps they edit a series of technical bulletins, all of which must have a similar structure although they are written by different authors. They may be asked to impose consistency in a bibliography, or to help a researcher prepare a poster for display at a conference.

Primary publication

Among so many ways of communicating the results of research, the most important is the *primary publication.* This, as its name suggests, presents results for the first time to interested specialists around the world. It establishes officially who made a discovery first. It is the form of publication that brings its author the greatest prestige; it is given great weight by committees making appointments or promotions.

A primary publication

- contains information that is new—that has not been published before.
- is easily available through normal channels. Any researcher should be able to obtain a copy through a library or by subscribing or buying it. (The reports of many research institutions may be difficult to obtain worldwide, especially if they are cited without an address being given. For this reason some primary journals bend the first rule and will accept material that has previously appeared in a purely institutional publication.)
- usually depends on external experts, or referees, to assist the specialist editor in deciding what should be published.
- insists on accepted standards of good scientific writing. In its pages, research is reported in such a way that other researchers can repeat the experiment and check the results for themselves. Reference is made to previously published work on which the new work is based. The articles are logical, accurate, and consistent in style.

Primary publications may be books, journals, or reports. In the physical and life sciences, however, by far the greatest amount of primary publication is through journals. This seems to be increasingly true of the social sciences as well.

Because of the overwhelming importance of journals, they receive special attention in the next two units. But much of what is said there—for example, about titles, authors, and abstracts—applies as well to other forms of publication for the specialist.

Many kinds of journals

A journal is a publication with a continuing life that gathers together the work of many authors, according to its own editorial guidelines.

Journals vary greatly in quality and in nature. A journal may

- be general or highly specialized, although there has been a trend toward more and more specialization.
- be international, national, or local in content and readership.
- be published by a non-profit agency (such as a research institute) or by a commercial firm; as well it may be sponsored by a professional society, a university, or a research department.
- require subsidy or be self-supporting.
- appear every week, every two weeks, every month, every two months, every three months, every year, at some other stated interval, or even irregularly.
- use referees or depend solely on the judgment of the editor and an editorial board of experts.

A journal may be thin or fat in thickness and small or large in page size. It may contain many or few types of material. A journal may, for example, publish all of the following:

- original articles reporting the results of research
- short notes about research or research methods

- review articles, dealing with previously published material and research trends
- comments on published papers
- letters
- corrections
- editorials
- the business of a sponsoring society, including reports of its annual meetings or workshops
- book reviews
- advertisements
- guidelines for authors
- synopses of articles that cannot be carried in full, or of papers given at a conference

Standard structure for articles

Over many years, the editors of scientific journals have agreed on a standard form an article should follow. They feel that this structure meets the needs of their readers best.

There are some variations between disciplines and between journals within one discipline, but in most fields of the life and physical sciences this structure is normal. In slightly different form, it is also used in many of the social sciences.

Authors must understand and follow this structure if they wish to be published in national and international journals. Editors must understand it if they want a journal they edit to meet international standards.

The structure may seem complicated. rigid, or arbitrary. In fact, it has been developed carefully through trial and error and experience. There are reasons for most of it. Authors will accept its rules better if they understand the reasons.

The basic parts of a scientific article are the

- title
- author
- abstract
- text
  - introduction
  - materials and methods
  - results
  - discussion
- references
- notes
- acknowledgments

These are discussed in the following units.

4.2
Editing articles: title, author, abstract

Authors naturally spend most of their writing time on the text of an article. Before that they concentrate on the research the article reports. They may spend relatively little time on what comes before the text. Yet these are the words that will most likely determine whether or not the paper is read.

Researchers do not pick up a journal and read it from start to finish. There are too many journals and too little time. They look first in the table of contents for interesting titles or authors. They will likely read the abstracts of articles that interest them. They may stop there, or they may go on to look at the tables and figures. Only if an article has unusual interest, or holds special promise for their own work, are they likely to read all of it.

Most journals do not get read even in this way. More and more researchers depend on secondary sources to find papers of value to them. These may be a periodical that publishes the tables of contents of other journals, or a carefully annotated and indexed printed bibliography, or a bibliographic database that can be searched electronically from a computer terminal. Secondary sources usually contain only titles, names of authors, publication data, and perhaps abstracts; very few to date contain the full text.

The more researchers depend on searches through secondary sources, the more important it is to make sure the contents of those sources are accurate and effective.

Title

The title is likely to be reprinted in bibliographies and subject indexes, stored in bibliographic databases, and cited in other articles. On the basis of the title alone, future researchers may seek or ignore the full text. A poor title may prevent future researchers from finding important information.

Qualities

A good title for a research report

- contains as few words as possible (many journals limit titles to 25 words; some want fewer).
- describes the contents of the paper accurately.
- describes the subject as specifically as possible within the limits of space.

- avoids abbreviations, formulas, and jargon.
- usually omits the verb.
- is as easy as possible to understand.
- contains key words, for the benefit of information retrieval systems.

Things to watch

Cut unnecessary words in titles. In particular, delete words like "Some notes on . . . " or "Observations on . . . " or "A consideration of. . . " Such phrases add nothing. Make the title get to the point.

Reject or revise titles that depend on allusion to a literary work or that involve metaphors. These are all right in literary journals or poetry. There is no place in a research paper for a title like "Man does not live by bread alone: the nutrient value of IR64 rice."

Make sure the title is accurate and specific. It should describe the research clearly. Revise titles that are too general in wording.

Be sure the title does not promise more than what is in the article or make the article sound more important than it is. A small experiment should not appear too general in significance. Normally titles report the subject of the research rather than the results or conclusions.

Make sure that as many as possible of the key words from the article appear in the title. These are words that will be used to index the article or to find it through computer searching.

Make sure that the most important words in the title stand out—usually by being the first words.

Make sure that the title follows the preference of the journal. Some journals like titles that are a single statement ("The relationship of brevity and readability in titles"). Some like titles that have a title and subtitle joined by a colon ("Readability in titles: the impact of brevity"). Some use either style. A few prefer titles with verbs ("Short titles are often easier to read").

Here are some examples of unsatisfactory titles, all for the same paper:

- Protein in rice
- Notes on Indonesian rice as a source of protein
- Some observations on the PER and other qualities of six Indonesian rices
- Rice: truly the staff of life
- Judging nutritional value in rice
- Our investigations will help monitor future improvements in rice quality
- Protein quality and properties evaluated using solubility fractionation, electrophoreses, and gel filtration in Rojolele, Rendah padang, Serayu, Semeru, and Cisadane High and Normal protein rices
- In improved varieties of rice, we found that protein quality declines but protein quantity rises faster

The editor of the *Indonesian Journal of Crop Science* avoided all these traps and gave the paper the following title:

- Evaluation of protein quality and properties in six varieties of Indonesian rice

Authors

The names of the authors should present no problems. After all, authors know their own names and how to spell them. In fact, these few words can cause considerable discussion and even argument.

Qualities

Authors' names should

- be complete enough to ensure proper identification. Many journals use only initials and the last name. If there is any chance of confusion, encourage authors to use their full first name plus initials. There may be several agricultural engineers named A. Khan, for example, but probably only one named Amir U. Khan. Proper identification is important to avoid errors in bibliographies and computerized information retrieval systems.
- include only people who are truly authors.
- list the authors in a logical order. The simplest order is alphabetical. Alternatively, the names can appear in order of the importance of each author to the work being reported.
- be followed by an address for each author. This may simply be the name of the institution where each author works. Some journals like to include a full postal address, at least for the senior author, so that readers can write for more information. The information may appear immediately after the names, or as a footnote on the title page, or as a note at the end of the article. Sometimes an author move to another institution; in that case the main entry should give the name of the institution where the work was done, followed by the author's current address, possibly in a footnote. It is no longer customary to print an author's academic degrees.

Things to watch

Names rarely need much editing. Just make sure they follow the style of the publication. Does that style call for full first names or initials? How should the order of names be decided?

If you have any doubts about the spelling of an author's name, double-check it. An unusual name could be a typing error.

Editors sometimes are asked to help authors who cannot agree on who should be listed or in what order the names should appear. Wise editors do not take sides but may offer advice. Rules have been developed for these questions. Here are some of the most important:

- Only people who have made an important contribution to planning and carrying out the research should be shown as authors. An important contribution means being involved in conceiving or designing the

research, or in analyzing and interpreting the data, or both. Someone who simply gave advice, or who helped collect data, should not be listed as an author but can be acknowledged in a note.

- Anyone listed as an author should also have helped to draft the article or have revised important parts of it.
- Technicians and other helpers should be mentioned in the acknowledgments. They should not appear as authors unless they have made a major contribution. (A technician who simply follows instructions should not be listed as an author; but a technician who makes an important suggestion that solves a problem might be considered a junior author.) Collecting data is not important enough to make a person an author.
- Each co-author should give final approval to the version to be published. The editor may wish to have this confirmed. Sometimes one author is too eager to have a paper published and submits it without consulting the other authors. This can create real problems if the article gets into print.
- Unless the names appear in alphabetical order, the first person listed is considered the senior author. This is usually the person who had the original idea for the experiment and led the investigation. Or it may be the person who did most of the research and the writing. Others may be listed in order according to the importance of their contribution to the experiment.

The head of a laboratory or institute may wish to be considered an author of all papers coming from that organization. This isn't something to fight. One proper place is as the last author (which is recognized also as a place of importance).

If you have a chance, urge the authors to agree on the order in which their names will appear before the study begins. They may decide to change the order if one of them makes a greater contribution than expected; but at least they have an agreement to begin with.

The battle to get listed as author is no joke, because it can mean promotion. A veteran editor named Robert Day recalls one paper 12 paragraphs long that had 27 authors!

Abstract

Abstracts (also called summaries) usually appear at the beginning of the article, but may come at the end. Sometimes abstracts are published in two languages. A journal published in Malaysia in English may contain abstracts in both English and Bahasa Malaysia, for example; a journal published in China in Chinese may include English-language abstracts. In this way the most important information reaches a wider readership.

Qualities

A good abstract

- is short. Most journals limit abstracts to 200 words, or fewer. Some say it should be no more than 5% of the length of the paper.

Indonesian Journal of Crop Science, 1985, Vol. 1, No. 2, pp. 93-104

Maize response to phosphorus application at different levels of residual phosphorus in a Paleudult and a Eutrustox

I Putu G. Widjaja-Adhi[a], M. Sudjadi[a] and J.A. Silva[b]

[a] *Centre for Soils Research, Jalan Juanda 98, Bogor, Indonesia and*
[b] *Department of Agronomy and Soil Science, University of Hawaii, Hawaii, USA*

(Manuscript received 21 January, 1985)

Abstract

Two experiments were conducted, one on a Typic Paleudult in Lampung, lndonesia and the other on a Tropeptic Eutrustox in Molokai, Hawaii to assess the responses of maize to phosphorus application at various levels of residual phosphorus in the soil. Different levels of residual phosphorus or classes of soil-test values required different response equations to formulate fertilizer recommendations. Within a soil family, information on maize response to phosphorus application is transferable, if the change in soil fertility due to previous soil management can be defined by testing for soil phosphorus.

[*Keywords:* Agrotechnology transfer; Fertilizer, phosphate; Maize; Phosphate, applied; Phosphate, residual; Tropeptic Eutrustox. Hawaii; Typic Paleudult, Indonesia; *Zea mays*]

Abstrak

Respons tanaman jagung terhadap pemberian pupuk fosfor pada berbagai tingkat residu fosfor dalam tanah Paleudult don Eurrustox

Dua percobaan diselenggarakan, satu pada suatu tanah Typic Paleudult di Lampung, Indonesia dan yang lainnya pada suatu tanah Tropeptic Eutrustox di Molokai, Hawaii. Tujuan percobaan adalah untuk menduga respons tanaman jagung terhadap pemberian pupuk fosfor pada berbagai tingkar residu fosfor dalam tanah.

Hasil percobaan menunjukkan bahwa setiap tingkat residu P atau setiap kelas nilai uji tanah memerlukan persamaan respons pemupukan yang berlainan guna merumuskan dosis rekomendasi. Dalam suatu famili tanah pengalihan informasi mengenai respons jagung terhadap pemberian fosfor hanya dapat dilakukan, jika perubahan kesuburan tanah akibat pengelolaan tanah sebelumnya diketahul. Untuk itu uji tanah hara Pdiperlukan.

Introduction

Crop response to phosphorus application has been reported frequently for various tropical soils. Lathwell (1977) reported results of several studies of phosphorus response on Oxisols and Utisols. These soils are deficient in available phosphorus in their native states and require phosphate fertilizers for optimum crop yield when first brought into production. Yost *et al.* (1979) found that the response on a highly weathered soil in Brazil was influenced by placement methods and rates of application. Harris (1980) reported the results of a study on rates, placement and sources of

- is written in normal language. Words should not be omitted to save space, as they are in cables. There are other ways to be brief.
- stands on its own. It will be read separately from the paper, in publications like *Biological Abstracts* or more specialized services like the Southeast Asian Weed Information Center newsletter *WEEDWatcher*. The abstract must be complete in itself.
- reports the objective' of the research; its extent or scope; the methods used (by reference if they are standard, or described briefly if they are not); the main results, including any newly observed facts; the principal conclusions and their significance.
- contains all the key words by which the paper should be indexed. These are sometimes listed as well in a short separate paragraph beneath the abstract.

Things to watch

Make sure the abstract is no longer than necessary — and no longer than the publication permits. Cut all unnecessary words. Prune ruthlessly.

Make sure it contains all the necessary information. If space allows, it should include all new items and observations, even if they are not central to the paper's purpose; that information might be useful to other people.

Make sure the abstract can stand alone. Delete

- references to tables or figures that appear in the paper.
- abbreviations or acronyms unless they are standard or explained.
- references to literature cited. If a publication must be mentioned, reference should be in full (author, title, journal, date, etc.)
- any information or conclusions not in the paper itself.
- general or fuzzy statements or adjectives. Make sure findings are given as hard facts.

This kind of abstract is normal for reporting new research. A broad-ranging review article might require a different kind of abstract: a table of contents that describes the topics covered in the paper. Such an abstract does not stand on its own, but does indicate exactly what kind of information the article contains.

Abstracts are often set in a different size or style of type than the main text. In that way they are easy to recognize. Strangely, however, they are often set in a smaller size than the rest of the article. This makes them harder to read, and that seems to conflict with their importance. Editors might think about this when considering the design of their publications.

Dates

Many journals report, near the title, the date the manuscript was received in the editorial office and sometimes the date it was accepted for publication. This infomiation is not essential, but it can help establish exactly who was the first to discover something new. It also indicates when the research was done, which may be important if there has been a long delay in getting it published.

4.3
Editing articles: the text

The text of a research report should follow the rules of all good writing. The information in itself may be complex and technical; the language should not make communication still more difficult. Long words and long sentences do not make research important. Some authors think otherwise. They may tell an editor who has simplified their prose: "That may be what I mean but it doesn't sound scientific!" They are fooling themselves, Good scientific writing is straightforward, clear, concise, and vigorous.

The structure of research reports varies slightly from discipline to discipline and from journal to journal. This unit considers four major sections of a paper: Introduction, Materials and Methods, Results, and Discussion. Some journals have a further section called Conclusions. Others follow the Materials and Methods with a section called Results and Discussion, followed by Conclusions. This last system has one disadvantage: the reader may find it difficult to separate actual results and the author's interpretation.

Introduction

The introduction should be relatively short. It is often too long in manuscripts, especially in papers from conferences. The introduction indicates what is of interest in the paper and why the author carried out the research. It also gives the background the reader needs to understand and judge the paper. In a primary journal, the author should not need to explain why the research is important. If it is important, a fellow scientist should recognize that fact.

Qualities

A good introduction

- defines the nature and extent of the problem studied.
- relates the research to previous work, perhaps by a brief review of the literature. This should include only publications that are clearly relevant to the subject of the paper.
- explains the objectives and method of investigation, including, if necessary, the reason why a particular method was chosen.
- introduces the logical order of discussion that will be followed in the rest of the paper.
- states the principal results of the investigation.
- defines any specialized terms or abbreviations to be used in what follows.

Things to watch

The editor must make sure that

- the author leads logically to the hypothesis or principal theme.
- the hypothesis is clearly stated.
- the introduction does all that it should in no more than a couple of typewritten pages.

Materials and methods

In reporting the materials and methods used in the research, the author must provide all the information that will allow another researcher to judge the study or actually to repeat the investigation and test the results.

Qualities

The content will vary depending on the nature of the experiment and the discipline. As appropriate, however, this section should include

- the design of the experiment.
- any plants or animals involved, with exact descriptions (genus, species, strain, cultivar, line, etc.).
- the materials used, with exact technical specifications and quantities and their source or method of preparation. (Generic or chemical names are better than trade names, which may not be universally recognized.)
- the assumptions made.
- the methods followed, usually in chronological order, described with as much precision and detail as necessary. (Standard methods need only be mentioned, or may be described by reference to the literature as long as it is readily available. Modifications of standard techniques should be described. If the method is new it should be described in detail. Methods of interpreting data should be described as well as methods of finding data.)

Things to watch

Many editors find this section demands special attention. Even if they are not specialists in the subject under discussion, they may sense that the explanation is not completely clear. They may then have to help the author untangle thoughts.

Explaining how something is done. clearly and briefly, is one of the most difficult tasks in writing. That is why cookbooks are hard to write and good cookbooks are hard to find. A good recipe is a model of reporting materials and methods.

The simplest way to organize this section is usually chronologically. If the writing is confused, ask the author to set down just what was done, one step at a time, leaving nothing out.

Be sure that the writing is clear and detailed enough to be followed by any competent researcher in the same field. Watch that

- there are no ambiguities in abbreviations or names.
- all quantities are in standard units.
- all chemicals are so specifically identified that another scientist can match them exactly in repeating the work.

- every step is stated, including the number of replications.
- all techniques are described, at least by name if they are standard or in as much detail as needed if the author has modified a standard technique or devised a new one.
- nothing is included that does not relate to the results that follow. (Sometimes authors include steps that relate to results reported in another paper.)
- there are no unnecessary details that may confuse the reader.

Results

The results are the core of the paper. This section presents the data the researcher has found.

Qualities

Well-presented results

- are simply and clearly stated.
- report representative data rather than endlessly repetitive data. (As a 19th century geologist said: "The fool collects facts; the wise man selects them.")
- reduce, large masses of data to means, along with the standard error or standard deviation.
- report repetitive data in tables and graphs, not in the text.
- repeat in the text only the most important findings shown in tables and graphs.
- include negative data—what was *not* found—if they affect the interpretation of results. Otherwise, negative data are omitted.
- give only data that relate to the subject of the paper as defined in the introduction.
- refer in the text to every table and figure by number.
- include only tables, figures, and graphs that are necessary, clear, and worth reproducing.

Things to watch

The editor must read the text critically to make sure it meets these criteria. Cut

- repetition of data.
- unnecessary negative data.
- data that do not relate directly to the objectives of the study.
- unnecessary figures or graphs—and any that are not referred to.
- unnecessary words. (Watch especially for sentences that begin: "Table 5 shows that . . . " Tables don't show anything. Cut those words, and put the reference to the table in parentheses at the end.)

The reader will usually follow the results more easily if they appear in the same order as the objectives were given in the introduction.

Discussion

In the Discussion section, the author explains what the results mean and their implications for future study.

Qualities

A good discussion

- does not repeat what has already been said in the review of literature or in the results.
- relates the results to the questions that were set out in the introduction.
- shows relationships between the facts observed during this investigation.
- shows how the results and interpretations agree, or don't agree, with previously published work.
- discusses theoretical implications of the work.
- states conclusions, with evidence for each.
- indicates the significance of the results.
- suggests future research that is planned or is needed to follow up the results.

Things to watch

The editor must judge whether readers at this point will say "So what?" If they might, the author has not done an adequate job. The discussion is the most difficult part of any paper, and the one that editors most frequently ask to have revised.

Ensure in particular that the author has

- dealt with each of the originally stated objectives.
- in organization, followed the order of the original objectives.
- introduced previously (most likely in the introduction) the subject of each conclusion, so that none comes as a surprise.
- avoided unnecessary detail or repetition from preceding sections.
- reported previously all methods, observations, or results referred to in this section. This is not the place to mention them for the first time.
- interpreted the results and suggested their implications or significance for future work.

Footnotes

Footnotes (notes at the bottom of the page) should be avoided in general. They break the reader's flow of thought, and they add to the cost of printing.

Some journals give references in footnotes. This practice has almost disappeared in the sciences. however, and seems to be growing less in other disciplines. When notes are used to cite references, it is usually more economical to group them at the end of an article or book than to insert them separately, one or two at a time, at the bottom of each page.

Footnotes are more often used to provide information the author feels is important but would interrupt the flow of discussion. An editor can often find ways to insert such notes into the body of the text. often by putting them in parentheses. If a statement is worth making, it is usually worth making in the text.

Footnotes are indicated in the text by a superior number ([1,2]). a superior letter ([a,b]), or a symbol ([*,†]).

Things to watch

Footnotes should be typed on separate sheets of paper, not at the bottom of manuscript pages. They will likely be typeset separately from the main text, and if they are grouped together in this way they can be set more economically. They should be double-spaced so they will be easier to edit and set.

Footnotes may be used for some essential information like the address(es) of the author(s).

Watch for footnotes that may be fascinating but do not add to the argument. They should be deleted.

Acknowledgments

Acknowledgments form a separate section of the article in many journals. Here the author has a chance to thank any institution or individual who helped significantly in the investigation. This may include a granting agency that supplied funds, a laboratory that supplied space or materials, or a person who gave advice. The acknowledgments are also a suitable place to recognize that a paper arises from a thesis. If no separate place is provided for acknowledgments, they may have to be included in the introduction or as an endnote.

4.4 Citations and references

Authors support their arguments by citing previously published material. Readers may want to refer to those publications, to get information for their own purposes or to check the author's use of the cited material.

To serve the reader, citations and references must be clear and accurate. They are easier to use if they are consistent in style as well.

Most publications and most editors have definite preferences in the way they cite references in the text and list references at the end of articles. One person looked at 52 scientific journals and among them found 33 different systems being used.

Citations

Three main systems of citation are used in scientific publication today. Within these systems there may be many variations. The main systems are

- name and year (also called author-date)
- number
- number, with references in alphabetical order

Name and year

In the first system, the name(s) of the author(s) and the year of publication are fitted into the text. Both may be in parentheses, or only the date may be in parentheses, depending on the sentence structure.

> A recent study suggests that the refereeing system works effectively (Lock and Smith 1986).
>
> Lock and Smith (1986) support the view that the refereeing system works effectively.

Sometimes the page number must be included as well.

> Papers published in the *BMJ* had significantly more citations in the years up to 1984 than either of the groups of rejected papers (Lock and Smith 1986, p. 312).

If there is more than one reference with the same author(s) and year of publication, a lowercase letter is added to the date.

> (Lock and Smith 1986a), (Lock and Smith 1986b), etc.

At the end of the paper, all references that have been cited are given in full. They are listed in alphabetical order according to the last name of the author. If there is more than one author, alphabetical order is decided by the name of the first author in the reference. If there are two or more items by the same author(s), they are arranged chronologically.

Advantages. The author or editor can add or remove references easily. The reader knows immediately who wrote the work cited, and when it was published. Works by the same author are listed together.

Disadvantages. The reader may find that the references interrupt the flow of the text. This may not always be a problem: specialist readers will know many of the authors, at least by reputation, and will not mind being reminded who said what. When many works are cited at one time, however, as can happen in the introduction, the system can be more distracting: in such cases the reader may have to skip several lines of continuous names and dates before returning to the argument. For the publisher, this system adds extra words and figures that have to be set and therefore increases the cost.

Number

In the second system, references are numbered in the order they are mentioned in the text. In some journals, the name(s) of the author(s) may be given as well.

> As Stainton says, long, learned notes are regarded by many authors as the essential insignia of scholarship—and by many readers as 'Do not enter' signs (9).
>
> Scientific papers are not designed to be read; they are designed to transmit information. Any real deviation from the standard mold will be likely to inhibit easy grasp of the information by the reader (Day 3).

The work referred to keeps that number every time it is cited throughout the text, even if it is cited several times at widely separated points.

(This is different from an older system of consecutively numbered notes, still used sometimes in the social sciences and in the humanities. In that system, each reference, even to the same work, involves a new, individually numbered note.)

At the end of the paper, all references that have been cited are listed in numerical order.

Advantages. The publisher saves money in typesetting. Readers can skip over the numbers easily. They can find the references quickly in order as they appear in the text. The system is especially good for articles or other short manuscripts that have few references.

Disadvantages. If the author or editor decides to add or remove a reference, the entire manuscript must be renumbered following that change: this can be a big job, especially if several such changes are made. The reader may find that, in the list of references, works by the same author are separated. Both reader and editor may find it difficult to

check the list of references for the work of any single author, since the references are not in alphabetical order.

Number with alphabetical references

The third system combines the advantages of both previous systems. All references are first placed in alphabetical order according to author. Then they are numbered in that order. These numbers are used for citations in the text.

Advantages. The publisher saves money in typesetting. Readers can skip over the numbers easily. References are listed in alphabetical order.

Disadvantages. The author or editor will have to renumber the references and citations if any references are added or removed from the alphabetical listing. Some readers may be troubled by the fact that citations will not appear in the text in numerical order.

References

Each reference must be described in detail at the end of the article. The list is usually headed "Literature Cited," or "References Cited," or simply "References."

The list of references should include only works that are 1) actually cited in the paper and 2) actually published or, if not published, are available in libraries or from the author or an organization. Personal communications should be referred to in the text but not in the listing of the literature.

Delete any references that are not cited. Question any that do not make it clear how they can be obtained by a reader.

There is fairly general agreement on what each reference should contain and editors should make sure that all necessary data are present. Editors should not have to check the accuracy of the information, but should make sure the author has double-checked it. If there is any doubt about this, it is wise to spot-check some of the references at a library.

Articles

A reference to a Journal article should contain

- names and initials of all authors (although, if there are many authors, some journals will list only the senior author *et al.)*
- title and subtitle
- name of the Journal (usually abbreviated)
- volume number
- first and last page numbers
- year of publication
- month or number of issue, if pages are not numbered consecutively through a volume

Lock, S., and J. Smith. 1986. Peer review at work. Scholarly Publishing 17:303-16

Books

A reference to a book should contain:

- names and initials of all authors
- title and subtitle
- number of edition, if there is more than one
- name and initials of editor or translator, if any
- place c f publication
- name of publisher
- year of publication
- volume number, if more than one
- page numbers, if any need to be cited specifically

Stainton, E.M. 1982. Author and editor at work. Toronto: University of Toronto Press. p.17

Proceedings

For the proceedings of symposia, conferences, and workshops, references should include

- names and initials of authors
- title of paper
- names and initials of the volume editors
- title of symposium or conference
- date and place of meeting
- place of publication
- name of publisher
- year of publication
- numbers of specific pages

Day, R. A. Writing in the basic sciences. In Scott, J.T.; Heumann, K.F.; Langlois, E.G., eds. Scholarly communication around the world: proceedings of a joint global conference sponsored by the Council of Biology Editors, International Federation of Scientific Editors' Associations, Society for Scholarly Pubiishing; 15-20 May 1983; Philadelphia. Washington, DC: Society for Scholarly Publishing; 1983:33-4.

Variations

While editors agree on the content of references, they do not necessarily agree on the form.

Some publications print the titles of books and journals in italic, and the titles of chapters and articles in roman within quotation marks. Some put capital letters at the beginning of every word in a title. Some put "p." in front of a page number. In the sciences, these practices are going out of fashion. Most scientific publications separate the elements of a reference by periods but not by typographic style. More and more use "down-style" in titles, and use capital letters only as they would in a normal sentence. More and more prune the references of all unnecessary letters.

The placing of the elements also varies from publication to publication. In some the date is put immediately after the author(s), as in the first two

examples above. This is particularly valuable if the name and year system of citation is used. In other publications the date is at the end.

Many publications list the names of all authors if there are no more than two or three. If there are more than that, they list only the senior author *et al.*

Some journals, particularly in the health sciences, have reduced punctuation to a minimum. They have dropped the periods after initials in authors' names, and have even removed the space between initials (thus Smith, J.L. becomes Smith J L). Others omit the periods but keep the space (Smith J L). Still others follow more traditional punctuation and spacing.

To save space, many publications use abbreviations for journal titles. A number of abbreviations have become standard.

Some publications give the first and last page numbers of articles. This helps the reader order copies through a library service. It also tells the reader how long the article is.

Citations and references are one of the most complicated areas of editing. It can also be one of the most time-consuming, if authors submit manuscripts with inaccurate or inconsistent references. Editors should not get unduly lost in the finest points of punctuation and style: what is important is that the reference be clear and accurate. The examples in this unit suggest some of the many possible variations. For other examples and more detailed instructions, refer to a good style guide, or study a journal or other publication you would like to copy.

4.5
Editing tables

Editors sometimes accept authors' tables uncritically. They may feel that tables are too sensitive to edit. In fact, tables deserve just as much editorial attention as text. Many researchers read them before reading the text; they may even consider the tables the most important part of a paper. A good table is worth hundreds of words. A bad table may confuse more than it communicates.

Here are some questions an editor might ask about any table included in a manuscript. The advice follows rules generally accepted in scientific publication.

General

What is the purpose of this table? Is the author using it to present the results of research to other specialists? Is it providing data primarily for future reference? In the first case, a table should be designed for easy understanding: numbers may be rounded and results combined so that relationships can be quickly seen. In the second case, there should be more emphasis on precision and ease of finding specific data.

Is this the best way to present the data? A table presents large amounts of detailed information in a small space. It makes it easy to see relationships of data within the table, and to compare that information with data presented elsewhere.

Broad trends and interrelationships can be shown more clearly in a graph, however.

The information in a small table often can be presented more easily, more briefly, and more clearly in one or two sentences in the text. If a table is not the most effective way (or the most economical way) to present data, the editor should suggest an alternative.

Is the table complete in itself? Can it stand alone, for example, if it were reprinted in another publication? The reader should be able to find all necessary information in the table without referring to the accompanying text.

As in so many other situations, the six basic questions (unit 1.3) can be used to analyze the contents of a table and ensure they are essentially complete. It should be possible from the table to answer all six questions easily. If it is not possible, further information may be needed, or the title and headings may need editing.

- *Who* provided the data? (Are the respondents identified in a survey? Is the source provided in a table that is based on previous research?)

- *What* is being measured? (This in effect is the dependent variable, the one that is affected by changes in the other variable. Is it identified clearly and properly?)

- *Why* is there variation? (This is the independent variable, one that varies regularly, such as time or the gender or income level of respondents. Is it identified clearly and properly?)

- *How* does the variation occur? (What processes are being measured?)

- *Where* were the measurements made?

- *When* were the measurements made?

How does the table relate to the rest of the manuscript? Tables are expensive to set in type. They also take space to print and time to read. They should contain only data that deserve publication. They should not include large amounts of raw experimental data. They should include only data that support significant conclusions and cannot easily be included in the text. Has the table met all these criteria?

Does the table support the subject of the manuscript‘? Is its information truly relevant and significant? (Authors sometimes cannot bring themselves to discard data they have worked so hard to gather even when the figures do not relate to the subject under discussion.)

Is all the information in the table consistent with information in the text and other tables? Are the units of measurement the same? Do the data agree? (Sometimes text and tables disagree.)

Does the table contain data also in the text? If so, should the text be edited to remove duplication? Should the table?

Does the table contain data also in a graph? If so, should either the table or the graph be omitted?

Title and headings

Is there a reference to the table in the text? Each table should be mentioned in the text. If there is no reference, it may be an oversight. On the other hand, it may suggest the table is unnecessary.

The reference should be by number. Avoid references to “the table above” or “the following table” or “the table on the next page.” It may be impossible to place the table exactly where the author wants, because of the way the pages break or because of the publication’s design.

Is the table numbered? Each table should be numbered, using arabic figures.

The tables should be numbered in the order in which they appear, which should be the same order as they are mentioned in the text. Each table should have its own number: even tables in series should be numbered Tables 4, 5, 6, not Tables 4a, 4b, 4c.

The numbering should start at 1 in each article, chapter, section, or other major unit of the text.

Is the title satisfactory? Does it identify the table clearly and accurately?

Does it contain unnecessary words? The title should not give background information, or duplicate the headings, or describe results. Normally it will not even have a verb. It is purely descriptive.

Is the title of this table consistent in style and form with titles of other tables in the series?

Does the title or subtitle (if there is one) give necessary information about units of measurement, size of sample, or methods of treatment? Does any such information refer to the *entire* table—to every column of data? If it doesn't, move the information to the appropriate column heading.

Are the column headings clear, accurate, and appropriate? Are they brief and meaningful? Do they identify the units in which the data are reported? (Units of measurement should not be repeated in the body of the table.)

Are the units logically consistent across the table? (Does one heading refer to days, another to weeks?) Are the units appropriate to the context? (In a study of work, is it more appropriate to report the time spent on each task in hours, days, or weeks?) Are the units the same ones used in the text or in any accompanying tables or figures?

Would the column headings be easier to understand if they were grouped, using two or even three levels of headings? Such subheadings should be placed under straddle rules (thin lines stretching under the main heading).

Are abbreviations and symbols standard and easy to recognize? If not, are they explained in a footnote?

Are the sideheadings clear, accurate, and appropriate? Would they be easier to understand if they were grouped, with main entries followed by indented sub-entries?

Are items consistent within the sideheadings? The same rules apply as for any items in a series: things that are logically similar should be described similarly.

Are items consistent with entries in other tables in the manuscript with which this table may be compared?

Are breaks in numerical series clear? It may be ambiguous to break a numerical series as 0-10, 10-20, 20-30, etc. It is clearer to report, if only whole numbers are involved, 1-10, 11-20, 21-30, etc, or 0-9, 10-19, 20-29, etc.

Have footnotes been used appropriately? Are all that are needed present?

Footnotes make it possible to streamline the information in the body of the table. They can be used to define abbreviations for terms that are too long to fit in the table. They can be used to report exceptions, limitations, or other qualifications of data. They can give sources of data and permissions. They can report indications and explanations of statistical significance. Footnotes can grow longer than the table itself, and that is undesirable: but used appropriately they improve a table's efficiency.

Footnotes that apply to an entire table should appear first without any special identification. More specific footnotes can be identified in the body of the table by a superior number (1,2), a superior letter (a,b), or a symbol (*,†). Choose a system that cannot be confused with data in the table.

In every table consider the need for footnotes. Should a measure of probability be reported? Is it there? Should a source be reported? Is it there? If the reference to the source is incomplete, is the source cited fully in the references at the end of the manuscript?

Are any other notes, about the table or about specific data in the table, clear and brief? Are they correctly identified within the table? Are any unusual or ambiguous abbreviations defined?

Data

Are the data in the table all related to its subject? Does every column or line relate to the subject under discussion? Any that do not should be deleted.

Is there too much information in the table? Assuming that all data in the table are relevant and significant, is there still too much information?

Has the author included columns that are unnecessary? For example, is it necessary to have a column that gives the total of two preceding columns if the numbers are so small the reader can add them mentally?

Can some of the information be put in a footnote or in the title? Would the table be clearer if the data were divided into two or more tables? Would such a change make trends stand out more clearly?

Have the data been presented appropriately? Are figures at a reasonable level of significance, given the units of measurement and the context? Will they be meaningful?

(Is it necessary to report an area as 105,321 ha, or is it satisfactory to describe it as 105.3 in a column headed "× 1000 ha"? In a study of work, should a task be reported as taking 3.44 days, accurate to within five minutes in an 8-hour day? Should grain yield be reported as 7461 kg/ha or as 7.5 t/ha when the figure is only an average?)

Simpler figures save space. They remove clutter. They make it easier for the reader to see relationships and trends.

In any case, figures should not be carried out to more places, and should not indicate greater accuracy, than is reasonable or is indicated by the data.

Have the data been presented in a logical manner? Are sideheadings arranged in an order that has some logic? Items may be arranged chronologically, geographically, alphabetically, by custom, or by order of magnitude (the largest usually at the top).

Are column headings arranged in a logical progression?

Are data that have to be compared close together?

Are the most important data prominent? In cultures that read from left to right, top to bottom, tables are read in that order: first the title and column headings, then the sideheadings, and only after that the field of data. Experienced readers go quickly to the right-hand column and bottom row if these present totals or results. The top and left side of a table are usually considered most important. If entries are to be arranged in order of magnitude, the order is usually established by the data in the first column. The last column also is important, and the bottom or top may be reserved for totals.

Are the data accurate? The editor cannot verify all the data, but can check the accuracy of calculations within the table. A careful editor will at least spot-check for errors.

If columns or rows end in totals, is the addition correct?

Do columns of percentages total 100? (Some variation is acceptable because of rounding of individual entries, but if a column totals less than 99.8% or more than 100.2%, the percentages should be checked.)

Presentation

Have the data been presented correctly? Have numbers been shortened when appropriate. Can multiples (for example, "× 1000 ha") be used in the headings? Unnecessary zeros obscure meaning.

Are columns of figures aligned on the decimal point or, if there is no decimal point, along the last integer?

Are rows aligned with the sideheadings? If a sideheading is more than one line long, data should align horizontally with the last line.

In numbers without a full number before the decimal point, has the author begun with a zero ("0.12" rather than ".12")? (Some publications relax this rule for columns in which all numbers are less than 1 .)

Are missing data indicated correctly, usually with a blank or a dash? (Some publications distinguish between these alternatives: a blank space means the data could not be obtained, a dash means simply the data were not obtained.)

Is the table well designed? Is it easy to read? It is easier to compare data down columns than across rows. Subheadings go into sideheadings more easily than into column headings.

Will the table fit on the page of the printed publication? If it must be extended on to a second page, the sideheadings should be repeated. This is a convenience for the reader, who would otherwise have to jump across the width of the inside margins to follow a row of figures, and might get lost. It is also a safeguard because pages are sometimes bound inaccurately and then rows do not line up properly.

Is the table unpleasantly or wastefully long and narrow or short and wide? This may be corrected by changing the axis: making the sideheadings into column headings and vice versa. Before doing this, make sure that the table remains consistent with other tables, if any, in the manuscript.

Are rules used correctly? Normally, the only full-width rules considered necessary today run above and below the column heads and at the bottom of the table. Shorter rules may be used to group columns in straddle heads. Vertical rules are almost never used.

Totals are set off by indentation and/or space.

Table 11. Yield and income gain of fertilizer users and nonusers by tenure. Camarines Sur, Philippines, 1981-84.

Item	Owner-cultivator		Tenant-cultivator	
	Fertilizer user	Nonuser	Fertilizer user	Nonuser
Revenue				
Gross yield (t/ha)	2.6	2.1	2.4	1.9
Net yield (tha)[a]	2.3	1.9	1.4	1.0
Gross value ($/ha)	144.8	118.3	87.5	62.5
Costs ($/ha)				
Current inputs	10.3	2.6	11.1	2.1
Labor	14.1	4.8	17.1	8.9
Power	12.4	12.2	10.7	11.6
Cash costs	36.8	19.6	38.9	22.6
Gross margin ($/ha)	108.0	98.7	48.6	39.9

[a]Net of harvesters' and threshers' shares, and in the case of tenants, owners' shares.

Is there enough white space between columns to permit easy reading? Is there so much white space between columns that it is difficult to compare figures horizontally?

The CBE Style Manual suggests some useful ways to condense tables. If columns just to the right of the sideheadings describe the experimental variables, can they be rearranged as subheadings within the sideheadings? Can columns sometimes be combined, as in this example:

No. inoculated/ no. dead
10/3
10/2
20/12
20/3

Is the typescript clean? Will the typesetter be able to follow it easily? If not, have it retyped.

Tables, like all other copy, should be typed double-spaced. They should be on separate pages from the text because they probably will be set separately.

4.6
Editing the proceedings of a conference

The proceedings of a conference, workshop, or symposium should be published quickly. If at all possible, they should appear within four to six months of the conference. If it takes a year or more to publish them, much of the information will be dated, including the recommendations.

This may sound like a dream. Too often, the editing of proceedings is a history of exasperation and delay. The authors scatter after the meeting. Their papers trickle in, sometimes months late; some never appear. The papers that do arrive are uneven in length and quality. Some are good; some need revision; a few may deserve to be rejected but possibly can't be. Many should be shortened. The authors have used different styles of abbreviation, citation, and reference, all of which must be made consistent. References may be missing or need to be checked, and illustrations have to be redrawn. The process takes months, even (sometimes, unfortunately) years.

It does not have to be this way. Proceedings can be published quickly—if the editor begins working on them early, and if everyone else involved cooperates. Most of the work should be done before the meeting ends.

Here are eight steps by which editors can speed publication.

Help plan

Try to be part of the planning. If possible the editor should meet with the organizing committee, or even be part of it. Often the editor has had experience with other proceedings, and can offer good advice.

Organizing committees are likely to be concerned with other matters: the meeting site, the speakers, important guests, accommodation, budgets, arrangements for meals and refreshments, and so on. They may not think of some of the questions an editor considers important. Later it may be too late.

For example, who will own copyright in the published proceedings? Is the sponsor of the conference an organization that has a permanent address and continuous life? That is, will it be in a position to administer copyright and deal with requests to reprint material from the proceedings? If not, is there another body in a position to do so?

Is there any formal agreement between authors and publisher, and what are its terms? Will the authors receive a free copy of the proceedings,

or more than one free copy, or offprints? Have the authors transferred copyright in their papers to the publisher? What rights have they, if any, to publish their findings elsewhere, before or after the proceedings are published?

Are discussions following the papers to be recorded, transcribed, edited, and reproduced? Are the organizers prepared to accept the cost in money and time? Do they really think it is worth it? Would it be better to appoint rapporteurs for each discussion who will write brief summaries of important points?

Define jobs

Define responsibilities. Be certain who is supposed to do each job.

Sometimes the organizing committee will choose one or more subject specialists to be generally responsible for the proceedings. The specialists' names will then appear as editors of the volume.

Such people (volume editors) can be of great help to the editor who prepares the manuscript for publication, especially if the manuscript editor lacks seniority or expertise in the subject of the conference. During the planning of the conference, a manuscript editor might even suggest that a volume editor be appointed.

If there is one, be certain everybody understands which jobs will be done by the volume editor and which by the manuscript editor.

Volume editors should be responsible, first of all, for content. As colleague3 of the speakers, they can insist firmly that instructions and deadlines be followed. As specialists, they can judge quality. They can recommend revision. They know what may be cut from a paper that is too long and what must be kept.

They may occasionally have to settle disagreements between authors and the manuscript editor. Most likely they will be responsible for reading proof of the proceedings, especially if the authors work in many different countries and it would take too long to mail each of them proof to check and return.

Beyond that, volume editors may do any of the other jobs involved in publication. They may prepare and sign agreements with authors. They may make: sure that all permissions have been secured to reprint material that is in copyright. Some edit the manuscripts for language and accuracy.

Send instructions

Send authors detailed instructions. The organizing committee should insist that papers be submitted well in advance of the meeting, typed in a form suitable for publication.

The committee should send all participants rules for preparing and typing the manuscript. These should include maximum length, styles of references and tables, and specifications for illustrations. They may

form a small leaflet, or at least a single sheet of instructions. The effort involved will save time later. If participants follow the instructions, the editor will not have to impose consistency on their papers. Afterward the same instructions, perhaps revised in detail, can be used for future conferences.

Set a deadline

Set a date by which all manuscripts must be submitted for editing. In setting this deadline, allow enough time to finish the editing *before* the meeting. Establish a schedule. Be realistic.

For example, an editor may calculate it will take, on average, one working day to edit each paper to be given at the conference. Some well-written papers will take less than a day. Others will take more: some authors may be writing imperfectly in a second language; some may ignore instructions about style no matter how firmly they are stated. Remember also that few editors work without interruption. They may have to set aside one manuscript to read proof of another publication; they have correspondence to deal with; they go to meetings; they get sick. This editor decides to be safe and doubles the average time in order to allow for such interruptions. That means two days per paper. If the program calls for 30 papers, the editor must receive the papers 60 *working* days—nearly three months—before the conference begins.

Not all the manuscripts will arrive on time, of course. But the work can get done as long as most arrive on time and the rest arrive later in a steady flow. Inevitably, a few will not arrive before the conference. They will have to be edited there.

In editing conference papers, look for material that can be cut. This may be unnecessary or redundant tables and figures, paragraphs that add little information, and material more suitable for a spoken presentation than a printed article.

As a general rule, try to minimize the amount of material that does not add to scientific knowledge. Opening speeches, the program of the conference, and such matter may be omitted. If an official speech must be included, perhaps it can be summarized in a preface or introduction. The best volume of proceedings is a document useful to future readers, not a monument to a meeting that took place in the past.

Be there

Go to the meeting. For speedy publication, it is essential that the manuscript editor be at the conference. The chairman should introduce the editor at the beginning of the meeting and emphasize the importance of the editor's job.

Wise editors take to the meeting transparent tape, scissors, a stapler, pencils, and other supplies for quick cut-and-paste editing. Such items often are not easily available at the conference site.

Editors may also bring copies of related volumes their organizations have published. These will show participants what the new proceedings

will look like. They may also result in orders for previous publications. Selling copies should be a secondary concern, but price lists and order forms can be useful.

Finish the job

Try to complete the editing before the conference ends. There can be no time lost after the conference in corresponding with authors about revisions. Make sure that editing is complete before the conference ends. Try to meet each speaker during the conference and go through that person's paper, getting answers to all questions, clarifying meanings, and getting agreement to all cuts. Persuade authors to do any necessary revision during the conference. Usually there are resources available for speakers to check references or data.

The editor and organizers must make sure that recommendations and any other material arising from the conference are in the editor's hand at the end. In this way, the editor can go home with a complete manuscript that needs little more than tidying before typesetting begins. As one experienced editor said: "When I leave a conference, everyone knows that what's in my folder will get printed, and anything else won't."

Settle problems

Deal with any remaining problems. Sometimes an author cannot revise a paper at the conference. There may not be enough time for substantial revision, or the information may be unavailable. Give that author a deadline by which the revised manuscript must be in your hands. Allow enough time for the work to be done, but not so much that the publishing schedule will be in danger. Make sure the author agrees, and involve the volume editor if there is one. When you are back at the office, write to remind the author that you need the manuscript by the agreed date.

Occasionally a paper may need so much revision that it must be rejected. This should not happen often if the speakers at a conference have been warned in advance that they must bring papers suitable for publication.

Some publishers feel they must have the proceedings refereed. Others argue that the conference itself is a form of refereeing, since each paper is submitted to discussion by the author's peers during the meeting. Frequently, in fact, authors do revise papers on the basis of discussion during the meeting.

Recommendations arising from the meeting should be published prominently. Group them. Some publishers put them at the front of the book before the papers themselves. The recommendations are what many readers look for first.

Occasionally, after a conference, authors ask to withdraw their papers from the proceedings volume. The reasons vary, and so may the responses.

Sometimes it is so the material can be published elsewhere. In such cases, an editor may not be very sympathetic, if the proceedings themselves are being published rapidly. (It is hard to blame an author

for getting restless if the proceedings are taking more than a year to appear.) In other cases the author may want to revise the paper as a result of discussions or new information at the conference itself and needs extra time to consider the approach. Occasionally the author may realize that a policy suggested in the paper conflicts with an official policy or a superior's viewpoint and could cause difficulties in the office. In such cases, an understanding editor will probably release the paper. The manuscript is, in fact, the author's, and nothing is gained by publishing questionable material or stirring up trouble.

Publish quickly

Publish the results quickly. Back at the office, quickly tidy the manuscript for the printer. If necessary, have it checked by a local subject specialist. Then send it for typesetting. For extra speed, prepare camera-ready copy in the office by using a typewriter or word processor.

Some publishers, anxious to save time, do not show the authors proof, but then there is always the danger that errors will be missed. The volume editor or the conference organizers may be asked to read proof instead of the authors. A cautious publisher will show the authors proof but will give them only a short time to return corrections, and will warn them that if they do not meet the deadline the proof will be sent back to the printer as it is. In all cases, the emphasis should be on rapid publication.

The typesetter and printer, as well as the publisher, must be aware of the need for speed. Set schedules, and see that they are kept.

4.7 Editorial review

Before a manuscript can be edited, it must be accepted for publication. This decision is usually made by an editor who is a specialist in the discipline, or by a committee of specialists, not by the editor who will eventually check the manuscript for details and prepare it for the printer. All editors should be concerned with quality, however, and the manuscript editor may need to understand the process by which specialist publications are accepted.

Few specialist editors can keep up with all the developments in all the fields in which an organization or journal may want to publish. Many get help from editorial committees of other specialists, each an expert in a particular field. In addition, they often seek advice about individual articles or books from experts outside the office (these experts are sometimes called *referees)*. On the basis of what these experts say, the editor may decide to

- accept a manuscript as it is.
- accept it, provided certain changes are made.
- reject it, but suggest that the author revise and resubmit it.
- reject it completely, but perhaps suggest another journal or publisher who might accept it.

Usually the editor passes the experts' advice on to the author. That advice may include several pages of detailed suggestions for improvement. The refereeing system therefore has two benefits:

- It advises the editor how to act.
- It helps the author produce a better manuscript.

Asking advice

Journals have different ways of asking the referees to report. Some have forms that are easy to fill in; some ask more general questions and hope this will produce longer, and more detailed, comments that can help the author. Basically, editors ask whether the manuscript meets the criteria of a good primary publication:

- Does it contribute new information to its field?
- Is the work significant as well as new?
- Has it been published before?
- Are there flaws in the original plan?
- Are the conclusions soundly based?

- Is the writing clear enough and complete enough for other researchers to duplicate the experiment?
- Should any parts of the manuscript be expanded or made clearer?
- Are references to other work complete and accurate?
- Are there too many references, or too few?
- Are the references appropriate and recent?
- Does the manuscript deserve publication at this length?
- Is the writing style good enough?
- Are all figures and tables properly prepared?
- Is the abstract (if there is one) adequate? Are the abstract and the title informative?

Choosing referees

Usually editors ask €or two expert outside opinions, or one outside opinion and one from a member of the Editorial Board.

Normally, they promise that the author will never learn the name of a referee: they guarantee *anonymity*. They hope this will encourage referees to be honest and objective in their reports. Without this protection, many referees might hesitate before writing a severe criticism of a paper that deserves it.

Editors also try to make sure that referees are neither close friends nor enemies of the author. They want objective opinions.

Many publishing organizations, for the same reason, avoid referees who work at the same institution as the author. They know that colleagues may hesitate to criticize one another. They also know that people at the same institution sometimes fight with one another.

This system of editorial review is not always perfect. Referees do not always agree. Sometimes they miss problems that appear only when detailed editing is under way. Sometimes they approve manuscripts that should be rejected, or advise the editor to turn away manuscripts that deserve publication. Overall, however, most editors agree that the system works.

It works best when editors actively seek the most expert possible opinions. This may mean going outside their own institutions or their own countries for advice. In many countries, editors and authors understandably are reluctant to do so. I have met this attitude in Canada as well as elsewhere. Obviously some manuscripts cannot be sent outside the country in which they are written. They may be in a national language that is not widely known outside, or they may be about subjects in which no outsider is truly expert. Other manuscripts, however, could benefit from outside opinion, and so could the journals or publishing organizations to which the manuscripts have been submitted. To seek expert opinion outside one's national borders is not intellectual neo-colonialism. It is recognizing that international standards exist in scholarship and trying to meet them.

Good referees are

- experts in their fields.
- interested in more than a narrow field.
- objective in judging manuscripts.
- generous about minor failures.
- conscientious.
- prompt in returning manuscripts.
- reliable.

Referees! review manuscripts because they think it is part of the job of a scholar. Also, it gives them a chance to see what is being done by other people before it gets published.

Editors find referees in several ways. They

- keep lists of people who have proved in the past to be good referees.
- use the members of their Editorial Boards.
- ask members of their Editorial Board to suggest other people.
- sometimes follow suggestions made by the author (but rarely use more than ope referee suggested by the author).
- look for possible referees among authors cited in the manuscript: people who have proved their expertise in the field.
- check the secondary literature to see who has written in the field.

Editors also keep track of referees who have proved disappointing: people who are slow returning their comments, or who give short reports that are of little use, or who write reports that are biased or are personal attacks. Such people are not invited to act as referees again.

Answering complaints

Authors ,sometimes complain about refereeing, and editors must answer those complaints. Some of the main complaints and answers to them follow:

- It isn't fair that referees should be anonymous. Authors should know who is criticizing their work.

  (But referees might be less honest without this protection. In the small world of scholarship, the author might be a friend who could not be openly criticized, or a powerful administrator who could take revenge for criticism.)

- It isn't fair that the referee should know who the author is. Authors with big reputations or from prestigious universities or research centers are treated better than authors who are unknown or come from little-known institutions.

  (There is some evidence that this is true, but attempts to hide the author's identity have not always been successful either. The world of science is so small that experts usually know what others in the same

field are working on, and so can guess the author's name. As well, many authors identify themselves in their articles, for example by referring to previous articles they have written. Many institutions nevertheless do use the "double-blind" system, in which authors' names are kept secret from referees in the same way as referees' names are kept from authors.)

- Referees are important people in their fields. They are therefore conservative, and try to keep new ideas from being published.

  (There is some truth in this also. Editors must be aware of the problem. For a manuscript that is unorthodox, they must try to choose referees who are open to new ideas. Editors must also be aware of strong differences of opinion in scholarship, and avoid giving a paper to a referee who is opposed to the author's point of view.)

- Referees may recommend that a paper be rejected and then publish its idea as their own.

  (This is rare, and usually the author can prove it happened. Of course, referees may unconsciously use an idea in their own work, but that seems unavoidable. Authors who are concerned about this danger can protect themselves by presenting their findings at a conference before submitting them for publication, thus proving their claim to the work.)

- Refereeing delays publication.

  (True, but good editors ask referees to move quickly. The alternative would be that everything could be published. No one would be exercising quality control.)

5
Reaching the non-specialist

If the results of applied research are to bear fruit, they must spread beyond the community of specialists. They must reach the people who will use them.

The results must reach people who will use them to help others: extension workers, health care workers, and, among others, teachers at all levels, They must reach those who will use them to help themselves and their families: among them farmers, fisherfolk, artisans, and parents. They must reach the men and women who will decide the path of future research and development: policymakers and administrators. And they must reach the more general public on whose goodwill the funding of research depends.

Communicating effectively with such people can be more difficult than editing for specialists. For non-specialists the results of research must be translated into language — often everyday language—they can understand. The editor may have to act as an interpreter, working closely with the author. Frequently, the editor must do the writing.

This module examines some of the ways of reaching the non-specialist. Special attention is paid to newsletters, which are common to many institutions and which present special demands.

This module should be read in close consultation with Modules 1 and 2.

5.1
Planning to reach the non-specialist

It is rarely possible to explain all the details of a research report to people who are not specialists in that field. It does not matter whether the subject is agriculture, aquaculture, health care, economics, mechanical engineering, or publishing. Experts in every field have their own language. They use technical terms. They deal with complex processes. They work with abstract ideas. They need a special vocabulary to communicate clearly with one another, and they need to report in detail so that other specialists can follow them. Non-specialists cannot understand much of such specialized writing, and few would want to if they could. (Can you imagine anyone who is not an editor reading all this publication?)

Fortunately, it is rarely necessary to explain all the details to non-scientists—or even *most* of the details. Usually it is possible, with language that non-scientists can understand easily, to explain

- all the facts they *need* to know if they are to get the benefits of the research;
- why it is important that they know these facts, and how they can *benefit* from that knowledge.

Imagine you have just bought a radio, and you ask an enthusiastic electrical engineer how it works. He talks about the theory of radio and explains Hertzian waves, variable condensers, amplifiers, and other technical information. All you really want to know is how to operate your new radio: how to turn it on, how to adjust the volume, how to find the right station. You also want to feel confident that if you do these things you will hear news or music or whatever it is that made you want to buy a radio. As far as you are concerned, the extra information the engineer has provided is just static.

To explain science to the non-scientist is difficult but not impossible. Henri Bergson once said that if the fruit of a piece of scientific research cannot be put down in everyday language, then that research is not of much value. The vice-president of Kenya, Mr Mwai Kibaki, was more direct. “Make it simple!” he told an international gathering of scientists in Nairobi in November 1987. He urged them to use simple language in research reports so they could reach the ordinary people. He pointed out that the non-specialists they should be informing include decision-makers who vote the funds to support research.

In preparing material for non-specialists, the author and editor must consider certain questions.

What is the message?

What is the exact message to be communicated? Be absolutely certain about the answer. It should be possible to state it in a single specific sentence—for example, "We are telling mothers how to cook vegetables so as to get the most food value" or "We are telling farmers the best way to train oxen" or "We are recommending a new treatment for dysentery to health care administrators."

The first step in clear communication is to know precisely what is to be communicated. The second is to remember it. Sometimes publications have two or three purposes that cannot easily be combined. Sometimes people start off writing with one purpose in mind, but become so fascinated with part of their material that the purpose changes. Editors must help authors to define their purpose and stick to it.

Who are the readers?

Who exactly are the intended readers? Again, be absolutely clear. A publication for one group of readers may not be suitable for another group. It :is difficult to reach all kinds of non-specialists with a single publication. A pamphlet for teachers of domestic science should be written differently from one addressed to housewives and differently again from one addressed to policymakers in the field of nutrition, even though the basic message in all three cases may be the same.

What do they know?

How much do these readers know already? This may be the most difficult question to answer. It may contain big surprises. Here are some examples of publications in which this question was not asked.

A poster told Asian farmers: "Dry your rice in the sun!" The farmers knew that already. They had been doing it all their lives, and so had their parents and grandparents. The poster told them nothing new. It was a waste of money. It should have told them a way to dry their rice in the sun more efficiently.

A pamphlet warned farmers about a particular insect that could harm their crops. On the cover it had a picture of the insect 15 cm long. The farmers didn't know what they were looking at. The insects that were harming their crops were much smaller. They had never seen an insect magnified 10 times. The cover failed to communicate.

A research institute put out a leaflet advising farmers to spray chemicals to save their crops. It did not tell the farmers that their plants were being destroyed by insects which would be killed by the spraying. The farmers didn't understand the connection. They thought the crop was being destroyed by evil spirits. Chemicals didn't seem the way to handle that problem. The leaflet did not explain cause and effect, and as a result it failed.

It is dangerous to assume that the intended readers know a fact just because the author knows it or the editor knows it. There is always a chance that the readers don't. A good editor finds out what the readers know.

If there is any doubt, it is usually better to tell too much than too little.

Is this enough?

Is this giving the readers all the information they need? Has every step in a process been explained? Has enough background been given to convince the reader to respond in the way the author wishes? Careful editors go through the text, looking for gaps in logic or in procedures.

Is it too much?

Is this giving the readers more information than they really need? When my children were young they were always asking questions. I would answer them in language they could understand, and they would immediately ask another question. If they finally asked a question I could not answer simply, or if I got tired of answering, I would reply with more facts or more complex ideas than they could understand. That always stopped the questions.

Too much information stops interest. Too little information, as we have already seen, prevents communication. Editor and author must provide just the right amount of information — enough to interest, instruct, or convince readers, not so much as to discourage or repel them.

How big are the bites?

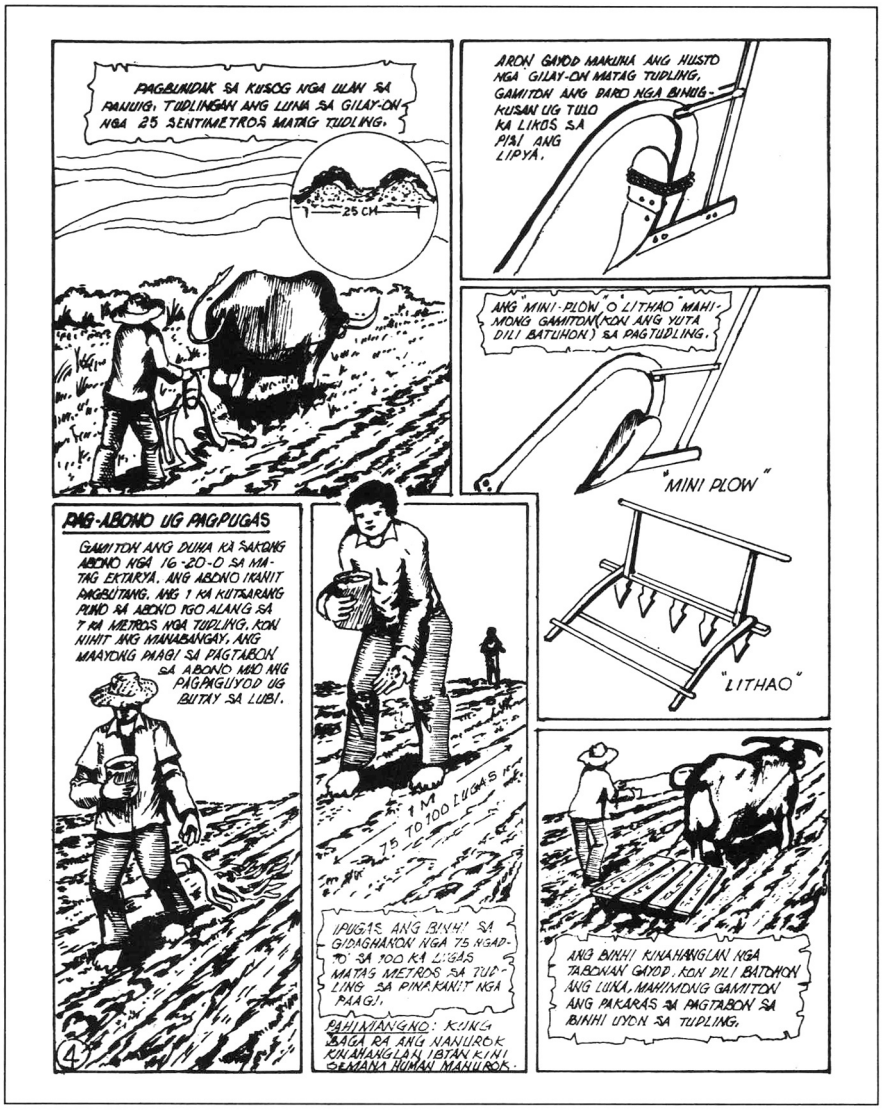
Is this giving the readers more information than they can absorb easily at one time? Information is a lot like food. Too big a bite is hard to swallow. Small bites are easier to chew and absorb.

We all get long articles, booklets, journals, and books we would like to read, plan to read, but don't have time to read at the moment; so we set them to one side and may never read them. Short documents are more likely to be read at once.

A full-sized book may look impressive and give its author and editor great satisfaction. But if it is aimed at a person who owns few books, it may be too impressive. That person may say, "This is precious. I will save it. I don't want it to get dirty." The publication might be read more thoroughly if it had been published as a series of cheap leaflets.

Is this interesting?

Is this publication actively trying to interest its intended readers? Material that is published need not be read. Advice that is published need not be followed. Effective publications attract readers by looking interesting and being interesting. They explain why their contents are important and how they can help the reader. They adopt forms they know their intended readers find attractive. That may mean a one-page formal summary for a policymaker; it may mean a comic book format for extension publications. (There is nothing unsuitable about comic books, if that is what the intended readers mainly read.)



Will it be understood?

Is the information in a form the intended readers will understand?
Editors must be certain that the words are right for the reader. This has already been discussed (unit 1.5).

Sometimes even the right words can lead to confusion. A research institute once published a large and colorful poster with the title "Natural enemies of rice insect pests." The poster showed pictures of insects that eat other insects that destroy rice, or that kill the rice pests in other ways. The institute was proud of it until scientists met a farmer who said, "That's a great poster. I've been killing every one of those bugs I see." The farmer, and many others, had got the wrong message. They had seen the words "enemies" and "pests" and related them to the pictures. That institute now emphasizes the positive. Instead of "natural enemies" it talks of "friendly insects" that help the farmer.

Not only the words but the pictures must be understandable. Sometimes pictures do not communicate clearly.

For example, a booklet in West Africa told people how to store clean drinking water. One picture showed people gathered around a jar holding drinking water. They looked happy because it was good to drink. Some readers understood the message. Others thought the people were standing around drinking tea.

People unused to illustrations may have problems with a drawing of something that normally moves. They may not recognize a picture of fire; for example, they may think the fire is a flower or a container. They may have trouble recognizing cause-and-effect between activities in two pictures. For example, they may not see that the man who is planting a seed in one picture is the same person gathering a good crop in the second. In the same way, they may not understand that time has passed between pictures. They will, apparently, understand pictures better if the pictures contain people: like everyone else, they identify more closely with other persons than with abstractions and things.

Editors must ask whether the pictures as well as the words communicate clearly.

How can it be tested?

How can the answers to all these questions be tested? There is only one answer to this question: you must ask the intended readers or people who are similar to them. An administrative report should be reviewed by an administrator in draft form if possible. A booklet for fisherfolk should be tested on actual fisherfolk, either in draft or in its first edition. Then it can be improved, and the findings can be used to improve other publications aimed at that group.

Testing can be done by editors, asking whether the communication is effective. Alternatively, it can be done by researchers trained in studying responses to various forms of communication.

In any case, publications should not be issued and forgotten. Each new publication gives a chance to learn more about the process of communication and how to make it more effective. If response is poor, it is particularly important to know why, so that the mistakes will not be repeated. If response is good, it is equally important to know why, so that the successful technique can be used again.

Successful editors learn from their own failures and successes.

Processes

Effective planning for publication for the non-specialist thus involves three processes:

- *Research.* What do the readers know already? What do they want to know? What do they need to know?

- *Testing.* How well does the draft manuscript serve the purpose that is desired? How can it be improved?

- *Careful editing.* Is the language always clear? Will non-specialist readers understand all the terms? Has the author assumed that the readers know more than they actually do?

A case history

That is how Dr Ben Vergara, an IRRI rice scientist, prepared A Farmer's *Primer on Growing Rice,* a thoroughly illustrated guide for extension workers to use when working with farmers.

1. He discovered that no such basic book existed.

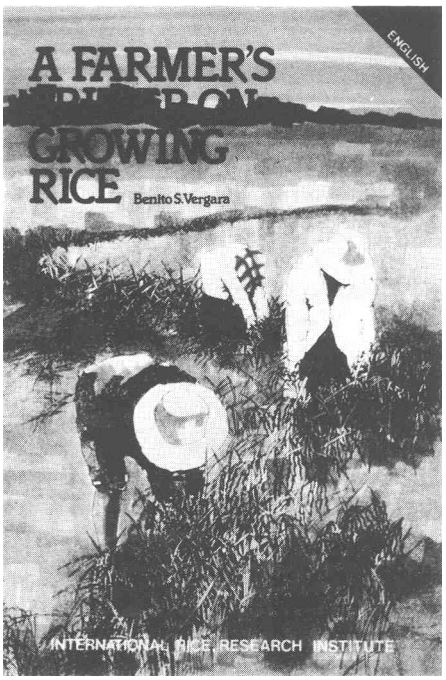
2. He sat through a training course on rice production, making notes on what questions the trainees asked. During another course. he asked the trainees what else they needed to know.

3. He tested his draft manuscript with a group of teachers, and revised it on the basis of their comments.

4. He tested the draft with a group of trainees, and revised it again on the basis of their comments. He also showed it to a senior colleague and took into account that scientist's suggestions.

5. From a number of suggested titles, he chose one that promised to attract readers.

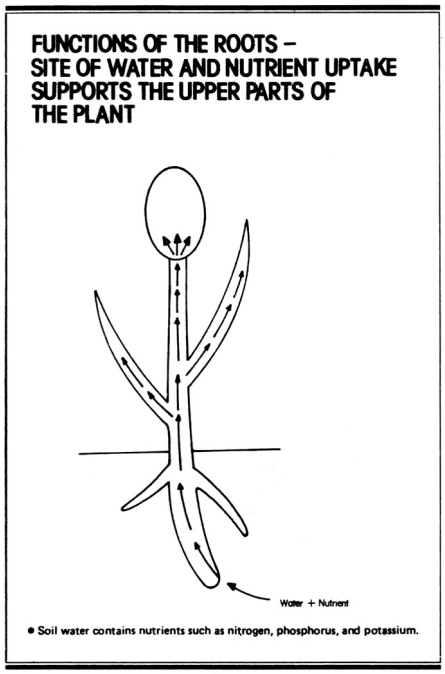
6. He gave the manuscript to an editor who went over it word by word, making sure that every term was defined the first time it was used, that the ideas were presented in a logical order, and that every statement was clear and in good English.



The process apparently worked. A Farmer's Primer on Growing Rice was published in 1979. Several hundred thousand copies have been printed since then, and not just in the original English. At last count, it had appeared in 40 editions in 33 languages in Asia, Africa, and Latin America; 20 more editions were either in production or being translated. It is probably the most widely translated book in the history of agriculture.

Even so, neither IRRI nor Dr Vergara is resting on success, Most publications can be improved, and this one is no exception. Dr Vergara planned the book for extension workers who have formal education in agriculture. But his excellent title suggests the book is for farmers, and tens of thousands of copies have gone out to them. A publication intended tor one purpose and one readership has spread, with the same purpose, to a different readership. Research shows that this second group of readers does not always understand it. IRRI has found the following:

- The sentences and words are sometimes too complicated for easy reading
- Farmers find the first three-fifths of the book interesting. Those pages deal with rice plants, how to grow them, and how to transplant them.



The contents are familiar. Then comes a chapter on photosynthesis: what goes on inside the plant as it grows and matures. Here, research finds, many farmers get lost. The chapter gives more information than they want or need. They stop reading, and miss the useful advice in the chapters that follow this one.

- In one illustration of a simple process, some did not know what a plus sign (+) meant.
- They thought one diagram of a rice plant looked like a ghost. And they could not recognize a picture of a hand holding a seedling ready to be transplanted. The hands they know are attached to arms and then to bodies: a hand all by itself had no meaning.

As this was written, a second edition of *A Farmer's Primer on Growing Rice* was being prepared. It will deal with these problems: the chapter on photosynthesis will go to the end, for example, and several illustrations are being redrawn. The lessons learned from testing that book have already been applied in books that have appeared on growing soybean and cowpea.

5.2
Helping the non-specialist understand

It is never easy to explain in simple language the problems and answers of complex research. Some specialists do it well. They have learned how to describe, with understandable examples and in plain words, the questions that interest them and what they have learned about them. Such people often hold senior positions: the ability to write clearly is one of the skills that bring promotion.

Other specialists throw up their hands in despair when asked to explain to non-specialists. "We can't do that," they say. "We are specialists. We use the language of our specialty. We need an interpreter!" They usually aren't quite that helpless, but often they do need advice. That is where the editor comes into the picture. If all else fails, the editor may have to write the explanation.

Here are seven techniques that will help the non-specialist understand.

Make words work

Follow the ways to make writing more effective (units 2.3–2.5). In particular, remember the following:

- Use specific, concrete, exact words.
- Use words and terms the reader can understand.
- Use simple, direct words.
- Eliminate jargon.
- Keep sentences short (and paragraphs, too).
- Eliminate unnecessary words and ideas.

Define terms

Define words the reader may not know, using words that are familiar. Definitions should be easy to understand. They shouldn't be taken straight from a dictionary.

One of the best ways to define things is to explain them. The words and ideas that are used should be ones the readers will know from their own experience. Definitions fail if they are written in words as hard to understand as the original term.

It does not help the reader, for example, to say that *Puntius gonionotus* Bleeker is called *Pla ta pian Khao* in Thailand. It helps a little to describe the subject as Thai silver carp. Now the reader knows at least that the writer is talking about a kind of fish. The picture becomes clearer when the writer explains that this is a popular Thai food fish; it is

a freshwater fish that can be grown easily and that produces many offspring; it eats mostly water plants and algae. A writer in an aquaculture newsletter did all that. We still are not sure what Thai silver carp tastes like, but this article was for fish farmers, not gourmets.

To take another example, it does not help to say: "Snow is crystals of ice formed from the vapor of water in the air." (That is the definition in the dictionary.)

You may have a clearer picture if I write: "Sometimes snow falls in tiny crystals, like diamonds in the air. It piles up like a dry, cold, white powder — almost like *sugar,* except that it turns into water in *your* hand. Some very cold nights when *you walk* on the snow, it squeaks. Sometimes it gathers in *low hills* that can cover a car." (See how the italicized words refer to things familiar even to people who have never seen snow.)

Compare these two definitions, from separate publications:

Agroforestry is a collective name for all land-use systems and practices in which woody perennials are deliberately grown on the same land management unit as crops and/or animals. This can be either in some form of spatial arrangement or a time sequence.	Agroforestry is the term used to describe agricultural systems in which shrubs and trees are grown together with food or plantation crops on the same piece of land, sometimes in association with livestock.

The second author apparently rewrote the first definition, using common words. With a little effort, an editor might simplify the text even further.

Use examples

Use examples. They bring the message to life. They are a powerful tool for the writer and editor. They bring the discussion to the level of the individual. Even the most complex issues can be explained by examples.

The world is running short of forests as people cut down the trees for fuel and timber. A writer explained the size of the danger with one vivid example:

> In Lusaka, the capital of Zambia, the price of a bag of charcoal has increased fivefold in a year. In less than two years, the woodlands surrounding the city may vanish.

Another began a booklet about the use of appropriate technology in the Third World:

> Mzee Mohamed Mdeda is a peasant. He farms to make a living. With both his wives, and all three sons, he used to cultivate three hectares of land. They used hand hoes, and it was backbreaking work.

Last season Mzee Mohamed got a Kifaru plough. Now he can manage ten hectares, in less time and with the help of only one son. All of a sudden he has more time for other projects. He can raise cash crops. His wives have time to look after the home. There is more food on the table and more money for the family. He is thinking of improving the house. "It is a lifetime dream becoming true," he says. And all because of a plough.

When Mzee Mohamed moved from a hoe to a plough, he was taking one step in mechanizing agriculture in Tanzania.

This unit depends on examples to make its points.

Explain statistics

Explain statistics. Keep them simple. Cut out any that are unnecessary. Relate them to what is important to the reader. Put them in terms the reader can understand.

Many Ifugao farmers in the northern Philippines cultivate only one-fifth of a hectare of land. What does that mean? We can bring that statistic to life by explaining: "On that much land a farmer may be able to grow 400 kg of rice a year. It takes nearly half that much rice just to feed one active man during a year. These small landholders cannot support their family by farming. The whole family must find work to live." The few extra facts took an editor nearly an hour of research, but they were worth it.

One writer was talking about a huge amount of money. He said: "Make a pile of 100 one-dollar bills. Put it in a corner of a football field. Then make more piles until you completely cover the football field. That is how much money we are talking about."

Statistics should be reported simply. They shouldn't be crammed together, as in this example. The revision corrects the problem easily.

With a 3000-year history of fish culture, China uses over 10 million hectares of ponds, lakes, reservoirs, canals, rivers and their tributaries, as well as many paddy fields, for fish cultivation.	China has been farming fish for 3000 years. By now it is raising them in more than 10 million hectares of ponds, lakes, reservoirs, canals, rivers and their tributaries, not to speak of paddy fields.

In particular, watch that statistics that come close together relate to one another. This newspaper report was confusing.

A major study from the International Wheat Council said total grain consumption in developing countries could exceed 1.35 million tons in 2000, compared with 871 million in 1985.

Total world grain production now, of wheat, rice and coarse grains like barley, is around 1.75 billion tons, slightly in excess of current demand.

Many readers missed the jump, between paragraphs, from grain *consumption* in the *developing* world to grain *production* in the *whole* world. The author should have provided better guideposts.

Statistics should be in perspective. A short article reported that "India has a buffalo population of more than 62 million. That is about half the world's total. Buffalo produce more than half of India's milk." People cannot easily understand a number as large as 62 million. The last two sentences set the first in context. They gave it meaning.

If authors do not supply this kind of simple context, the editor may have to help. Sometimes all it takes is a little imagination. An article appeared recently about a library of 872 reference volumes published in microfiche. (Microfiches are sheets of film, usually 100 x 150 mm, containing 98 pages in miniature; they are read with a viewer that projects the image full size on a screen.) This story came to life with two simple facts. First, the whole library weighs only 10 kg, including the viewer. Second, it can fit in a drawer and part of a desktop instead of taking up an entire room. Were these facts included by the author or added by the editor? It doesn't really matter. The reader understands the impact of using microfiche instead of print on paper.

Use illustrations

Use illustrations. A drawing can show how a machine works, how to plow a field to prevent erosion, how to identify an insect or plant, how a food chain operates. Maps can show places and distributions. Simple graphs show trends. Photographs identify people, places, and processes. A good illustration is worth many words. It can communicate more directly and more clearly than words.

Be sure, however, that the intended readers will understand any illustration used. Not everyone knows how to read a map or graph. Not everyone will be able to recognize a machine from an exploded three-dimensional drawing, or a process from a flow chart. Illustrations must be carefully tuned to the visual understanding of the readers, just as words must be chosen to fit the readers' level of education.

Illustrations have an added advantage in publishing for the non-specialist. If they are attractive they will draw the reader into the article. Often they are the first thing read.

For more about illustrations, see Module 6.

Write about people

Bring people into the report. Explain research and development by showing how they affect people. Readers are interested in people. They can identify with people more easily than with things or with abstractions. Effective writing brings ideas down to the level of the individual.

The statistics about Ifugao landholding in a previous section moved from the abstract to a single unnamed farmer. They could have been

made still more effective by describing a particular farm family and showing how its members manage to make enough money to live.

An article about an improved village cooking stove began with a dramatic example of its efficiency: "Instead of waiting up to three or four hours, Mrs Mary Nyambura serves a meal of maize and beans after only one hour." Everyone who has ever cooked—or waited for—a meal can share Mrs Nyambura's pleasure in the new technology.

An article about the development of community health centers in Sudan took one young man as an example. Here are some excerpts:

> Kwiriko's village, Nangala, is home for a few hundred farmers, traders and landless laborers. It is an hour's drive from the southern capital, Juba. A short walk from the road, past children and chickens and thatched huts, is the white two-roomed primary health care unit where Kwiriko has just finished morning surgery.
>
> "I treat between 10 and 20 people a day, for malaria, diarrhoea or eye infections, or if they have hurt themselves in the fields," he says.
>
> He was chosen by his village to study at the province's community health worker (CHW) training school for nine months.
>
> For Kwiriko, who finished school in his early teens, the training was not easy . . .
>
> This village is fortunate in that every month a doctor comes to run a clinic for mothers and children and to bring Kwiriko's supply of drugs and his salary. And once a month he and the doctor go to the nearest dispensary to discuss problems with other CHWs.
>
> Kwiriko's youth and relative lack of influence limit his effectiveness even though the village elders do approve of his work. Like almost all CHWs he is a man, which means women would not find it acceptable for him to examine them. His training included aspects of mother and child health but CHWs are expected to work closely with Sudan's 4,500 village midwives, one of whom works in Nangala.

Although the paragraphs are about one person, the readers learn much about the general conditions and constraints under which community health care workers practice. their training (details omitted), and their usefulness. If this had been written in more abstract terms—about all community health workers as a group—would it have been as interesting or as effective?

Another article discussed the need to control the sale of medical drugs in developing countries, where international companies sell many drugs that have been banned in the West. The article dealt with the problem in a detailed but impersonal way. Then, three-quarters of the way through, came this paragraph about the effects of one drug that had been sold as a painkiller:

> A Malaysian university lecturer almost died when his doctor gave him phenylbutazone to treat a stiff neck. He suffered from rashes which later erupted, leaving raw flesh, and the tissues of his eyes

> and his nails dropped away. Another physician diagnosed his condition as Steven-Johnson Syndrome, a reaction to the drug, and gave him only a 50 percent chance of survival. Fortunately, he recovered, after a three-week stay in hospital.

The article suddenly had life: the problem had been explained in human terms. Readers breathed a sigh of relief at the lecturer's narrow escape and said, "Yes, something must be done to prevent dangerous medicines being sold."

Use quotations

Quote directly from a person speaking. Quotations bring the reader directly into contact with the person who is involved in the work being reported. Quotations are convincing. They involve people. (They must, however, sound like the person who is speaking. They should not sound like the writer of the article.)

An article on pesticide poisoning illustrated the importance of chemicals to the small farmer, despite their dangers to health.

> As Sinnan Chellapan puts it, "Without pesticides there is no farming."
>
> Sinnan splits his time between driving an ambulance and farming. At the end of a long, dusty road which creeps through the green mountains and surrounding tea plantations, he has a one-hectare farm where he grows cabbage, tomatoes, lettuce, leeks, and celery.
>
> "If I don't apply pesticides for one week the crops are destroyed," says Sinnan. The frequency of spraying depends on the weather. "When it rains, I have to spray every two days."

In that example, the individual's dependence is made clear in his own words. In the following extract, the quotation gives extra authority to the author's statement.

> One species of tree, *Balanites aegyptiaca,* also called Desert Date, produces valuable timber and fodder, as well as edible fruit if allowed to grow to maturity. "In my home area," explains Dr Sang to underline its importance, "you cannot cut that tree without permission of the elders."

Here is one final example that sums up most of the principles set out in this unit.

> When Zhou Guihou, a south China rice grower, started raising fish in paddy fields, he found he had struck riches. Fish breeding earned him 12,500 yuan (US$6,250) in three years.
>
> This is a good sum of money, considering that an average young state farm worker can earn only 540 to 600 yuan (US$270 to 300) a year.
>
> "Raising fish in paddy fields can make a big profit," Zhou said.

The writer used simple, direct words, chose a person as an example. explained statistics in a way the reader can understand, and made his main point with a quotation.

5.3
Capturing the reader's interest

Just as plants in a rain forest must compete for light and animal species compete for food, publications must compete for the attention of their intended readers. Authors and editors can become so wrapped up in the importance of the subject that they forget this simple fact. They forget that every reader they want to reach has other things to do.

Most people today receive more printed material than they have time to read. As a result, each separate text must battle for attention. Articles in a newsletter or journal compete with other articles in the same publication. Publications compete with other publications. They compete as well with radio, television, films, and other forms of information and entertainment. And all these media compete with other demands on their intended audience: telephone calls, correspondence, meetings, social events, travel, sports, not to speak of family, friends, noise, sickness, and the need to sleep.

Effective editors, in addition to everything else, have a strong sense of competition. They are determined to capture and keep the reader's attention.

They know that the reader's first impression is most important. If a text is not immediately interesting, readers are apt to go on to something else. Attention can be captured by

- an interesting or unusual design
- a powerful or attractive illustration
- an interesting title
- an effective opening paragraph

Experienced writers spend considerable time planning how to attract readers. Editors must help writers who have never been trained to make that effort. They may have to search through the body of a manuscript to find the facts that will most interest the intended reader. Then they must make sure the reader sees those facts.

Design, illustrations, and title can all call attention to facts, but it is dangerous to depend entirely on them. As well, editors should make sure that points of interest appear in the opening paragraphs. This is particularly important when publishing for non-specialists who are not obliged to read past the first few lines of text. Strong openings are particularly valuable, therefore, in newsletters, extension leaflets, and documents intended to convince policymakers.

Here are some proven guidelines for capturing the reader's attention.

Show the benefits

Appeal to the reader's self-interest. Make it clear at once how a reader can benefit from reading the text.

There is an old English saying: "Early to bed and early to rise makes a man healthy, wealthy, and wise." That little verse contains much of what research has shown people are most interested in. Readers want to know how to

- *keep healthy and fit.* They fear sickness and disease. They want to know how to escape them. They want to know about research and results that will help prevent sickness or cure disease.
- *make more money.* They want to know how to escape poverty or, if they have already done so, how they can increase their earnings. They want to learn about new crops and better ways to grow current crops. They want to know how to prevent disease in their livestock and how to market the cattle more efficiently. They want to know about new opportunities to raise cash.
- *understand the world and the people around them.* Nature and society can be threatening. People want to know how others deal with the problems that surround them. They want to know how others have succeeded.
- *enjoy life more.* Once their most urgent needs are met, people look for an easier life. They want to know about any development that will save them time and effort or relieve monotony, whether that is an improved cooking stove, a new recipe, a mechanical weeder, a better kind of hand pump, or a computer.

A publication that appeals to any of these basic interests is likely to be read, as long as people can see from the very beginning how it will help them.

Appeal to curiosity

Appeal to the reader's curiosity. Most people are curious about other people. Many are curious about the world around them. Many enjoy solving problems.

Readers generally are more interested in facts, people, or events if they are

- *large in impact, size, or significance.* A typhoon attracts more interest than a breeze; a lottery winner who becomes a millionaire overnight is more interesting than someone who earns a normal promotion; the visit of a president gets more attention than a visit by an editor. Similarly, "miracle" varieties of plants and major breakthroughs in medicine attract more interest than normal advances in research. (Nonetheless, each new advance is important and deserves to be made interesting to those who can benefit from it. And many so-called breakthroughs fail; editors must beware of claims that cannot be supported, no matter how attractive they may seem.)

- *nearby or familiar.* The typhoon is more interesting if it passes within a few hundred miles than if it is far away; the lottery winner is more interesting if she lives in the same village than in a distant city.

  Readers' interests spread outwards in a series of concentric circles. People are generally most interested in themselves (at the center of all the circles), then their immediate family (the next circle), then close friends and more distant relatives, their neighborhood, their town or city, their state or province, and so on. They will be more interested in achievements that will help people in their own country than those that affect only people on a faraway continent. They will be more interesred in developments that affect familiar institutions than in those that affect little-known ones.

  Editors sometimes go through manuscripts looking for the "local angle" that will draw the attention of non-specialists who live or work in a particular place. Then they give that aspect special prominence.

- *recent.* Both the typhoon and the lottery seem more interesting if they happened yesterday than if they happened a month ago.

  We have been conditioned by the news media to attach special importance to new developments and recent events. A conference or a discovery that happened four or five months ago, no matter how important, may seem out of date.

  Editors, especially of newsletters, should be prompt in publishing reports. When possible they should emphasize that an event happened recently; they may minimize references to when an event happened if much time has passed. Sometimes events that seem stale can be freshened with a little imagination: the report of a conference held some time ago may begin with the implementation of its recommendations; an account of a discovery can describe its first applications.

- *unusual.* The typhoon will be more interesting if it was totally unexpected; the lottery winner will be more interesting if that was the biggest prize on record. People are fascinated by the unusual, the biggest or smallest, best or worst, first or last, fastest or slowest.

  Editors will sometimes look through a manuscript for something totally unexpected and use that to catch the reader's attention.

Use the opening

Make the opening work. The first words are crucial. They deserve considerable time and effort from both author and editor. If they fail to attract, the reader may be lost to the competition.

Every manuscript does not have to begin in the same way. Variety adds interest. Some kinds of openings are more suitable for one kind of manuscript than another, however. Here are some of the ways articles

can begin, with examples taken from newsletters and magazines that report developments in research to non-specialists.

Information. This is a straightforward report of the subject answering three or more of the questions: who? what? why? where? when? how? It assumes the reader is interested and wants information quickly. A reader who stops after the first paragraph will already know the most important facts. Editors should guard against packing too many facts into a single sentence, however. Here are two successful examples.

> Government policies that provide low-interest credit help big farmers more than they help small landholders in Sri Lanka, according to a recent study. Small paddy farmers still borrow most of their money from moneylenders or other people at high interest rates.

> Farmers in the Topisi and Makoro extension areas have formed groups to fight ticks, which menace their livestock.

Picture. This draws a scene for the reader, an illustration in words. Editors should make sure the picture is clear, and that it is quickly tied to the main message. Here is a long opening, but an effective one.

> Issifou is squatting on the ground under the big shade tree in the family courtyard in the large village of Dogondoutchi, in southern Niger. A couple of paces away his sisters are dehulling millet with a pestle. Spread around him are a hammer, shears, pliers, and anvil, and a thick strip of steel which must once have been a truck spring. Next to these tools of his craft is his raw material—empty cans.
>
> In less than two hours, using the shears, the hammer, and the pliers, he makes a watering can. He only needs to solder it in a couple of spots before it can be sold to people in the village. He will sell it for 2500 CFA francs, about one-eighth of the price of the same item in the capital, Niamey, 400 kilometers away. It is an essential tool for growing vegetables in the dry season.
>
> Dogondoutchi is one of four centers of operations of a project for training artisans and supporting their enterprises.

Anecdote. Everyone enjoys a story. Editors should make sure the story is short and is firmly related to the principal theme. Here are two examples.

> "URGENT STOP SOLD OUT STOP PLEASE SEND ANOTHER ORDER."
>
> That's the sort of telex the publishers of the magazine *Famille et Developpement* (Family and Development) in Dakar, Senegal, were getting this June. Zaire asked for 15,000 additional copies of the latest issue, three times as many as the original order. Abidjan, the capital of the Ivory Coast, sold its 5,000 copies in less than a week, and the distributor in Senegal asked for it to be reprinted.
>
> Very few "quarterly" magazines that have missed the newsstands for several months in a row can claim such a faithful readership.

> The politicians in Ankara had never seen anything like it. In the late 1970s, a petition with 60,000 names came before the National Assembly — more signatures than any other petition in the history of the Turkish republic. And what was surprising, in this land of male domination, was that all the 60,000 signatories were women. What drove so many women to action? Their desperate need for child day-care centers.

Question, This kind of opening appeals to the reader's curiosity and pleasure in answering questions correctly. These are the same qualities that make quiz games so popular. It is not a type that should be used too often, however. If every story opens with a question, the device becomes boring. Editors are in the business of giving information, not asking for it. Used occasionally, questions can be extremely effective. Here are examples.

> What do microfilm and cabbage rolls have in common other than the fact they both come in rolls?
>
> The answer is that they both store well in aluminum pouches. So well, in fact, that the pouches are being used by Canadian and Indonesian documentation specialists to store archival microfilm— that is, microfilm documents that are supposed to last "forever."

> So you think you have problems with aphids on your house plants? Consider this: Farmers near ICIPE's Mbita Point Station, hard by the shores of Lake Victoria in western Kenya, often complain about hippos lumbering ashore at night and ponderously munching their way through the field crops. How would you like to devise a management strategy for a king-sized pest with the temperament and appetite of a hippo?

Quotation. Direct speech draws the reader directly into the report. But the quotation must be unusual or forceful. A bland quotation makes a bland opening. Here is an article about dust and its danger to health, which begins with a verbal explosion.

> "You want to see dust, do you? I"ll show you dust!" exclaimed the National Guard officer. "Come home with me, look at my linen, my bed, my fridge! There's dust all over the place!"
>
> The air in the mining town of Redeyef, in the south of Tunisia, is so dusty that one can't really see the sky, only a vague glimmering through the grey clouds.

Background. This provides a context within which the reader can assess the significance of the developments reported. It should not be used too often, or readers will want to shout: "Get to the point!" Background openings should be short, so that the reader gets to the main message quickly. If they are too long, editors should trim them or find another way to begin. Here are two that provide the context in a single paragraph and then tackle the main message in the next.

> Egyptian street vendors are famous for fried *falafel,* a nutritious snack prepared with faba beans. In Syria, *shorbat ads*—lentil soup—is a winter favorite. And in parts of North Africa and the Middle East, millions snack on *hummos,* a chickpea-sesame dip.
>
> These and an array of other Middle Eastern dishes are made from legumes, dietary staples generally containing two to four times the protein of cereals, and hence known as the poor man's meat. Legumes are often a cash crop for the small-scale farmer, and they also supply straw for animal feed. The "big three" legumes—faba beans, lentils, and chickpeas—account for about two-thirds of food legumes produced in the Middle East and North Africa.

> In the developing world, cities are growing twice as fast as the overall population. Jobs are scarce, there is a critical shortage of decent housing, and urban services strain under the load of growing demand.
>
> In such difficult circumstances, it is crucial for urban planners, politicians, and administrators to have up-to-date social and technical information on which to base their policy decisions.

Contrast and *surprise.* The first kind combines opposites; the second plays on our delight with the unexpected. Both are difficult to use well and are only occasionally suitable. When they can be used, they can be effective. Editors should make sure, however, that in the first there is a real difference, and that the second is truly surprising.

> Although Sri Lanka is endowed with substantial marine animal life in the deep seas surrounding the island, the tropical climate makes it difficult to keep the catch fresh. Ice is a necessity.

> Interviewing Lawrence Schafer is like trying to get a policy statement from a hummingbird. He darts from one subject to another, constantly interrupting himself, his hands always in motion.

> The chances of dying of a smoke-related disease in this country are one in five. Those odds are worse than playing Russian roulette with a six-chambered revolver.

(In Russian roulette, a player loads one chamber of a revolver with a bullet and leaves the other five empty, then spins the cylinder, aims the revolver at his own head, and pulls the trigger. There is one chance in six the firing pin will strike the bullet. Sane people consider the risk too great to take.)

The same report can begin in different ways, depending on the intended readership and the purpose of publication. On pages 175-176, the story of Dr Vergara's agricultural bestseller is told with eight different openings. Some are more appropriate and effective than others. One is clearly unsuitable, for reasons that are explained later.

One story, eight openings

To show the potential for creative editing, here are eight different openings for the same story. Each has its own strengths or weaknesses; each does its best to capture the reader's attention in the first words of the account. Which do you find most effective?

Information

Forty editions of *A Farmer's Primer on Growing Rice,* a manual written by IRRI scientist B. S. Vergara, have been published in 33 languages. Editions in at least 20 other languages are being prepared.

The *Primer* may be the most widely translated agricultural book in existence.

Picture

On the plains of Pakistan, a farmer studies how to grow better rice from a book first published in the Philippines. Its language is Urdu. On the rice terraces of Java, another farmer studies the same pages written in Bahasa Indonesia. Farmers elsewhere in the world read the book in Singhalese, Chinese, Portugese, Gujarati, Kiswahili, Bengali, Thai, and Nepali.

A Farmer's Primer on Growing Rice has already been published in 40 editions in 33 languages. Editions in 20 more languages are being prepared. It may be the most widely translated agricultural book in existence.

Anecdote

Some years ago, Dr. Ben Vergara, an IRRI scientist, was teaching methods of growing rice to a group of extension workers from several Asian countries. He found there was no simple book that explained the "why" and "how" of good rice-growing practices. So he set out to write one.

Today his *Farmer's Primer on Growing Rice* is used throughout the Third World. Forty editions have been published in 33 languages, and 20 more are being prepared. It may be the most widely translated agricultural book in existence.

Question

Did you know that the world's most widely translated book on agriculture was written by a Filipino rice scientist?

A Farmer's Primer on Growing Rice has already been published in 33 languages, and is being translated into 20 more. It was written by Dr. Ben Vergara, a long-time IRRI staff member.

Quotation

"Please send me a copy in Cebuano of *A Farmer's Primer on Growing Rice,"* a Filipino farmer wrote from southern Leyte. "My neighbor has one and has doubled his rice crop. I want to do as well."

This kind of letter arrives daily at the International Rice Research Institute, publisher of what may be the world's most widely translated agricultural manual. Forty editions have appeared in 33 languages, and 20 further translations are being prepared.

Background

Through most of history, farmers taught their children how to grow rice. In the last half century, science has joined them. Research has shown better ways of farming and has developed better rices, adding to the world's food supply. But the new techniques have rarely been explained in language the farmers can understand easily.

Today, farmers around the world are learning how to grow better rice in a simple textbook in their own language. A Farmer's Primer on Growing Rice, developed in the Philippines, has been published in 33 languages already, and at least 20 further editions are being prepared. It may be the world's most widely translated book on agriculture.

Contrast

It is mostly pictures, but its few words may make it the most widely translated book on farming in the world.

A Farmer's Primer on Growing Rice, first published in English, now is being read in 33 languages, and 20 more translations are under way.

Surprise

It's the rice farmer's bible. whatever his religion. And it's being translated as rapidly as if it were the Bible.

A Farmer's Primer on Growing Rice now appears in 33 languages. Twenty more translations are being prepared. It may be the most widely translated book on agriculture in the world.

Cut weak starts

Discard openings that do not work. Good openings are hard to write. Authors in a hurry sometimes slip into routine kinds of beginnings that rarely attract uncommitted readers. Here are three common problems.

- Many reports of conferences begin with the fact the conference was held, where it was held. the dates it was held, and its theme. This usually takes five or six lines. Only after that, if they are lucky, will readers learn what was discussed, recommended, or decided. By that time they may have gone on to something else.

- Descriptions of institutions too often begin with the history of the institution, its place in a larger organization, its location, and its general goals. That information is for bureaucrats. Most readers will be more interested in what the institution has achieved, what it is doing now, and how it can help them. Those facts should come first.

- Some openings are so general that they could begin almost any report in the same field. The story usually can start perfectly well if this kind of opening is cut out. Here is an example:

> Agriculture is our greatest industry and will remain so for many years to come. Any practice that increases agricultural production is therefore vital to the national economy.
>
> Good plowing is most fundamental ... (and the article goes on to discuss plowing techniques).

Check the facts

Make sure the opening is supported by the facts. In trying to attract readers, It is possible to distort the message or exaggerate it. A modest advance may become a "breakthrough"; a conference may become "historic '; a plan may be made to sound like reality.

Just as often, the change in meaning is more subtle—often a qualification is omitted to gain emphasis. The Question opening on page 175 is an example. The writer dropped the words "may be," which appear in all the other openings for this story. The question would have little impact if the words had been included; but without them the question suggests something that is unproved. A question should not be used to open this story.

In the competition for the reader's attention, editors can never afford to forget the facts.

5.4
Capturing attention with a title

In most publications, editors try to attract the reader's attention by printing some words in display type, that is, in type larger than the regular text. This larger type may appear on the cover of a book or booklet; it may be used for the title of an article in a journal or a chapter in a book; it may be the main message of a pamphlet or advertisement; it may be the headline of an article in a newsletter.

In every such case, larger type by itself will not necessarily attract the reader. The words must do much of the work.

Because the type is large, there is room for only a few words. Each word therefore must work extra hard.

In scientific publications, titles follow certain rules. The rules have been designed to identify the subject of research quickly and make the article easy to find in bibliographic searches.

In publications for the non-specialist, the subject should also be easy to identify. But the words can be more vigorous than in a formal publication. There are fewer firm rules. A title is successful if it captures the reader's eye.

Avoid the general

A title which is too general does not inform and is unlikely to attract. For example:

A motherhood issue

The fragmented pyramid

The first is the title of an article about the way Egyptian women solve problems of water supply and sanitation. The second is from an article about community health services in a Haitian shantytown and the fact people aren't using them. But who could guess those subjects from the titles?

Sometimes a title can be misleading. A book called *The Road to Teheran* describes the diplomatic maneuvers that led to a meeting in Teheran in 1943 of the wartime leaders of the USA, USSR, and UK. That meeting decided plans that settled the end of the second world war and much of the future of Europe. But the title is ambiguous, and copies keep appearing in libraries and bibliographies under Travel.

Other titles carry only minimal information.

Seminar on Cooperative
Farm Management Development

SEAFDEC Council meeting

DISC workshop held

These tides would be more effective if they suggested what *happened* at the meetings: the most important decision, discussion, or recommendation.

Inform

Titles for the non-specialist can be purely informative.

Water project benefits
quarter million people

Rice research in Bangladesh

Health care project for calves
extended to five districts

Giant shellfish hatchery
begins in Mexico

Campos wins
"Woman of the
World" award

The oblique-banded leafroller:
a new pest in pistachios?

They are more effective, however, if they show how the reader can benefit, possibly with the help of a subtitle.

Putting your best foot forward:
Preparing typescripts that will
be accepted readily and
published fast

Getting the most from
oxen and implements

12 ways to make your life easier

Use imagination

Effective titles take time and imagination. Here are some good ones:

Beefing up the Pakistani diet

for an article on using preserved beef to add protein in traditional diets.

Togo's maize bugs are
in for a big surprise

for a list of 12 ways to store maize so as to prevent damage from insects.

Why not use a cow
to light your house?

for an article about biogas plants, which use manure to produce methane gas for cooking and light. And one last flight of imagination:

The fatal attraction of buffalo urine

for an article about traps which attract tsetse flies with the smell of buffalo urine.

Follow these steps

Authors often suggest good titles. Other times, the editor must write them. Here are 13 steps in writing effective titles for books, booklets, pamphlets, folders, magazine and newsletter articles, and any other kind of publication for the non-specialist.

1. Read the text thoroughly and make sure you understand it.

2. Search for the most important idea. Pick out key words.

3. State the principal message in one short sentence. Use the key words.

4. Ask: "Will this principal message interest the reader? Is there some way I can make it more interesting?" Try to find a wording that will show how the material can help the reader. One way to do this is to start the title: "How to . . ." or "Ten ways to . . . "

5. Get variety in titles. There are as many kinds of title as there are of openings. If a report begins with an unusual opening, however, the title should not normally duplicate it. Two questions, for example—one in the title and one in the opening—would be too many.

6. Continue revising. The rules of readability apply in titles twice as much as in ordinary text.

- Use active verbs.
- Find strong nouns.
- Use short, simple words.
- Cut words that aren't working.
- Be positive.
- Avoid the verb to be.
- Avoid repetition.
- Avoid ambiguity.

7. Titles don't need verbs. But the most powerful ones do have verbs and make a complete statement. The present tense gives extra vigor.

8. Check that the title is correct. In trying to capture interest, editors sometimes promise more than is in the text. Be sure the readers will not be disappointed. Protect your credibility.

9. Be sure the meaning is clear. Some people will read only the title. Because there are only a few words to work with, it is especially important to guard against ambiguity.

10. Look for wording that is clear but unusual: an alliteration, a simple rhyme, or even a touch of mystery.

11. Make sure the heading has the same feeling or flavor as the story. Heading, and story should not read as if they came from two different writers.

12. Think how the title will look. It should fill the available space comfortably. Some white space makes a heading more readable; too much looks ugly. Use upper and lower case for greater readability. If the title bas more than one line, group the words so they break into lines neatly. Lines should be roughly the same length. Don't settle for titles that look like this:

Natural enemies control rice
insect pests

The first line should have been broken after the third word.

13. Be prepared to work hard on every title. Good titles are not easy to write.

5.5
Newsletters: a fable

A calamansi is a small, green citrus fruit with a sour taste and, for its size, a surprising number of seeds. It is a staple of Philippine cooking.

Several months ago, Dr. Chin. the director-general of the Calamansi Research Institute, went to conferences in the Philippines and Canada on the newest citrus research. He also met with 20 local calamansi growers who had come to take a course on what to do about the huge oversupply of calamansi seeds. He lectured at several universities in his country. People seemed interested in the institute but he came to feel that they really did not know as much as he thought they should about the progress in research toward bigger calamansis. He decided that the institute had a "communications problem."

A newsletter is born

He called in the director of publications, Mrs. Diaz, and directed her to produce qa regular newsletter. He allotted the director a little extra money but said he expected her to find most of the necessary money in the departmental budget. After all, he said, it could not cost very much to produce a four-page newsletter several times a year.

Dr. Chin said the board of trustees would be happy to see a newsletter and that the people from the World Bank and from the other citrus centers would like it too. Together, the director-general and the director of publications decided that the newsletter could also go to scientists, to the editors of the local newspapers, and to extension workers, who could put it in their packs along with samples for farmers of the new three-inch calamansis. Dr. Chin mentioned two conferences that should be announced, and gave Mrs. Diaz the paper he had read at the conference in Canada and a letter about an award received by the chairman of the board of trustees.

"Right," said Mrs. Diaz. She asked her secretary, Ramon de la Cruz, to put together a detailed mailing list. At the next coffee break, Mr. de la Cruz asked colleagues about the names of people who should go on that list. He also asked a secretary in the director-general's office for any lists she had. Soon he had 300 names on cards.

At the same time. Mrs. Diaz sent a short memo to her colleagues at the center. She announced that her department was going to publish a newsletter and asked everyone to send in material. Two heads of departments sent in thick envelopes with papers given by scientists on their staff. Each added a note saying that this material had to be printed. One sent a list of new appointments and staff publications. Two sent nothing.

The director of publications gave all the material to her information officer, Mr. Tom Gee, saying that she expected the first four-page issue to be ready to mail in one month. Mr. Gee recognized that he had material for 36 pages. Mrs. Diaz told Mr. Gee to talk to each department head about what could be left out and to get material from the departments which had sent nothing. Mr. Gee did so. After a month of arguing and persuasion, he had reduced the material to 16 pages. He had also discovered that the department heads all expected to see his revisions at least twice for checking before they were printed.

Meanwhile, Mr. Gee talked to the graphics department, which prepared a design. He gathered pictures and gave them to the graphics department with clear instructions about how the pictures were to be used and how each article was to be placed.

It appears

Two months late, the newsletter finally appeared. One thousand copies were printed because Dr. Chin, the director-general, was sure that there would be hundreds of requests once the first 300 were mailed out. The secretary handed out copies around the office. Mrs. Diaz paid the bill, which was much bigger than she had imagined. She told Dr. Chin that she was not sure how her department would pay for the next issue.

Several people wrote Dr. Chin and Mrs. Diaz nice letters about the newslettzr. Everyone said that the newsletter was a success.

Mrs. Diaz wrote a memo asking for money to publish six issues a year. Dr. Chin supported the request enthusiastically. But some of the senior scientists were less certain. They thought the money would be better spent on research.

The board of trustees was meeting just about this time, and some of its members heard about the newsletter and the disagreement about its funding. They brought the matter up before the full board. The chairman wanted to support Dr. Chin, but recognized that there were powerful voices on the other side. To settle the matter, the board called in a consultant, an expert in newsletters, for an opinion on the things that had occurred so far and how the institute should proceed.

What do you think the consultant said?

What the consultant said

The consultant said there can be no arguing with success, and the first issue of the *Calamansi Newsletter* had obviously been a success. She had been told so many times. She praised the director-general's initiative in starting a newsletter and Mrs. Diaz's efforts and imagination in carrying out the director-general's wishes. She said Mr. Gee had worked hard. She said what a pleasure it was to visit the Calamansi Research Institute, especially during the cold months in her own country, and she congratulated the institute on the efforts it was making to produce bigger and better calamansis.

She had herself started several newsletters, she said, and had watched several others being born. Every newsletter is different, she added, but, she had to admit, if she had been starting the *Calamansi Newsletter* she might have done a few things in another way. At that point someone said, "But you agree it was a success! What few things did we do wrong?" So the consultant explained.

Dr. Chin

- said there was a problem but did not identify it.
- decided on the solution (a newsletter) without any goals or any research about the readers he wanted to influence and their needs.
- planned that the newsletter would go to groups of people with no common interest.
- did not consider what actions he expected from the readers.
- did not consult his professional staff.
- did not establish a budget.
- underestimated the cost.
- wanted to impress his colleagues more than he wanted to have the job done right.
- dictated the contents of the newsletter.
- overestimated interest in the publication.
- expected miracles from his staff.

Mrs. Diaz

- did not ask for a budget.
- did not build the mailing list carefully.
- did not write an editorial policy.
- did not delegate responsibility early enough.
- did not explain the publication to her colleagues.
- did not involve a designer early enough.
- let the writer instruct the designers, instead of consulting them and leaving them to do the job at which they were expert.
- sent the writer to deal with department heads, a job she should have done herself.
- relied on casual comments to judge the effectiveness of the newsletter.
- did nothing to ensure that the newsletter would be read by her colleagues in senior management.

At the end of the consultant's report, the only happy person in the room was Mr. Gee, who felt (incorrectly) that he had known what was wrong all the time. Dr. Chin and Mrs. Diaz were anxious to defend their baby. The board members felt they could not very well cancel the newsletter after only one issue, and anyway most of them thought it was a good idea. Finally, the trustees voted to support a newsletter in principle, but for the time being without any more money. They said that planning should start again, following recommendations of the consultant.

Those recommendations appear in the following pages. With them, the *Calamansi Newsletter* became a true success. Dr. Chin, Mrs. Diaz, Mr. Gee, Mr. de la Cruz, the consultant, and the institute all lived happily ever after.

5.6 Planning newsletters

Newsletters are published by research centers and other institutions for two purposes: to convey information to the readers, and to promote the public image of the publishing organization.

A newsletter can be more informal than a magazine or newspaper. It can also be more personal, treating its readers as part of a small, specially chosen, specialized audience.

Typically, newsletters are 4, 8, 12, or 16 pages long—and rarely more than that. The page size usually is A4 or 8-1/2 × 11 inches, two sizes that permit flexible design.

A newsletter does not normally express an obviously independent or official point of view. It gives information. Normally it is positive in tone.

Detailed planning is important in starting a newsletter. It is equally important to review that plan from time to time once the newsletter becomes established. Planning may follow seven stages. The editor should be, involved in all of them.

Make a plan

Make an editorial plan. Prepare a written statement of editorial purposes and policies. It should include the following:

- why the newsletter is being published: what goals it is expected to achieve.
- the readers it is intended to reach.
- the language best suited to reach them.
- the nature of its contents: what will be published in it and what will not.
- a clear statement of who has editorial control: the editor of the newsletter, the head of the institution's publications department, or the director-general? Is there to be an editorial committee? If so, what is its function?
- practical details, such as frequency of publication, size and number of pages, probable circulation, methods of distribution, and schedules. If possible, the designer and printer should be included in this pan of the planning.

Get it accepted

Make sure the plan is understood and accepted. Secure the approval and understanding of managers, members of the board, and other members of the institution before starting publication.

Develop some formal support such as an advisory board for the newsletter. Develop more informal ways to consult people within the institution and the readers.

Tell the staff of the institution what will be needed from them.

Plan the budget

Make a budget plan. You will have to know the size and design of the newsletter, how many copies are to be printed, and how often it will appear. Prepare a total budget including the costs of

- editorial time (allow enough hours)
- design
- photography
- composition, halftones, paper. printing, and binding
- postage and other direct costs of distribution
- keeping the mailing list up to date
- regular evaluation of the newsletter's success

Plan a three-year budget. It will take that long for the existence of the newsletter to be widely recognized.

Agree on jobs

Define the role of the editor. Everyone should be clear who decides what will be included in the newsletter.

The editor should have as much status and responsibility as possible. The editor should be able to depend on the support of his or her department manager and the head of the institution.

If the editor can employ staff writers, they should be able to depend on the editor's support. Writers should not have to deal with senior staff on matters of editorial policy.

Plan distribution

Prepare a distribution plan. Make sure that all the people who should receive the newsletter are on the mailing list. Prepare the list methodically to include all the people who might be interested or whom the institution wants to inform and influence.

Take advantage of the newsletter to reach groups outside the prime target readership. Send it to newspapers and other public media as part of a public relations program. Let them know they can quote from the newsletter.

Here is a short checklist of possible readerships for an institutional newsletter. It may be useful in developing an initial mailing list.

- newspaper, radio, TV
  - local
  - national
  - international
- colleagues
- scientists working in related disciplines
- extension workers

- newsletters of related organizations
- related professional organizations
  - home country
  - international
- policymakers
  - local
  - national
  - international
- funding agencies
- board of trustees
- influential former staff members
- documentation centers
  - libraries
  - universities
  - specialized
- university staff
- university students
- visitors
- bookstores
- business people
- other newsletters
- people who appear in articles
- people who contribute articles

Make it easy for people to get on the mailing list.

Plan the design

Design the newsletter. An editor has four options for designing a newsletter, or redesigning one.

- Use a designer to lay out each issue. (This is unusual except in the largest organizations.)
- Use a designer to establish a standard format that the editor can follow most of the time. The editor may consult with the designer from time to time after that for help with problems or for comments on solutions.
- Use a designer to establish a standard format, which the editor can follow after the first issue.
- Use no designer: the editor creates the design and applies it. (This may be the most common approach.)

Design of publications is discussed generally in module 7 and for newsletters specifically in unit 7.11.

Plan to review

Plan from the beginning to measure the newsletter's success. Carry out annual readership surveys (see units 1.6 and 3.10).

Build feedback devices into the newsletter. For example, include order forms for publications or registration forms for conferences.

Sell or give away advertising space and measure any response to advertisements.

Request and print letters to the editor.

Run contests.

Make sure that senior staff receive and read the newsletter. Ask for their comments.

5.7 Editing newsletters

A good newsletter is like a small magazine. It should be edited with the same imagination, planning, and attention to detail. Unfortunately, many newsletters show little evidence of editing.

Good newsletters have personality. They are put together by one person from one point of view. Their editors have the arrogance to believe that they know what their readers want. In many, the editor is visible, and talks with the readers in an editorial note.

A good newsletter observes all the rules of editing for non-specialists. Here are some of the more important ways the rules can be applied to produce lively newsletters that will be read.

Show by example

Show what the institution is doing by giving examples and emphasizing people. An effective newsletter does not publish official, general, bloodless accounts that belong in an annual report. It singles out projects and personalities. It does not say, "Look at this long list of all the things we are doing in this broad field." Instead, it chooses one project or one person and concentrates on that subject as typical of the work under way. In the next issue it can go on to another project or person. If there are three or four such articles in each issue, everyone gets reported eventually, and the reports are read.

Articles that survey a whole field in a short space are likely to be dull. Details and human beings add life to even the most complex research report.

Good newsletters are not about great institutions. They are about the people who make the institution great.

Good editors find stories by leaving their offices, visiting labs, going out into the field, talking to colleagues. They know what is going on, and they are alert for interesting examples all the time.

Create a personality

Be different. A good newsletter has its own personality. It does not look like every other newsletter its readers see.

It is not exactly the same every time it appears. Each issue contains some articles that are different in approach, about different areas of interest, or about the same area reported in a different way.

It does not treat each article in the same way. Some articles will be long (even 2–3 pages); some will be short.

A good newsletter shows clear evidence that a human being has judged the material for importance and interest to the reader, and has organized it. The greatest failing of newsletter editors is treating all the articles as if they were equally important. In part this may be caused by lack of money or poor design, but sometimes it is just lack of imagination or effort.

Plan ahead

Plan well in advance. Editors know that certain events are going to occur. Good editors organize coverage beforehand.

For example, pictures of visiting speakers or award winners can be obtained before the occasion. It may be possible to write to their home organizations and ask for an informal portrait in the office or lab. This avoids the "grip-and-grin" type of photo of the ceremony.

A wise editor also has a small stockpile of "insurance" material that can be used any time a planned story is not ready by the deadline.

Be interesting

Emphasize what is interesting and important. Give less space to what is dull but necessary.

Lively newsletters do not reprint press releases without editing. They avoid publishing speeches or long official statements word for word. They report only the most important points made in speeches or statements.

They contain a minimum of administrative news, unless their principal purpose is to serve as an official gazette. Newsletters published mainly for readers outside the institution may ignore staff news except for the most senior appointments or departures. Others publish brief administrative items in groups under a single heading.

Lively newsletters do not refer to the director-general or president of the institution in every article, or even in many articles in a single issue. Readers want to know about other people too. (The president of one university became a faculty laughing stock because his picture appeared so many times in every issue of the campus newsletter.) They do not, in particular, publish articles that begin: "President Eduardo N. Buenavista announced today . . . " They know their readers want the news, not the president's name.

Many newsletters introduce humor when they can. It attracts readers.

Edit tightly

Edit tightly. Newsletters are short on space. Their readers are usually short on time. Good newsletters don't waste words. The articles are written tightly and to the point.

Capture the reader

Capture the readers' attention. Use good headlines and interesting openings in the articles. If an editor can't find a good headline and opening, something is probably missing from the story.

Look for feedback

Give the readers a chance to talk back. Encourage letters to the editor. Survey readers to find out what they like and don't like and what changes they would like to see.

Say who you are

Provide basic information. In one tidy place, a newsletter should give

- the name, address. and phone number of its institution
- the name of the department responsible for the newsletter
- the name of the editor of the newsletter
- the frequency of publication of the newsletter
- the date and number of this issue
- how to send in changes of address
- how to submit material for publication or reach the editor

It may report the names of agencies that fund its organization, as a way of saying thanks. It may also provide an International Standard Serial Number (ISSN).

The first issue

The first issue of a newsletter is always special, It gives the editor a chance to explain what the newsletter is trying to do. It also gives the editor a chance to introduce himself or herself, and to explain the benefits that come from the sponsoring organization. (Some of this can also be done any time a new editor is appointed.)

The first issue of a newsletter may

- *introduce the publication:* its purpose and how it came to be started; what will be published in it: how often it will appear; who it will be sent to; its editorial committee and editorial responsibility; its correspondents.
- *introduce the sponsoring instirution:* its purpose; its size, scope, and capabilities; its research programs and strategies; a brief history, with major achievements; its director (introduced, perhaps, in a separate interview); its financial supporters; its relationships with other organizations. (The introduction to the institution should probably be separate from the introduction to the publication. It could be included in an interview with, or a column by, the director of the institution.)
- *introduce the editor:* report the editor's name and department; give the editor's background; publish a photo of the editor. (Both the publication and the editor could also be introduced in a personal column signed by the editor.)
- *provide for feedback:* ask for comments; tell how to contribute material, and give deadlines; explain how to get on the mailing list; ask for a mention of the newsletter if material is reprinted.

See also unit 6.6: Using photographs for effect.

5.8
Interviewing for information

Details, examples, and quotations make writing interesting. But they do not often appear in scientific or official reports. To find them, the editor of a newsletter or magazine may have to interview scientists or administrators.

A good interview is a friendly conversation. Both people are relaxed. Yet at the end of the interview the writer has all the information needed. Here are some ways to achieve that goal.

Before the interview

The success of any interview depends in large part on what happens beforehand. Good interviewers do their homework in advance. They prepare carefully.

Be sure about the reasons for the interview. Be clear about what is to be discussed, why it is important, and how it will be used.

Tell this to the person who is going to be interviewed. That will avoid embarrassment or confusion during the interview.

Arrange the meeting in advance. Say how long a time you will need.

Try not to use the word "interview" in making the date. It may sound frightening. Ask if you can "talk."

Do background research. Read all you can about the subject. Some interviewers spend five hours in research for every hour of interview.

This will save time in the interview: you won't have to ask as many questions. Moreover, the person you are interviewing will be pleased you have done your homework. And if you don't do research, you won't know what questions to ask.

Doing your homework should also help you avoid errors. Sometimes interviewers go to work without research but with firm ideas of what they expect to hear or see. These preconceptions can get in the way of the facts. Because of them, the interviewer may misunderstand what a person is saying. Then the report is inaccurate or even misleading.

Prepare a list of questions in advance. At least make a list of the topics you want to cover. With a list of questions or topics, you can control the interview

If you plan the questions in advance, they will be worded better. Here are some rules about that:

- Don't ask questions that can be answered ''yes" or "no." Those answers don't give new information.
- Don't ask questions about things you should know (like how to spell the person's name).
- Don't ask questions that are too general. The person may have trouble answering them.
- Don't ask questions that are too long.
- Ask short, conversational questions.
- Ask questions that will get the person talking. Ask: "What do you think about . . . ?"; "Why . . . ?": "Tell me about . . . "

Organize the questions in a logical way that will encourage an easy flow of conversation.

One writer suggests making a plan that is summed up in the letters GOSS: *Goals, Obstacles, Solutions. Start.* In other words, plan questions that ask: What are you trying to do? What problems have you faced? How have you solved them'? How did you get started doing this?

At the interview

A successful interviewer may not be relaxed, but looks relaxed. That puts the other person at ease, and people who are comfortable speak more freely. In contrast, an over-eager interviewer, or one who seems skeptical, blocks conversation.

Make a good impression. Arrive on time. (Allow extra time to get to the meeting place.) Dress appropriately.

Be relaxed and friendly. Don't show that you are nervous. Don't suggest that you are in awe. Spend a few minutes in casual conversation if possible. Both you and the person you are interviewing will relax.

Then start with the easy questions that will keep the person talking easily. Don't start with questions you should know, like the person's exact title. If you have had trouble learning that, save the question till the end.

Listen. Don't talk more than necessary to keep the conversation flowing. Don't interrupt. Don't argue.

Encourage the person who is talking. Nod your head. Agree. Smile. Laugh when appropriate. When you ask questions, sound interested.

Look at the person as much as possible. Keep a friendly eye contact.

Let pauses happen. The person will usually say something more.

Keep asking questions. The answer to the first question on a topic may not give everything you want. Ask a second question, probing more deeply: "I don't quite understand . . . " or "Why is this . . . ?"

Sometimes it takes several questions to get to the heart of the matter. Ask politely, but keep asking new questions until you feel you understand the subject and have all the information the reader will want or need.

Look for examples or analogies. Ask for them. They will make the story come alive for your reader.

Be alert. Something may suggest a whole new topic for questions-one you hadn't thought of before. Pursue that topic.

Note mannerisms of the person being interviewed — gestures or speech patterns — and the surroundings of the interview. Human details give life to the most technical subjects.

Take notes. Try not to be obvious about it, but make notes. Write just enough words to refresh your memory later. If you spend the whole time writing on a note pad, the person being interviewed will dictate to you, and won't talk easily or be relaxed. Do write down good quotes.

Some people like to use a tape recorder. If you do, be sure you know how to operate it. Tape recorders have disadvantages, however. Some people don't like talking into a recorder, and after the interview the whole conversation has to be played and transcribed, which takes a lot of time. I advise using a tape recorder only if the topic is very complicated and you want to be sure of having everything right, or if it is controversial and you want to be sure of having exact quotations.

At the end, say "thank you" and leave. But first ask if there is anything else the person wants to talk about. Sometimes the most interesting thing may be said just when the interview seems to be finished.

When you come to the end of the amount of time you asked for, offer to leave even if you're not finished. The person you are interviewing may agree to continue.

After the interview

Once you are outside the door, don't let time pass. There is nothing much more difficult than trying to reconstruct an interview and write a report from a few scribbled notes that are several days old.

Read your notes at once, and expand them. Do this while your memory is still fresh. Add points you didn't have time to write down.

You will usually find you have more than you can use. That's all right. It means you can pick the best material. Some of the other material may be useful for another report.

Write the story as soon as possible. Do it while everything is fresh. You may remember things you didn't put in the notes.

Use quotations carefully. Unless you plan to use a Question-and-Answer approach in the story, only part of the writing will be quotations from the interview. Choose them carefully. Quotations should be used

- as signposts, to tell the reader the subject is changing.
- to emphasize a point.
- to express judgments that you, as writer, shouldn't make.
- when the person interviewed has said something in a way better than you can write it

Check the facts. Check them yourself if you have any doubt about your notes or about what you were told.

If appropriate, ask the person who was interviewed to check what you have written. But make it clear that you want only the facts checked, not the style of writing.

Sometimes the person you have interviewed will say, "Of course, you must not publish this without showing it to me first." Usually it is just as well to agree, especially if the person is a colleague or is in a position of authority.

Using the mail or telephone

It is possible to have an interview by mail or by telephone although it is rarely as satisfactory as an interview face to face.

In an interview by mail, the questions must be very carefully worded. If the meaning isn't clear, or the answer isn't what you need, there won't be a chance to ask the question a second time.

In telephone interviews, it's a good idea to call in advance and make an appointment. This ensures that the people you want to interview have time to talk with you and so will be more relaxed. It also gives them a chance to plan what they want to say. You might also suggest they call you after the interview if they have second thoughts. Or you might offer to call again, especially if the interview does not seem successful.

5.9
Planning folders

A folder (sometimes called a pamphlet or a brochure) is a publication that fits on a single sheet of paper. Frequently the paper is an A4 or 8-1/2 x 11 in. sheet folded twice, but it may be larger or smaller, and may be folded three or four times. The folds may be parallel or at right angles to one another.

A folder may carry many kinds of messages. For example, a folder may

- *urge* readers to join an organization
- *tell* readers about an institution they are visiting
- *advise* readers about ways to prevent tooth decay
- *instruct* readers about the best way to prepare a field for planting
- *warn* readers about the dangers of smoking
- *inform* readers about publications they can get from an extension department
- *explain* to readers the advantages of a new variety of plant

In every case, a folder must do this in a small space and in few words or pictures. Folders present special problems in planning, writing, and design.

Qualities

An effective folder is

- personal: directed to one reader
- focused: limited to one clear message
- attractive: designed to capture the reader's attention
- simple: easy to understand at a single reading
- concise: free of waste words or irrelevant ideas
- instructive: clear in stating what action the reader should take

Think of the folder as a series of pages or panels joined together. Try to make each panel an effective unit on its own.

Cover

The cover of any publication has only one purpose: to persuade people to read what is inside. Plan the cover carefully. Ask always whether the words and design will make readers want to open the folder.

First, attract the reader's attention. Write a title that gives the main message briefly and interestingly ("How the Calamansi Research Institute, helps you," "Ten ways to better health," and so on).

This is the place to show how the folder can help the reader. People won't take the time to read the whole message unless they can see some benefit to themselves.

Use big type for the title. Don't be scared of 36 pt type, or even larger.

Use an attractive illustration, preferably showing people doing something. If the folder is about an organization, remember that an institution is its people, not its buildings.

First panel

Start by showing how the subject of the folder helps people, especially how it helps or can help the reader. This means talking about the present and the future.

For example, if you are writing about an organization, don't begin with when it was established, or its place in the government hierarchy, or its buildings, or its formal objectives. These are not facts that interest most people. They can be reported later, preferably toward the end.

The folder may not be about an organization. It may urge the reader to take some kind of action. In that case, show immediately how taking the action will help the reader.

Later panels

Continue relating information, as much as possible, to the reader's interest.

If the folder is about an organization, explain what it is doing, what it has achieved, and what it offers — and do it as simply as possible. Avoid jargon.

Talk about individual people. People like to read about people.

Explain the work being done by one or a few researchers. Let them stand for the organization. Then talk about the organization as a whole. If the folder is about agriculture, explain how one farmer already benefits from following a new practice or planting a new variety. Then go on to talk about groups of farmers (see unit 3.2).

Designing a folder

Make sure the folder has a family resemblance to other publications from your organization.

Use type large enough to be easily read.

Don't be afraid to leave some space empty. A crowded folder looks difficult to read. It is not attractive.

Align the type at the top of the panels. Try to make each panel a complete unit. That's the way people read folders.

Don't let type run across the folds. Keep each panel a separate typographic unit.

Don't worry if the panels are not exactly the same length at the bottom.

Use headlines or symbols to break up the text.

Illustrations

Illustrations add impact. One or two can be a big help in making a folder more effective.

Make illustrations big. They may run across a fold into a second panel. Just make sure the fold does not pass through a major element in the picture such as an important face or an important part of a machine. Show people in the illustrations. Follow the other guidelines for using illustrations effectively (Module 6).

Final points

Don't forget to give the address of your organization.

Add the date when you will be printing the folder. If it is not important to the readers, the date can be in small type in one comer. You may need the information in the future.

Make sure you have told the readers what you want them to do. Are they to order a book? change their eating habits? register for a workshop? Sometimes the message is implied in the body of a folder but is never said clearly in a few words of practical advice. Don't be afraid to repeat the advice at the end.

You may want to make it easy for readers to respond by printing a special form they can mail back. If you do include a response form, don't put it on the back of any information you want the reader to keep, such as the name and address of your organization. Print it on a separate panel, perhaps with your return address on the back. Print a dotted line to show that the form is to be cut off and where it should be cut.

If the folder is to be mailed without an envelope, leave a full panel for addressing it. Leave enough space for stamps. Include your return address.

5.10
Planning posters

A poster is a piece of paper or cardboard with only a few words and perhaps an illustration. It is used to convey a quick simple message. It is usually mounted in a place where the intended audience will see it repeatedly. It should be the right size for its location.

(Note: This unit is about posters for non-specialists or posters announcing simple messages to specialists. Researchers sometimes prepare posters for presentation of results at a professional meeting or workshop. These contain much more information, and different guidelines apply.)

Advantages

A poster

- commands attention. A person may miss a newspaper or television announcement, but a good poster in the right place usually catches the eye.
- presents its message over and over every day as long as it is standing.
- reaches both large and small. specialized and general audiences.
- can be replaced easily when it is time for a new message.
- reinforces other messages in a communication program.

Encourage action

People passing a poster often look at it for only a fraction of a second. They may absorb the message without even slowing down. That means the message must be brief, direct. and large so it can be absorbed quickly.

The simplest, most effective posters encourage some sort of action in a few words: “Don’t forget to vote.” “Wash your hands before eating,” or “Fight drugs.”

A poster that does not suggest any action may look attractive but may be a waste of an organization’s money. Inspirational or “image” posters are for people with large budgets.

Some posters have more than a few words. Their publishers expect people to stop for a minute or two to read the words. If that kind of poster is put up where people normally sit or stand around, it may be read in full. If its message helps people, they may even pause to read it as they pass by. However, no one should count on long messages being absorbed.

Qualities

Successful posters usually have

- one short, simple message in large type: a call to action
- an element of surprise that catches the attention of people walking past

They may also have

- a simple illustration that attracts the eye and reinforces the message
- the name of the sponsoring organization
- lots of :empty space: a crowded poster is unattractive
- strong color
- an additional brief message supporting or explaining the call to action

Planning

As the first step in planning a poster, write down its purpose. Include the call to action which tells readers what they are supposed to do.

Decide if you want the message of the poster to be absorbed quickly or if you expect readers to stop and absorb the message. Don't fall in between.

Write down what you know about the readers: their educational level, age, location, numbers. This information will help you decide where to put the posters and how many you will need.

Design

Make sure your type and illustration can be read easily from 5 meters (16 feet) away.

Words

Use few words, unless you are sure your readers spend time standing around near the poster.

Use simple words.

Make the words big.

Keep the type plain.

Don't use more punctuation than necessary.

If you use an illustration, put the words on a plain background. Don't put words on a picture where they will be hard to read.

Illustrations

Use an illustration to reinforce the words.

Make it big.

Keep it simple. Avoid too much detail.

Use a picture of something familiar, or something commonly associated with your message. To many people, a red light announces danger, an open hand symbolizes charity.

If you use a photograph, choose a dramatic close-up of people. Avoid scenery.

If possible, make the illustration colorful. If you are limited to black-and-white, make sure there are strong blocks of black for maximum contrast with the white paper and the poster's surroundings.

Plan

Make a sketch of your proposed layout.

Cut pieces of colored paper the size and shape of the blocks of text and the illustration. Move them about on a piece of paper the size of the poster until you have a satisfactory arrangement.

Make sure the reader's eye will move easily from one element to another.

Keep it simple.

Putting them up

Posters should be placed

- in many different locations; the message is more likely to be absorbed if it is seen frequently.
- at eye level.
- where there is clear space.
- where the light is good.
- where many people pass.
- where material is changed often enough that people want or need to look at it frequently.

Timing

Posters should be changed every few weeks. It never hurts to leave the space empty for a few days before mounting a new poster. People will notice that something has changed and are likely to take another look.

Feedback

Ask your friends and colleagues if they are ready to act on the message of the poster. Get their impressions. Watch bulletin boards to see if people are noticing the poster. If they are not, plan what you can do to improve impact in the future.

5.11
Public relations

Because they work with words, editors sometimes are asked to look after their institution's public relations. Often, however, they are called in only when there is a problem. But a good public image cannot be turned on like an electric light—when budgets are cut, for example, or an institution comes under public attack. Building a good reputation takes long-term planning, continuing attention, the involvement of senior management, a large enough budget, and actual achievements.

Ask yourself "In the future will my organization be judged only on the basis of its research? Or will it also be judged by its success in spreading the results of research to scientists and the general public?" If the answer to the first question is "No" and to the second question "Yes," then the public relations program is as important as the publications program.

One training unit cannot teach how to achieve good public relations. For editors who may need them, however, here are some general guidelines. It will be clear from them that a public relations program is not something that can be accomplished in a few hours. Even a small program will take several hours each week.

Tell how you help

An organization must explain to the public what it is doing and how it works to help the public. Otherwise people likely will not understand or approve of what the organization is doing. Then the organization will suffer. Funding may drop or cooperation lessen.

But a good public relations program alone is not enough. An organization must be doing good work and making right decisions. Too often, what are defined as poor communications or inadequate public relations are the result of bad management or bad systems. This happens, for example, when requests for information go unanswered or a manager doesn't return telephone calls.

Know your image

An Organization must know what people outside think of it. Senior management must understand what the public expects of the organization, and what it must do to meet those expectations. This is important because an institution's relations with the public are occurring all the time, whether we want them to or not.

Involve everyone

Everyone in an organization is responsible for public relations. People form their impressions of an organization from its employees: the people who are closest to the organization and represent it all the time, both on and off the job. If employees greet visitors with a smile, the public image will be a happy one. If employees complain all the time, the image of the organization suffers.

Management must make sure that employees know and understand what their organization is trying to do, and can talk intelligently about its programs.

Ask questions

Planning a public relations program starts with the question: "Does the public understand the goals of our organization and do they approve of them?" If the answer is "No," or "Yes, but not as much as we would like," then more questions follow:

- What do we want to achieve in our total program of public relations?
- What should we do to meet those goals?
- What audiences need to be reached?

  An organization may have many publics. An international organization may be concerned mostly with the support of donor agencies in other countries; but it must also be conscious of the people in its host country, and especially of its closest neighbors. A national agency will similarly have to be concerned about local, state or provincial, and national groups. An agricultural institution must be aware of the farmers who will put its research into practice as well as of the policymakers who will encourage the farmers to do so; a medical research institute must seek the support of health care workers as well as of its ministry; and so on.

  Sometimes, in concentrating on one public, an organization may neglect some of its other publics. This can harm it in the long term.

- How can we best reach each target audience?
- What will it cost to do this?
- How would we like each audience to respond to each of our efforts?

Plan and review

Public relations (PR) involves four steps:

1. *Listening.* This could also be called research and analysis. An organization must have systems to tell it what will happen tomorrow and for the next five years. It must anticipate troubles and opportunities and plan for them. The primary job of a public relations person is to keep the senior management aware of what is going on outside. To do this the PR person reads newspapers and magazines, carries out or commissions surveys, uses opinion polls, watches television, and in other ways follows public thinking. The PR person is a bridge between an institution and the public, explaining each to the other.

2. *Planning.* Having listened very hard to all the audiences and decided on specific goals, the PR person plans the public relations program for each target audience, decides on budgets, and (very important) gets the plan approved. A good rule at this point is to write everything down, especially the ways the organization will eventually decide whether or not the program is a success. This will help prevent misunderstandings or disputes later.

3. *Developing and conducting the program.* This is the time to decide what is going to be done; to choose the media that will be used to meet the objective and reach the audiences; and to establish a timetable and a budget. Then comes the job of creating and distributing the materials.

4. *Monitoring and evaluation.* It's essential to watch all the time to see what works and what doesn't. This phase cycles back to step 1. Without steps 4 and 1 the organization has no idea what it should be doing or why. Without evaluation, it's possible to do some things right by luck and judgment, but it's equally possible that money is being thrown away.

Reach the public

All significant audiences must be reached in any well-planned public relations campaign.

Mass audiences can be reached through newspapers, magazines, radio, and television. This takes time and effort. It works best when the editors and staff of the media feel friendly toward the institution and its public relations person. For that to happen, however, the institution and its staff must be friendly toward the media. They must answer the media's requests if they expect the media to respond to theirs. Too often, institutions seem to expect good relations with the press as a right, rather than as something to be achieved. They approach the press only when they want something good reported, and then are angry when it isn't. An organization must also be prepared to deal promptly with bad news.

Relations with the press are not helped by mistrust. Yet too often it appears that each side mistrusts the other. Specialists fear that they will be misquoted, or consider talking with the press less important or less worthy than communicating with other specialists. Those who work for government agencies may be reluctant to meet the press because they are limited in what they can say publicly on political or social issues. Journalists, on the other hand, may be afraid of specialists. Most of them have had little education in science and hesitate to move into areas in which they have no background.

Even with friendly and positive relations, the Competition for space and time in the mass media is intense. An institution is likely to have its activities reported in them only occasionally. And then there is no way to control how the report will be worded. It is often more effective and efficient to reach for more specific, better defined audiences through other channels.

Specific audiences can be reached in a number of ways:

- *spoken word:* meetings, speakers' bureaus, the grapevine. The most effective public relations is face-to-face contact, People decide what to think by listening and talking to other people more than by any other means.
- *printed word:* professional magazines, the institution's own publications, pamphlets, booklets, manuals, books, letters, bulletins, newsletters, inserts in the institution's mail, printed speeches, bulletin boards, posters, advertising, annual reports.
- *images:* motion pictures. slides, film clips, displays, exhibits, special events and celebrations, open houses.

Keep it up

An organization that is not concerned about its public invites that public to misunderstand it. Such misunderstanding may lead to action that will hurt the organization. A decision that harms the organization may eventually harm the very public the organization is working to serve, but by that time it may be too late to repair the damage.

5.12
Writing press releases

Editors at research institutes are sometimes asked to write press releases for distribution to local or national newspapers and magazines and radio and TV stations.

Here are some general rules for writing such releases.

Plan releases

Don't write too many releases. If you flood the market, the media will develop resistance.

Don't send out releases that you find uninteresting. Ask yourself "Would I use this if I were a newspaper editor?"

Don't send every release to everyone on your mailing list. Send a release only to media you think will find it interesting. An editor who receives from one organization too many releases that can't be used stops reading any release from that organization.

Recognize two kinds of press release and write them differently.

- One is a feature. It reports an ongoing activity—perhaps a research project that promises benefits or a training program that is helping people. It could be published tomorrow but would be equally valid three months from now. Avoid tying it to any specific date. Editors hold feature stories like that for times when they can use them. You may want to keep sending the release to additional media as long as the activity continues.

- The other is news. It is tied to a specific event that has just happened, is happening, or is just about to happen. Make sure that the time is clear and that it is now. News editors want news that is absolutely up to date.

Capture attention

Write a good headline for the story. Some experts believe that this is unnecessary, since the newspaper will probably write its own headline. But a good headline does capture attention and may make the editor's job easier

Capture the reader's attention in the first sentence. The first reader of a press release is likely to be an editor who (a) is busy and (b) receives many press releases every day. These editors don't have time to read past the first few words.

Don't start a release: "President Juan P. Enchillada of the International Corn Flour Research Institute is pleased to announce that ..." Get to the point right away. Readers (and editors) want news. The only person really interested in the fact that the president has made the announcement is the president. Everyone else wants to know *what* was announced.

Give the main information in the opening sentences. The first paragraphs should answer the questions Who? What? Where? When? Why? and How? You can test the opening with two questions:

- Is every word vital to the story?
- Will the reader learn the main facts of the story from the opening? Does it provide a summary of what you want to say?

Write tightly and accurately

Remember that the release may be cut. Newspapers are crowded for space. Editors often cut from the bottom up. They expect that press releases will be written so that they can be cut in this way. Never leave important facts to the last.

Find a local angle if you can. A newspaper or TV station is more likely to be interested in a story if it is about a person or organization from its region.

Be accurate. If there are errors in one press release, an editor may never use another release from that source.

Use short sentences and short paragraphs. That's what newspapers and most magazines like.

Try to be objective. Write the release the way an editor would want to use it, without praising or flattering your own organization or its members. Keep to facts.

Supply photographs if possible for newspapers and TV.

Follow format

Follow these rules for preparing a release. It will be more likely to be used by a busy editor.

- Type it double-spaced with wide margins. Correct any typing errors neatly.
- Make it clear the document is a release.
- Make sure the editor knows where the release came from. Include the name and address of the organization, and the name, address, and telephone number of the person who can supply more information if the editor wants it.
- Show the date the release is issued if it is news.

- Say that the material is "For immediate release" if it is. Sometimes public relations offices issue releases in advance, on the understanding that the material will not be published until a specified date. This is not always a good idea. Errors can occur, and news may be published before it should be.
- Make sure each page is clearly identified as part of the release. Each page should have a short identifying phrase and a page number.
- Try to keep to two typed pages. If more space is needed, consider writing a separate "background" release. Make sure it is clearly identified as connected with the main release.

Evaluate

Evaluate your press releases occasionally. Ask the people who receive them whether you are giving them what they need, in the form they need it. Are you giving too much or too little? How can you do it better?

Be patient. Releases have been published as much as two years after they were written. Better late than never; they still helped build a positive image for the institution that had issued them.

6
Illustrations

Illustrations present special problems for editors. This module considers some of the basics of, and questions to be asked about, the most common forms of illustration: drawings, graphs, maps, and photographs.

Special attention is given to photographs because editors are so likely to have to deal with them, and because editors often have more flexibility in dealing with photographs than with artwork. Some editors take photographs and write captions themselves; these skills are treated briefly in separate units.

Illustrations should be discussed with authors as early as possible, preferably before any artwork is drawn or photographs taken. That way, it is possible to avoid misunderstanding and errors. Much of the information in the following units can be revised and distributed as advice to authors who are preparing manuscripts.

This module assumes some knowledge of the ways illustrations are reproduced. If necessary, it should be read in consultation with unit 8.5.

Some of the units are designed as checklists and may be used separately. As a result some information is repeated. This should be ignored if the module is used as a whole.

6.1 Illustrating the text

Some texts require illustration. Others can be made more effective by adding illustration. In any editorial planning, therefore, illustrations play a part. When should they be used? Where should they be used? How should they be used? What kinds should be used?

It's a good idea to discuss plans for illustration with the author as early as possible. It will save time and misunderstanding later. It will also get the author thinking about possible illustrations,

Authors and editors may not always agree. Authors sometimes want far more illustration than the budget can allow or the editor thinks is necessary. At other times authors may not want to bother with illustrations the editor feels are necessary or desirable, especially if it is the author who must supply the illustration.

Once a decision is reached, illustrations require just as much editorial attention as words. They are likely to be studied before the words are read: people normally look at pictures first. They take time and money to produce, and more time and money to reproduce. They use valuable space on the page. They must meet technical standards. And they are just as likely as the text to contain errors, distortions, distractions, and confusions—flaws the editor must guard against or correct.

Editing illustrations needs a sympathetic, trained, and alert eye, just like editing words.

Kinds of illustration

Illustrations may be artwork or photographs.

Artwork includes drawings, graphs, and maps. It can be printed in black and white, in black and white with one or more additional colors, or in full color. Photographs can be printed in black and white, in another color, or in full color. Photographs and artwork can be combined in one illustration, although that involves extra expense.

The editor may have to help choose which style of illustration would be best for a particular publication. As in any editorial decision, the choice will depend on

- the subject
- the purpose
- the intended readers
- the cost and available budget

For example, we may want to publish an illustration of an insect that attacks rice plants.

Let us imagine that it is to appear in a booklet to be used by extension workers. They will use it to help teach farmers how to recognize the insect. For this purpose the best form of illustration may be a color photograph, and we may want to reproduce it so the insect is close to life size. That way it should look exactly like the insects the farmers see in their fields.

If there are two insects that look alike, but only one is harmful, we may want to publish drawings of both of them. Photographs may not show the differences between them clearly. We may instead use two simple sketches that emphasize those differences.

Perhaps, on the other hand, the purpose is to illustrate a paper describing the insect for scientists. In that case, a highly detailed drawing may be necessary.

To that, we may wish to add a map showing where the insect has been found, and a graph showing recent increases in its numbers.

The illustrations are different because of different purposes and different readerships.

Advantages

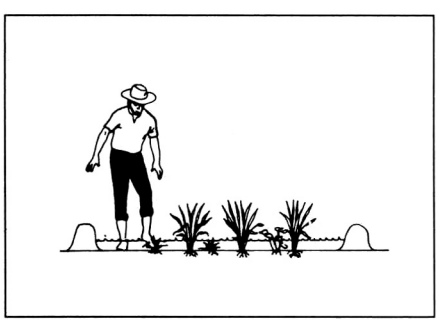
Photographs show exactly what the camera sees. They reproduce exact tones, textures, colors, and details, allowing of course for flaws in the process of reproduction.

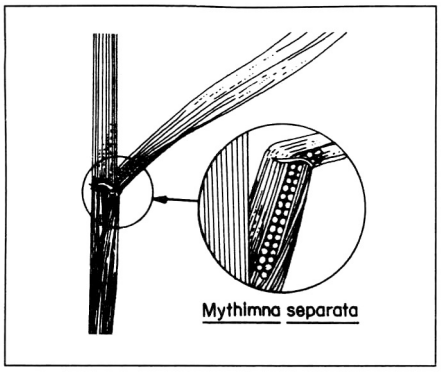
In addition, photographs are relatively cheap and fast to produce. Many photos can be taken in the time an artist needs to finish one drawing.

Photographs also have an immediacy and a sense of reproducing actual events. They are well suited for newsletters and many other publications for the non-specialist.

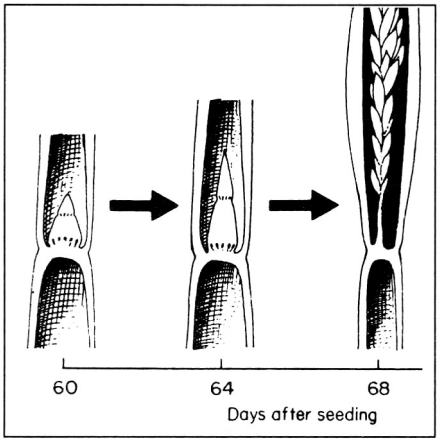
Drawings, for their part, have certain advantages over photographs to meet particular needs.

- Drawings can control the viewer's perception by showing only essential details and omitting any unnecessary details.





- The artist can emphasize differences and important points, by altering scale (for example, by magnifying one part of the subject) or by using a different tone or color.



- Three-dimensional drawings can show hidden developments within the plant or give an exploded view of a complex subject like a piece of machinery.

- Drawings can show the direction of flow in a process: for example, the flow of paper in a rotary press.
- Drawings can show relationships, like the food chain that stretches from plankton to people. Graphs are particularly valuable for showing relationships between variables. Maps show spatial relationships.

Purposes

Illustrations should have a purpose. Otherwise they should not take up space. Each illustration should be examined with two questions in mind.

- How does this relate to the author's message?
- What is its purpose in relation to the text?

More specifically, an editor may ask about any illustration:

Does it provide important additional information? Illustrations provide some information far more clearly than words can do. They can show the exact appearance of a species of plant or animal; they can show the exact appearance of the symptoms or effects of a disease; they can show the exact distribution of a population, or the exact way in which a piece of machinery should be adjusted. In such cases, words cannot begin to equal the power of illustration.

Does it provide useful supplementary information? Sometimes an illustration is not essential but gives the text greater impact. For example. a leaflet about malaria may not need a drawing of an Anopheles mosquito; a book about a group of outstanding rice farmers does not need their faces: a description of agriculture in Java does not need a map of the island. But in all these cases the illustration may clarify descriptions in the text and will improve communication between author and reader.

Does it attract attention or generate emotion? An illustration may be largely decorative. It may simply be a maize or millet plant, a cow's head, a microscope, a graph showing progress, or the symbol of an institution. It may show a scene, a person, or an action that is typical of the subject of the text. It can even be an abstract design. Such illustrations do not convey a great deal of information, but they do draw the reader's eye to the page and suggest what the message is about. An illustration can also create emotion. If the publication is intended to create a response in the reader, then an emotional illustration may be more effective than words.

Does it do none of these? If an illustration does not provide essential or supplementary information, attract readers, or prompt an emotional response—then why use it? Illustrations cost money and take up space. They should all work.

Creative editors do not stop with the illustrations that come with the manuscript. They ask themselves whether more are needed or desirable. They ask:

- Has the author described something that would be easier to understand with an illustration?
- Could we attract more readers, or prompt a greater response, by using an illustration?
- How can we obtain this additional illustration?

Artwork and photographs make somewhat different demands on the editor. These are discussed in the following units.

6.2
Working with artists and artwork

Authors often supply any necessary artwork along with their manuscripts. Commercial publishers, in fact, generally consider artwork the author's responsibility. They expect finished art, ready for reproduction, or rough sketches, which they will have prepared in final form at the author's expense.

Many research institutions and extension agencies have artists on staff, some of them highly trained in the technical needs of a particular discipline. In that case, both authors and editors can work closely with the artists as fellow employees.

The alternative is to commission a freelance artist. Finding good ones can be difficult. Editors should keep an eye open for work by promising successful artists, and keep a list of names. That may prove useful even for editors who have artists on staff, in case a particular need cannot be met in-house. (An illustrator who can draw detailed pictures of microorganisms may not necessarily be able to draw posters, for example, though surprisingly many can.)

Whether working with staff or freelance artists, it is easiest to work with the same ones regularly. That way editor and illustrator come to know how each other thinks.

Some good illustrations can also be obtained without an artist and without charge. They are out of copyright and in the public domain, and can be reproduced from existing publications. Entire volumes ("swipe books") have been published of such free illustrations.

Instruct the artist

Artists are creative people and their work is difficult. They must interpret in two dimensions objects that are three dimensional; they must depict scenes that are simplified from reality but must still be recognized without difficulty; sometimes they must set down on paper ideas that have no dimensions. They work best when they understand clearly what is needed.

It is worth spending time before an artist starts work explaining clearly and in detail what is wanted, why the illustration is needed, and how it will be used. That saves time. cost, and possible unpleasant surprises. No editor should have to say after the artist has completed a drawing, "But that's not what I wanted!"

The instructions will be determined in part by the budget, the schedule, the skill of the illustrator, the capability of the printer, the purpose of the illustration, the nature of the intended readership, and the wishes of the author.

If you are not working directly with the artist, ask the author to pass on your explanations and instructions. Some basic instructions can be printed an a sheet or two of paper and given to all authors and artists.

Content

Be as precise as possible about the content. If the picture is to be of a plant, animal, or other physical object, provide a specimen if possible. Otherwise, provide a photograph or a drawing which can serve as a model.

For other kinds of subjects, draw a rough sketch or provide an example. At the very least, explain in writing exactly what is wanted.

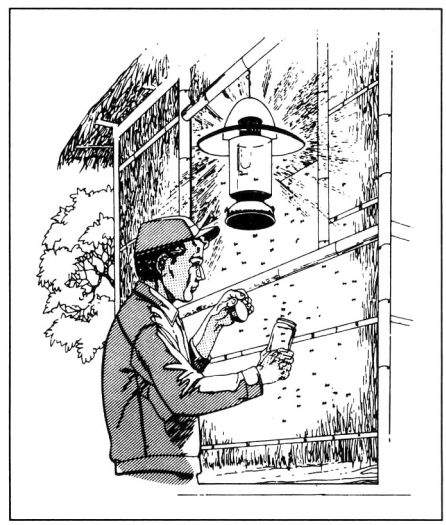
At this stage, give the artist any words or numbers that are to appear in the illustration. They will be part of the planning. It is difficult to fit a legend or other text into a drawing once it has been finished.

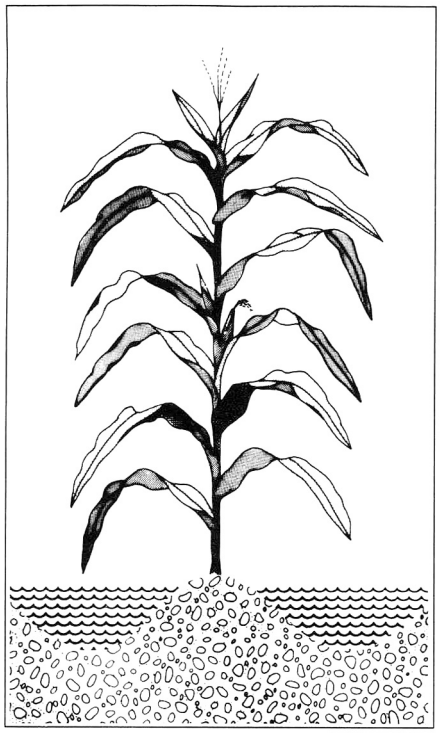
Words and numbers should be typed, double-spaced, on a separate sheet of paper. If some text is more important than other text, or if some text should be treated differently from other text, make that clear. Data to appear in graphs and charts should be provided in full.

Style

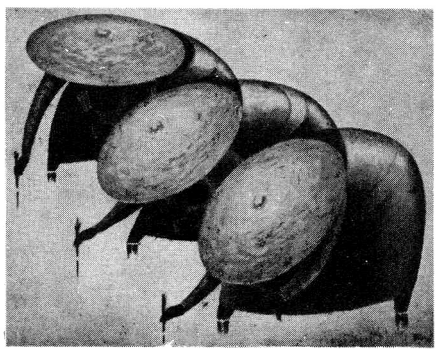
Decide what kind of artwork is wanted. Various styles of artwork are available. The choice will depend in part on the amount of money available and the nature of the publication. The subject is also important: some can be done best in one style, some in another. If possible, consult the artist and perhaps the printer before making a final decision.

- *Line art* - is the simplest to prepare and the cheapest to reproduce. Usually it is done with pen and ink, though today it can be produced by computers. Most scientific illustration is done in this way. So are most graphs and maps.





Line art uses only lines and dots. that is, *solid black and solid white.* The artist gets shading and depth by drawing lines close together, or by cross-hatching (lines close together and running in two directions in a crisscross pattern), or by stippling (clusters of many dots). The same effects can be achieved more quickly. if not so beautifully, using transfer tones. These are patterns of tiny dots printed on plastic sheets which can be cut out and added to outline drawings. Transfer tones are particularly useful for distinguishing different areas in graphs and maps.



- *Continuous tone art* uses different shades of black and white, ranging from solid white, through progressively darker tones of grey, to solid black. It may be produced by water color or charcoal, pastel crayons, paints, or pencils. The shading is far subtler than in line art. Reproduction must be by halftone, however, and therefore involves more expense than line art.

- *Two or more colors* can be used in either line or continuous tone art. The extra color may be used to highlight part of the drawings: a line in a graph, an area in a map. a key area in an animal. Or it can be added simply for decoration, to attract readers. Extra colors cost extra money, however. The artwork is more complicated and each color involves extra printing.

- *Full color* paintings can give the artist the most freedom. They are often the most effective way to show the distinguishing characteristics of a species of plant or animal. Other times they are used for impact, to attract and impress readers. They are also the most expensive kind of illustration.

Purpose

Explain the purpose. Artists who know why an illustration is wanted work more intelligently and more creatively. A picture intended mainly to inform should be accurate and detailed. One that is intended mainly for decoration can be freer. An artist who does not know the purpose of an illustration may provide unwanted detail or omit something vital.

Readers

Describe the readers. The artist may have already had experience working with these readers and know what is most effective for them.

Reproduction

Explain how and where the illustration will be reproduced. Will it be printed by offset lithography? by letterpress? by electronic stencil or office photocopier? by silk screen? It makes a difference.

In offset lithography, for example, line art can be reproduced as cheaply as type. In letterpress, line art involves extra expense. Office duplicators and photocopiers may have difficulty reproducing solid blacks. The method of reproduction can influence the illustration in many ways. The illustrator may suggest ways to get the most effective illustration for the method of reproduction that is planned.

The artist should also have some idea where the illustration will be used. On a poster? On the cover of a publication? On the same pages as the text of a publication? On separate pages on a different kind of paper from the text? On white paper or colored paper? In reverse (that is, in white on black)? All these questions matter to the artist.

For example, a poster may carry more text than a cover. Illustrations on coated stock, separate from the text, can be finer than those printed on normal paper with the text. Illustrations on colored paper or in reverse may need thicker lines. An experienced artist will know how to compensate for these variations, so long as the information is provided beforehand.

Specifications

Give physical specifications for the artwork. Most important, tell the artist the size and shape that are needed. Should the picture be horizontal (wider than deep), square, or vertical (deeper than wide)? Perhaps the subject will determine shape, or it can be left to the artist to decide; but if it matters to the publication plan, then the artist must be told.

How wide will the picture be when it is printed? The full width of the type area? If the publication has more than one column of type, will the illustration be put in one column, or across two or more? Will it occupy a full page? The artist has to know, and must know what that means in centimeters, inches, or picas. Provide a sketch of the design for the publication or a sample page from a similar publication, with the dimensions marked.

Further instructions may include the following:

- size of artwork in relation to size of final publication. Artists are often asked to prepare artwork 1.5 times the size planned for publication. When the artwork is reduced, its lines will look sharper but there should be no loss of quality, and the extra size gives the artist extra freedom.
- quality of the illustration board, white paper, or tracing paper to be used.
- the appropriate size of technical pen for the planned reduction.
- the screens that will be accepted in transfer tone. In artwork drawn 1.5 times final size, screens of 10% to 50% are probably safest; in darker screens the space between dots may be filled in with ink.
- the style of letterform to be used in legends and other text. Sans serif, uppercase and lowercase, is a good standard, in 12 pt if the artwork is prepared 1.5 times final size. (The 12 pt type will reduce to 8 pt.)

One other instruction is usually worth repeating. That is: Keep artwork simple. Omit all unnecessary details. Let the main message stand out.

Schedule

Say when you need the illustration. Be firm about deadlines, whether you are dealing with the artist directly or through the author. Allow time for revisions.

Check results

If possible, check the artist's work at two stages: rough sketch and final artwork.

Rough sketch

Most artists begin with a rough sketch of what they plan to draw in pen and ink. Wise artists get approval of the concept at this stage. If their approach is unsuitable, they want to know before they spend a lot of time preparing final art.

This is the point to consider the content of the illustration. In particular, ask:

- Is the purpose being met?
- Is the drawing accurate in concept?
- Is its style appropriate to the subject and readers?
- Is its design pleasing and effective?
- Will it be understood easily by the intended readers?
- Does it require more information to be understood?
- Does it contain too much information? Should it be made into two or more illustrations?

If possible, test the sketch. Show it to someone typical of the intended readers and see whether the message is communicated clearly. This is particularly important in illustrating publications for non-specialists (see unit 5.1).

If an editor is working directly with the artist, rough sketches may be checked with the author, if that is convenient. Similarly, authors working directly with the artist should be encouraged to show rough sketches to the editor. Everyone benefits—and saves time—by sharing opinions at this stage.

Final artwork

Final artwork should be checked against the same questions asked about rough sketches. It should be examined carefully for accuracy of detail. In addition, technical questions should be considered. These should be asked of all artwork supplied by authors.

- Is this illustration mechanically satisfactory? Does it meet the physical specifications? Are the lines strong and sharp? Are there pencil marks or other unwanted marks that will show when it is printed? Is it the original artwork or a glossy photostat? (Office photocopies are rarely acceptable.)
- Has it been creased? Is it dirty? Are there marks from paper clips or from writing on the back?
- If it is reduced for publication, will it lose detail? Will the lines become too thin to print clearly? Will the space in the screens fill in with ink?
- Is the type large enough? Will words be easy to read when the illustration is reduced? Will the letters break down when they are reduced?
- Is the text consistent in style and spelling with the text of the publication?
- Are all the illustrations in this publication uniform in quality, style, and weight of line? (This is especially important if more than one artist is involved.)
- Have all the illustrations been planned for a standard reduction? Two graphs side by side, one reduced to 40% of the original and one reduced to 80%, may look very different.

Corrections

Final artwork sometimes needs minor alteration. Lines may need strengthening; a mistake may need to be erased or covered with opaque white fluid; a word may need changing or its spelling corrected; a punctuation mark may need to be inserted.

Unless you have a very sure eye and hand, never try to correct artwork yourself. Editors should leave corrections on illustrations to illustrators.

Never mark the illustrations to show where corrections should be made. Sketch the corrections on an overlay of tracing paper, taped to the back of the illustration and folded down over the face. This will give clear instructions to the illustrator without damaging the artwork. Or show the changes on a photocopy of the artwork.

Author's OK

Make sure the author approves the finished illustrations. It is cheaper to find out if there's anything wrong at this stage than in proof.

Captions

Illustrations usually need brief amounts of text to identify them and sometimes to explain points of special significance. These bits of text are usually set in type smaller than the main text and appear below the artwork.

In publications for specialists, illustrations are usually numbered (Fig. 1, Fig. 2, etc.) in the order in which they appear. Numbering starts with 1 at the beginning of each article, chapter, or other major section. Numbers are often omitted in more general publications.

In letterpress printing, halftones are often printed in a separate section on coated paper. These illustrations are commonly called Plates instead of Figures.

Captions for drawings may include the name of the artist. If the artist has copied previously published material, the caption should give credit to the original source.

Captions should be prepared in the same way as any other manuscript to be typeset — preferably typed, double-spaced, on letter-size paper. They should be sent to the typesetter with the rest of the manuscript. They should not be pasted to the artwork.

For general rules about writing captions, see unit 6.7. It deals specifically with captions for photographs, but much of the advice can apply to captions for drawings as well.

6.3
Editing graphs

Graphs are separate but support the author's text. They provide a great deal of information in compact form. In both respects they are similar to tables, although their purpose is different. Tables present numerical data for interpretation; graphs present visual data for direct and easy comparison. In one other respect the two are different. Tables can be edited rigorously because they arrive in manuscript, before typesetting. Graphs are more difficult to alter because they so often arrive as finished artwork, ready for reproduction. Yet graphs, like all other parts of a manuscript, deserve careful editing.

Here are some questions an editor might ask about any graph provided with a manuscript. Several of the questions are similar to those asked about tables (unit 4.5). As there, the standards suggested follow rules generally accepted in scientific publication. Several of the questions might be asked about any piece of artwork.

General

Is this the best way to present the data? Graphs are most suitable if the author wants to present data simply and clearly in order to

- show trends or relationships
- compare trends
- compare parts of a whole

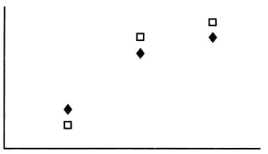
With graphs, the reader can see the message immediately by comparing one visual element with another. There is no need to read through columns of numbers.

Detailed information can be hard to extract accurately from a graph, however. When that is the purpose, tables are more effective.

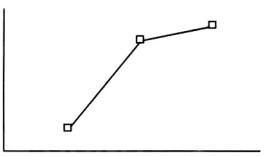
Sometimes a graph is intended to illustrate only one fact: an optimum value, for example, or a point at which yields reach a maximum. If that single fact is the only significant information, is a graph needed? Instead, perhaps the value could be reported in one sentence in the text. That saves space and time. Because it also eliminates unnecessary information (the shape of the curve, the axes, and other elements), the message is clearer.

If a graph is not the most effective or economical way to present data, editors should suggest an alternative. If a graph is unnecessary, it should be deleted.

Is this the best form of graph for the data? Different forms of graph serve different purposes. They should not be confused.

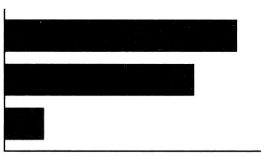


Scatter graphs show the distribution of one or more series of data over two variables. They cannot be used to show trends or make comparisons.

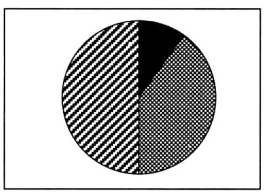


Line graphs are used to show trends over movement, often over time. They should not be used to compare relative size or quantity.

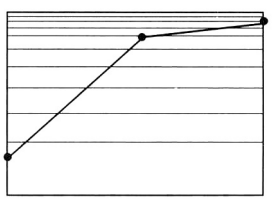
Column graphs can be used to compare the size or quantity of different items at one time, or to show differences in the size or quantity of the same item at different times. They should not be used to show trends.



Bar graphs can be used to compare the size or quantity of different items at one time. They should not be used to show trends or variations over time.



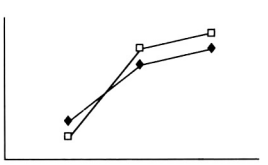
Pie charts can be used to show the relationships between parts of a whole. It is difficult to compare the parts accurately, however, unless the "pie" is labeled with percentages. It is even more difficult to compare the parts of two items by putting two pie charts side by side. For comparisons, column graphs are more effective.

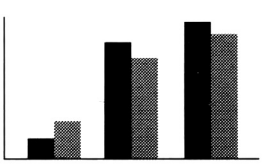


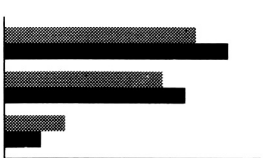
Semi-logarithmic graphs are useful when comparing change in two items that differ greatly in size or quantity. The horizontal axis has the normal arithmetic scale, showing absolute change; the vertical axis has a logarithmic scale, showing relative change. This is not the place to explain how logarithms work, and their use makes this the most difficult kind of graph for non-specialists to understand. Semi-log graphs show relative change. They should not be used to compare change in absolute amounts.

Variations are possible within some of these types in order to

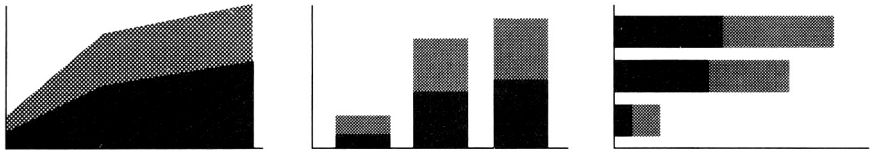
- *compare two or more series of data—by* drawing a curve for each series in a line graph; by showing a separate column or bar for each series at each point on the axis in column and bar graphs.



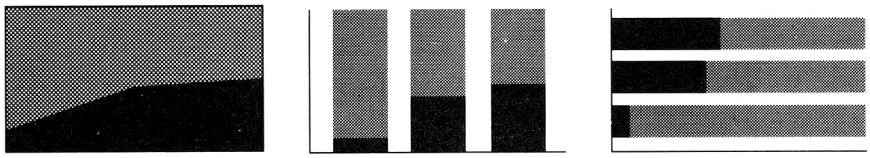




- *compare parts and the total of parts—by* adding the values of the parts, one above the next, so that the top line shows the total. This can be done for one item over time in line or column graphs, or for several items at one time in column or bar graphs.



- *compare parts as a percentage of the total—by* assigning a value of 100% to the full length of the vertical axis (in line or column graphs) or the horizontal axis (in bar graphs) and subdividing the space proportionately. This can be done for one item over time in line or column graphs, or for several items at one time in column or bar graphs.



Is the graph complete in itself? Could it stand alone—for example, if it were reprinted in another publication? The reader should be able to find all necessary information in the graph, without referring to the accompanying text.

How does the graph relate to the rest of the manuscript? Graphs take time to draw, and space to print. They should not be published unless they contribute to the manuscript as a whole.

Does the graph support the subject of the manuscript? Is its information truly relevant and significant?

Is its information consistent with information in the text, in tables, and in other graphs? Are the units of measurement the same? Do the data agree? Are spellings and capitalization the same?

Does the graph contain data also in the text? or in a table? If so, should the text be edited to remove duplication? Should either the table or the graph be edited or omitted?

Is its appearance consistent with other graphs in the manuscript? Are the designs similar? Are the lines the same weight? Will they look consistent if reduced to the same size? Lines get thinner and lettering shrinks the more artwork is reduced.

Is there a reference to the graph in the text? Each graph should be mentioned in the text. If there is no reference, it may be an oversight; it may also suggest the graph is unnecessary.

Reference should be by number. at least in scientific publications. This may seem too formal in publications for non-specialists. Whether using numbers or not, avoid referring to "the figure above" or "the graph on this page." It may be impossible for the printer to place the graph in those exact places; then the reference will have to be corrected in proof.

Title and labels

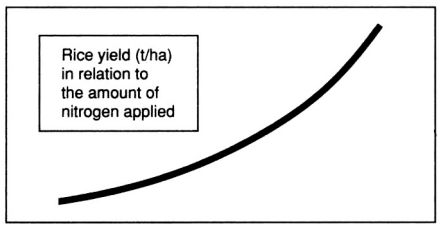
Is the graph numbered? Graphs are normally numbered with all other illustrations (line and halftone) in a series called Figures. Illustrations should be numbered in the order in which they appear; this is normally the order in which they are mentioned (or first mentioned) in the text. Each should have its own number: Fig. 1, Fig. 2, Fig. 3, etc., not Fig. la, Fig. lb, Fig. 1c.

Numbering should start at 1 at the beginning of each chapter, article, or other major unit.

Is the title satisfactory? In most publications, titles of graphs are set in type below the artwork. Titles are usually purely descriptive. They do not give background information or describe results. They may not have a verb. For example:

Figure 2. Changes in rural retail prices for selected commodities in East Java, May 1983–May 1985

Fig. 3. Maize response to phosphorus application at different levels of residual phosphorus on the Tropeptic Eutrustox at Mauna Loa, Hawaii; Autumn 1981



In publications for non-specialists, a short title may appear within the body of the graph. In such cases, the title acts as a heading, attracting attention. Titles also are placed in the body of graphs used for slide and other non-print media.

In either position, does the title identify the graph accurately? Is it clear what is being measured?

Are any abbreviations or symbols used in the graph explained? If it is not evident in the graph itself. does the title say when and where measurements were made?

Does the title contain unnecessary words? Is it consistent in style and form with titles of other graphs in the manuscript?

The title and any other information to be set in type should be prepared like normal manuscript—preferably typed, double-spaced, on letter - size paper. It should go to the typesetter with the rest of the manuscript. It should not be pasted to the artwork.

Are the axes clearly labeled? Has the author identified exactly what is being measured along each axis? Are units of measurement identified?

Has the author followed standard practice in assigning axes? Independent variables, such as time or income, are usually measured along the horizontal axis. Dependent variables, which are affected by changes in the other variable, are usually shown along the vertical axis. Readers will be confused if time, for example, is suddenly measured vertically.

Data

Is there too much information in the graph? Can readers see relationships quickly? Is there so much information that readers are likely to be confused? Can any details be omitted?

Would the graph be clearer if the information were divided into two parallel graphs that could be published side by side or one above the other? Would trends then stand out more clearly?

As a general rule, line graphs should be limited to four or five curves. Column graphs should be limited to three or four series of data, that is, no more than three or four columns in a group. Beyond that, readers will have great difficulty sorting out lines and making comparisons.

Has the graph been reduced to essentials? A good graph has been described as one that gives the greatest number of ideas in the shortest time with the least ink in the smallest space. (Edward R. Tufte. The Visual Display of Quantitative Information. Cheshire, Connecticut: Graphics Press, 1983)

Are there unnecessary lines enclosing the graph in a rectangle? The only necessary boundaries are the axes.

Do grid lines run across the body of the graph? Grid lines are usually needed only when accurate measurements must be made. Normally grids can be shown by tick marks along the axes.

Have figures along the axes been simplified? In a time scale, have months and years been abbreviated (not “January February March” but “J F M”; not “1985 1986 1987” but “85 86 87”)? Have large quantities been abbreviated to reduce the number of zeros (not “Persons: 50,000 60,000 70,000” but “Thousands of persons: 50 60 70”)?

Can the amount of information along the axes be reduced? It is usually enough to report quantities at every second or fourth grid mark.

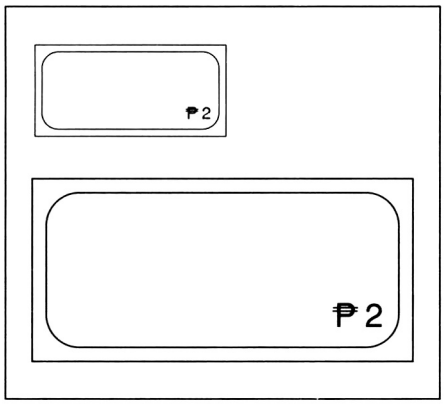
Are labels needed within the graph to identify curves and columns? Can symbols or tones be used to distinguish data series instead? If labels are needed, are they as short and inconspicuous as possible?

Anything that detracts from the basic information in a graph—the curves, columns, or other visual data—weakens the impact and may interfere with the message.

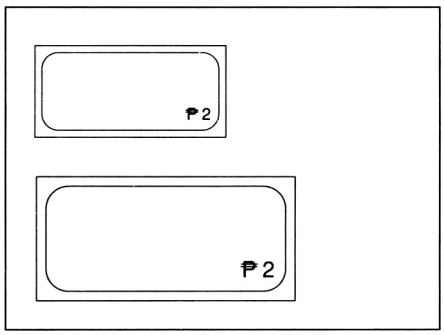
Does the graph distort the data? Are data points along the axes spaced appropriately and uniformly? The spacing can emphasize or minimize rates of change. Closely spaced grid lines increase the slope of a curve; widely spaced ones flatten it. In a series of graphs, grid proportions should be uniform.

Does the vertical scale start at zero? If it does not, changes at the higher values may appear out of context.

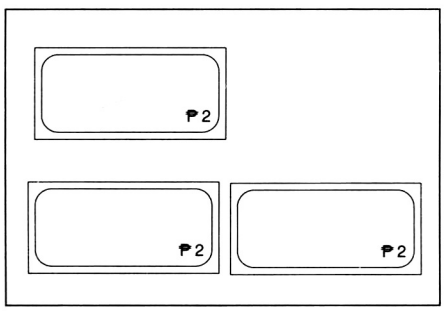
Does the graph use pictorial symbols instead of lines or other geometric forms? This kind of graph is attractive but can easily be misleading.



For example, an artist may be asked to draw a graph illustrating the fact that, in one country, farm income doubled in the last 10 years. He draws pictures of two banknotes in the country's currency to represent the difference in incomes. The first is 2.5 cm wide, the other is twice that, 5 cm wide. But because we see the whole bill rather than just one dimension, the second bill looks four times as big as the first. In seeking a dramatic visual effect, the artist has distorted the data.



In a second attempt, the artist again draws two banknotes. This time, instead of doubling one dimension, he draws the second backnote exactly twice the area of the first. The graph is accurate, but difficult to read. People have trouble comparing areas. Few would immediately recognize the relationship of 1:2 between the notes.



On the third attempt, the artist finds a simple and accurate solution. He draws one banknote, and beside it two banknotes exactly the same size as the first. This time no one can mistake the meaning.

If pictorial symbols are used, they should all be the same size. They should be easy to identify. and closely associated with the subject of the graph. They should be simple so that they can be reduced for printing. If two or more symbols are used in one graph, they should be so different in shape that they cannot be confused even when reduced.

Has the author provided any necessary credit? A graph that is copied from another source may be in copyright. In that case, the author must seek permission to reproduce it and acknowledge the original source as well as the fact that permission has been granted.

If a graph has been prepared from previously published data, or from data collected by another researcher, that source should be given.

In either case, this information can be added to the title. If the source is not reported fully there, is it cited in full in the references at the end of the article?

Presentation

Do the relative weights of lines suggest the importance of the information they communicate? The most important lines should be the heaviest or thickest, the least important lines the lightest or thinnest. In order of importance (and therefore in order of weight), the parts of a line graph normally are

- curves and data points
- labels identifying the axes
- numbers at intervals on the axes and any words identifying the curves
- axis lines and the grid ticks on the axis lines (many people suggest these should be half the thickness of the curves)
- lines showing means of a number of observations

This same order of importance can be applied to other styles of graph.

Do the axes meet standard specificications? How long are they? Axes should stretch to the last data point in either dimension, or to one interval beyond that point. Longer axes waste space. Shorter axes leave the data without a reference point.

Are the interval points accurately and evenly spaced? Are they so close together that they crowd the data?

Are there too many interval points for easy reading? Are too many of them numbered for quick reading? Data points should be reasonably spaced. Not all need to cany numbers, so long as it is possible to identify each one easily.

Are the interval numbers outside the graph, where they will not conflict with the data?

Is the baseline set at zero? This is not necessary in graphs based on an index or in semi-logarithmic graphs. Most graphs, however, should start at zero to provide accurate and complete data.

Has the axis been broken to show a break in the grid? This can be done if a large part of the graph is unused. For example, if the lowest value is 100 and the highest 200, the grid and axis might be broken between 5 and 95.

Are the data consistent and accurate? Are curves all the same thickness? Are columns or bars all the same width? If they are not all the same, do the differences emphasize the proper data? (That is, if one curve looks heavier than the others, is it truly the most important?) Are any data given undue emphasis?

If data points are needed in a line graph, are all present?

Is the information accurate? Editors cannot check for total accuracy in graphs, because they don't have full data. But they can compare graphs with any data reported in the text. Sometimes an artist makes an error and the author misses it.

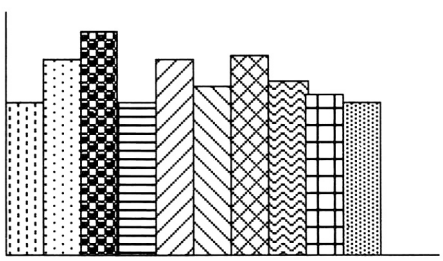
Is it easy to recognize different series of data? In scatter graphs, is a different symbol used for each series of data? Can the differences be seen easily? Will they be easy to see if the graph is reduced?

In line graphs with more than one curve. can each curve be recognized easily? Is each curve significantly different from all others?

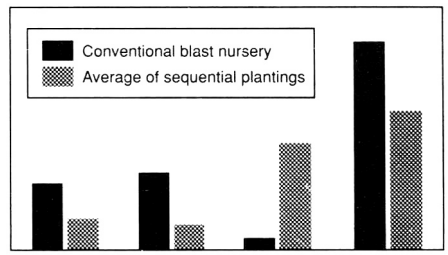
Curves can be made distinctive by assigning different symbols to each curve at the data points. If this technique is followed, will the chosen symbols stand out clearly from the line. even when the graph is reduced? The symbols X and * do not reproduce well. Other symbols to use are

Another solution is to use different kinds of lines. One curve might be solid, another made of dashes, a third formed of dots, a fourth drawn with a dot-pattern tone. This method does not work well if the curves cross. Be especially careful in reducing graphs drawn in this way: tones can fill in, and dashes and dots can come to look almost the same.

In column and bar graphs and pie charts, each series can be assigned a different pattern. The neatest method is to use transfer tones in different screens. (Transfer tones are patterns of tiny dots printed on clear plastic sheets, which can be cut and stuck onto graphs.)



It is easier to apply tones to a bar or pie chart than to draw patterns by hand. Tones are also easier to read. Hand-drawn patterns of lines running in different directions can cause optical illusions: horizontal lines make a column look wider than it is, vertical lines make it look taller, and diagonal lines fight one another. Patterns made up of little circles or crosses scattered within a column are distracting.



If tones are used, is there enough difference between them for a reader to distinguish one from the other easily? It is hard to distinguish between 50% and 60% screens. The difference between tones should be at least 20%, and preferably greater if they must be identified from a key. In other words, a graph might have columns with 10%, 30%, 50%. and 70% screens; for even easier recognition the screens might be 10% (nearly white), 40%, 70%, and 100% (solid black). Tones that are close to another in appearance should be separated by areas with tones with greater contrast.

Once again: What will happen to the tones when the graph is reduced for printing? Will the difference between screens still be evident? Will the space between dots fill in with ink?

The most effective way to distinguish between series is by using different colors. Unfortunately, budgets rarely permit this solution.

Are data series clearly identified? The series must not only be easy to distinguish from one another. The reader must also know what they refer to.

This can be done by a short label close to the curve. Such labels should be horizontal for easy reading. They should not follow the slope of the curve.

It is often neater to use a key: an enclosed area within the axes containing the symbols or patterns used to identify data series along with a short description of each. The descriptions must be short, only one word or, at most, a few. Longer explanations of symbols or patterns can be set in type in a legend, following the title.

Is the lettering satisfactory? Is the text in a readable type face? Sans serif faces are desirable because they are clean, neat, and can be reduced without losing clarity. In other faces, series and thin strokes can be lost if the graph is reduced.

Condensed typefaces should be avoided. They may fill in if the graph is reduced.

Is lettering in uppercase and lowercase'? Words entirely in capitals are more difficult to read.

Hand lettering is difficult to do well. Typeset letters or transfer letters are usually neater and easier to read.

6.4 Editing maps

Maps present special problems because they contain so much information - not only graphic but textual material, not just lines and shades, but words and often data.

When possible, editors and authors should discuss maps before they are drawn. That can prevent problems later. Here are questions to ask in planning maps. Some of them (the first three and the last) should be asked as well about any map submitted with a manuscript.

Judging needs

Is a map necessary? Does this map provide essential information? Does it make information in the text easier to understand? Does it show a pattern of distribution or behavior that is not obvious from the text or tables? Or is it mostly decoration? If so, is it worth the cost?

An editor should ask these questions of any illustration, but especially about maps. They are expensive to make. They can take a great deal of space in a publication. They offer many chances for error.

Sometimes an editor may feel that a map is needed when the author has not planned one. In that case the editor should ask the author to prepare the map. If the map is really important, the editor may have to arrange to have it drawn.

How much information is needed in the map? Keep maps simple. Few people know how to read a complicated map. Too much information confuses them. Also, complex maps are more expensive to make.

Sometimes it is better to have two maps instead of one that crowds too much information into one space.

What kind of map is needed? There are two kinds of maps.

Reference maps show where a place is located. They answer questions like: “Where is Bogor?” “How can I get from Bogor to Jakarta?”

Thematic maps are more like graphs imposed on geography. They show relationships that are more than location. Thematic maps may show patterns of rainfall in Nigeria, population densities in Asia, the areas

where rice is grown in the world, the incidence of a disease like malaria. the distribution of a particular species of fish or weed.

A thematic map rarely can contain reference material, except for a few place names to help the reader locate areas. A reference map can contain little thematic material. The purpose must be clearly defined.

Preparing the map

Is there an existing map that can be used? Base maps, showing the outline of a country or region, are sometimes available. They save time and effort. New data can simply be added.

It is usually difficult to use any other kind of existing map directly. A map made for one purpose will rarely be suitable for another purpose. It will either show too much detail or leave something important out.

Existing maps are needed to help draw new maps. Don't ignore them. But use them with caution.

Who will draw the map? Drawing maps is a special skill. A map drawn by an amateur looks like an amateur effort.

Very few authors or editors can draw maps suitable for publication. Even an illustrator who is an expert in drawing graphs or other artwork may not know the specialized skills of map-making.

An expert in drawing maps is a cartographer.

Authors should be asked to supply maps drawn by a professional: preferably a cartographer, otherwise a good illustrator. If they cannot, then the editor must work with a cartographer if one is available, or with an illustrator.

What do we need from the author? Ask the author for the following:

- A good existing map of the area for the illustrator to use for reference, or information about where the illustrator can find such a map.
- A sketch map, traced from an existing map, carefully locating every feature that is to appear on the final map.
- A typed list of all the words that are to appear on the map. These should be organized by type of features and divided by order of importance. This list should include, as appropriate,

  names of places
  names of rivers, lakes, and other geographical units, including roads and railroads
  latitude and longitude numbers
  full text of the explanatory legend and any other words needed to explain symbols or tones

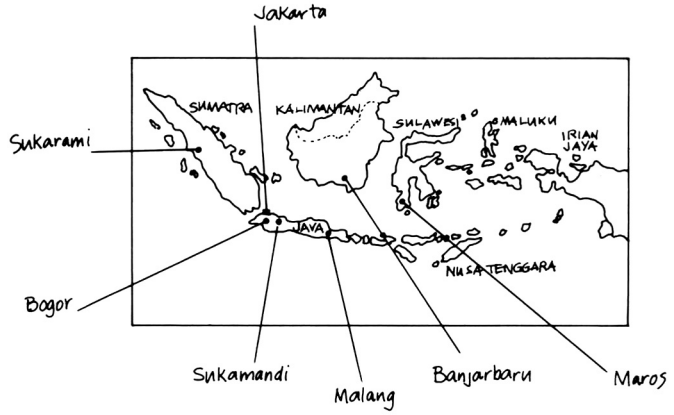


Figure 1. Indonesia: sites of research institutes coordinated by the Central Research Institute for Food Crops

1st size type:	SUMATRA	2nd size type	Sukarami
	KALIMANTAN		Bogor
	JAVA		Jakarta
	SULAWESI		Sukamandi
	MALUKU		Malang
	IRIAN JAYA		Banjarbaru
	NUSA TENGGARA		Maros

A map of the Indonesian Archipelago with a typed list of features. From Onno Brouwer. The cartographer's role and requirements. Scholarly Publishing 14:3

What does the illustrator need? Provide the illustrator with the following:

- All maps provided by the author.
- Fully edited material for the map. The editor must check what the author provides to make sure that it is complete, clear, and consistent with the text of the article in content and style.
- Details about the final size planned for the map and how it will be printed.
- A detailed sheet of specifications, as for any other kind of artwork. This will ensure that the map meets the publisher's standards. You may wish to specify typeset or transfer lettering, which is usually neater than hand lettering. If you are not working directly with the illustrator, ask the author to pass on this information.
- A schedule for finishing the map.
- A budget for finishing the map.

Things to watch

Is the final map acceptable for publication? The following are questions, that should be asked of any map, whether or not the editor has been previously involved in its planning.

- Is it the right size for the page and for the information it must contain?
- Are the lines even and sharp? Do their widths indicate which features are most important? Do the lines fight with the words?
- Is the lettering easy to read and neat? Do the size and weight of the lettering agree with the importance and nature of the features being identified? The most important features should have the most visible type. Bodies of water are normally identified in italic.
- Have tones been used appropriately to distinguish one area from another? Is it easy to distinguish between tones? Tones that are too similar (separated only by 10%) are hard to tell apart, especially if the map is reduced. (Tones are better than lines to distinguish different areas. Lines running at different angles can fight against each other. Tones are also better than fancy drawings like little trees to suggest a forest or clumps of grass to suggest swamp.)
- Is the map as easy to read as the text?
- Is the map consistent with the text? Are place names spelled the same way in both places?
- Is the information in the map what is promised in the title? If not, should the title be revised?
- Does the map provide information to set it in context? If needed, does it have latitude or longitude marked? Or geographic directions (at least north)? Or a scale?
- Are the symbols in the legend and on the map clear in meaning? Are different symbols or colors so similar in appearance that it is hard to distinguish between them?
- Does the map have a pleasing artistic balance in itself and between its elements: lines, text, tones, colors, and so on?
- Has credit been given to the source of data? A map may be based on one that has been previously published. So long as it is completely redrawn, there should normally be no need to request permission to use the data, but full credit should be given to the author and original publication. If it is a new map but the data come from other publications, they should be credited.
- Are there political or other questions to consider? If two countries disagree over territory, political boundaries can present problems, especially for publications that will be distributed internationally. Books have been barred from some countries because they showed a boundary claimed by the other side in a dispute. Place names can also be sensitive if there is disagreement over what should be used; sometimes the most practical solution is to omit place names. Editors must decide how to handle such questions. Sometimes it may require a policy decision within the institution.

6.5
Choosing photographs

Artwork takes time and effort of technically skilled artists. Good photographs also take effort and skill, but less time. As a result, editors can ask authors and photographers for more than one picture of any subject. That way, the editor can choose the best to publish. Frequently the editor's choice will be the same as the author's or photographer's, but editors do have two advantages. They bring fresh eyes to the selection, and they know the overall needs and plans of the publication.

Explain in advance

The first step in choosing photographs should occur before any pictures are taken. It is explaining exactly what is wanted.

Tell the photographer why the pictures are being taken, how they will be used, what kind of readers they are intended for, when they are needed, and exactly what they should show. Be as specific as possible. The more exact you are, the more likely you are to get what you want. But listen, too: good photographers have good ideas of their own.

If possible, go with the photographer. Help to arrange pictures. Suggest further photos; because of your knowledge of the subject, you may spot possibilities the photographer would miss. Watch for distracting details the photographer may miss while concentrating on focus and exposure. Too often editors just say, "Go get some pictures of. . . "; then they are disappointed at what the photographer, who has worked without instruction or information, brings back.

When authors take the photographs, talk to them in advance if you can. Explain the qualities of a good photograph and explain what you would be interested in publishing in addition to what they already plan. If it is common at your workplace for authors to take photographs for publication, consider holding a seminar on the subject, using the material in this module.

Choosing photos

Of course, it is not always possible to speak to the photographer or author in advance, especially if the subject is distant. As a result, editors are often given one photograph and told it is the only one available. Then they must decide whether or not it is good enough to use. Sometimes it may have to be used, whatever its defects; even then, the editor may have ideas on how it can be used best. Photos can often be improved by visual editing, called *cropping*.

Other times, the author may supply far more photos than can be used. In that case, the editor must certainly choose among them.

In selecting photographs, editors should look at three things:

- technical quality
- message
- composition

Technical quality

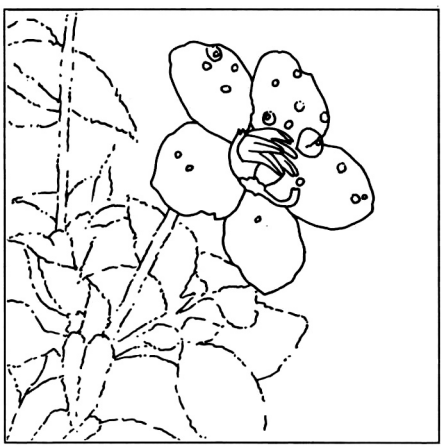
Technical quality is fairly straightforward to judge. Modern cameras take much of the guesswork out of taking photographs; as a result, exposure and focus will usually be correct. Even so, mistakes can occur, or photographers may not consider all the questions a careful editor will ask.

Exposure

Was the photo correctly exposed? Is the photograph so light that details are lost? Is it so dark that they cannot be seen? To some extent, errors of exposure can be corrected in the darkroom. If a negative is available, ask what can be done to get a better print.

Focus

Is the picture in focus? The image should be sharp and clear. Normally there should be no fuzzy lines or areas.



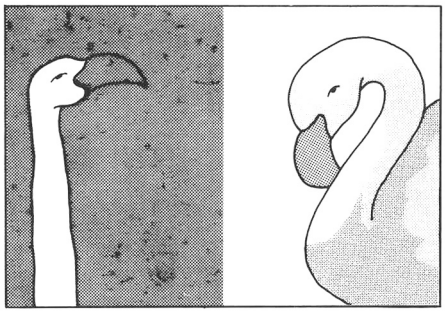
Sometimes it may be technically impossible to have the entire picture in focus. This is most likely to happen with very small subjects or in poor light. In that case, the question may be asked: *Are all the important parts of the photograph in focus?* In a picture of a flower, for example, the author may want to show the sexual organs; then these must be in sharp focus, but it does not matter if the leaves behind them are fuzzy.

A photographer may deliberately use focus to emphasize one part of a picture. In the previous example, it is good that the leaves are out of focus. That way the reader's eye is directed to the part that is sharp, the important subject. There is no distraction from non-essential background detail.

Clarity

Are the important details clear? Even if the picture is in sharp focus, important details can be lost. If the photo is of people who must be recognized, are their faces visible? Are they large enough to be recognized? If the photo is of a piece of machinery, are the most important parts prominent? If it is of disease on a leaf, can the disease symptoms be seen clearly? Sometimes the most important part of a picture is too small to be seen easily. Sometimes the most important part does not stand out from the rest. Sometimes, if the picture was taken in bright sunlight, shadows cover the important details and make them black.

Contrast

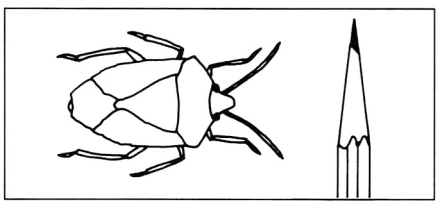


Is there enough contrast between subject and background? A dark subject photographed against a dark background is difficult to see. Similarly, a light subject against a light background does not stand out. There must be enough contrast between the two.

Tones

Is there a range of tones? A good photograph in black and white ranges from dark to light. through many levels of gray. It is not all one tone or two. Details are clear in both shadows and bright areas.

Scale



Has the photographer indicated scale? In many pictures, it is impossible to guess how large an object is without help. In scientific photographs, size is often indicated by including a meter stick or centimeter rule. There are other ways of suggesting size. In photos of small objects, a common coin or a pencil tip may be used. In larger objects, a person or an easily recognized object may be included.

Physical standards

Is the photograph physically acceptable? If it is a print, is it suitable in size—usually between 90 × 125 mm (3.5 × 5 in.) and 200 × 250 mm (8 × 10 in.)? Smaller photographs may be lost, or they may not reproduce well if they have to be enlarged. Larger ones can be awkward to handle.

What is the surface like? For the best reproduction, prints should be glossy or near glossy. Dull finishes and textured ("silk") finishes do not reproduce as well. Ask authors to provide the best possible prints if quality of reproduction is essential.

Is the print in good condition? Is it clean? Are there creases or fold marks? Are there any pencil or pen marks on the image? Has anyone written on the back with a sharp pencil or ballpoint pen? Anything that harms the quality of the photo will likely show up when it is reproduced.

Is the print black and white or color? If a photo is going to be printed in black and white, it will look best if the original print was black and white. It is possible to reproduce in black and white from color prints, but the quality is rarely as good. Editors should consider whether contrast between colors will stand out in black and white. This is difficult to judge except by experience. It is necessary to remember, for example, that a bright red may turn out as dark gray, almost black, and a light blue will appear as light gray, almost white. A mid-blue image on a mid-gray background, for example, will stand out in a color print, but may disappear almost entirely in black and white because there will be so little contrast in tones.

If the photo is going to be reproduced in color, a transparency usually gives better results than a print. Transparencies, like prints, should be clean and unmarked.

Message

A picture should have a message. It should provide important information, or tell a story, or create emotion and response, or attract readers. The best photos do at least three of these, and sometimes all four. If a photo does none of them. perhaps it shouldn't be used.

Even before considering technical details. therefore, editors should ask whether the photograph is necessary. just as with any other kind of illustration. Should it be dropped? Would the message be clearer if the photo were used as the basis for a drawing? If the purpose is to attract, could that be done more effectively with a drawing?

Editors should be able to judge the message of a photograph. Here are some questions to ask in this connection.

Recognition

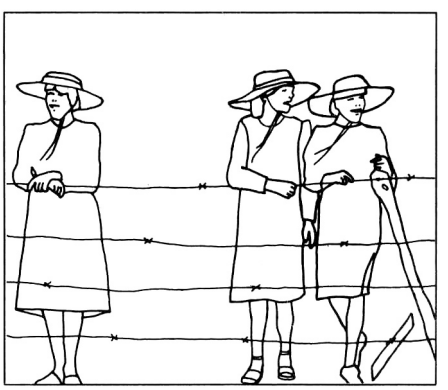
Is the message easy to understand? Are the subjects easy to recognize? In publications for specialists, photographs may need a long caption to explain the details to be found in them; even so, the subject should be quickly recognizable. In publications for non-specialists, photographs usually should need few words. People may need to be identified by name, or specific processes may need to be explained; but the fewer the words that are needed, the greater the impact of the photo itself. Sometimes a photo can stand without words.

Unity

Is there more than one message? A photograph, like any communication, should have only one principal message, and only enough content to communicate that message. A second message, or too much content, confuses readers. A good photograph concentrates on what is essential, and omits anything unrelated to the main message.

For example, a close-up photo taken in the field may show two insects. One is the subject of the communication. The other is unrelated and just happened to be there. Which should the reader focus on? Can one be cropped out?

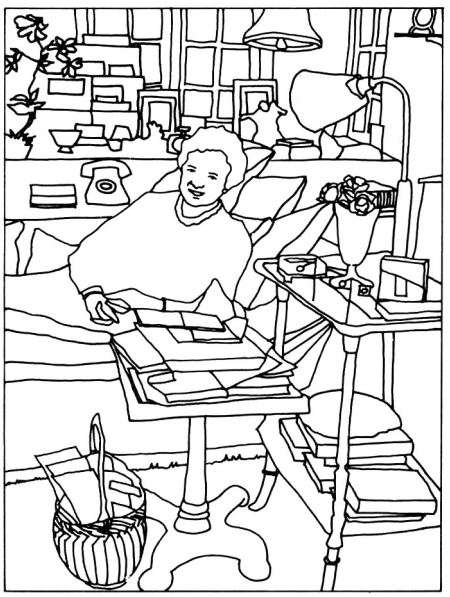
That is a simple example. Here are others. A picture shows three people. Two are looking in one direction; one is looking somewhere else. What does the picture say? A picture of a crowded market seems to be concentrating on a merchant selling herbal remedies. But half the people in the photo are looking in the other direction. What at? Where is the reader's eye to turn? A poor artisan is photographed wearing what seems to be expensive jewelry. Does this mean the artisan is not poor? Or that the jewels are not precious? Details can send messages that compete with the main one.



Details

Do details support the message? Sometimes details can make a picture come to life. The director of a research institute might have a sign on his desk saying "Think!" If that can be included in a portrait, it will tell much about the director.

Distractions



Do details interfere with the message? There can be too many details in a photograph, in particular, in the background. A field photo of a plant may have someone's feet behind the plant, or part of the truck that carried the photographer to the spot, or a mess of old leaves or stones around the plant. A picture inside a room may be filled with clutter, or may be taken in front of a curtain with a large pattern that draws attention away from the people who are the subject. A picture of a doctor vaccinating a child at a community health center may have two or three people in the background making faces at the camera. A small tree directly behind the subject may seem to be growing out of his head. Details like that may be difficult to spot while the picture is being taken; they stand out when the print is made and distract viewers from the principal message. When possible, they should be cropped out — or another photo used.

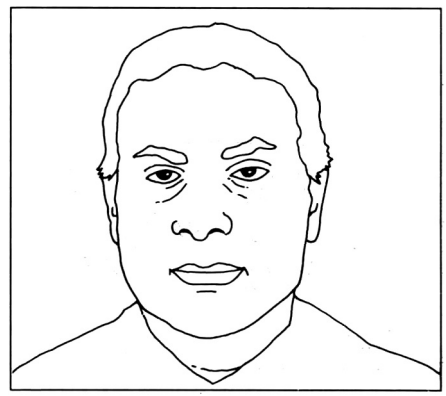
Relationships

How does this photo relate to other photos in the same publication or article? If two or more photos are closely related, they should be as similar as possible in lighting, background, and approach to the subject. Pictures before and after treatment are an example: they will contrast in appearance but should show the same subject under closely similar conditions. All pictures accompanying any single piece of text should present the same message as the text itself and thus should complement one another. They should not be in conflict.

Interest

Is this photograph different from other photographs of the same kind? It may be difficult to answer this question with a "yes." Photomicrographs of viruses look pretty much the same; so do identification photos of flies, leaves, or hand pumps. Too much imagination in the photography can make it difficult to compare individual items.

On the other hand, photographs of some microorganisms can be arresting in their drama, and identification photographs of birds can be works of art. There is no reason why photographs of people for publication should look like passport or police photos, with mouths grim and eyes staring straight ahead into the camera.



Some kinds of photographs appear so frequently in newsletters and other institutional publications that readers scarcely look at them. One of these is an audience staring thoughtfully at the front of the room, presumably at a speaker. Audiences all look much the same: the same photo, at least in theory, could be used to illustrate every conference held. Facing that photo, too often, is one of a speaker at a microphone. Again, the pose is the same as many others: the microphone might be the same, only the face changes and that is sometimes hidden by the microphone. A third all-too-common photo shows a group of 25 or more people attending a conference, standing or sitting in straight rows looking at the camera: again, the faces are so small that the people are scarcely recognizable.

Photos such as these are impersonal. They carry little information except that a conference was held. Nor do they attract many readers or create emotion, except perhaps of boredom.

With a little effort, photographers can find more interesting ways to report that a conference was held. They may single out a few of the participants and pose them with the principal speaker. If there are only four or five people in the picture, their faces and expressions can be seen: they become flesh-and-blood individuals. If they are important people, or come from great distances, or are in some other way unusual, the picture is improved. Preferably they are not just standing around. They are doing something: talking with animation, gathering around a microscope, looking at a farm animal, studying a specimen. That adds action and some information about what the conference was about.

Readers look at pictures that show *people* large enough to be seen as individuals with expressions. They would rather see a director sitting at a desk, smiling up at the photographer, than a sour-faced passport photo of the same person.

Readers look at pictures that have *strong messages.* Such pictures usually show action: a farmer reaping a bumper crop, a doctor examining a child suffering from dysentery, or a poor worker practicing a new skill. Or they show feeling: pleasure, anger, frustration, sorrow, triumph, or any other emotion in a person's face or body.

Readers look at photographs that are *different.* An unusual picture may come from an unusual camera angle—low down or high up—or unusual lighting. It may show something totally unexpected: split-second timing that catches an animal just as it captures its prey, or the face of an insect larva filling a whole page through the magic of the electron microscope, or a subject of special beauty or tragedy. Often such photographs are unplanned: they were taken at just the right instant by an alert photographer. These are the photographs that delight editors and give a publication life.

Composition

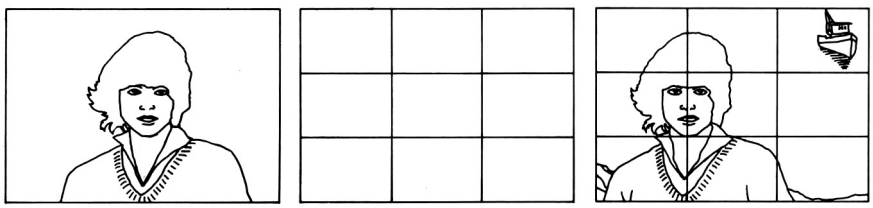
The composition of a photograph is the way the objects or people in the picture have been arranged. This is very much like the arrangement of notes in a piece of music, which may or may not be pleasing. In large part it is a matter of individual taste and judgment, but some guidelines do exist.

Center of interest

Does the photograph have a strong, single center of interest? The reader's eye should go directly to one point in the picture, and that should be the most important part of the message. If there is no central point, the eye may wander until the reader gives up. The message may be missed. If the editor has trouble finding a single spot of interest, it's reasonable to guess that readers will have the same problem.

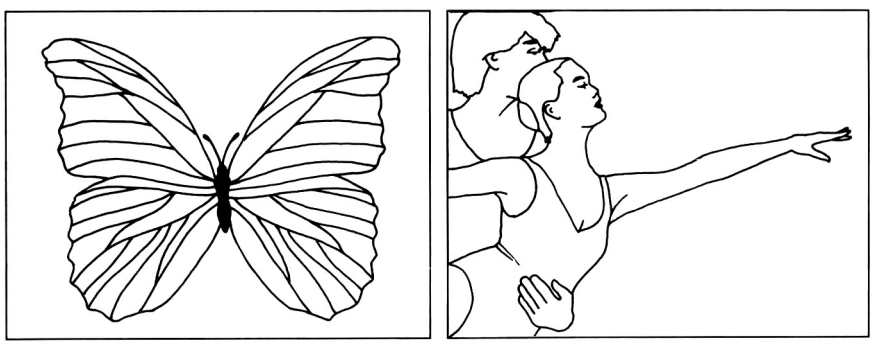
Rule of thirds

Where is the point of interest? Centered or off-center? The center of the photograph seems the obvious place to put the subject. Often that is true, especially if the subject is a single object which is not alive. But a more dynamic, and therefore usually more interesting, composition can be obtained if the center of interest is slightly off-center. One way to do this is to imagine the photograph divided into thirds horizontally and vertically. The four points where the lines cross are strong places to locate the center of interest. Horizon lines are usually most pleasing when they are along one of the two horizontal lines. If the photographer has not done so, editors can often alter the shape of the picture to follow this "rule of thirds."

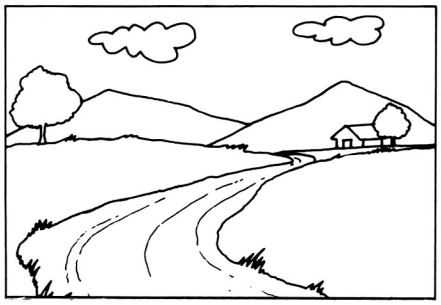


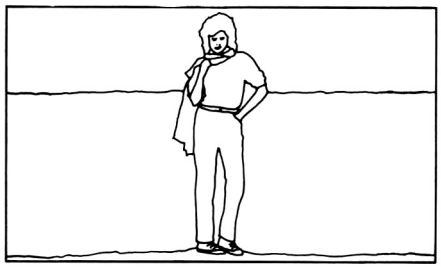
Balance

Is the picture balanced? One side of the picture should not feel heavier than the other, nor should a photograph be top-heavy. In either case, the reader may feel the picture is going to fall over. Balance can be symmetrical like the butterfly or nonsymmetrical, like the dancers, but it should be present. If there is action, it should move into the picture, not out of it.

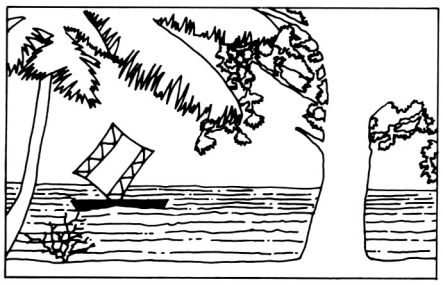


Impact





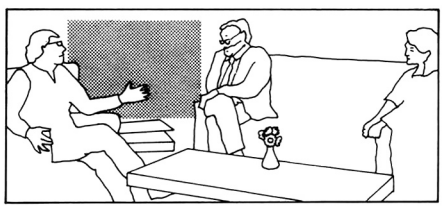
Has the photographer achieved a composition that is both simple and strong? There are many ways to do this. One is to make the principal subject fill most of the available area. Another is to use strong lines—diagonals, triangles, circles, and S-curves—as part of the composition. The lines may be in the architecture of buildings, the shape of a river, the posture of a person.

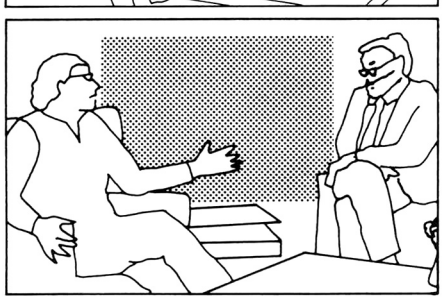


Depth can be created in a picture by including a bit of foreground. In a landscape, for example, this may be an overhanging branch which acts as a frame for the top of the photo.

Editors cannot add such techniques to pictures, but they should recognize them. It could be a mistake, for example to edit out a "framing" branch to save space because doing so would reduce the impact of the published photo.

Use of space





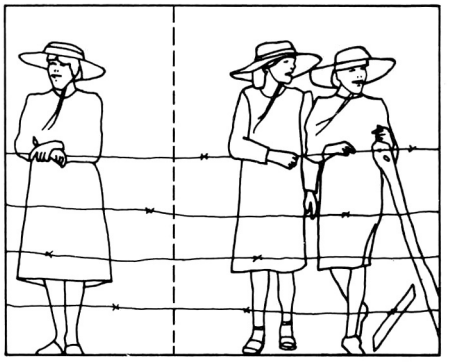
Is there empty space in the photo? The shape of the picture should fit the shape of the subject. A photo of a person standing upright in a field should be vertical (deeper than it is wide); otherwise, there will be waste space on the sides. A photo of a person plowing with a team of oxen should be horizontal (wider than deep); otherwise, there will be waste space at the top and bottom. Just as every word in a text should work, every square centimeter of a photograph should also work. Empty space is waste space: it contains no information.

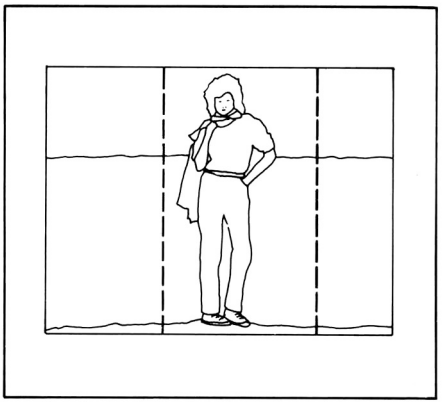
Any space between people or objects seems to grow once it is photographed. As an example, imagine two people talking. They think they are close together. So does a viewer, who sees the whole room in which they are standing: the space between them is small in comparison to the area viewed. Now take a photograph of them. The photographer has done well and got up close. The two people fill the sides of the picture; but the space between them fills the center. It has grown into a large part of the area the reader is viewing. This is a common problem, whether the people are standing, or sitting, or shaking hands, or if one is giving an award or diploma to the other. Experienced photographers know they have to cheat and urge people to pose far closer together than is normal. That way the space looks reasonable.

Cropping

Often an editor can improve a photograph by using only part of it. This is called cropping. It can

- remove unnecessary or distracting details.
- remove wasted empty space.
- give extra emphasis to what is most important by concentrating attention on that part of the picture.
- improve composition, perhaps by imposing the rule of thirds.
- correct a "crooked" picture so as to make vertical elements vertical and the horizon horizontal.
- make a picture fit in a space dictated by the publication's design.

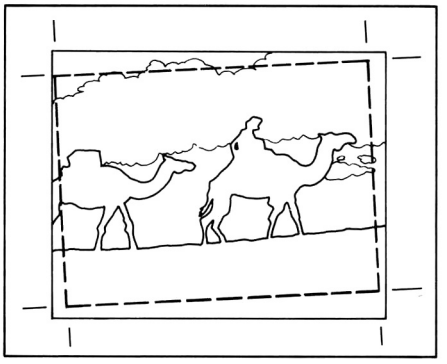


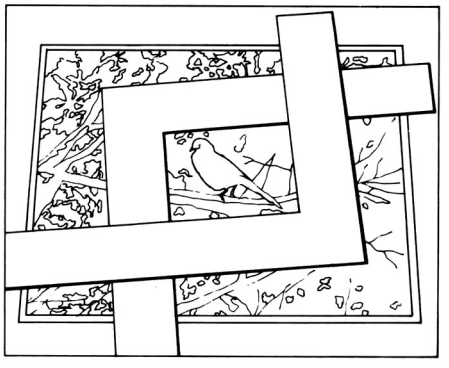


It is easy to see how a picture will look when it is cropped. Just make two L-shaped pieces of cardboard, with each arm a little longer than any photograph you will be working with. Lay them down over the photo to make a rectangle. Slide the L-shaped pieces up and down and sideways until you have found the best way to crop the picture. Get rid of unnecessary details. Get the most impact.

Also try to obtain a pleasing shape. Square pictures are not usually as attractive as rectangular ones. Rectangular ones should not usually be extremely narrow (a great deal taller than they are wide) or extremely shallow ,a great deal wider than they are tall).

Cropping is one of the most important jobs an editor does with photographs. In choosing photos, always consider how they can be cropped. Editing can make a poor photo acceptable. It can transform a mediocre photo into one to publish with pleasure.





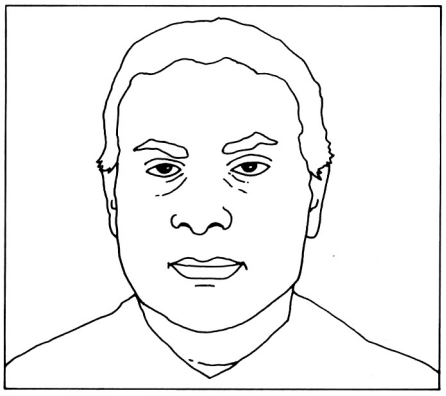
6.6
Using photographs for effect

Photographs can add to the immediate impact of publications. But to achieve impact, they must be used with some courage and much imagination. Here are 16 further suggestions, especially for editors of newsletters and other publications for the non-specialist.

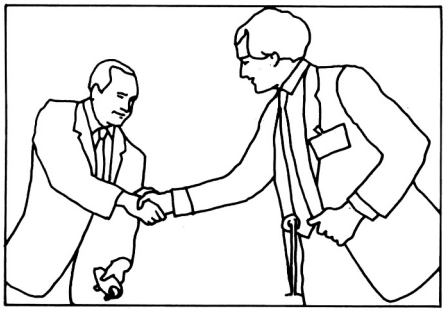
Make photos big. Small photos don't catch the reader's eye. Small halftones don't show detail. A good picture can often be 10% or 20% larger than the editor first planned.

Don't use too many. Too many photos make a clutter. The reader's eye doesn't know where to turn. Pick the best photos and give them the maximum space. That will draw the reader's eye where it belongs.

Don't use bad photos. You will bore, and eventually lose, the readers. Sometimes a photograph must be used no matter what its failings are; but with good planning such occasions should be rare, and then unsatisfactory photos should be placed where they will do least harm.



Avoid ID or passport photos. No one really wants to look at a face without a body staring out of the page—even if the face looks happy, which is rare in such pictures. Show the person doing something, even if it is only reading a book or writing a letter. It is better, of course, if the person is doing something more closely related to his or her professional interest.



Avoid grip-and-grin photos: pictures of people smiling at each other as they shake hands, or as one receives an award from the other. These are about as meaningful as most handshakes. Too often they have a lot of empty space in the middle as well. Show the people doing something more interesting.

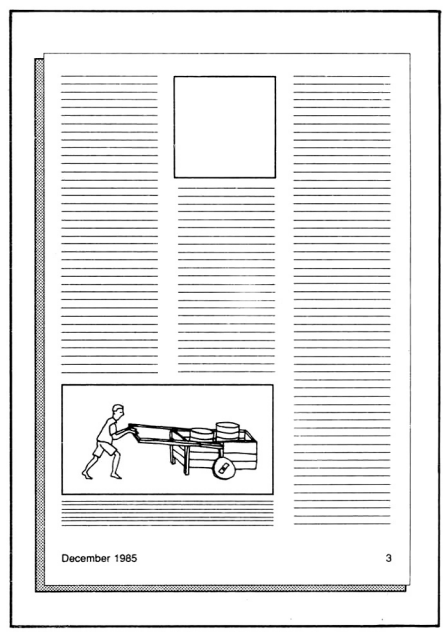
Plan in advance. Planning is the only way to avoid ID and grip-and-grin photos and all the other bad photos that appear so often in publications. Act in good time if you want a picture of a person; at the last moment the only thing available may well be a passport photo. Plan beforehand what you want the person to be doing in the photo. Plan what two people should be doing instead of shaking hands.

If you want to show a crowd, make sure it's a crowd. Pictures of crowds can have great impact. There are many good examples of tens of thousands of people gathered in one spot to celebrate an anniversary, salute a leader, or watch some unusual event. There are equally impressive photos showing huge herds of animals in migration, or thousands of automobiles lined up for export. These pictures are impressive because they show so many individuals. On the other hand, an audience at a lecture is not a crowd. It is just a bunch of people sitting in seats.

If you want to show individuals, show only a few at a time. A good general rule is never to show more than five people (or things) in one photo if they are individually important. If there are many more than five, the reader may have trouble absorbing all the information. Also, unless the picture is printed unusually large, details like facial expressions will be lost in the halftone screen.

Show the faces. In reproducing photos of people, make sure their faces can be recognized and studied. Faces show character, and faces are what people like to see. Here is another general rule: Choose a small coin in your national currency, about 2 cm (0.75 in.) in diameter, and make sure that in pictures of people the heads are at least that large.

Arrange photos so they face into the page or across to the facing page. A person in a photo should not be staring or walking off the page. An ox should not be pulling a plow off the page. Otherwise, the reader may follow the direction the picture is facing and look off the page and never return. Instead, point looks and action into the publication. Best of all, point than toward a title or something else of importance on the same or the opposite page.



Flop photos if you must, but use caution. If a photo is facing off the page and can't be moved, it can sometimes be "flopped" so it will face the other way. That is, the negative can be turned over and a new print made that is a mirror image of the original one. But be careful. If there is any lettering in the photo, it will read backwards. Watches and wedding rings will appear on the wrong wrist or hand. A right-handed carpenter will suddenly become left-handed. If you flop, watch for all such details.

Don't use a second color with halftones. Some publications print a light solid color over their photographs to give them extra impact. But the extra color is more likely to reduce the quality of the image if it is done cheaply; and to do it well, with duotones, is expensive.

Avoid the merely pretty. Photos should truly illustrate the subject of the text with which they are connected. Sometimes editors use photos that are attractive but have little to do with the message.

Look for photos in the files. Departments take pictures and keep them. Use the full resources of your organization to find good photographs, or if your own organization doesn't have photo files ask authors to search theirs. Think about pictures from the past as well as the present. If there is no good new photo available to illustrate a development, perhaps an old photo—showing what things used to be like—will serve as contrast. If you are truly desperate, see what you can find in other publications; give that publication credit if anything good turns up.

Don't give up. If all else fails, an artist can often work from an unsatisfactory photograph and make a drawing that will serve the purpose.

Crop ruthlessly. Cut waste space, distracting details, conflicting secondary messages. Trim photos as closely as you prune text.

6.7
Writing captions

Most photographs need some words to support them. This text is often called a *caption.* Good captions add to the impact of good photographs.

Because they should be short, captions demand effort and skill. Just as in titles, every word counts.

In scientific publications, captions should be clear and descriptive. They should state exactly what the photo shows, usually without verbs. They are often numbered, like tables and graphs, beginning from 1 in every article or chapter. If one caption refers to several related photographs in a group, the individual parts may be identified by lowercase letters. For example

> 7. First meiotic stages in spermatocytes of *N. bakeri:* a) interphase, b) leptotene, c) pachytene, d) diplotene, e) diakinesis, f) premetaphase, g) metaphase I, h) anaphase I, i) telophase I. The sex chromosome is indicated by an arrow. IRRI, 1964.

In more popular publications for non-specialists, caption writers enjoy more freedom. They can use verbs. They strive for interest. They still have to work hard.

Here are some guidelines for writing captions in either kind of publication.

Keep captions short. Two or three lines of type are usually enough, especially in general publications. They may have to be longer in scientific publications. Occasionally, a long caption—up to 10 or 15 lines—may serve in place of a short caption and a separate text.

Make them easy to find. Put them where the reader will look first. Usually that means under the photograph. If the photo is at the bottom of the page, the caption may go above it, and if the photo is not wide enough to fill a whole column the caption may go at the side: but in such cases, make sure the caption looks different typographically from the main text so the reader won't be confused.

Explain and identify. Say what is happening in the photo, if it isn't obvious. Identify the people in it, usually by name. Explain their significance: their position, what they do, where they come from, or any other distinguishing feature. Sometimes a person may represent a group such as farmers or patients; in that case, the name of the individual may not be as important as the nature of the group represented. Point out any

significant detail the reader may otherwise miss. Only occasionally is a caption unnecessary.

Identify clearly. If several individuals have to be identified, use phrases like "from the left:" or "from the top:" or "clockwise from the top." Do it as unobtrusively as possible, and as briefly as possible. There is no need to say "from left to right" or "from top to bottom": where else would the eye move within the photo except in those directions?

Don't explain the obvious. If there are two people in a photo, one a man and one a woman, it shouldn't be necessary in identifying them to say which is on the left and which is on the right, as long as their names can be expected to make that clear to the reader. (Remember that to people outside a particular culture. it may be difficult to distinguish between male and female names.) If a photo shows a farmer bringing in a rice crop, don't write "An Indonesian farmer harvests rice." Instead, explain why the action is significant: "One-third of the world's people depend for their main food on rice grown by farmers like this Indonesian."

The caption should not tell readers what they already know from the photograph. Ideally, it should give them something new to think about that will make them want to look at the photo again.

Make the caption-photo combination stand alone. Many people will look at the photo and its caption before reading the accompanying text. They may never read the main text. Don't depend on the main text to explain details in a photo.

Explain the significance of work illustrated in the photo, even if it is described at length in the text. Don't identify a person in the caption just as "Dr. Singh", say "Dr. T. J. Singh. director general of the National Buffalo Research Institute." This does not make it any easier to keep captions short, but it must not be forgotten.

Get to the point quickly. Never begin "This photo shows . . . " Say what is happening. Not: "In this picture a group of village women are seen making a list of the problems that affect their daily lives." Instead: "Village women list problems that affect them every day."

Make them fit. Try to make captions fit neatly in the space planned for them. Don't have two full lines followed by a last line with only one word. In such cases, cut the caption to fit in two lines or expand it to take up most of the third line. An unattractive caption weakens the impact of its photo.

Give credit. It is courtesy. even if not always required, to print the name of the photographer. This can be done in small type beside or under the photo, or it can be done in a separate part of the publication listing all such photo credits. Staff photographers are not always credited by name, though their employer may be.

Photographs are subject to copyright. If a photograph belongs to another institution or person, it may be necessary to secure permission to use it and perhaps pay a fee. It is usual to print the name of the copyright owner and acknowledge that permission has been granted.

If a photograph has been given without charge by a government agency or similar body, it is normal to recognize that it is being published "courtesy of" that organization.

Prepare captions in the same way as other manuscripts. Captions should be treated like any other manuscript going o the typesetter. They should be preferably typed, double-spaced, on letter-size paper. They should not be pasted on to the photographs. They should have full instructions for setting.

6.8
Basics of photography

Editors who work with photographers don't need to know how a camera works, but it helps—just as it helps in working with printers to know something about what they do. Editors who take their own photographs have to understand how a camera works. This unit is a brief, simple introduction for both kinds of editor.

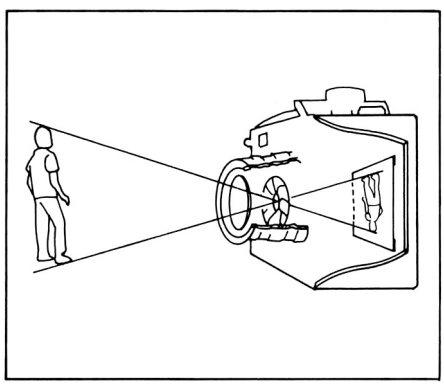
Camera basics

Cameras come in many sizes, shapes, and models. They all work in the same basic way.

Essentially, a camera is a lightproof box. Light can enter at only one place: the lens. Then it is allowed to enter only under strictly controlled conditions.

Photography begins with light. That is why pictures don't come out if there is not enough light.

The light bounces off the subject of the photograph, through the lens, and into the camera.



The lens gathers the light and focuses the image onto light-sensitive film, which is held at the back of the camera. The film stores that image.

When the film is processed with special chemicals, the image becomes permanent, as a photograph.

We can control the amount of light entering the camera in two ways:

- by changing the size of the opening through which light enters—the *aperture.*
- by changing the amount of time the light is allowed to enter—the *shutter speed.*

Some cameras are built for simplicity. They have a fixed aperture and shutter speed, set to give just the right amount of light under normal conditions. Someone using this kind of camera only has to frame the picture in the viewfinder and press the shutter.

Things to watch

With a more complicated camera, the photographer has more control. It is possible to take pictures under a wide variety of conditions and to obtain special effects. With this kind of camera, the photographer has three things to keep in mind:

- *focus:* the sharpness of the image. The camera is built so that the lens can move back and forth, closer or farther from the film, to match the distance between the camera and the subject of the photograph. The lens must be adjusted to exactly the correct position for sharp pictures. Many cameras have built-in rangefinders, which help the photographer focus accurately. With other cameras, the photographer must estimate distance or, when the subject is very close, measure the distance carefully.

- *aperture:* the size of the opening. This size is measured in f/ stops. The langer the f/ number, the smaller the aperture and the less the light that is allowed to enter. Camera apertures normally range from f/l.7 (wide open) to f/22 (very small).

- *shutter speed:* the amount of time the shutter is open. Better quality cameras can take pictures at shutter speeds ranging from 1 or 2 seconds to 1/1000th of a second. If the camera is held in the hand. pictures should be taken at 1/60th of a second or faster speeds; at slower speeds, a tripod is usually needed. If a picture is blurred, it may be. because the photographer's hand shook slightly at a low speed.

The aperture and shutter speed must work together to allow the right amount of light into the camera. If too much light enters, the film will be overexposed; if too little light enters, the film will be underexposed. In bright sunlight, therefore, the photographer will use a smaller aperture, or a faster shutter speed, than on a cloudy day. In a dark room or woodland, the photographer will use a large aperture and, perhaps, slow speed as well.

Note: f/ numbers do not progress in an orderly way. They run:

f/2 ff2.8 f/4 f/5.6 f/8 ff/11 f/l6 f/22

Each one of these f/ stops lets in half as much light as the f/ stop immediately preceding it. Therefore, we can get the same exposure (the amount of light entering the camera) with openings of f/2.8 at 1/500 second, f/4 at 11250 second, f/5.6 at 1/125 second, and f/8 at 1/60 second.

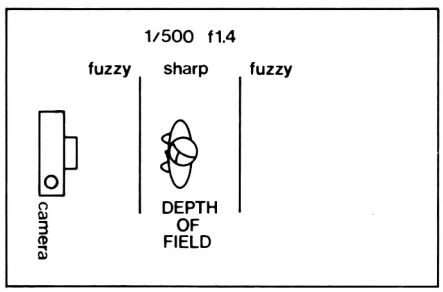
Many cameras have built-in light meters that help the photographer choose the correct aperture and speed. Separate, hand-held light meters are also available. Often it is enough simply to follow the directions that come with the film.

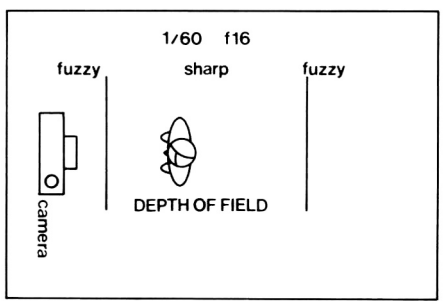
Lenses

A camera lens is not as flexible as the human eye. People can look over a wide horizon. They can see things out of the comers of their eyes. They can change focus quickly, without even knowing they are doing it, from objects that are close to those that are far away. A camera lens, in contrast, has a limited field of vision. It must be focused mechanically on a particular object and may have to be changed to focus on other objects.

Some of these limitations can be overcome with a family of lenses that can be fitted onto the more expensive and flexible cameras. These lenses may be telephoto lenses, which enlarge the image. They are like telescopes or binoculars, and make distant objects seem close up. Others are *wide-angle* lenses, which make it possible to photograph more than is normally possible of a landscape or a room-even 180°. There is always a loss, however. Telephoto lenses narrow the field of vision. Wide-angle lenses make objects look more distant, or distort images. No lens can equal the human eye.

Depth of field





A lens focused on a particular object sees more than that single object sharply. Some distance in front of the object is always in focus, and so is twice as much distance behind the object. The space between these two points—the nearest and farthest points that are in focus at one time—is called the *depth of field.* Under certain conditions, the depth of field may stretch from 1 meter in front of the camera all the way to the horizon. Under other conditions, the depth of field may be only a few centimeters around the object that is being photographed.

The depth of field depends on the size of the aperture, the closeness of the object being photographed (the range), and the type of lens. Small apertures (high f/ numbers) give greater depth of field than large apertures (low f/ numbers).

When the camera is focused on objects close at hand, there will be less depth of field than when it is focused on objects farther away.

At any aperture or range. telephoto lenses have less depth of field than standard lenses. Wide-angle lenses have greater depth of field.

Film

Film comes in different sizes to fit different kinds of cameras. Probably the most common size used for photographs that are going to be published is 35 mm.

Film may be *black* and *white* or *color.*

It may be *negative* (used to produce prints, in black and white or color) or *positive* (for slides or other transparencies).

It comes in different *speech.* Fast film needs less light to record an image. Slow film needs more light.

Film speed is measured in various units. Two of the most common are known as ASA and DIN. For example:

	Fast		Medium		Slow	
ASA	1000	400	200	100	64	20
DIN	31	27	24	21	19	14

Slow films generally have finer grains and give sharper images than fast ones. Fast films are valuable if the light is weak or the action is fast.

Film processing

Black and white film is made up of very thin layers, like a sandwich. The two most important layers are the base, which is transparent, and the emulsion, which is supported by the base.

The emulsion consists of many grains of light-sensitive silver salts. In the darkroom, when the film is developed, chemicals change the silver salts into dark metallic silver. The more light that has struck the film, the more Silver there is. Thus at points where the camera has seen something white (which gives off much light) there is a black deposit; where it has seen something black (which absorbs light) there is no deposit. The result is a *negative,* with differing shades of black, gray, and white, all the opposite of what the camera actually captured.

The negative is *fixed* in a bath that washes away any undeveloped silver salts, so that the negative will not become darker. Then the negative is washed to remove any soluble salts. If these processes are not done properly, the print may be too light or discolored.

A *positive print* is made by reversing this process. Light is passed through the negative onto paper that has been treated with light-sensitive silver salts. Where the negative is clear, much light will pass through and the paper will be exposed and be dark; where the negative is black, no light will pass through and the print will be white.

Prints can be made either in a contact frame (they will be the same size as the film) or in an enlarger, which acts like a camera (and makes bigger prints).

Color film is based on the same principle of a sandwich. It has three emulsion layers, each sensitive to one of the primary colors: red, green, and blue. It adds these layers together to give the desired color.

Paper for printing black-and-white photographs varies in speed, contrast, and color. New papers are plasticized for quicker drying.

6.9
Taking photographs

Editors sometimes have to take their own photographs for publication. This requires some skill. Good photographs also require a steady hand and a sharp eye. Here, in summary, are some rules to follow in working with a camera.

1. Hold the camera steady.

2. Remember focus, shutter speed, and aperture. Forgetting any one of them can ruin a photo.

3. Make sure you are looking straight through the viewfinder. Otherwise you will lose details at the side of the picture.

4. Squeeze the shutter release gently. Otherwise you may move the camera and blur the photo.

5. Keep the lens clean. Dirty lenses make pictures fuzzy.

6. Move in close to the subject. Close-ups are always more interesting than photos taken of something from a distance. Try to make the subject fill the picture. This may be the most important thing to remember in composition.

7. Keep the message simple. Have a single idea. Try to remove unnecessary details. Try to have the picture tell a story or otherwise give information.

8. Choose a background that is uncluttered.

9. To make people look natural, keep them busy. People feel more relaxed when they are doing things.

10. Have people move close together. Empty spaces always look bigger in a picture than in life.

11. Take more than one picture of a subject. Look for new angles and viewpoints.

12. Watch the position of the sun. Don't shoot into the light (unless you want that special effect).

13. Take advantage of a cloudy day to photograph people. Clouds remove harsh shadows and people don't have to squint. If the day is sunny, photograph people in open shade, outside the direct sunlight.

14. Frame the center of interest with objects in the foreground. This will give the picture a feeling of depth.

15. Make sure the photograph is balanced in composition.

16. Use the rule of thirds as a guide in placing subjects in a photograph. Imagine the picture divided into thirds horizontally and vertically. Put the center of interest at one of the points where the dividing lines intersect.

17. Use strong lines to attract attention to the center of interest or to make an attractive composition. The lines may be straight or curved or in an S shape; they may be repeated or form triangles.

18. Watch the background. Avoid cluttered backgrounds. Don't have trees or other objects growing out of the subject's head.

19. Watch the horizon. Make sure it is level, unless you want a special effect.

20. Use a flash when there is not enough light. Remember that if you get too close to the subject with a flash, the picture will be overexposed; if you are too far away, it will be underexposed. The usual range of a small electronic flash is about 1.2 meters (4 feet) to 5.5 meters (18 feet).

6.10
Preparing illustrations for the printer

Illustrations are delicate. Manuscripts can be pencilled, cut with scissors, pasted together, or stapled. Artwork and photographs can't. Any damage to them will show when they are reproduced. Moreover, many cannot be replaced without cost in time, money, and effort. Some photographs can never be duplicated again because they show a unique event or capture a particularly unusual action; some drawings can never be recreated because the artist is dead and they are now of historical importance.

Yet illustrations must be edited, and they must go to the printer with clear, detailed instructions about how they are to be used. Here are some ways to do this without harming the illustrations.

The advice in this unit applies to both artwork and photographs.

Keep them apart

When you receive a manuscript, make a record of any illustrations that accompany it. Find out if any are particularly valuable. If your institution permits, insure those ones against damage or loss.

Keep all illustrations separate from the manuscript. Hold them in a separate file or envelope. Work with them as little as necessary. If possible, make photocopies to work with while you are editing the manuscript.

Treat them with care

Never put food, drink, or even a burning cigarette on the same desk as illustrations. If a cup spills, any illustration near it could be ruined. This seems obvious; it is often forgotten.

Handle illustrations by the edges. Don't take a chance on harming them with fingerprints. The acid from sweaty fingers can eat into a photograph's emulsion and leave permanent marks that will appear in the printing. Dirty fingers can deface a piece of artwork.

Never use staples to attach an illustration to other papers. The tiny holes will show when the picture is printed.

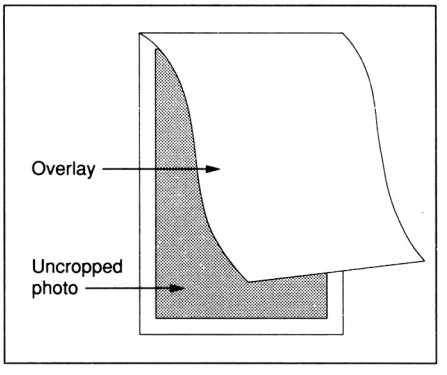
Don't use paper clips, unless the illustration is well protected with heavy paper. Paper clips make marks that show when an illustration is printed. On a glossy photograph in particular, anything that harms the surface is likely to show.

Never write on the back of a photograph with a hard pencil or ballpoint pen. The pressure will crack the glossy finish in the front and show when the picture is reproduced. Use soft pencils and press as lightly as possible, or use felt pens.

If you use a pen, test to make sure the ink will not bleed through to the front. Make sure the ink is dry before putting the photograph on top of any other print. Some of the new resin-coated photographic papers do not absorb ink well, and drying can take a long time; on these papers, use a grease pencil or write on a label that can be stuck to the photo.

Be equally careful about writing on the back of any other kind of illustration. Hard pencil can mark paper, and ink can bleed through. Never write or draw on the image area of an illustration. Even light pencil marks will show when it is printed. Write instructions in the margin, on a label, or on an overlay.

An overlay is a sheet of thin paper glued or taped to the back of the illustration and folded over to cover the front. If you write on an overlay, fold it away from the illustration or protect the front of the illustration with a piece of cardboard. If you use a pen. be sure the ink does not bleed through onto the illustration.



Don't put marks anywhere in the image, even if you don't plan to reproduce that part of the illustration. You may want to use the illustration some day in another publication, with different cropping.

Identify the illustrations

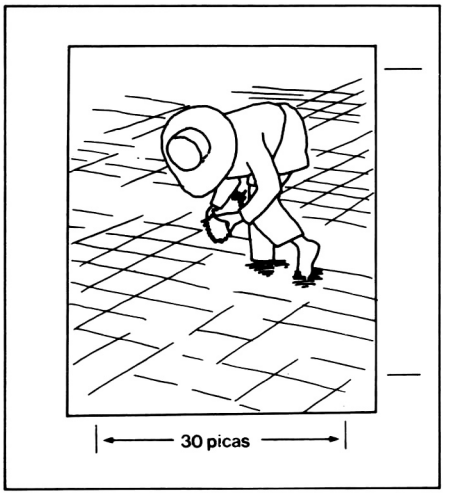
Number photographs for reference, even if they are not going to be numbered in the publication. Add the author's name and the publication, in case the illustrations get separated from the manuscript or lost. Printers may be working on illustrations for several publications at once, and sometimes pictures get misplaced. Protect yourself.

The number can be put on the back of the illustration, or on an overlay sheet.

One of the best ways is to put it on a tab, at the bottom of the illustration. Both the number and the image then will be visible when you are working with the picture. This has special advantages if printing is to be by offset lithography. When the picture is photographed for reproduction, the number will be visible in the negative. Make the number large enough to be seen easily if the picture is reduced. The printer can identify illustrations quickly by the number, but will cut out the tab when stripping the negative into the flat. The same tab may have the author's name and the percentage of reduction. (Reduction is explained on pages 258–260.)

If the illustrations are to appear on the same pages as text, write each picture number in the margin of the manuscript approximately where you want that picture to appear. Circle the number so it won't be set in type. It will be a guide to the designer or printer in making up pages.

Show Cropping



Unless you want to use the full image of the illustration, show where you want it cropped. Draw short lines in the margin using a colored pen or a grease pencil so that they are clear. Draw the lines only on one side in each dimension—that is, either on the top or the bottom, and only on one side. The printer will understand that you want the lines square with the print: if you draw crop marks on all four sides, you may not get them quite square and the printer won't know what you want.

Alternatively, show the area you want to reproduce by drawing a rectangle on an overlay sheet or on a photocopy of the illustration. You will have to do this if you are cropping to make a "crooked" photo vertical. Overlays sometimes slip out of place. To be safe, mark on the overlay where the comers of the illustration should appear.

Never cut a print to show the cropping. Give the printer the entire original in case it is necessary to change the cropping slightly to fit the available space.

Give the size

Say how big the illustration is to appear when printed. It may be the same size as the original sent to the printer. Often, however, illustrations are reduced in size.

Reducing a picture not only saves space; it makes the image look a little sharper, and may hide small defects in drawings. Illustrations are commonly reduced so they will appear 65% to 85% of their present size. It is dangerous to reduce them to less than 50% of the present size, because detail will be lost and lines may break down. Illustrations can also be enlarged, but this may make shaky lines or poor focus more obvious.

Instructions can be given to the printer in two ways:

- State the *actual size* you want the picture to appear in picas, centimeters, or inches. This can be written in the margin if there is enough space, or on an overlay. Give instructions for only one dimension—the one that must be absolutely accurate. This usually is the width, because pictures normally should fit neatly into columns. (You do not need to give instructions for more than one dimension, because the other will automatically follow.)
- State the reduction you want by telling the printer you want the picture to be a certain *percentage* of its present size. This percentage can be written on the tab, in the margin, or on an overlay.

For example, a photo now may be 50 picas wide. It is to fit into a column of type 30 picas wide. The photo can be marked to be

30 picas wide. Or the printer can be told to reduce it to 60% (30/50 × 100%) of its present size. The result will be the same.

Giving instructions in actual measurements is certain to give you what you want. Use this method if you have any doubt about understanding how to use percentages.

Give any other instructions

Tell the printer about any concerns you have. If certain areas of the photograph are more important than others, mark them on an overlay or a photocopy. Then the printer will try to get the best possible reproduction of those areas, even if other areas do not come out quite as well.

If there is any question as to which is the top of the illustration, mark that with an arrow on the back or on an overlay.

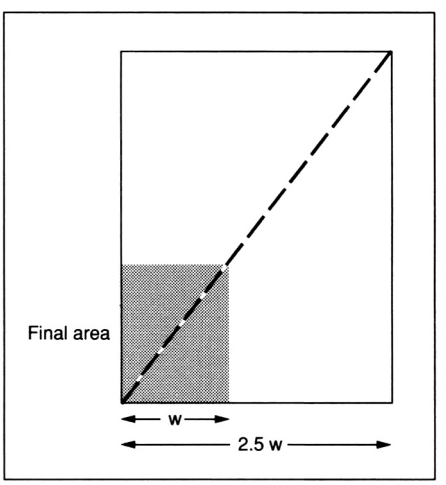
If the printer is to add typeset arrows, numbers, or words to an illustration, provide the text and show exactly where they are to be placed. Use an overlay or a photocopy.

Photographs can be retouched to remove defects, but this is a difficult skill. Unless you are very certain that it can be done well, leave the photo as it is. Bad retouching is worse than none.

Calculate their published size

In planning a publication, and especially in making a dummy, you will want to know the exact size of any illustration after it has been reduced or enlarged. If you know the new width, the height is easy to calculate because the dimensions will remain in the same proportion.

One way to do this is to draw a rectangle exactly the same size as the portion of the original illustration portion that will appear in the publication (that is, after any cropping). Then draw a diagonal line bisecting the rectangle. Measure the final dimension you have specified, either from the side (if your instructions were for a certain width) or from the bottom (if your instructions were for a certain height) to the diagonal. Complete the rectangle. That will be the size of the artwork as it is to be printed.



The new dimensions can be found more easily on a pocket calculator using the formula:

$$\frac{\text{final width}}{\text{original width}} = \frac{\text{final height}}{\text{original height}}$$

As an example, let us return to the photo 50 picas wide which you want to reduce to 30 picas wide. If the photo now is 40 picas high, the reduced height will be

$$\frac{30}{50} = \frac{X}{40}$$

$$x = \frac{30 \times 40}{50} = 24 \text{ picas}$$

If you can obtain one, you may also use a proportional scale, or scaling wheel. This is a circular slide rule that can produce these calculations quickly.

Pack them carefully

Be careful when sending illustrations by mail or messenger. Pack them flat in an envelope with stiff cardboard so they can't be bent. Protect the front of the illustrations especially well.

Don't enclose papers that are stapled or clipped unless there is stiff cardboard between them and the illustrations. Otherwise the metal may mark the illustrations.

Write on the outside of the envelope or package: PHOTOGRAPHS! HANDLE WITH CARE. DO NOT BEND OR CREASE.

I have a friend who says the only way to mail photographs with perfect safety is in a wooden box. Few of us would go that far, but it is something to think about.

7
Design for publication

Editors are involved mostly with words. They work hard to make a text as easy as possible to read and understand.

They must also think about how those words will be presented physically. Bad design can make the best edited text difficult to read. Good design can make it still more readable.

Editors may work with professional designers and artists, or with printers who have their own suggestions about design. Editors sometimes design publications themselves.

The difference between good and bad design is partly a matter of personal opinion and of custom: what readers are used to. There are also some rules and standards that have been tested and proved valid.

This module introduces some of the factors that make publications easier to read, and explains why some choices in design are better than others. In places it requires knowledge of printing techniques discussed in Module 8, Introduction to print production.

7.1 Planning

We are surrounded by design.

Buildings are designed to meet special needs, using special materials, to make special statements. A school built of bricks, a research institute of concrete, a Supreme Court building of stone, a cowshed of sticks — all are designed to serve a specific purpose, using appropriate materials, and to express the intention of their builders.

In the same way, clothes can be designed to meet special conditions (cold, heat, rain), using appropriate materials (wool, cotton, synthetic fiber), and to make special statements (blue jeans, T-shirt, formal dress).

Some of the best design was not created: it evolved. The body of a shark, the wing of a gull, the petals of an orchid, the fast-growing stalks of deepwater rice—these are superb examples of design to meet a particular need.

But everything made by people is designed, consciously or unconsciously.

Planning

Design is planning the physical characteristics of an object before it is made.

When the design is good, the object works well and is easy to use. When the design is poor, the object does not work well and is difficult to use.

Good design is choosing physical characteristics that meet special needs, use appropriate materials, and make desired statements.

Good design in print

- helps make the author's message clear and effective.
- often reduces costs of production.
- saves readers' time and effort because the message is easy to read.

Questions

Planning a design is part of planning a publication. It involves many of the basic questions an editor must ask. (See units 1.3 and 1.4.)

- What is the principal message?
- Who are the intended readers?

- How and where will they use the publication?
- What response do we want from them?
- How long will the publication be used?
- How much information must be communicated?
- What are the special needs for illustration, if any?
- What is the budget?
- How many readers will there be? (or) How many copies will be printed?
- How will the publication be distributed? Will it be sent by mail? Should it fit into a particular size of envelope? Should it use lightweight paper?

If someone else is designing the publication, the editor must provide this information. The other person may be an expert designer, artist, or printer. Still, he or she will not know as much about this particular publication as the editor. Plan to spend an hour or more describing the publication and its readers before the designer sets to work. This will be the most important discussion in all the time you work with the designer on that job. A thorough explanation at this point will save hours of revision later.

Once a design is proposed, the editor should test it against the answers to the previous questions.

- Is the type a suitable face?
- Are the size of type, length of line, and spacing suitable for easy reading?
- Is the page an appropriate size for the intended use? (If it's a book to be used in the field, is it small enough to fit easily in a pocket? If it's a reference work to be used in a library, should the page be larger, so that it will hold as much data as possible?)
- Is the binding appropriate for the intended use? (Will a reference book stand up to long use? Will a lab manual open flat on the bench?)
- Have the illustrations been planned so that details can be reproduced clearly'.' (Do they require a larger page, or coated paper?)
- Do the format and any use of color create a mood that reinforces the message?
- Does the design fit within the budget?
- Will it attract the intended readers?

Choices

There are many choices in design, and each must be made with the reader in mind. In publication, design involves three areas of choice:

- format: the shape and size of the publication
- type: the shape and size of the characters that form the words of the message
- layout: the arrangement of these characters plus illustrations and any other elements on the page(s).

Each of these elements is a tool to help communicate the author's message to the readers.

The choices include

paper	typeface(s)	layout style
color	type sizes	type area
page size	spacing	margins
binding	heading styles	grid pattern

Often, the choices are limited. But usually some choice can be made.

7.2
First choices

Once the basic questions about readership and function have been answered, we can get down to designing a publication that meets those needs anti purposes. The first thing to consider is general appearance, the kind of paper, color(s) of ink, size and shape, and style of binding.

In these areas, as always, the interests of author and reader are most important. Aesthetics as well is involved: the publication should meet current local opinion about what is pleasing or attractive.

Decisions in this area are also technical. Faulty choices—a poor quality of paper, an extra color of ink, a page 1 cm too wide-can flaw a publication or add unnecessary expense. Editors who design publications should work closely with their printers and seek their advice regularly.

Paper

Small publications usually make use of only a few general classes of paper:

- *Book paper* For books, booklets, pamphlets, brochures. journals. Book papers may be coated or uncoated (see below); they may be made specially for offset or for letterpress printing.

- *Cover paper* For the covers of books, booklets, journals. magazines. Cover paper is thicker than book paper and may also be stronger to protect the inside of the publication. It may be coated or uncoated, plain or colored. After printing it may be sprayed with varnish or laminated with a thin sheet of plastic to give it extra protection.

- *Bond paper* For letterheads, stationery, business forms. and simple folders. Bond papers come in a wide range of quality. Some are strong and long-lasting, and feel more expensive than book papers: others are low-cost.

- *Newsprint* For booklets. newspapers, or other publications that must be produced cheaply and in large quantities, but do not have to last long. Newsprint is a low-cost paper of poor quality, mostly used for newspapers. It has a coarse texture. It is good for reproducing words and line drawings, but not photographs.

Book papers

Editors are most likely to be concerned with book papers. There are three basic kinds:

- *Antique-finish* Slightly rough paper with a natural or cream-white color. Good for reproducing text, especially by letterpress. Not usually good for reproducing photographs, especially if detail is important.

- *Smooth white* Usually made specially for offset printing. These papers have a hard, smooth surface but are not coated. Good for all publications and general printing. Photographs reproduce well on them.

- *Coated* White paper with a smooth coating of clay. Expensive. Used mainly when high quality reproduction of photographs is essential. Illustrations printed on coated stock are sharp and crisp, and four-color photographs have an extra sparkle. Coated papers may have either a glossy finish or a dull (matte) finish. Glossy coated paper reflects light into the eyes of the reader and slows reading; matte is better.

Qualities

Within each basic kind of paper, there may be more choices to make. These are the most important.

- *Weight* This is literally the weight of a sheet of the paper. Some kinds of papers weigh more than others, and the same kind of paper may be made in different weights (or thicknesses). Editors may choose heavy papers to get better printing quality or to make the publication look impressive. Lighter weights save money in shipping and postage. In most of the world, the weight of a particular paper is measured in grams: the weight of one sheet one square meter in area. American papermakers use a different standard. For book papers the base is the weight in pounds of 500 sheets of paper cut to 25 x 38 inches. In either system, the important thing is *relative* weight. Cover papers are heavier than book papers, coated papers are heavier than uncoated paper of the same thickness, and so on.

- *Bulk* Papers come in different thicknesses, or bulk. A book 2.5 cm (one inch) thick may contain as few as 200 pages or nearly 1000, depending on the thickness of the paper chosen. In the same kind of paper, the heavier weights are thicker than lighter weights. But there is no fixed relationship between weight and bulk in papers of different kinds: a thin coated paper may weigh more per sheet than a bulky antique paper. Bulky paper may be chosen occasionally to make a thin publication look thicker and therefore more important. More often, editors are anxious to choose paper that will reduce the size of a publication, because thin books may be cheaper to ship (more copies fit in a carton) and take less room to store.

- *Color* Book paper can be bright white, ordinary white, or cream-white. In other papers, dozens of reds, blues, yellows, and other colors are available. Bright colors can be used to attract attention. A publishing institution may choose certain colors with which it is associated and use those colors on all its covers. (But if the same colors are used on too many publications, or over too many years, the technique loses its impact. All publications come to look the same. Different colors should be introduced from time to time.)

- *Strength* How well will the paper stand up to folding, creasing, or constant use? Publications that are going to be used frequently, or roughly, or for a long time need strong paper.

- *Opacity* In too many publications, the printing on one side of a sheet can be seen from the other side. Opacity in paper prevents this *show-through.* Some papers are more opaque than others, either because they are heavier or because they were specially treated when they were made. Editors should watch this quality carefully. A great deal of show-through interferes with the message. It is especially noticeable in publications with large white areas (if there are many graphs, for example) or dark areas (if there are many photographs, for example).

- *Grain* Paper is made up of many thousands of tiny fibers of wood or cloth. When paper is formed in large machines, these fibers tend to line up in one direction. This gives paper a grain, something like the grain in wood. Paper folds or tears more easily along the grain. When paper is folded across the grain, it may get rough or crack. This is a special problem with heavy, stiff paper. In books that are folded for binding across the grain, the pages may not lie flat, especially if there are large changes in humidity. For this reason, printed publications are usually designed so that the paper grain runs parallel to the binding edge. Fortunately, editors do not often need to know about grain, but they should understand it: printers sometimes have to explain that a particular design presents problems because of grain.

Obviously there is a close relationship between weight, bulk, and opacity. If the choice of papers is limited, it may be necessary to trade one quality off against another—to accept a more opaque paper even if it is heavier. Papers are made, however, that are thin, lightweight, and opaque. They may be more expensive than other available papers, but any publishing organization that mails its publications widely (especially internationally) may find that the savings in postage are greater than the extra cost of the paper.

In choosing papers, try to see samples. Feel the papers and test them for strength, opacity, and quality of reproduction. Ask for publications, as similar as possible to the one you are planning, that have been printed on the various kinds of paper you are considering, That is the only way to be certain about your choice.

Ink

Ink comes in a rainbow variety of colors, but most publications are printed with black ink. There are two reasons for this.

First, black ink is easier to read than other colors. It provides the greatest contrast with white paper. Some colors, like yellow or light blue, are almost impossible to read on white paper. Even dark colors (dark blue, dark red, dark brown) are not quite as readable as black; they may require slightly larger type than would be necessary with black ink. Black also reproduces most clearly in office photocopiers, if the printing is likely to be copied that way.

Second, black is the color that is usually on the press, and it is therefore cheaper to use. If a customer wants to print in another color (for example, blue) all the black ink must first be cleaned off the rollers and other parts of the press. Once the blue printing is finished, the press must be cleaned a second time before it is used again with black ink. Cleaning takes time, and printers charge for this extra work.

Printing in two colors (for example, black and blue) casts still more. The printer must set up the press and run it for each color separately, and clean it between colors. In offset printing, the second color requires a separate plate. Printing in two colors other than black (for example, red and blue) is still more expensive because the press must be cleaned the extra time.

Some printers have a press that can print more than one color at a time, but that also costs extra money. Two-color and four-color presses cost more to buy than single-color presses, so the printer must charge more for their use.

(For more about printing processes, see unit 8.2.)

Page size

The size of the page depends on answers to the basic questions already listed, especially:

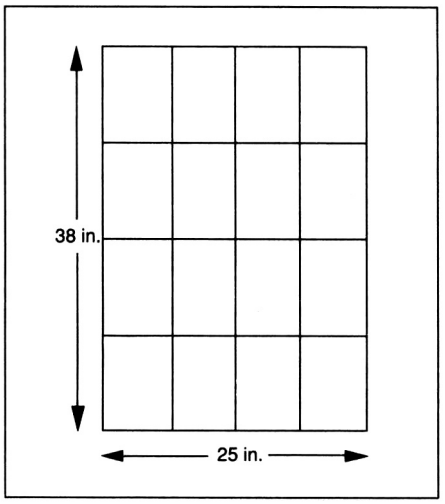
- Who are the readers?
- How will they use the publication?
- Where will they use it?
- How much information must be communicated?
- What are the special needs of illustration?

It will also depend on the size of the sheets of paper to be used for printing.

Book paper is produced in a range of standard sizes. Each of the standard-sized sheets is large enough for several pages of a publication.

The most economical page size makes full use of a standard sheet. Otherwise, paper will be wasted. And paper is expensive. Even used with care, it may make up one-third or more of the cost of manufacture.

The standard sheet of book paper in North America and some other parts of the world is 25 x 38 inches. Another standard sheet size in those areas is 35 x 45 inches. From these sheets, the most economical page sizes are the following:



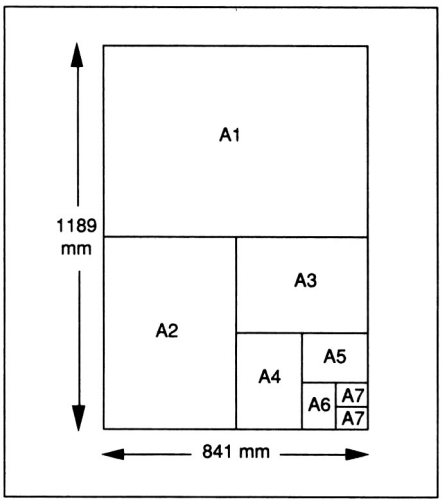
25 × 38 in. sheet

6 × 9 in. (152 × 228 mm) 5 ½ × 8 ½ in. (140 × 216 mm)	32 pages/sheet (16 each side)

35 x 45 in. sheet

7 × 10 in. (178 × 254 mm) 8 ½ × 11 in. (216 × 280 mm)	32 pages/sheet (16 each side)

With care, the printer may be able to get slightly larger pages than these (for example, 6 1/8 × 9 1/4 inches), but it is impossible to use every last bit of the sheet. Some paper will always be lost in trimming when the book is bound.



(Note: it is standard printing practice to give the horizontal dimension first. A 152 × 228 mm or 6 × 9 in. page is taller than it is wide.)

Other parts of the world use a standard sheet defined by the International Organization for Standardization (ISO). This is also called a metric sheet. The basic IS0 standard sheet is 841 × 1189 mm, or 1 square meter. This can be subdivided into sheets that are always in the same proportion of 1:1.414. Each subdivision has a number. These are the most common page sizes for publications:

A4	210 × 297 mm	32 pages/sheet (16/side)
A5	148 × 210 mm	64 pages/sheet (32/side)
A6	106 × 148 mm	128 pages/sheet (64/side)

Not all printing presses are made to fit these standard sheet sizes. The most economical page size may depend on the size of the press you plan to use. Or it may be decided simply by what sheets are available, or by what the printer happens to have in stock. Sometimes a printer will have an odd size of sheet that may be a bargain.

If you are in any doubt, *ask the printer*. Find out the most economical page size for the press that will be used on your job.

Binding

In binding, the basic editorial questions again must be considered, especially the way the publication will be used, the number of pages, and the budget. In most research or extension publications in developing countries, the choice will be among

- simple or accordion folding (brochures and folders)
- saddle stitching (usually for booklets of 64 pages or fewer)
- side stitching
- mechanical binding (plastic rings or spirals)
- adhesive binding (for publications of 64 pages or more).

These different forms of binding are discussed in unit 8.6.

7.3
Typefaces and type measures

The letters of the Latin alphabet come in thousands of designs.

Some are easy to read.

Achievements

Some are difficult to read.

RESISTANCE

Some are classically formal.

SISTINA

Some are informal.

PROFILE

Some are flowery.

SAPPHIRE

Some look like handwriting.

Mistral

The variety is enormous.

Other forms of alphabet or ideograms (Hindi, Arabic, Chinese, and so on) may have fewer varieties but still have distinctly different forms.

Even if an alphabet is unfamiliar, the differences in form can be clear to see.

العلم نور والجهل ظلام
العلم نور والجهل ظلام
العلم نور والجهل ظلام
العلم نور والجهل ظلام
العلم نور والجهل ظلام
العلم نور والجهل ظلام
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العلم نور والجهل ظلام
العلم نور والجهل ظلام

Comparing typefaces

The design and use of letterforms in printing is a special subject called *typography*. To master it takes many years. Editors do not need such detailed knowledge. It helps, however, to know a few simple ways to compare letterforms. Then you can see whether a particular letterform is suitable for a particular publication. The choice of typeface can make a publication easy or difficult to read. It also establishes the visual voice of the publication. It sets the emotional tone.

In printing, letterforms are divided into *typefaces,* which are something like species in the natural sciences. A typeface is an alphabet with specific characteristics by which it can be distinguished from any other typeface. Sometimes the differences are so small that only specialists can recognize them easily. But few editors in the developing world have wide choices in typefaces. It is usually enough to be able to recognize broad differences.

Typefaces can be divided, at the simplest level, by function and by form.

Function

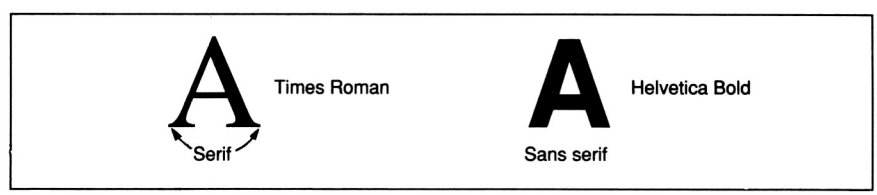
Some typefaces are best for the text of a publication. This material will be read continuously, often for dozens of pages at a time. Type used in this way is often called *text* or *body* type. It is not usually large in size. This paragraph is set in text or body type.

Typefaces are also used for titles, headings, and large announcements. This material will be read in bursts of a few words at a time. It is usually larger than the general text of the publication. It is called *display* type. The headings in the margin of this publication are set in display type; the titles of the modules and units are set in a larger display type.

In any publication, text and display type may be different sizes of the same type. Or, with care, one face can be used for the text and another for display. (See unit 7.6)

Form

Some typefaces have *serifs,* little hooks that appear at the tops and bottoms of the letters. Others have no hooks. They are called *sans serif* ("sans" means "without" in French).



Another way to compare typefaces is by the weight of the lines that make up the letterforms. Some faces with serifs have great contrast between the lines in the letters: some lines are thin, others thick. The lines in other faces with serifs are different in weight but the contrast is not so great. In a few faces with serifs, there is no difference in weight between lines.

In most sans serif typefaces, the lines are of equal weight. The letters also tend to be geometrical in shape, based on straight lines and true circles. Sans serif type is a 20th century idea.

Form and function

Type with serifs can be used for either text or display. So can sans serif type.

There is a third group of typefaces that (at least in the latin alphabet) should be used only for display. These are the decorative and script faces. They should never be considered for text. *Decorative* faces, as the name suggests, are intended to look pretty, but in them it is almost impossible to read more than a few words at a time. *Script* faces are designed to look like handwriting, and may also be difficult to read. The last 25 years have seen a flood of ugly decorative and script faces. Wise editors approach such faces with great caution.

Type fonts

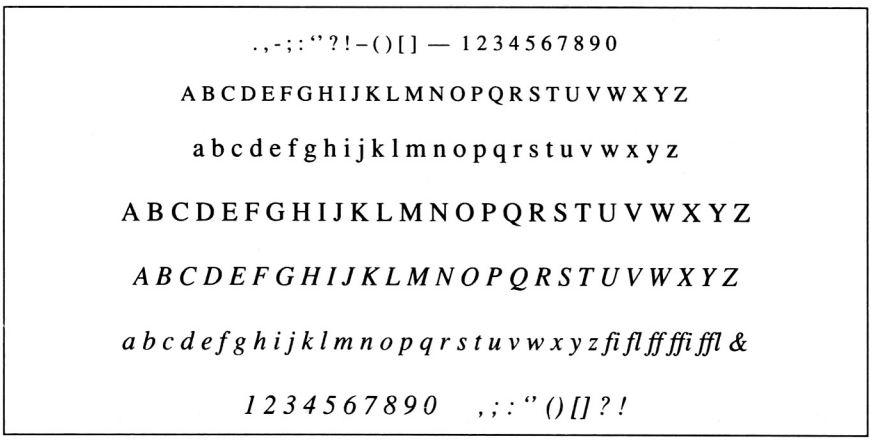
Within any single typeface, there can be a great number of sizes and shapes of characters. A complete range of characters in one size of one typeface is called a *font.* A font may include the following kinds of characters:

- capital letters, also called *uppercase* letters
- small letters, also called *lowercase* letters
- numbers, also called *figures*
- punctuation marks
- special symbols
- *small capitals* (or level small capitals), which look like capitals but are only as high as the lower-case x
- *ligatures,* or combined letters, such as *fl* or æ

Not all these characters are available in all typefaces. In most they come in two forms:

- *roman* characters (the normal, upright kind in which most text is printed)
- *italic* characters (sloped forward, looking a little like writing).

Here is a font of type with roman punctuation marks and figures, level small caps, roman lower and uppercase, italic upper and lowercase, and italic figures and punctuation. A typeface may have fonts in many different sizes, from very small to very large.



Type families

Any one typeface may have several variations. Typefaces that are related to one another form a *type family.*

Helvetica Light
Helvetica Light Italic
Helvetica
Helvetica Italic
Helvetica Bold
Helvetica Bold Italic
Helvetica Black
Helvetica Black Italic
Helvetica Light Condensed
Helvetica Light Condensed Italic
Helvetica Condensed
Helvetica Condensed Italic

The most common variation is *boldface* or *bold.* This type is heavier and darker than the basic face. Some type families have *extra bold* faces; a few have *light* faces; both these extremes should be used with care.

Some families also contain *condensed* faces. In these the letters have been squeezed so that more will fit in a given space. A few families include *extended* faces, in which the letters have been stretched sideways.

Type measures

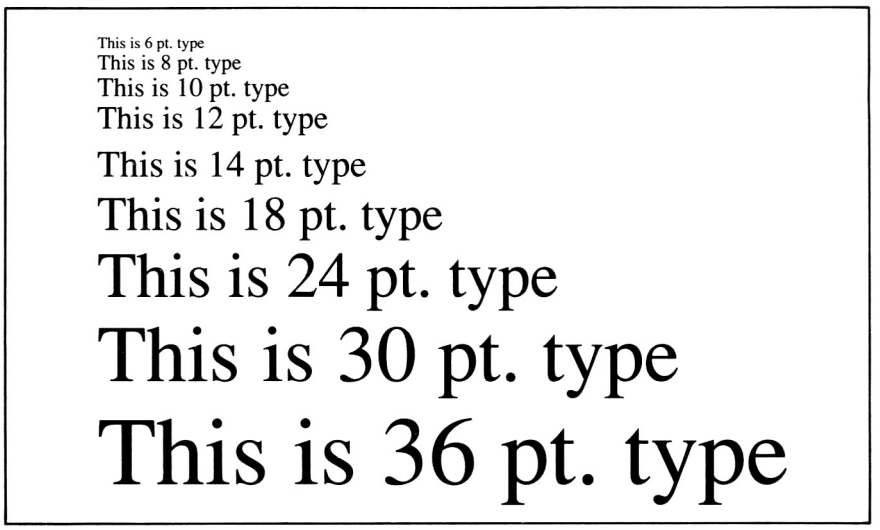
Type is measured in special units. Editors have to know them to communicate with printers. They may sound complex. They are not.

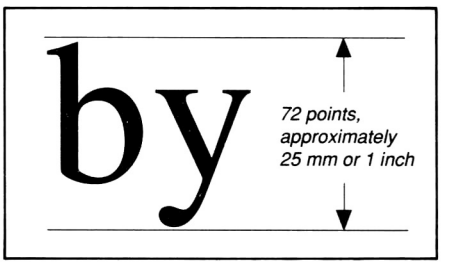
Different systems for measuring type exist in different parts of the world, just as different systems exist for measuring land (kilometers and hectares in some countries, miles and acres in other). The French measure type in ciceros; the Chinese use gohs.

The following system is probably the most widely used. It has three units of measurement: the point, the pica, and the em.

Points

The *point* (pt) is the smallest unit. One point is 0.01384 of an inch or 0.3515 mm. For practical purposes, we can say there are 72 points in an inch or 28.5 points in a centimeter.





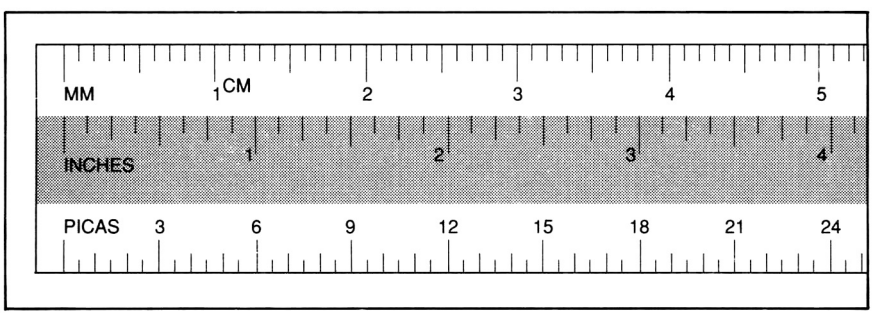
Points are used to measure the *size of type.* The size of a typeface is basically the distance from the highest point to the lowest point in the alphabet: for example, the distance between the top of a *b* and the bottom of a *y.* A small space is allowed at top and bottom so that the letters in two lines won't touch. In 12 pt type, the total distance is 12 points.

Points are also used to measure small distances in space between lines or characters in type.

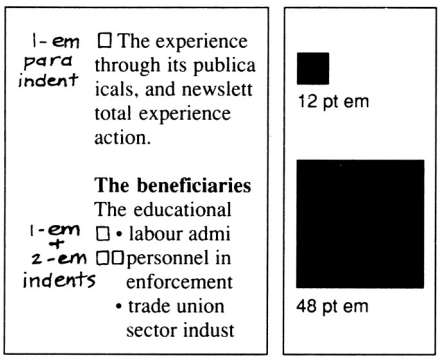
Picas

The *pica* is the second principal measure of length. One pica equals 12 points. Picas are used to measure the width of a line of type or the dimensions of a type area. The text lines on this page are a maximum of 27 picas wide. The area of text type is 27 × 54 picas.

Printers measure in picas and half-picas. Any distance smaller than a half-pica is described in points.



Ems



Picas and points are measures of *linear* distance. An *em* is a measure of *area.* It is not a fixed size. It is an area equal to the square of the size of type being used. A 10 pt em is 10 x 10 pt. A 14 pt em is 14 x 14 pt.

Ems are used to measure space in typesetting. For example, the first line in a paragraph may be indented 1 or 2 ems. Or a paragraph quoted from another work may be indented 1 em on either side.

Half an em is an *en.*

(Here is something more to watch, however. You may hear printers talk about an em when they really mean 12 points. In that case they are referring to a pica or a pica em.)

Summary

Point — linear measure
72 pts = 1 in.
28.5 pts = 1 cm
used to measure type size
used to measure small distances

Pica — linear measure
1 pica = 12 pts
used to measure line widths
used to measure type areas

Em — area measure
1 em = the type size squared
used to measure space in a line

En — area measure
2 ens = 1 em
used to measure space in a line

Abbreviations

Printers use abbreviations for many of these terms. Here are the most important.

roman	rom
italic	ita1 (or underline the word)
bold or boldface	bf (or below)
uppercase	uc
lowercase	IC
level small capitals	lsc or sc
upper and lowercase	ulc or u&lc
em	M or M or
en	N or N or

Two useful type families

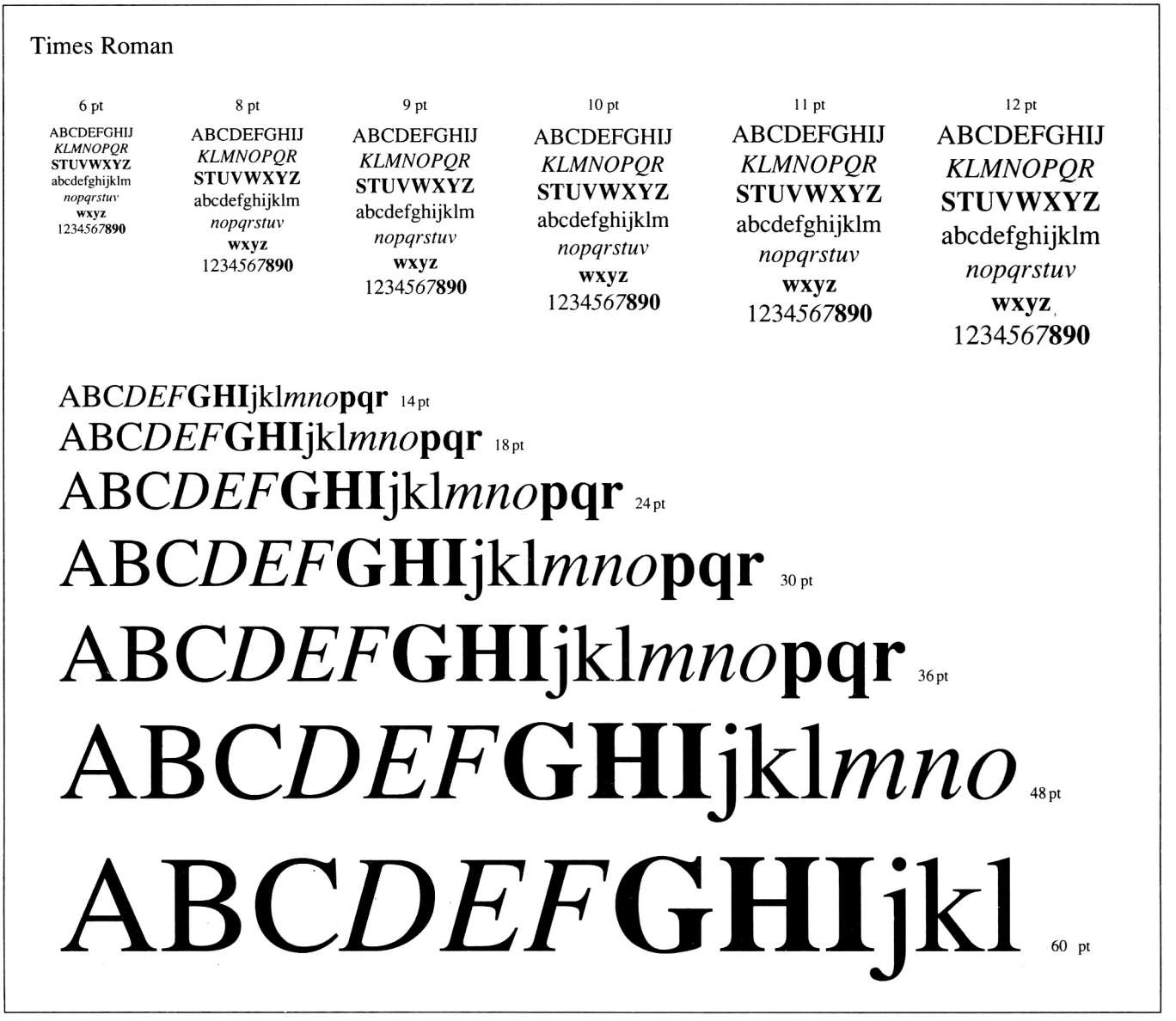
Here are two useful type families, one with serifs, one sans serif. Both are popular with editors and typographers for good reasons. With these two (or faces similar to them) any publishing program can be effective and economical. All its publications may look much the same, but that is not necessarily a bad thing. A standard design gives a publishing program a strong sense of identity. Its publications are quickly recognized.

Times Roman

Times Roman may be the most successful typeface ever designed. Certainly it is the most popular face designed in the 20th century.

Times Roman has several advantages.

- It is widely available on almost every form of typesetting equipment. (Somelimes, in some equipment, it has been changed slightly in form and has a different name.)
- It is available in all sizes, from 6 pt to 72 pt, and has a wide range of symbols and accents.
- It is easy to read.
- It is compact: a large number of words fit on a page.
- There are no fussy details. It does not call attention to itself.
- It is neutral. It can be used for many different kinds of messages.
- People are used to reading it. They feel comfortable with it.

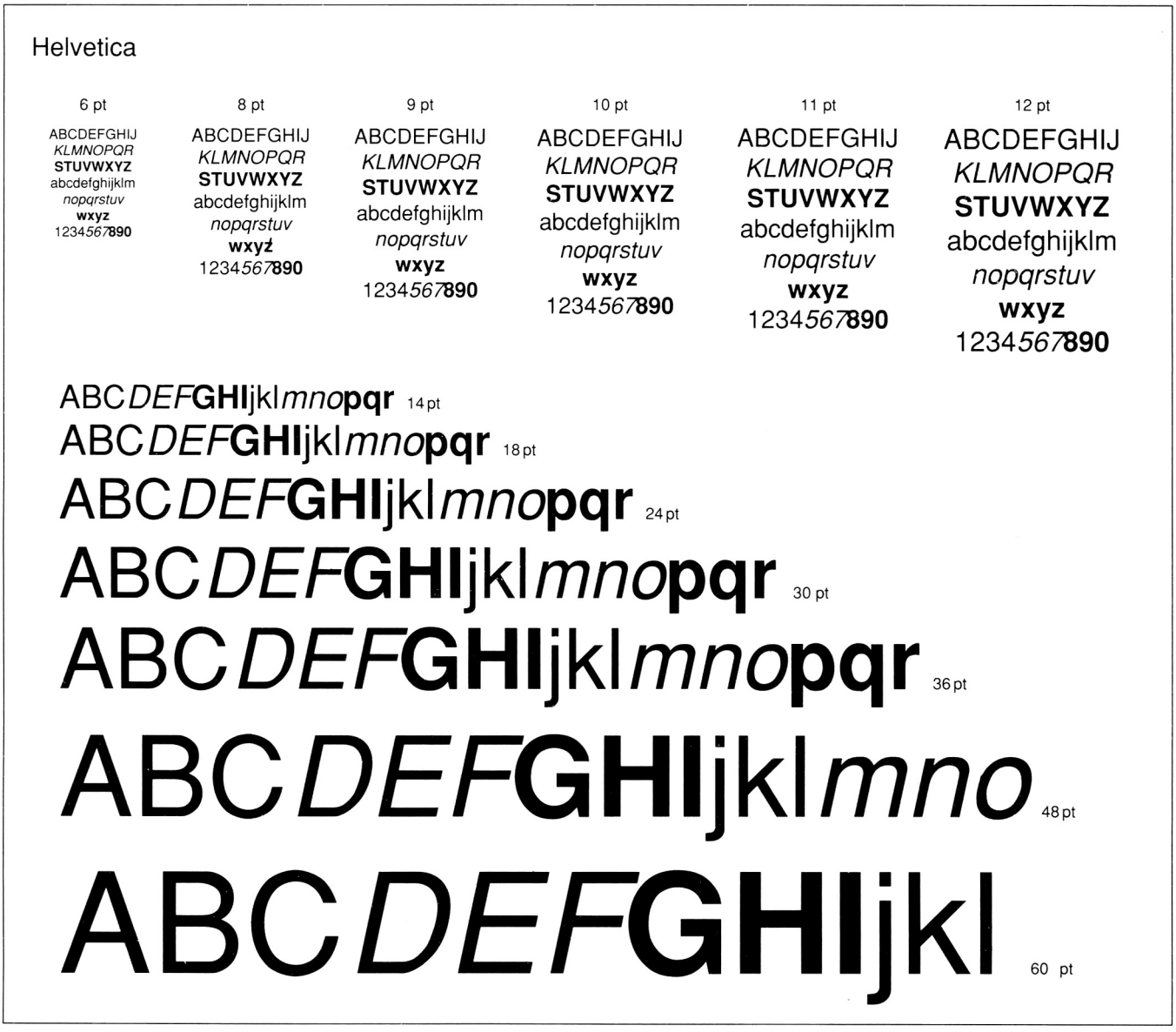


Helvetica

Helvetica is perhaps the most popular of several sans serif faces that look similar. If Helvetica is unavailable, typesetters may have Univers or Megaron.

Helvetica is popular for several reasons.

- It has a clean, modem look.
- It is easy to read, especially in short texts.
- It is compact.
- It or its look-alikes are widely available on all typesetting systems.
- It is available in a wide range of sizes and weights (regular, light, bold, and black).
- It is especially good for lettering on charts, graphs, maps, and drawings.
- It is neutral in character, and therefore good for a variety of work.
- It works well with a variety of other typefaces.



7.4
Easy reading: the typeface

If a text-especially a text of any length—is going to be easy to read. it must meet three conditions.

- The reader's eye must be able to move smoothly along the individual lines of type.
- The reader's eye must be able to move smoothly from line to line down the page.
- The reader must be able to recognize individual letters and words easily.

Several things make a printed text easy or difficult to read. The first is the typeface.

Some typefaces are easy to read, others difficult, just as one persona's, handwriting may be easy to read and another's not.

Editors often have little choice in typefaces. Type is expensive, and many printers can afford only a small variety. Here are some guidelines in choosing the best face from what is available, and in making the best use of it.

Weight

Typefaces that are unusually light or heavy in weight may be more difficult to read than typefaces that are more normal in weight.

Design is the art of assembling diverse elments into an organized unit. Typography starts with the letter and builds from there.

Use boldface sparingly. An author or editor may want an entire paragraph in bold to give it emphasis. The paragraph will certainly stand out on the page, but the result may be the opposite of what is intended. If reading is difficult, the content is not absorbed as easily.

Some typefaces look beautiful in display because they have strong contrast between lines in the individual letter. In texts, they may be almost impossible to read. The strong vertical lines act like stakes preventing the reader's eye from moving along the line easily.

Italic

Design is the art of assembling diverse elements into an organized unit. Typography starts with the letter and builds from there.

Many people think that a long stretch of text set entirely in italic is also difficult to read. This may be just because we are not used to reading italic. Some italic faces are in fact easy to read. Many others are not particularly readable, especially some that are made within a computer simply by slanting the regular roman face.

Authors and editors sometimes use italic to give emphasis to one or more paragraphs, or to identify a long quotation as coming from another source. Wise editors do so cautiously, making sure that the italic in the text face being used is easy to read in long stretches.

Italic is useful for emphasizing a few words at a time in a text that is otherwise in roman face. The italic blends well with the rest of the type. (A page with scattered words in boldface can look like a person with measles.)

Serifs

Design is the art of assembling diverse elements into an organized unit. Typography starts with the letter and builds from there.

Design is the art of assembling diverse elements into an organized unit. Typography starts with the letter and builds from there.

Typographers argue strongly about this, but many experiments suggest that sans serif type is not as easy to read as type with serifs. The serifs extend the letters horizontally and tie them together, so that the eye moves easily along the line. Sans serif letters, in contrast, are more isolated individually; the eye does not move as easily from one letter to the next.

The clean, modem look of sans serif type is often desirable. Sans serif works well as lettering in graphs, charts, maps, diagrams, and other illustrations. It can also be effective in text that is meant to be read in small units of up to 200 or 300 words. for example, in a booklet with many illustrations, each with a small amount of accompanying text. Many people feel, however. that sans serif is undesirable in a text that stretches continuously over many pages, especially if the paragraphs are long or the message complicated.

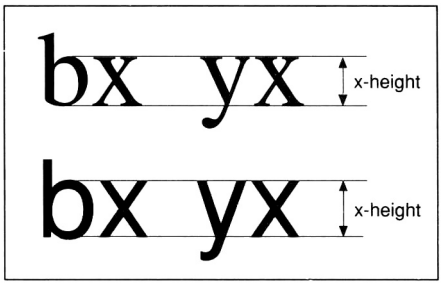
Sans serif italic combines the disadvantages of both styles and is one of the most difficult of all styles to read. Try not to use it in text for more than 10 words at a time.

x-height

The easier it is to identify individual letters, the easier it should be to read a particular typeface. In the Latin alphabet, most of the letters use only the middle part of the available vertical space. Only seven letters (b, d, f, k, h, l, t) stretch up to the top of the available space. Only five (g, j, p, q, y) stretch down to the bottom of the available space. Those 12 letters are said to have *ascenders* and *descenders,* and even in most of them the middle part is what distinguishes one letter from another. If the middle part is large and open. a typeface should be easy to read.

This middle portion is often called the *x-height* because it is the height of that letter, and *x* is the only letter with four serifs squarely in its upper and low comers.

The x-heght can vary greatly between typefaces. Some have long ascenders and descenders and relatively less x-height: others reduce the ascenders and descenders to obtain greater x-height. The two faces in the example are the same type size, because the distance from the top of the ascender to the bottom of the descender is the same in both cases, but the x-heights are very different. So is the appearance when they are set in text size.



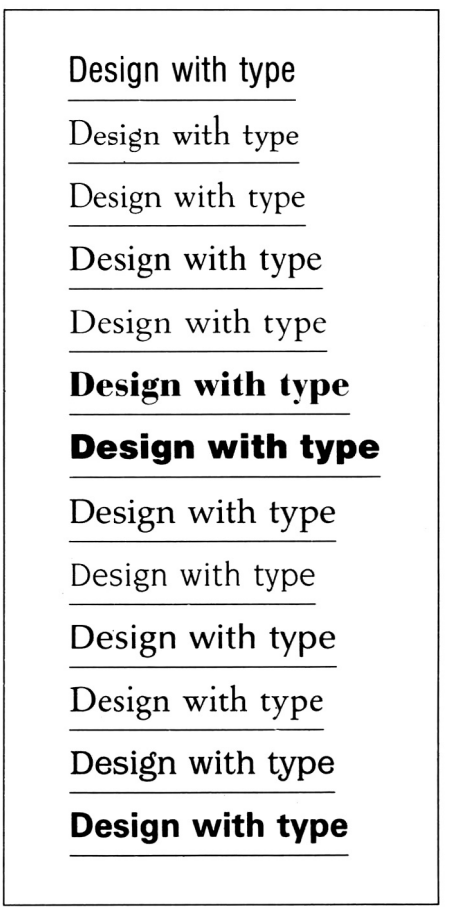
In two typefaces of the same size, the one with the larger x-height will look larger, and (unless it is badly designed) will likely be easier to read.

These two paragraphs are set in type of the same point size, but in two different typefaces. One typeface has a larger x-height than the other. Which do you find more readable?	These two paragraphs are set in type of the same point size, but in two different typefaces. One typeface has a larger x-height than the other. Which do you find more readable?

Letter width

The individual letters in most typefaces vary in width. An *i* is narrower than a *k,* which in turn is narrower than an *m,* and a lowercase m is narrower than an uppercase *M.* The differences give type much of its beauty and economy. In contrast, the letters on most typewriters are all the same width; they are not as compact (the i is as wide as the *M,* even though it doesn't need all that space) or usually as elegant.

An alphabet varies in width from typeface to typeface. That is, the same word in the same size of type may take more space in one face than in another. Some faces have been designed for economy: they are compact and fit many characters in a given space. Others have been designed more generously: their characters are rounder and more open. A type with a large x-height is usually wider than one with a small x-height if the normal letterforms have been maintained.



The difference in width of letterform may not be obvious. but it can have considerable impact. If there is a large amount of text, a more compact face can Save several pages of printing. If the typeface is chosen carefully, the loss in readability will be small.

Extremes in this area should be avoided for text. Condensed faces are suitable for display type, but would be difficult to read in text. Extended faces are wasteful.

7.5
Easy reading: other variables

Once a typeface has been chosen, several other decisions follow. They will determine how easy it will be to read the text set in that face. The most important are

- the size of type
- the length of lines
- the space between lines
- the space between words
- the use of uppercase and lowercase
- the contrast between type and background

Size of type

No one wants to read type that is too small to be read comfortably. No one wants to read type that is so large the eye has to travel great distances to read a sentence. Type should be a comfortable size.

What does that mean? The best size to use will depend on the average reader's age, education, and eyesight. For most adults, 11 or 12 pt type is easy to read. Publications about specialized subjects are often set in 10 pt type. Larger sizes should be used in publications aimed at people who have difficulty reading because they have poor eyesight or little education.

In the choice of type size, easy reading must be balanced against increased cost. The same number of characters must be set whether a manuscript is set in 10 or 12 pt, but the text will take up about 25% less space if it is set in the smaller size. A smaller type area means fewer pages and less printing. When paper is expensive and money is scarce, that can be a deciding factor - even if the reader does have to work a little harder.

Type smaller than 10 pt should probably be avoided except for short sections of text. Tables can be set in type smaller than 10 pt. So can the captions below pictures, text within illustrations, quoted extracts from other publications, and notes.

Sometimes you can use 9 pt instead of 10 pt or 11 pt instead of 12 pt without losing readability because the typeface you have chosen has a large x-height.

Length of lines

As you read this, your eye is moving continuously from the start of one line of type to the end of the line, then back across the page to the beginning of the next line, and so on repeatedly until the end of the page, at which point it must start all over. We (the author, editor, designer, and publisher) all hope you find these lines comfortable to read. They were planned that way.

If lines of type are too long, readers may lose their way. They may have difficulty finding the beginning of the next line: they may skip a line, or repeat what they have just read. They may get tired from too much eye motion.

> The use of writtten or printed symbols as a basic element of design is not a discovery of our era; it is not even a result of the invention of movable type by Gutenberg. It reaches back into the dawn of civilization, to wherever and whenever man took up a tool and attempted to inscribe on a receptive surface a message to be preserved. It would seem that there was something of an instinctive urge in the dark recesses of the pre-civilized mind towards an orderliness and a pattern in the grouping of the symbols which were to convey this message.

So what is the best length of line for easy reading? Considerable research has gone into answering that question. The answer varies, obviously, with the size of the type being used. It varies also with the design of the face.

Research suggests that a basically readable line is about two alphabets long, or 52 characters. In 10 pt Times Roman, that means a length of 20 picas. In 12 pt Times Roman, the basically readable line would be three picas longer.

In practice, lines are readable up to 65 or even 75 characters, provided there is enough space between them. In 10 pt Times Roman, this would be a maximum of 28 picas. That would be all right for specialized material, but would probably be unsuitable for general readers. A text that looks difficult to read is too often never read.

In pages with two or three columns of type, lines will be less than 52 characters long. With narrow columns, the reader's eye has to move less. Many readers can grasp an entire line in a newspaper at a glance; their eyes don't need to move horizontally, only vertically down the column.

Columns that are too narrow create other kinds of problems, however. The typesetter has trouble fitting words into such short lines, especially if many of the words are long. Spaces between words grow too large for comfort, and too many words are broken with hyphens at the end of lines. Reading again becomes difficult. Lines should normally be at least 20 characters long. In 10 pt Times Roman that would be 7.5 picas; in 12 pt at would be 9 picas.

> The invention of movable type did not change this urge towards the beautiful in graphic presentation; it simply provided the means of reproducing the original work and so widening the public who would see and read.

Space between lines

We can help the reader's eye move from the end of one line to the beginning of the next by putting some space between the lines. That space becomes a white roadway for the eye.

10/10 pt Times Roman
The objective of typographic design is to organize all of the elements of communication into a harmonious and unified whole, either by achieving a quiet uniformity of similar elements or by the visually exciting use of contrasting ones.

10/11 pt Times Roman
The objective of typographic design is to organize all of the elements of communication into a harmonious and unified whole, either by achieving a quiet uniformity of similar elements or by the visually exciting use of contrasting ones.

10/12 pt Times Roman
The objective of typographic design is to organize all of the elements of communication into a harmonious and unified whole, either by achieving a quiet uniformity of similar elements or by the visually exciting use of contrasting ones.

10/13pt Times Roman
The objective of typographic design is to organize all of the elements of communication into a harmonious and unified whole, either by achieving a quiet uniformity of similar elements or by the visually exciting use of contrasting ones.

Space between lines is often called *leading* (pronounced "ledding"). The name comes from the days of hand-set type, when compositors inserted thin strips of lead between the lines of type. Now the space is inserted mechanically or electronically.

The space is normally measured in points, but with modern methods of setting it can be adjusted to one-tenth of a point. For practical purposes, editors normally need use only 1, 2, or 3 points of leading.

The amount of line spacing will depend on the length of the line, the size of the type, the typeface, and the needs of the reader. In 10, 11, and 12 pt type, it is common to insert 2 pt leading. In 10 pt type, the space from the base of one line to the base of the next is then 12 points (10 points type + 2 points leading): we describe this type as 10 on 12 point, or more simply 10/12 pt. In 11 pt type, adding 2 points of leading means that the space from the base of one line to the base of the next is 13 points (11 + 2), which can be called 11 or 13 or 11/13 pt, and so on.

Leading is especially important if the line is long or if the face has a large x-height. Faces with large x-heights need more leading to help the reader's eye move easily from line to line.

The space between the lines should be consistent throughout a publication. Sometimes compositors add extra space to a few lines when there is not quite enough type to fill a column or page. (If a column of 10 pt type is one line short, for example, they might add 1 pt extra space in the first 10 lines but leave the rest of the column in standard line spacing.) This looks unpleasant, and it confuses the reader who may wonder why these particular lines have been singled out for special treatment. Easy reading depends on consistency in all areas of publication.

Leading does add to the cost of a long publication. An extra point of leading per line can add several pages to a book-length publication. As in so many other areas, it is necessary here to strike a balance between helping the reader and saving money.

Space between words

There must be enough space between words so that the reader can tell one word from another without trouble. On the other hand, there must not be so much space that the reader has trouble moving smoothly from word to word along the line. Large spaces between words are like ditches in a path that must be jumped.

There is no single rule for the right amount of space. Large type needs less space between words than small type. Wide type needs more space than narrow type. A type with a small x-height needs less than a more open face. One rule of thumb is to allow as much space between words as the width of the letter *c* in the typeface being used.

Justified or unjustified

Reading is easier if the space between words is consistent. The reader's eyes know exactly how far to jump between words. But this is impossible when type is *justified,* that is, when it is set so that all lines are exactly the same width and both the left-hand and right-hand margins are straight.

The reason is simple. One line of type will rarely have exactly the same number of characters or words as other lines in the same paragraph. The only way to make lines equal, therefore, is to vary the space between the words. As a result, in some lines of justified type the spaces between words are wide, in others narrow. This may not be a major problem if lines are long, because the extra spacing can be spread among several words. Even so, it can be distracting. In short lines, with few words, the spaces can become unpleasantly large or small. (Sometimes typesetters avoid wide spaces between words by adding space between letters within the words. This makes the line even more difficult to read. It should be avoided.)

The objective of typographic design is to organize all the elements of communication into a harmonious and unified whole, either by achieving a quiet uniformity of similar elements or by the visually exciting use of contrasting ones.

The objective of typographic design is organize all of the elements of communication into a harmonious and unified whole, either by achieving a quiet uniformity of similar elements or by the visually exciting use of contrasting ones.

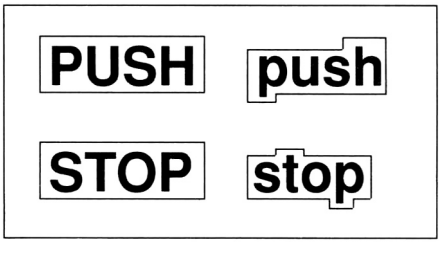
Space between words can be kept the same if the lines are *unjustified,* that is, if the right-hand margin is allowed to be uneven or ragged.

Some people do not like such *ragged-right* setting; they think it looks too informal or "not like a book." But there is no special reason for having straight right-hand edges. It is just something we are used to.

On the other hand, there is an advantage to ragged-right setting. It is easier to read. Until it is more accepted, it cannot be used for all publications, but it deserves to be considered.

Uppercase and lowercase

Capital letters can be over-used.



Words written entirely in capital letters are more difficult to read than words written in lowercase letters. The reason is simple. Uppercase letters are all the same height. The shape of words written in uppercase is always rectangular: it varies only in length. Lowercase letters have ascenders and descenders. These give lowercase words distinctive shapes, which can be recognized. Much of our reading is, in fact. done by recognizing whole words rather than individual letters.

Titles of articles and books are sometimes set entirely in capitals. They are hard to read, especially if they contain long words. All-capital setting should be used only when the lines are short and only a few words are involved.

THE ROLE OF PUBLISHING IN SPREADING THE RESULT OF RESEARCH

The Role of publishing in Spreading the Results of research

The role of publishing in spreading the results of research

Capitals also slow the eye when they are used to start every word in a sentence or title. A Sentence with Almost Every Word Beginning with a Capital Letter Is Jumpy and Hard to Read. Many publications now use a capital only at the beginning of titles or headings. The titles are then as easy to read as a normal sentence.

Some publications use this style in lists of references. They also prefer to report time as "10 pm" instead of "10 PM" and refer to "the head of the department" instead of "the Head of the Department."

Contrast

No matter how well the type has been chosen and composed it will not be easy to read if it does not contrast strongly with its background.

Black type on white paper is still the most readable combination for long continuous texts. Even for shorter texts color should be introduced with caution. Whenever any color other than black is used on white, some contrast is lost. If the ink is dark enough (dark brown, deep blue), the loss may not be significant. With many other colors, the first impact may be increased by using color, but not the ease of reading. For example, a red headline is eye-catching and easy to read if it is short and large; a block of text type set in red also catches the eye but can prove difficult to read. In such cases it may be advisable to increase the size of type to compensate for the loss of contrast. Light colors (yellow, light blue, etc.) should be avoided for text type.

Colored paper is a good way of attracting attention, but also demands some caution. Black contrasts well with yellow. On the other hand, black type, no matter how large, will almost disappear if printed on dark blue or dark brown paper. Colored paper should be light enough to ensure contrast. Again, it may be advisable to use type slightly larger than would be needed on white paper.

It is of course possible to combine two colors other than black and white and achieve high levels of contrast. This technique can be highly effective if the right colors are chosen, but it requires a trained eye. Most editors may need advice.

In reverse type, the letters appear white against a solid background printed in black or another color. Reverse type attracts attention and can be used for display, but even then the background may overwhelm the text. Reverse type should not normally be used for text; if it is used for text, it may be advisable to increase the type size slightly or use boldface.

7.6
Guideposts in type

Type in different sizes, forms, or faces can help readers find their way through any publication. It can announce what is important and what is less so. It can show how one part of the text relates to other parts.

Type thus provides a *visual structure* that matches the author's word structure. Used properly, type is a powerful editorial tool.

Functions

Several functions of the text can be identified by varying the style of type. The most important follow.

Titles

The major title is the title of the book, booklet, journal, newsletter, folder, or other publication. This is what the readers see first. It announces the main subject of the publication. It should be easily readable and attractive.

Minor titles are the titles of chapters or parts in a book or booklet, or of articles in a journal or newsletter. They show the basic structure of the publication and guide readers to the parts of greatest potential interest. They must stand out from the rest of the text.

Headings

Headings are lower-level announcements of a new section or new subject within a short text, chapter, or article.

Headings (also called *subheads*) should appear only as often as needed, and only when needed. Short texts may need no headings. Longer texts may need only one level of heading. Complex texts may need as many as three levels of heading. It is difficult to distinguish more than three levels of heading with type. If a manuscript is so complex that it needs more than three levels, another technique should be used, such as numbering paragraphs (see unit 3.2).

In a long publication like a book or journal, some parts of the text may need three levels of heading, other parts only one. In such cases there must be typographic consistency *within* parts, but not necessarily *between* parts. For example, the single-level heading in the simpler part may be in the same style as the second-level heading of the more complex part, if that is more effective typographically.

This unit, for example, has three levels of heading: 1) Helvetica uppercase and lowercase size 14 pt in the margin; 2) Helvetica uppercase and lowercase size 12 pt in the margin; 3) Times Roman italic boldface run-on in the text.

Text

The main text is the body of the publication. This is where readers will spend most of their time and effort. Special care must be taken to make sure it is easy to read.

Minor texts include abstracts, quotations, lists of references or bibliographies, notes at the end of a book or article, tables, and other secondary texts, sometimes including appendices. Readers will only refer to these; they will not read them continuously for long periods. Minor texts can be set in slightly smaller type than the major text.

Subtexts include footnotes, indexes, copyright notices, and some other publishing information. Readers will refer to this material only briefly and occasionally. An index, for example, will be read only one line, or a few lines, at a time. Subtext can be the same size as or slightly smaller than minor text.

Paragraphs

Paragraph openings announce that a new idea or set of related thoughts is beginning.

The start of a new paragraph can be shown typographically in two ways. The traditional way is to indent the first line 1 em (or more if that is desired or normal in the country where the text is being published). Another way is to leave a line of space between paragraphs; in that case no indention is needed. Avoid doing both: either indent or leave a line space. There is no need to give a message twice.

In the traditional method, the first paragraph after a title or heading needs no indention. The start of a new set of related thoughts has already been announced by the title or heading. The page will look tidier if the first line of the paragraph is not indented.

Type function and size

The size of type used for each of these functions will depend on several factors, including

- the nature of the subject
- the nature of the readers
- the customs of the country or region in which the readers live
- the availability of type of different sizes and weights
- the size of the publication, the width of the columns, and similar considerations

Here is a range of sizes used frequently to show the relative importance of titles, headings, and text.

Use within publication	Common sizes (in pt)	Remarks
Titles		
major	30, 36, 42, 48	
minor	18, 20, 24	
Headings		
1st level	12, 14, 18	
2d level	10, 12, 14	
3d level	text size	
Headings all in text size"		
1st level	roman capitals (sometimes bold or small capitals)	separate line
2d level	italic u&lc	separate line
3d level	italic u&lc	starting text line
Text		
major	9, 10, 11, 12	1 or 2 pt leading
minor	1 or 2 pt less than text	1 pt leading
subtext	2 or 3 pt less than text	1 pt leading or none

* If all headings are in the same typeface and size as the main text, typesetting can be done more quickly and will cost less.

Type function and face

The type used for titles does not have to be in the same face as the type used for text. Even first- and second-level headings may be in a different face from the text, as in this publication.

Changing the typeface adds to the contrast between the titles and headings and the text. But the distinction should be *immediately* obvious. The two faces should be very different in form. Sans serif, for example, can be used effectively for titles with a text face that has serifs. If display and text are to be set in two different faces with serifs, the two faces should not look even a little alike. For example, if the text is set in a face with little contrast between the lines that make up the letters, the display face could have strong contrast between lines. If the difference is not immediately obvious, readers will be confused. They will ask themselves "This looks a lot like the other type, but is it? Why is it different? Is this a mistake?" Questions like those interfere with the message, and should be avoided.

It is usually more economical to use contrasting faces only for titles, which are normally set separately from the text. It is probably best to use a contrasting face for headings only if they stand out from the text, as in these pages. Remember that each time the typeface changes within the text, another operation is involved. Each change costs time and money. The simpler the design is, the faster and cheaper it can be prepared for printing.

7.7 Page formats

Titles, headings, text, and illustrations must be combined on pages in a way that is attractive to the eye and convenient for the reader. This is the *format*: the pattern established by type area, margins, and print.

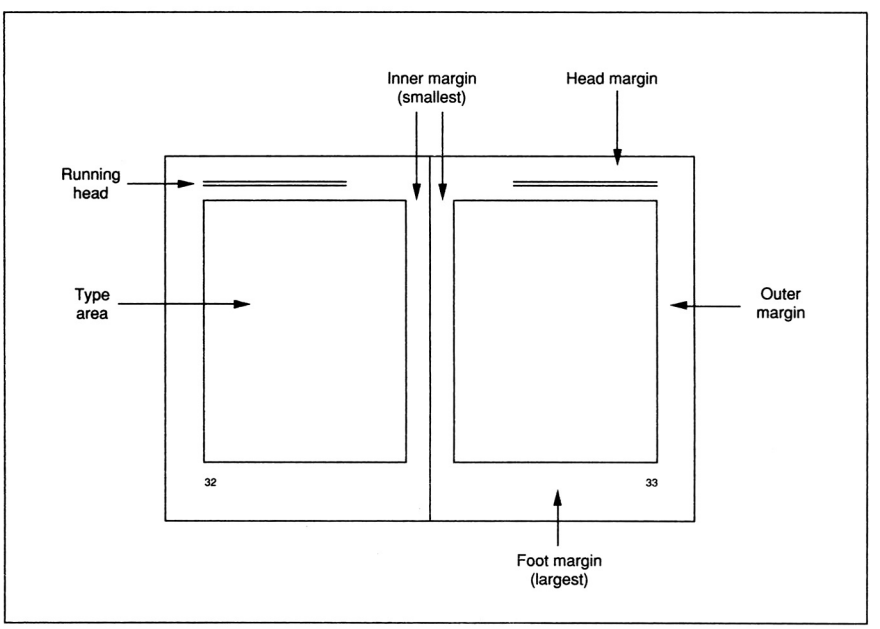
Here are some guidelines for planning or judging a page layout.

Margins

Margins should rarely be equal.

In most publications the margin at the bottom of the page should be larger than the one at the top. This helps the visual balance, since the reader's eye is certain to be drawn to the top of the page.

In bound publications (books, booklets, journals) and folders, the inner margins are traditionally smaller than the outside margins. This holds the facing pages together visually as a unit. If the inner margins were as wide as the outer ones, they would combine to make a single broad strip of white that would split the facing pages apart. One classic formula for the proportions of the inner, top, outer, and bottom margins is 1.5:2:3:4.



Librarians often bind or rebind publications, for example to gather a year's issues of a journal in an annual volume or to protect a paperback by putting it in hard covers. This operation cuts into the inner margin;

usually it takes about 3 mm (one-eighth of an inch) off that margin. Especially in journals, the inner margin should be wide enough to allow for this loss.

Margins should not be wastefully wide. But if they are too narrow, the page may look crowded and unattractive. If the inner margin is too narrow, a book may also be hard to read.

The area within the margins is called the *type area.* The type area includes running heads and page numbers (discussed later in this unit). Its proportions should be pleasing: this may mean that it should be a shape the readers are used to. In books and journals, the type area may take up only about 55% to 65% of the total page, if margins are large enough for convenient reading but not extravagant. In newsletters and magazines, the percentage will be higher.

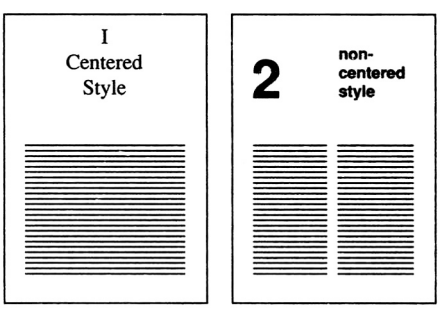
Design: centered or flush left?

The page should have a pleasing balance. Balance can be symmetrical or nonsymmetrical.

In symmetrical designs, titles are centered horizontally on the page. So are other elements: first-level and maybe second-level headings, running heads (defined on page 296), page numbers, and illustrations. If the page is folded in half vertically, one side mirrors the other side.

In nonsymmetrical designs, headings and other elements are usually on one side of the page. Balance is achieved with white space and relative weight of type.

Centered style is suitable for simple, straightforward texts, especially if they have few levels of heading. It is classical in appearance and has a sense of tradition.



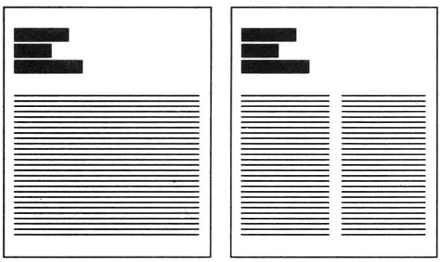
Non-centered style is more modern in appearance and is often easier to use for complex texts with several levels of heading. Some people think it is more suitable for scientific publications than the centered style.

The most common form of non-centered style is *flush left* in which all headings and other elements are lined up with the left-hand side of the page. *Flush right* layouts are less common. In cultures that read from left to right, flush right layouts are more difficult to read.

How many columns?

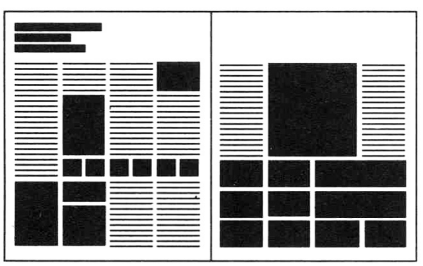
One column Formats may be designed with one column on a page or many columns on a page. One style is often more suitable than others.

A publication that is all text, with few or no illustrations or tables, can usually be planned in a simple one-column format. This is the traditional book design. The page size should be about 6 × 9 in. (152 × 228 mm) or A5 or smaller. Otherwise the column will be too wide for easy reading or the margins will be wastefully large.



Two columns More complex publications, especially those with many graphs and charts or scientific illustrations, may be better in a two-column layout. This format is flexible: tables and illustrations can be one or two columns wide, depending on their nature, and can usually be placed close to the references to them in the text. The format is also compact and economical. Because the two columns are normally narrower than a standard book width, their type size can be reduced and still be easy to read. As a result, a two-column page can hold more words than a single-column page the same size.

Economy plus flexibility make two-column formats attractive for reference books and many journals. Pages usually are larger than standard book size. A two-column page should be at least 6 × 9 in. (152 x 228 mm) or A5, and often larger. Otherwise the columns will be too narrow, especially for complex texts with technical words or detailed illustrations.



Three or more columns Magazines, newsletters, other publications made up of many small articles, and manuals with many illustrations and many separate steps of instructions can often work best with three or even four columns. The extra columns provide maximum flexibility in laying out text, illustrations, and other elements. In addition, the columns are narrow and accordingly easy to read. Pages should be at least 7 × 10 in. (178 × 254 mm) or A4.

Even if most of a publication is set in one column, sections with many short lines can be set in two or even three columns. An index, for example, is usually set in narrow columns. A complex table of contents can be handled the same way, and so can lists of short items, and notes at the end of articles or books.

Illustrations

Illustrations may appear as a separate section or on the same pages as the text. This will depend in part on the type of printing and paper to be used and the quality of reproduction desired. It may be best to print them as a group if there are frequent references through the text to the same illustrations, since they will be easier to find in one section than on scattered pages. Also, if illustrations are grouped in one section it may be possible to print them on a better quality of paper than is used for the text, and in that way get better reproduction. This is particularly important with halftones.

Frequently, however, the reader is best served when illustrations are close to the references to them in the text. This is difficult or expensive to do in letterpress, but is practical with offset lithography. (For more about these forms of printing, see unit 8.2.)

Many designers suggest that illustrations should appear at the top or bottom of a page, but never in the middle. When illustrations are in the middle, the reader must jump over them in reading the text. Some pictures will look better at the top of a page, others will look better at the bottom. Variety in placing them is good. However, the action in

pictures should always be *into* the page, not off it, and that can influence their position.

Tables

Tables should appear either at the top of the page or at the bottom. but always in the same place. That way the reader can find them easily and read the text without interruption. If two or more tables must appear on a single page, they should be stacked one immediately above the other.

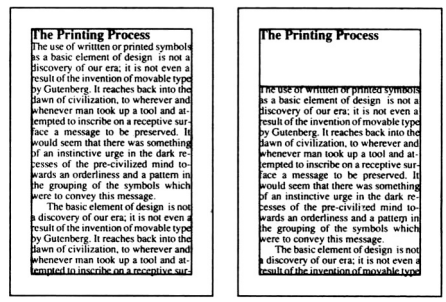
Occasionally there may be so many tables that they are best placed in a section of their own at the end of the text.

Grids

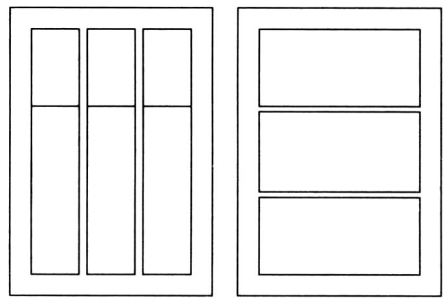
To help them in planning, many designers use a *grid.* This is an outline map of the page, using horizontal and vertical lines. A grid creates order and consistency in the appearance of the publication. It makes it easy to place type and illustrations, even in the most complex kinds of publications.

A grid may take many forms. The simplest kind outlines the type area and margins. A horizontal line may be added to show exactly how far down the page the text begins after the title of an article or chapter.

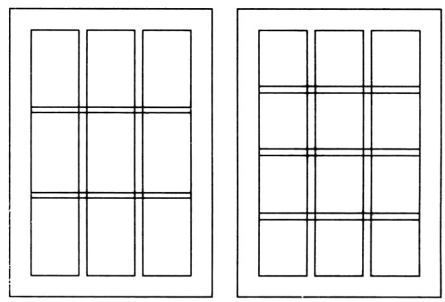
In more complex grids, the vertical lines not only define the inner and outer margins. They also show the number of columns, the width of the columns, and the space between columns.



Horizontal lines show the top and bottom margins and the depth of the type columns. They can also show where text begins, where titles go, and where illustrations or tables are normally placed.

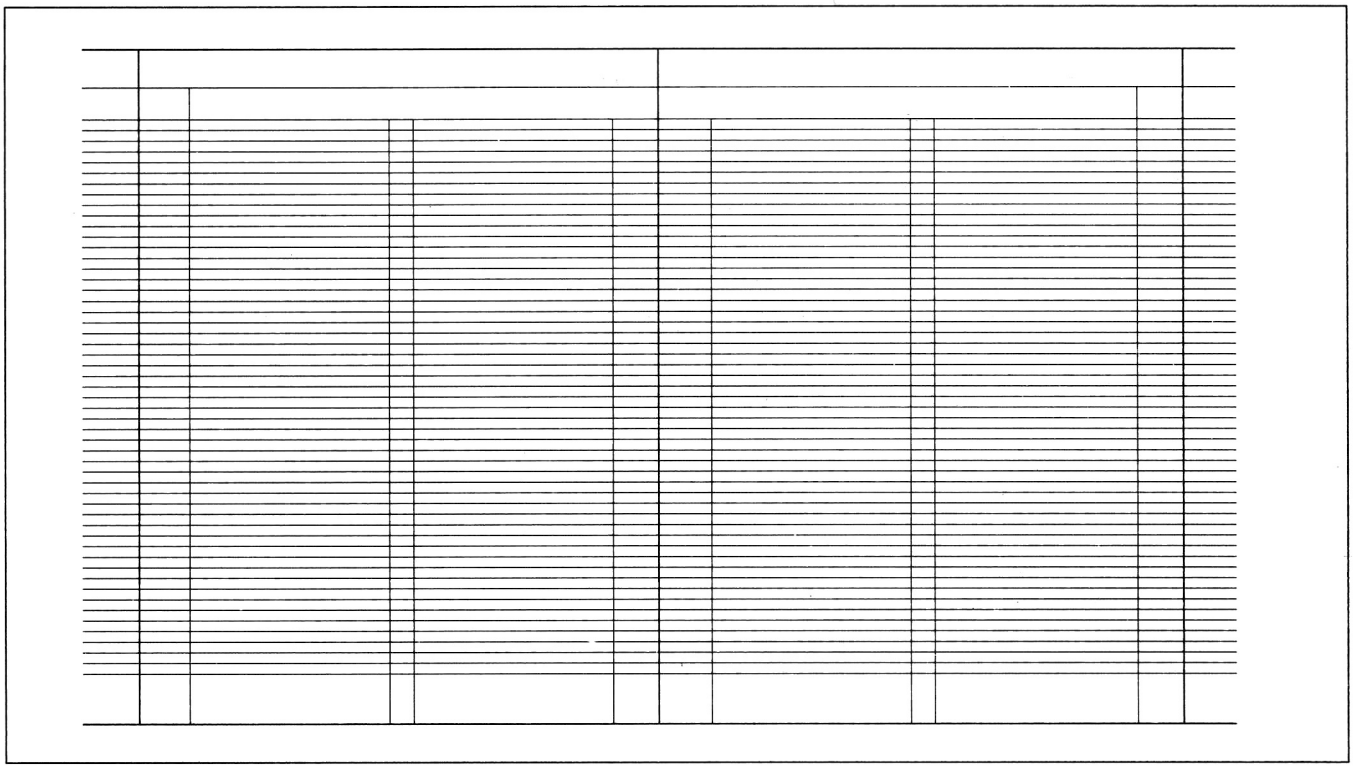


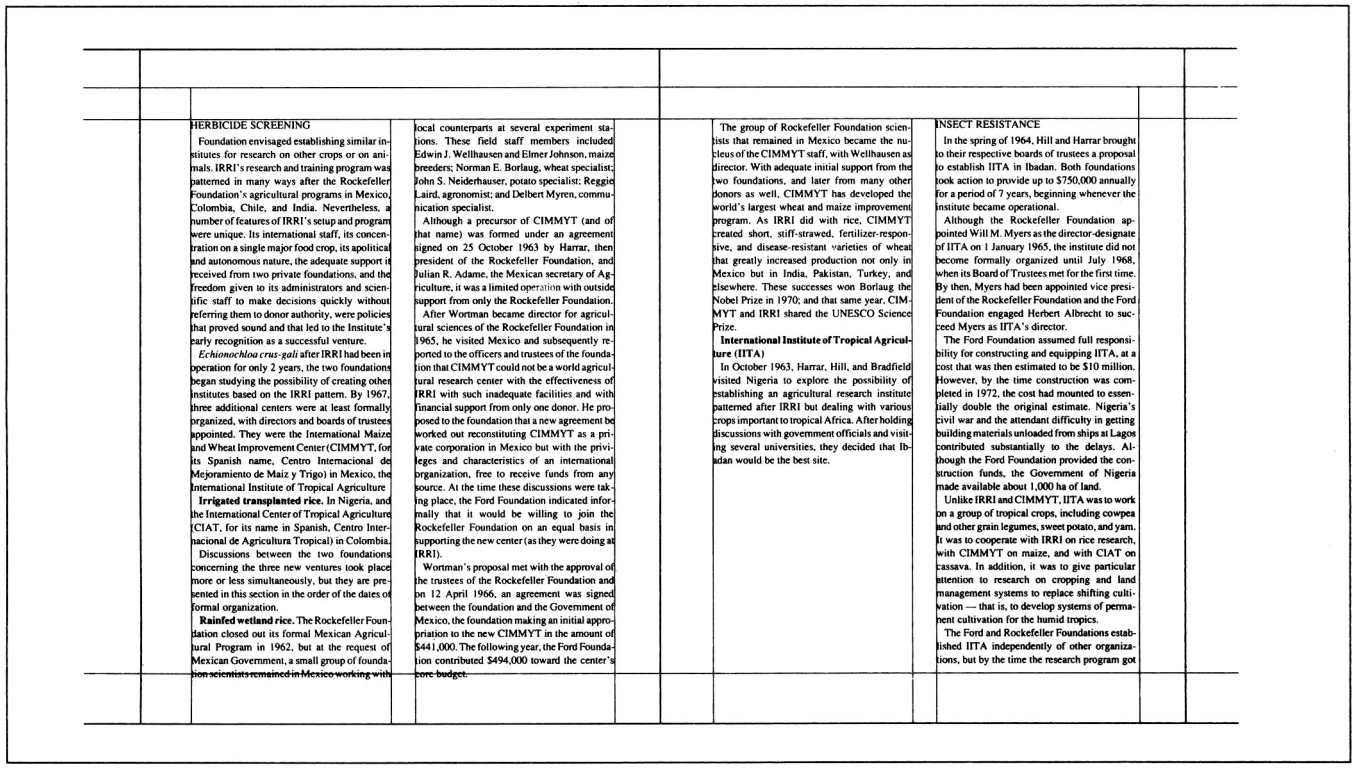
The vertical and horizontal lines together form rectangles that can be used to place type and illustrations. A grid that is divided in two horizontally, for example, can be used for a heavily illustrated book: pictures always go in the top half of the page and type in the bottom half. This manual uses a grid with two vertical columns, one twice as wide as the other. In effect, its grid has three equal columns but two are combined. Many variations are possible. Some are shown on the following pages.



Grids are particularly useful for someone with little experience in designing publications. They give a firm outline within which to work.

Grids also help the printer who must assemble the type and illustrations into pages. Using grids thus saves money. Grids also help readers, because the pages follow a consistent pattern.





HERBICIDE SCREENING

Foundation envisaged establishing similar institutes for research on other crops or on animals. IRRI's research and training program was patterned in many ways after the Rockefeller Foundation's agricultural programs in Mexico, Colombia, Chile, and India. Nevertheless, a number of features of IRRI's setup and program were unique. Its international staff, its concentration on a single major food crop, its apolitical and autonomous nature, the adequate support it received from two private foundations, and the freedom given to its administrators and scientific staff to make decisions quickly without referring them to donor authority, were policies that proved sound and that led to the Institute's early recognition as a successful venture.

Echionochloa crus-gali after IRRI had been in operation for only 2 years, the two foundations began studying the possibility of creating other institutes based on the IRRI pattern. By 1967, three additional centers were at least formally organized, with directors and boards of trustees appointed. They were the International Maize and Wheat Improvement Center (CIMMYT, for its Spanish name, Centro Internacional de Mejoramiento de Maiz y Trigo) in Mexico, the International Institute of Tropical Agriculture

Irrigated transplanted rice. In Nigeria, and the International Center of Tropical Agriculture (CIAT, for its name in Spanish, Centro Internacional de Agricultura Tropical) in Colombia.

Discussions between the two foundations concerning the three new ventures took place more or less simultaneously, but they are presented in this section in the order of the dates of formal organization.

Rainfed wetland rice. The Rockefeller Foundation closed out its formal Mexican Agricultural Program in 1962, but at the request of Mexican Government, a small group of foundation scientists remained in Mexico working with local counterparts at several experiment stations. These field staff members included Edwin J. Wellhausen and Elmer Johnson, maize breeders; Norman E. Borlaug, wheat specialist; John S. Neiderhauser, potato specialist; Reggie Laird, agronomist; and Delbert Myren, communication specialist.

Although a precursor of CIMMYT (and of that name) was formed under an agreement signed on 25 October 1963 by Harrar, then president of the Rockefeller Foundation, and Julian R. Adame, the Mexican secretary of Agriculture, it was a limited operation with outside support from only the Rockefeller Foundation.

After Wortman became director for agricultural sciences of the Rockefeller Foundation in 1965, he visited Mexico and subsequently reported to the officers and trustees of the foundation that CIMMYT could not be a world agricultural research center with the effectiveness of IRRI with such inadequate facilities and with financial support from only one donor. He proposed to the foundation that a new agreement be worked out reconstituting CIMMYT as a private corporation in Mexico but with the privileges and characteristics of an international organization, free to receive funds from any source. At the time these discussions were taking place, the Ford Foundation indicated informally that it would be willing to join the Rockefeller Foundation on an equal basis in supporting the new center (as they were doing at IRRI).

Wortman's proposal met with the approval of the trustees of the Rockefeller Foundation and on 12 April 1966, an agreement was signed between the foundation and the Government of Mexico, the foundation making an initial appropriation to the new CIMMYT in the amount of $441,000. The following year, the Ford Foundation contributed $494,000 toward the center's core budget.

The group of Rockefeller Foundation scientists that remained in Mexico became the nucleus of the CIMMYT staff, with Wellhausen as director. With adequate initial support from the two foundations, and later from many other donors as well, CIMMYT has developed the world's largest wheat and maize improvement program. As IRRI did with rice, CIMMYT created short, stiff-strawed, fertilizer-responsive, and disease-resistant varieties of wheat that greatly increased production not only in Mexico but in India, Pakistan, Turkey, and elsewhere. These successes won Borlaug the Nobel Prize in 1970; and that same year, CIMMYT and IRRI shared the UNESCO Science Prize.

International Institute of Tropical Agriculture (IITA)

In October 1963, Harrar, Hill, and Bradfield visited Nigeria to explore the possibility of establishing an agricultural research institute patterned after IRRI but dealing with various crops important to tropical Africa. After holding discussions with government officials and visiting several universities, they decided that Ibadan would be the best site.

INSECT RESISTANCE

In the spring of 1964, Hill and Harrar brought to their respective boards of trustees a proposal to establish IITA in Ibadan. Both foundations took action to provide up to $750,000 annually for a period of 7 years, beginning whenever the institute became operational.

Although the Rockefeller Foundation appointed Will M. Myers as the director-designate of IITA on 1 January 1965, the institute did not become formally organized until July 1968, when its Board of Trustees met for the first time. By then, Myers had been appointed vice president of the Rockefeller Foundation and the Ford Foundation engaged Herbert Albrecht to succeed Myers as IITA's director.

The Ford Foundation assumed full responsibility for constructing and equipping IITA, at a cost that was then estimated to be $10 million. However, by the time construction was completed in 1972, the cost had mounted to essentially double the original estimate. Nigeria's civil war and the attendant difficulty in getting building materials unloaded from ships at Lagos contributed substantially to the delays. Although the Ford Foundation provided the construction funds, the Government of Nigeria made available about 1,000 ha of land.

Unlike IRRI and CIMMYT, IITA was to work on a group of tropical crops, including cowpea and other grain legumes, sweet potato, and yam. It was to cooperate with IRRI on rice research, with CIMMYT on maize, and with CIAT on cassava. In addition, it was to give particular attention to research on cropping and land management systems to replace shifting cultivation — that is, to develop systems of permanent cultivation for the humid tropics.

The Ford and Rockefeller Foundations established IITA independently of other organizations, but by the time the research program got

White space

Space is part of any design. It shows the breaks between sections and sub-sections. It gives emphasis by setting important elements apart from other parts of the text. It makes a page look open and therefore more attractive. A crowded page discourages readers: it looks difficult to read.

Paper is expensive, and space should not be wasted. But space should not be ignored. It should be used as part of effective communication.

Space around headings

Space is part of any system of headings. It is normal to insert space before headings (at least at the first and second levels) to show that one part of the text is complete and another is starting. Occasionally a line of space without any heading at all is enough to show that the subject is changing.

Sometimes space is inserted below the heading as well as above it. This isolates the heading and gives it extra emphasis. But headings must be tied clearly to the text they refer to. Space above the heading should normally be larger than space below it.

When space is inserted above or below headings, it should always be in multiples of a line of the type that is being used for the major text. Otherwise, facing pages will not be even in length.

For example, if the major text is set in 10/12 pt type, space inserted should always be 12 points or a multiple of 12 points. The simplest approach is to insert one line (12 pt) of space above a heading and none below it: the heading is then tied firmly to the text it announces. Alternatively, two lines can be added above the heading and one below it. Or 8 points of space can be added above the heading and 4 points below (8 + 4 = 12), but some printers might have trouble following that instruction.

The second approach (two lines above and one below) is attractive but can present practical problems. First, it uses extra space. In a publication with many headings, that could add up to extra pages. Second, it can present difficulties in laying out individual pages. A subhead cannot be the last line on a page; and, ideally, there should be at least two lines of text below any heading before the bottom of the page. This can be difficult to arrange at any time if there are many headings. It is doubly difficult if there is extra space around each heading. Laying out pages that are the same length then can be a nightmare.

Notes

Notes are most easily placed at the end of an article or book. Notes at the foot of a page normally add to the cost of making up that page because they involve a separate operation. Some notes are too important to leave to the end, however, for fear that they might be missed. They must then be clearly separated from the rest of the text, usually by a line of space and their smaller size.

Page numbers

Unless it is a very short publication, pages should be numbered. The numbers can be at the top or bottom of the page. If the design uses a centered layout, they may be centered. Otherwise they should be at the outer edge of the type area, where the reader can find them easily. Page numbers are usually omitted on the title page, copyright page, and (if the publication has them) the half title and dedication pages. They are also usually omitted on the first page of the table of contents, the first page of chapters, and other opening pages; alternatively, they may be put at the bottom of those pages.

Running heads

Running heads are short single lines at the top of the page that act as guideposts, helping readers to know exactly where they are in the publication. Sometimes these lines are at the bottom of the page, in which case they are called *running feet.*

The page number may appear on the same line as the running head, with 1 or 2 picas of space between the page number and the running head. These lines are centered in a centered layout; otherwise they should be flush left on left-hand pages and flush right on right-hand pages, preferably with the page number on the outside. They should be typographically different from the text so that the reader can identify them easily. Running heads are omitted on pages that do not have page numbers.

Running heads may be different on left-hand and right-hand pages, though this is not necessary: both may show the chapter or a heading. If they are different, the left-hand page usually identifies a larger unit of text than the right-hand one. Possible combinations are: book title/ chapter title; section title/chapter title; chapter title/first-level heading. In books with many authors (a collection of papers, a proceedings), the running heads often show the name of the author (left-hand page) and short title (right-hand page) of the paper that appears on those pages. As always, consider which combination will most help the readers.

Running heads are unnecessary in pamphlets and journals. Journal designs should, however, allow for a comparable line on the first page of every article. That line should identify the journal and the volume and number or date of the issue in which the article appears. Newsletters may have running heads giving the name and issue as a reference if individual pages are copied.

Find models

Design should relate to function. Most of the suggestions for design in this module are intended to help the reader. But design is also a matter of opinion and custom. Not all editors or designers will agree with everything that is said here. Some of the suggestions may be inappropriate in some areas which have their own standards of what is attractive and effective in the design of publications.

Furthermore, design involves dozens of separate decisions. Only a few have been covered in these pages, and then only briefly.

It has been said before, but it is worth repeating: Study the design of other publications. Learn from them. Analyze them and identify what you like or what you think succeeds. Then adapt those answers to your own needs and the resources available to you.

7.8 Covers

The cover needs special attention in any publication, whether it is a full-sized book or a small folder. The cover is what the readers see first. It is what will attract them to the contents. It should shout: "Read me!" If the cover fails, the publication may never be read.

The cover cannot describe everything that is in the publication, or even all the important points. There isn't room. For maximum impact, the cover should try to carry only one simple message. That should be the basic message of the publication.

The cover should be related to the inside of the publication. It should follow the same layout style: if the text follows a centered layout, so should the cover. It may use the same typeface as is used for the main titles, the minor titles, or the text. It may follow the same grid pattern. It should introduce the rest of the publication honestly.

Text

Think carefully about the words that will appear on the cover. Usually these are

- the title (and sometimes a subtitle)
- (often) the name(s) of the author(s)
- (sometimes) the name of the publishing organization

The title is the only information that *must* be on the cover. In folders and pamphlets, it may be the only type on the cover. In journals, the only other type may be the volume, issue number, and date. The title must therefore be informative. It should be easy to read. And, especially in publications for the general public, it should be interesting. (For more about writing titles, see unit 5.4.)

The name of the author usually appears on the cover of a scientific report, a book, or other major publication. The name should be large enough to be read easily. If in the future the publication is cited, the first reference will usually be to the author, not the title, so the name should be easy to find.

The publishing organization may want its name to appear on the cover of every publication in order to announce its identity. That is a policy decision. The publisher's name rarely attracts readers. If the name is to appear, usually it should be near the bottom of the cover. (One

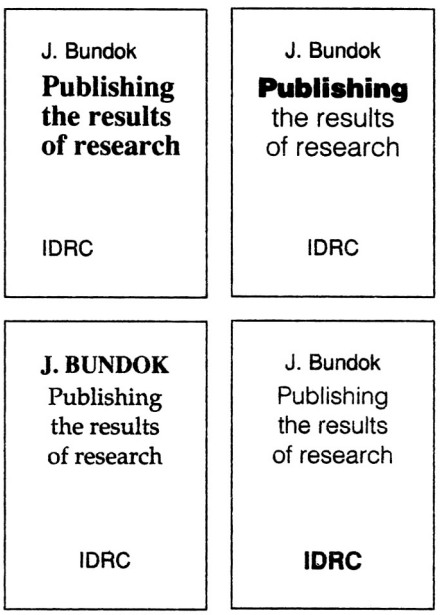
exception is the annual report of an institution. In that case, the name is truly part of the title and is important information.)

Type

Display type is usually larger and bolder on a cover than inside the publication. This is because the cover must attract people from a distance,

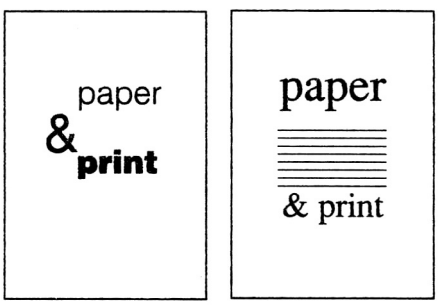
The most important words on the cover should be the largest or darkest. Usually the most important words are in the title. Occasionally they are the name of the author, especially if the author is famous. Sometimes, they are the name of the institution.

Within a title, some words may be more important than others. They may be emphasized by size, weight, or position. This must be done cautiously. A cover should not have too many letterforrms: that just confuses the reader.



If some words are larger than others, they should be truly larger, and there should be only two sizes involved. Too many in-between sizes weaken the message.

If some words are bolder than others, they should be truly bolder. Again, too many weights will weaken the effect. If some type is bold, some bolder, and some bolder still, it is like several voices shouting, all at the same time.



Sometimes handwriting or other forms of calligraphy can make a cover more personal and appealing. Such experiments should be tried with caution, however. The lettering must be clear and look professional. Otherwise readers may not treat the publication seriously.

Do not use fancy type that is hard to read. Many typefaces appeal because they are different—but the result may prove unreadable.

Illustration

An illustration on the cover attracts readers. It should relate closely to the subject of the publication. Perhaps it can be one that appears in the text. For the cover it may be enlarged, or cropped differently to remove unimportant details and add emphasis.

On covers, even more than inside, illustrations must have a strong visual impact. They should have motion or emotion. They should not be gray or washed out. The message should be clear.

It is usually better to use one large illustration than several small ones. As with the type, the illustration must be recognizable from a distance.

Sometimes an ordinary photo can be improved if it is cropped in an interesting shape, perhaps a circle or a square. But don't use shaped pictures unless they really add strength to the cover design. Triangles or unusual forms are difficult to fit into a design and should be avoided.

Pictures with people work well on covers, especially if the people are doing something. Generally, people looking into the camera are not as interesting as people seen slightly in profile. The person should be looking or moving toward the title or the open side of the book, which is where you want the reader to turn to next. There is no point in drawing attention to the bound edge. It is not always necessary to show a whole person. Sometimes the head and shoulders are enough; because they are big, they may have greater impact than a full figure.

Diagrams and charts from inside the publication can make dramatic shapes for the cover. For this purpose, they should be simplified, however, particularly by removing any numbers and type.

Illustrations generally look best in the lower half of the cover. This is particularly true of landscapes and head-and-shoulders portraits.

Color

Color attracts attention. Warm colors—the - red-yellow end of the rainbow—attract - more strongly than colder colors like blue and green. Strong colors have more impact than pale colors.

Some colors are particularly suitable for a particular subject. Green reminds people of agriculture, for example. Other colors are associated with national flags or an organization's crest. Some colors have strong emotional messages: bright yellow is usually a happy color, like the sun; deep purple seems sombre or unhappy. Color on the cover should be suitable for the subject of the publication.

One color Often the budget will allow only one color of ink to be used. In that case, black ink on a colored paper can be effective. Make sure there is strong contrast between the ink and the paper. If there is much text, use a bright paper. If the cover has only display type and perhaps a strong illustration, paper in mid-tone colors will be satisfactory. Avoid dark papers; the type will disappear against them.

For a little extra money, the single color can be something other than black. The printer may have many colors to offer, and caution is needed. The color must contrast with the paper. It should not be too light.

Two colors If the budget allows, a second color can be added to black. Again, there must be sufficient contrast.

With covers that have strong type (and perhaps a strong illustration), the second color can be printed as a background color. Some of the type can be reversed, that is, dropped out of the color so that it appears white. Then the cover will have three colors—black, background color, and white—for the price of two. To do this the background color must be mid-tone, light enough for black ink to be seen against it, strong enough for the white to contrast with it.

Two colors other than black can also be combined in this way. The effect can be heightened by using *screens.* (Screens are patterns of tiny dots, so small that they are not easily seen. The space between the dots is white; a screen printed in dark blue ink is in fact a mixture of white and dark blue and looks light blue. Screens come in different weights. A 75% screen has large dots with little white between them; a 10% screen has very small dots and is mostly white space; a 50% screen has an even balance of dots and white.)

For example, orange and dark blue can be used on a cover in solid colors and in screens. The screened blue looks like light blue. Screens of orange and blue together make brown. Type can be reversed in the blue to give white. The result is a cover that looks like five colors (dark blue, light blue, orange, brown, and white) but is really only two.

Screened colors must be chosen carefully. Not every color looks effective when it is screened. Some printers have books that show combinations of different colors and different screens.

Full color photographs Four ink colors are used to print the complete range of colors in a photograph or painting. Four-color illustrations are always effective on covers. They cost a great deal of money, however. On many publications, especially reports of research for specialists, they may be unnecessary. Sometimes the money could be spent instead on better paper for the inside.

In its use of color, as in its typography, the cover should be related to the inside of the publication. The purpose of the cover is to attract attention, but it should promise no more than the inside can deliver. The publication, from front to back, should be a visual unit.

7.9
Designing a publication

Up till now, we have been looking at principles of design that should concern every editor. Good design, after all, is part of effective communication between the author and the reader. Bad design is a form of static, and editors are supposed to eliminate static.

Editors sometimes must design their own publications. If you are in this position, here are 22 steps in creating a design. Following them should make the job easier and the design more effective.

Format

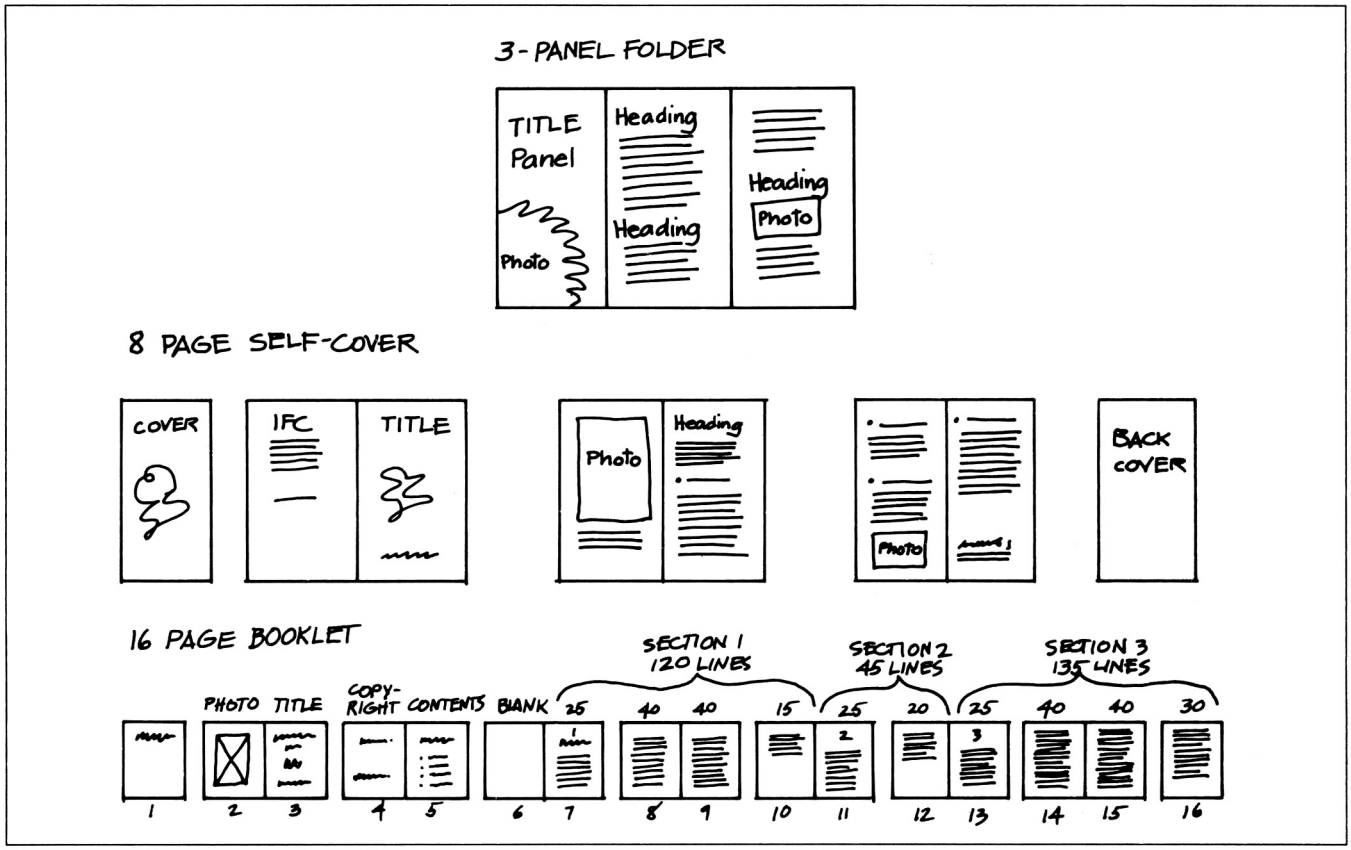
1. Analyze the manuscript and its readership. Study the illustrations and tables and how they relate to the text.

2. Choose a general format. Pick a page size that seems suitable for this publication, its special needs, and its intended readers. Decide how many columns you want on a page, and how wide they should be. Plan the basics of a grid.

3. Choose a typeface, type size, and leading that seem suitable for the major text. Decide on size of type and leading for minor text and sub-text. Make sure the typeface is available from a typesetter you plan to use. Preferably that typesetter should be local. Try to see a full page set in that face, size, leading, and width.

4. Check your decisions so far. Make a rough estimate of the length of the manuscript, using the short method explained in unit 9.1. Allow space for illustrations, tables, graphs, and display. Estimate how many pages of print this makes in the format you have chosen. If there are too many pages (or, more rarely, too few pages) for the budget or the purpose of the publication, adjust the design.

5. For a more accurate test of your decisions, make a *thumbnail sketch* of your plans, page by page. Work in pairs of facing pages so you can see how they will look when the publication is open. A thumbnail sketch is a miniature version of the publication. It shows where display, illustrations, tables, and graphs will appear. It is especially useful for planning short booklets and folders. Of course it will not work if, for example, the sketch allows only three pages for text that will actually need five pages. But if you take some care in allowing the right amount of space for text, the thumbnail becomes a blueprint for everything that will follow.



6. Decide what color of ink you will use and whether you want to use more than one color.

Text

7. Analyze the organization of the text. Find out how many levels of heading are needed.

8. Work out a typographic structure for the different levels of heading. Remember that typesetting will be cheaper if you keep the headings in the same size as the text. Find out the entire range available to you in the size you choose, including italic, boldface, and small caps.

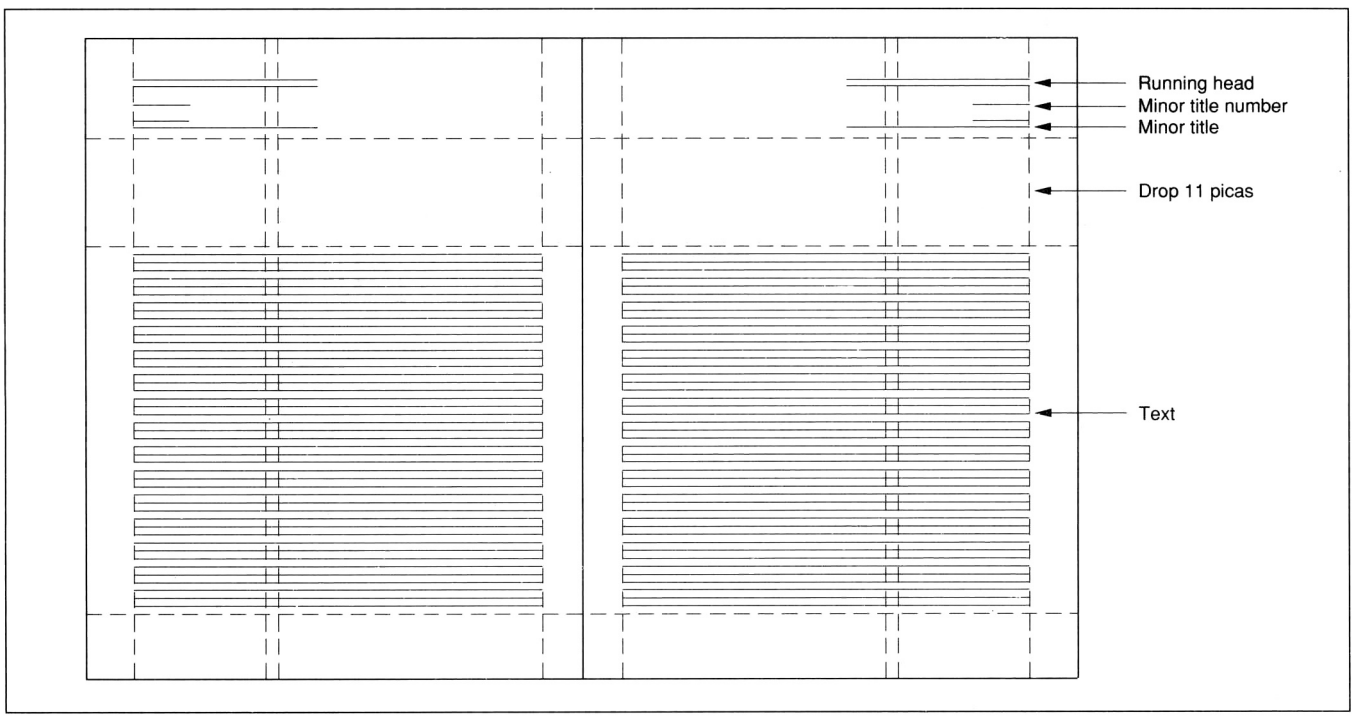
9. Check the manuscript against the face and styles of type you are considering for headings. Look at the longest heading. Will it fit in one line of type? If not, are you prepared to have headings more than one line long? Look at the shortest heading. Will it stand out in the style you have chosen? Look for special characters in the headings. Are they available in the face you have chosen? If necessary, adapt your design.

10. Decide how to treat paragraph openings. By indenting the first line? By leaving a space between paragraphs without indenting the first line?

11. Decide whether text will be set justified or ragged right. (In some designs the major text is justified but minor text and subtext are set ragged right to distinguish them from the major text.)

12. Now it is time to refine your design and grid. Draw a basic page plan showing two facing pages in the actual size they will appear. Draw the margins. Show the columns. if there are more than one. Plan where minor titles will go, and how much space to leave around them. Do a rough plan at first, and adjust it until you are satisfied.

13. From that rough plan, draw a final one using black ink on strong white paper. This is your master plan. Make a note in the margin to show the typeface, size, and leading you will use for each kind of heading and text. Draw in lines for running heads and page numbers. In the margin, note how many lines of type will fit on a full page. If you have any doubts at this point. ask the typesetter to set a sample page or two. It is cheaper to make changes in the basic design at this point than later.



Display

14. Choose a typeface and size for the minor titles. The typeface may be the same as the text face, but larger in size and perhaps in bold or italic. Or it may be a contrasting face. Don't choose a face that is only slightly different from the text face. If the text face has serifs and you want something else for the minor titles, find a sans serif or a readable decorative or script face.

15. Test your choice. Sketch a minor title on a piece of tissue paper, making the sketch look as much as possible like the real type. If you can, trace the letters from an example of the typeface. Make sketches for the longest title and the shortest title. Will they fit in the space you have allowed? Do they look pleasing on the page? Should the size be larger or smaller? Should the space around the title be larger or smaller? If you need more than one line for any title, can the words be divided at a logical place?

16. Make several sketches of titles in different sizes and faces. Choose which arrangement fits the titles best. Make a good copy of this arrangement on tissue paper. Put it in the right place on a copy of the master page. Write the type sizes in the margin.

17. By now you have established the *drop:* the amount of space allowed to contain a minor title before the text begins. On your master page plan and display layout, draw a line where the top of capital letters will go in the first line of text. Calculate how many lines of text type will fit on an opening page below the drop. Write that number in the margin.

18. Plan the title page. On pieces of tissue paper, sketch the major title and any other type to appear on that page. For the major title, use the same typeface you are using for minor titles, although the size may be different. Place these sketches on a copy of the master page. Move them around to find the most interesting arrangement. Try several arrangements and several sizes of type. Put the most important information in the upper half of the page—that is where the reader will look first. When you have a final arrangement, make a good copy. Make a note in the margin of the typeface and sizes.

19. Make copies of your two-page master page plan to use in dummying the publication. (Dummying is explained in unit 7.12.)

Cover

20. Plan the cover. The publication should hold together visually: the design of the cover should relate to the design of the inside pages. Try to use the same display face and the same layout style. To make the cover more attractive. you may be able to add an illustration from inside the publication. Even a diagram can be made into an interesting shape by removing the type.

21. Try to have some color on the cover to attract interest. The most economical way to do this is by using colored paper with the regular black ink. A second color of ink adds to the cost, and four-color illustrations are still more expensive. Whatever technique you use for adding color, make sure the type is large enough to be read at a distance, and that there is good contrast between type and background.

Paper

22. If you have not already done so. choose the paper for text, illustrations (if they are to be printed separately), and cover. Spend time on this: the best typographic design can be spoiled by the paper it is printed .on.

7.10
Design with typewriters

Many publications can be produced effectively on an office typewriter or word processor.

Sometimes there is no choice: there is no money for anything else. Other times, money may be available for typesetting but can be saved for other purposes. Typewritten copy can be effective as well as economical for straightforward publications that will reach only a limited readership. It is used in this way throughout the world.

Typewritten publications don't have to look like normal typewritten pages. The principles of good design can be applied to them as well as to more expensive forms of publication. If they are planned with the same care, using the same techniques, they will be readable and attractive.

Here are some further suggestions for designing publications produced on the typewriter.

Type

If possible, use an electric typewriter. The letters will be crisp and even. In mechanical typewriters, some keys always strike harder than others. As a result some letters are usually lighter or heavier than others.

Use a new ribbon. To obtain the best results, it should be a one-use carbon or plastic-film ribbon. Cloth ribbons give slightly rougher impressions, no matter how finely they are woven.

Make sure the typewriter keys are clean.

Avoid unusual typewriter faces: script, italic, or super-size letters. They are all harder to read than the straight roman faces.

Use the best available white bond paper. It should be hard enough to hold a sharp, clean impression.

Correct neatly, using a correcting ribbon or white opaque correcting fluid. No errors or corrections should show. The typing should be perfect.

Space

Spacing for reproduction is different from the spacing typists normally use.

Most typists use two spaces after a period or full stop. This looks too big in print. One space is enough.

Many typists and word processing systems allow five characters for a normal indention at the beginning of paragraphs. This is also too much. Two or three spaces are enough, and look more like print. Or leave no indent and insert a space between paragraphs.

For short lines (up to 90 mm or 3-1/2 inches), use single-space typing: no space between lines. For longer lines, up to 150 mm or 6 inches, insert half a line space between lines if that can be done on the machine being used. Double line spacing is rarely needed.

Size

Since the typewriter is being used to save money, the paper should always come from standard economical sizes.

The basic sheet for typing and reproduction will likely be A4 or 8-1/2 × 11in., depending on which system of sizes is standard in the area. On this size, two columns are usually most convenient for typing, each about 85 mm (in metric sheets) or 3-1/2 in. (on American sheets) wide.

A sheet that size can be folded once to make a booklet with pages A5 or 5-1/2 × 8-1/2 in. For this, a one-column format is probably best, though two can be planned successfully. The same sheet can also be folded twice to produce a three-panel folder, with each panel carrying a single column about 85 mm or 3 in. wide.

In American sheet sizes, an 8-1/2 × 14 in. sheet (216 × 356 mm, or legal size) can produce booklets 7 × 8-1/2 in. (178 × 216 mm), which should have two columns. Or it can be folded three times to make a four-panel folder 8-1/2 × 3-1/2 in. (216 × 89 mm).

Justified or unjustified

It is diffcult to justify lines on a standard typewriter. Each line must be typed once, counted, and adjusted for length. It is easier to justify lines on an electronic typewriter with memory, and still easier on a word processor.

Just because it is possible to justify lines does not mean, however, that it should be done. In typing, the disadvantages of justified lines are more obvious. The reason is that on a typewriter the characters, including spaces, are all the same width: there is no difference between an *i* and an *m*. As a result no fine variations are possible. The difference in word spacing (1, 2, or 3 characters—or even more) is obvious, can be unpleasant, and certainly slows reading.

There is no reason to pretend that typewriter reproduction is any more than it is. Normal typing has even word spaces and ragged right edges. That is a good style to follow.

Layout

As in any publication, the layout can be centered or non-centered, but should never be both. If the text is ragged right, a flush-left non-centered style is usually the simplest and most effective.

Titles

Major and minor titles can be inserted by transfer letters. These are letters, printed on plastic, which can be rubbed off onto the page. Using them takes some practice, but the result is neater than hand-lettering. It's a good idea to letter the titles on separate pieces of paper that can be pasted into the typewritten copy.

The transfer lettering should be in harmony with the typing. The standard typewriter face has lines of almost equal width and has strong, straight serifs. Sans serif display faces work well with typing because their lines are of equal width. In serif faces, try to find one with lines that either are almost equal in width or have great contrast in width. The serifs should be straight, not curved. Decorative or script faces rarely are appropriate for typewritten publications, which should look functional rather than fancy.

Use display type that is large enough to contrast effectively with the typing. If it is too small, the effort of transfer lettering will be lost.

Headings

Three levels of heading are possible in typing, using underlined words instead of italic. One system of headings is

- first level: capitals, in a separate line
- second level: uppercase and lowercase, underlined, in a separate line
- third level: uppercase and lowercase, underlined, in the first line of text

Two levels are better than three. It should not be necessary to underline all-capitals.

Illustration

Line drawings can be pasted onto typewriter copy and reproduced in the same way as the typing. If no new drawings exist, decorative illustrations can often be found in the files of your own organization or in old books that are out of copyright. Such illustrations fill space and make the page more attractive.

Running heads

Typewritten publications should follow normal rules for running heads and page numbers.

Reduction

Reducing typewritten copy usually makes it a little crisper and makes it look a little more like "real" typesetting. The typing can safely be reduced to 82% of actual size; the range of 82% to 90% is most effective. It is scarcely worth spending the money for reduction if the result is any closer in size to the original. If type is much smaller than 80% of the original, the letters are hard to read and the lines may become so thin they will not print satisfactorily.

The pages can be typed completely and then reduced. Or the text can be typed in long strips, reduced photographically, and then pasted into pages with titles and illustrations.

The assembled pages are then reproduced by offset lithography (see unit 8.2).

Either way, *the typing must be planned to be reduced.* This is a simple calculation. Imagine, for example, that the typing will be printed in columns 23 picas wide after being reduced to 85% of its original size. The text must then be typed in columns that are 23 x 100/85 picas wide: 27 picas.

Typists don't think in picas, however. They are used to characters or keystrokes. Most typewriters type either 10 or 12 characters to the inch (25 mm). An inch is six picas, so 27 picas can be translated for the typist as 45 characters (in pica type) or 54 characters (in elite type).

7.11
Design in newsletters

Newsletters are difficult to design well because they involve so many elements—headings, illustrations, more than one article on a page—and must compete strongly for attention. Here are a few further guidelines in designing a newsletter.

1. Keep the design simple.

2. Use a grid. Be consistent in applying it. Change it occasionally to give the newsletter a fresh look.

3. Establish a strong nameplate for the newsletter. The nameplate is the title at the top of the front page. Find a good name for the newsletter, and an attractive typeface to set it in. Keep the nameplate looking the same and in the same place in every issue. It is your main identification.

4. Three columns to a page give more flexibility to a design than two columns. Headings, tables, and illustrations can be one, two, or three columns wide. Make sure that the columns are not too narrow for easy reading.

5. Use illustrations. Give good photographs impact by making them big. Use line drawings for a change of appearance and for their beauty.

6. Use plenty of white space.

7. Give each page a focus using a dominant head, a large block of type, an illustration, or a photograph.

8. Put important material at the top of the page, less important material at the bottom.

9. Be tidy. Group small items under one heading ("Research reports," "Staff notes," and so on).

10. Take full advantage of a second color if you can afford it. Use it for screens, illustrations, and other areas you want to highlight. If funds are limited, use the second color only for the nameplate. Then print a year's supply of the nameplate and store the sheets until they are needed. (With good design, however, it should be possible to get impact without the expense of a second color.)

11. Be sure one page balances smoothly with the next, especially in facing pages.

12. Use only one family of type for body text and one for display.

13. Keep headlines short. Two lines of display type are better than three.

14. Don't use italic or sans serif type for text.

15. Don't set headlines all in capitals. Many editors feel it is unnecessary to capitalize the first letter of any word after the first.

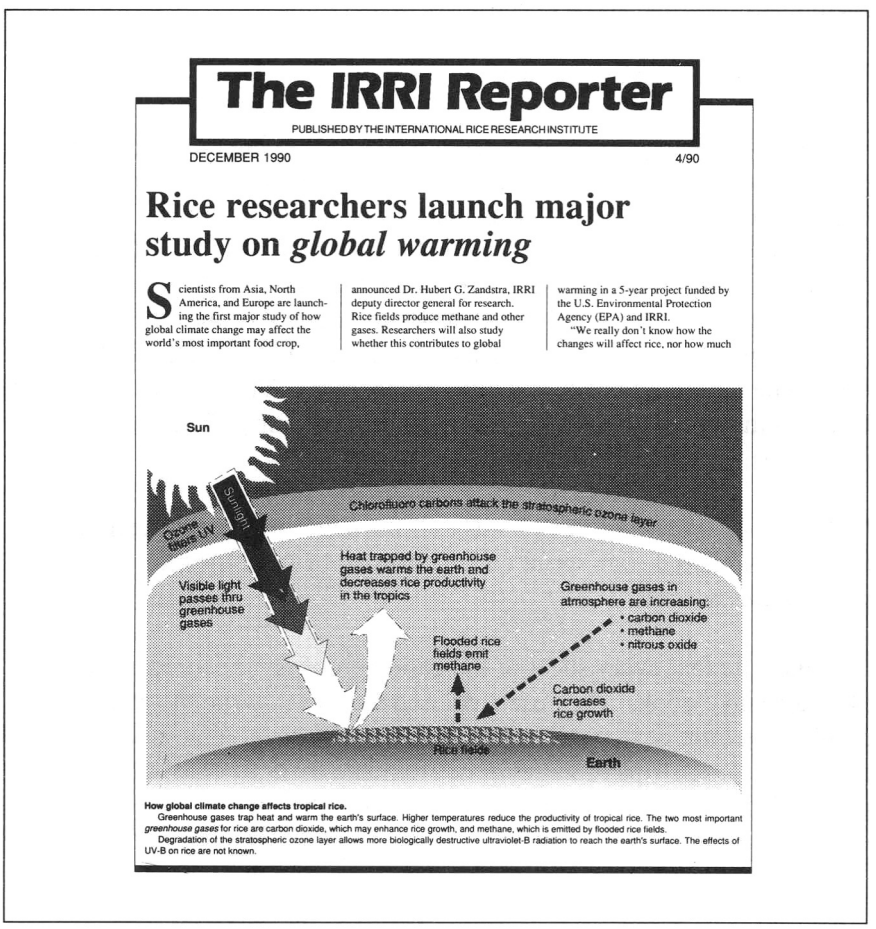
16. Don't use reverse type except occasionally in headings.

17. Don't use dark tones for emphasis.

18. In the bottom third of the last page, leave space for an address label. Print your own address, unless you plan always to mail in envelopes.

19. Be consistent.

20. Study other newsletters for ideas.



The IRRI Reporter

PUBLISHED BY THE INTERNATIONAL RICE RESEARCH INSTITUTE

DECEMBER 1990 4/90

Rice researchers launch major study on *global warming*

Scientists from Asia, North America, and Europe are launching the first major study of how global climate change may affect the world's most important food crop, announced Dr. Hubert G. Zandstra, IRRI deputy director general for research. Rice fields produce methane and other gases. Researchers will also study whether this contributes to global warming in a 5-year project funded by the U.S. Environmental Protection Agency (EPA) and IRRI.

"We really don't know how the changes will affect rice, nor how much

How global climate change affects tropical rice.

Greenhouse gases trap heat and warm the earth's surface. Higher temperatures reduce the productivity of tropical rice. The two most important *greenhouse gases* for rice are carbon dioxide, which may enhance rice growth, and methane, which is emitted by flooded rice fields.

Degradation of the stratospheric ozone layer allows more biologically destructive ultraviolet-B radiation to reach the earth's surface. The effects of UV-B on rice are not known.

7.12
Preparing a dummy

A dummy is a page-by-page model of the final publication. It shows where each line of type and each illustration should go. It is a guide for the person who will assemble the pages for printing: in type for letterpress, or in paste-up for offset.

Not every book needs to be dummied. Publications with few or no illustrations can usually be assembled without special instructions. For a complicated publication, or one that needs special care, a dummy is useful.

The dummy is made from a set of galley proofs, which are cut up and stuck in place. It includes proofs of the illustrations if they are available; if they are not, then the dummy must show the right amount of space for each illustration and show exactly where it is to go.

Here are six steps in dummying.

Draw a plan

1. Draw a detailed plan of two facing pages, following the design of the publication. The plan should be full-size. It should be on a large sheet of paper so that there are margins that can be used for writing instructions. On the two pages. show the type area exactly. Measure top and inside margins carefully. Mark where the first line goes and where the last line goes. Mark columns. Mark the normal drop if there is one—the point at which text begins after a chapter or article heading. Mark where running heads and page numbers go. This is a map you will be using through the whole preparation of the dummy. The more detail it contains, the more useful it will be.

Make enough copies of this plan for all the pages in the publication. If this is a standard design, print copies that can be used for future publications as well.

Number the proofs

2. Make sure that every sheet of the galley proof is numbered in order, like pages in a book. Then use a colored marker to write the sheet number over the type at several places on each sheet. You will be cutting the long strips of galley proof to make them fit onto the shorter publication pages. If each bit has a galley number, it will be easy to identify during the final assembly.

Arrange illustrations

3. Arrange the proofs of illustrations in the order in which they will appear. If you do not have proofs, cut out sheets of paper the right size for each illustration and number them. That way you will have something to place in the dummy.

In the margins of the galley sheets, mark with a number where you would like each illustration to go. Mark where tables or other inserted matter should go.

Place proof

4. Trim around the margins of the first galley sheet and start sticking the type into the plan. Remember that in most languages left-hand pages have even numbers (2, 4, 6 . . .) and right-hand pages have odd numbers (1, 3, 5 . . .). Remember also that in most publications the text starts on a right-hand page. Leave space for any illustrations, tables, or other extra matter. Stick the proof down with small pieces of transparent adhesive tape, rubber cement, or some other means that will let you lift up the proof. Don't use glue. You may have to adjust the dummy by a few lines here and there before you are finished.

When the first page is dummied, write a page number in the margin and go on to the next page.

Continue and adjust

5. Continue this process, one double-page spread at a time, until you reach the end. See that the type fits neatly. Facing pages should be the same length, and spacing between lines and around headings should always be the same. Lines on facing pages should line up across the pages.

Facing pages should look balanced, as one unit. They should not fight each other.

Watch for widows (a short line at the top of a page) or other unpleasant page breaks.

You may have to adjust the paging to remove widows or to include a table or illustration. If necessary, pages can be one line longer or one line shorter than normal, but facing pages must still always be the same length, and a two-page spread that is one line long should not be preceded or followed by a two-page spread that is one line short. Readers will notice that big a difference.

Making the pages fit neatly, especially if there are many illustrations, is not always easy. (For more on this, see unit 3.9.)

Revise if necessary

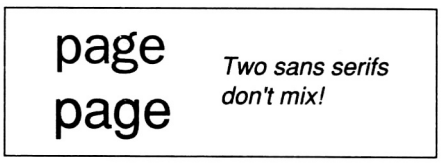
6. Revise the dummy if necessary until everything fits neatly. Try to make the publication fit in even forms or signatures. A form is usually a multiple of eight or sixteen pages, but sometimes a multiple of four pages, depending on the press that will be used. To print one extra page of type (for example, if the last page is page 17 or page 33) will take paper for at least three more pages.

You may ask the author to add a few words, or to remove a few words, so that you can add or remove one line to make the type fit more neatly on a page. You may also make those changes yourself, as long as they don't change the meaning in any way.

One last point: *Never use the dummy to mark corrections in proof.* The dummy is a guide for the person assembling pages. You may wish to tell that person about changes that will be made in proof. But if you want the changes made, mark them on the master proof where the typesetter will see them and make the corrections. Typesetters do not usually see dummies.

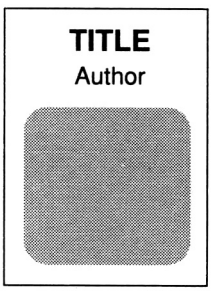
7.13
Last design tips

- If you mix typefaces (one face for display, another for the text) choose faces that are different in structure. Don't mix two that look almost the same.



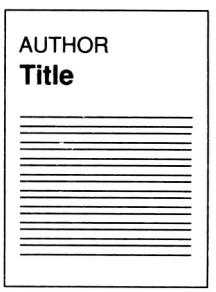
- Use either centered or non-centered layouts. Don't mix the two.

- On title pages and covers, put the most important information in the upper half of the page.



- Try not to use more than three sizes of type on a page or cover.

- On text pages, don't use display type that is too big. If the main text is 10 or 12 pt, the largest display type should be no more than 30 or 36 pt (three times text size).



Publishing

An essential part of research

IRDC paper

Publishing

An essential

part of research

IRDC paper

- Odd-number groupings of information often look better than even-number groupings. This seems to be the way we see things.

- Don't use too many ornaments or decorations. When you do use them, choose simple shapes. Don't over-design.

- Rule lines can be useful for separating units of information and for decoration. Use them carefully. Don't make them too thick.

Asian
Rice
Harvest

- Give extra emphasis to titles by using contrast in weight. Make the most important words stronger. Use this technique carefully.

KIS MII

Keep it simple!
Make it interesting!

- Use contrast of size in type. A large contrast can be effective. Use this technique carefully too.

- Remember KIS MII. Keep it simple! Make it interesting!

8
Introduction to print production

When editing is complete, the manuscript goes into production.

Some editors deal directly with typesetters, printers, and binders. They need to know the processes involved, some of the problems that may arise, and the special terms printers use.

Other editors hand the manuscript to colleagues who are responsible for organizing and supervising production of the publication. Even these editors will do better work if they understand what happens once a manuscript leaves their hands.

This module is a brief introduction to the subject. It contains basic information which may be helpful to editors. There are many books that can provide further details; but nothing on paper is as good as a visit to a printing house and talks with the men and women who work there.

8.1
The beginning of printing

In many books, the history of printing begins in Europe little more than 500 years ago. But printing is much older, and it really began in Asia.

Early printing in China

The Chinese had developed the basics of printing more than 1800 years ago. By then they had the three things needed for printing: paper, ink, and texts carved in relief—that is, the drawings and word-characters were carved into stone so that they lay below or above the main surface. The Chinese still use stone seals made in this way for personal signatures.

From that they moved to an easier medium to carve: they used wood-blocks. First, they coated a smooth block of wood with rice paste. Then they wrote the text on a fine piece of paper, and pressed it against the woodblock. The ink transferred to the rice paste, with characters as mirror images of themselves. Then an engraver cut away the wood around the characters so that the text stood out in relief. A printer spread ink on the characters, placed a sheet of paper over the woodblock, and rubbed the back of the paper with a brush. The characters thus were printed on the paper as in the original. This is the way the oldest known book in the world, the “Diamond Sutra,” was printed 1000 years ago.

There were difficulties with woodblocks. Each page had to be carved separately in one or more large pieces. The characters carved in the wood were in a certain order and couldn’t be used again in a different text. Errors were hard to correct. The next big step was to make separate characters that could be assembled in one text, then taken apart and used again in another publication.

That first happened, again in China, nearly 950 years ago. An alchemist named Pi Sheng made a set of characters of clay and glue, hardened by baking. He set texts by placing the characters in tight rows on an iron plate covered with a coating of resin, wax, and ash. He heated the plate so that this mixture would melt; then, when it hardened, the characters were firmly in place for printing. Afterwards, he melted the mixture again to loosen and remove the characters. Later printers had individual characters carved in wood.

Spread of printing

The idea of individual characters *(movable type)* spread to other countries. The Koreans picked it up early and by 1400 the king was ordering a set of 100,000 pieces of type made of bronze. Other people used wood. Among them were the Uighurs, nomads who lived on the borders of Mongolia and Turkestan. They were printing with wood type nearly 700 years ago, and may have carried that skill as far as Egypt.

For most of this time, in Europe scribes continued to duplicate books by copying them by hand, one by one, with pen and ink. Printing did not begin there until about 600 years ago, and then it was with woodblocks. (Knowledge of woodblocks moved west, together with silk and spices, along the caravan routes from China.) European blocks were mainly of illustrations with a small amount of text, but as the engravers became more skillful the number of words increased. By about 1400 small books were being printed in this way.

Gutenberg

Then came Johannes Gutenberg, the man who probably invented movable type in Europe about 1450. The great advantage of his type, over any previous kinds, was that it could be cast easily and quickly, in letters of different widths and heights, using a simple hand mold and a metal that melted at a low temperature. He combined this type with a special kind of ink and a printing press modeled on the wine presses of his time. All of a sudden it was possible to make hundreds of identical copies of a book or other manuscripts, and do it relatively quickly.

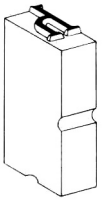
From that, time, printing spread rapidly across Europe and revolutionized the growth of knowledge. For almost 300 years the technology remained almost unchanged. Then new kinds of presses were developed, built of metal and eventually run on steam and then electric power. But Gutenberg and the printers who followed him are all part of a line of history that stretches back a thousand years earlier to Asia.

8.2 Printing

The printing press makes it possible to produce hundreds, thousands, and even hundreds of thousands of identical copies of a publication quickly and economically. The spread of research results depends greatly on the printing press.

Two major kinds of printing are used today: letterpress and offset lithography.

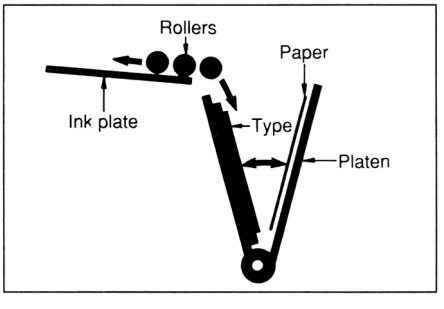
Letterpress



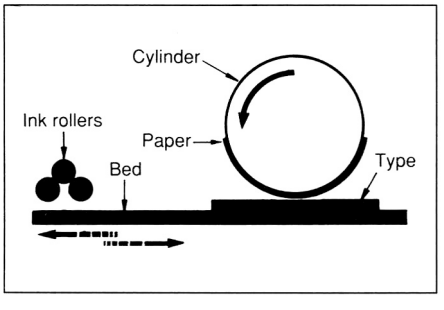
Letterpress is the traditional form of printing. The presses have been improved since the time of Gutenberg, but the principle remains the same. The surfaces to be printed are higher than the parts that are not to be printed. Ink is rolled on the raised portions. Then paper is pressed against them. The ink leaves on the paper an impression of the characters or illustrations. Then the raised portion is inked again, and the process is repeated.

Kinds of presses

Three main kinds of presses are used in letterpress.

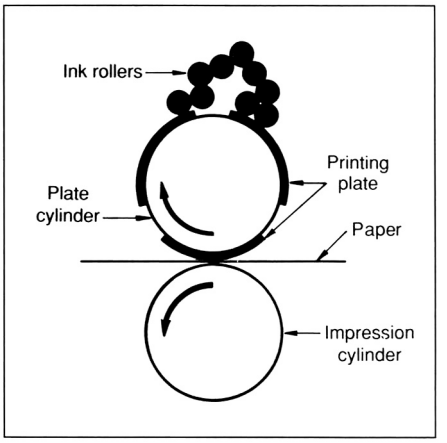


Platen presses open and shut like clamshells. The type is held vertically in a metal frame. The paper is held on a platen which is hinged at the bottom and swings shut to press the paper against the type. The type is inked by rollers which swing up and down as the press shuts and opens. Platen presses may be run by hand or by electricity. The design limits their size. Normally they can print only two to four pages at a time; some hand-operated platen presses can print only one page at a time. Paper is placed on the platen by hand, one sheet at a time. Platen presses are best for small publications with short runs, and for small printing jobs like business cards.



Flatbed presses hold the type horizontally on a metal *bed.* The paper is gripped on an impression cylinder that turns as the bed moves beneath it. After each impression the cylinder rises and the bed moves back. The type is inked by small rollers that run across it as it moves. Flatbed presses run by electricity. They can hold large areas of type and print up to 32 pages at one time on the bigger models. Paper is fed to the impression cylinder mechanically, one sheet at a time. Flatbed presses are faster than platen presses. If there is a choice, they are likely to be more economical than platen presses for long runs and large publications.

Rotary presses use curved printing plates that are specially made to clamp on a cylinder. That cylinder turns in one direction. An impression cylinder, turning in the opposite direction, presses against it. The paper passes between them. The plate cylinder is inked by small rollers at one side. The paper may be fed mechanically as separate sheets *(sheet-fed)* or continuously from a large roll *(web-fed)*. Rotary presses are fast but expensive. They are normally used only for large newspapers or magazines.



In most letterpress work, the printing area is made up of many small pieces of metal locked firmly in a metal frame. The pieces may be individual letters or lines of type (see unit 8.3) or blocks of illustration (see 8.5). All these many pieces must be exactly the same height from the bed if they are to print evenly. If some letters are lower than the rest, they may not press against the paper and so will not print. If some letters are higher than the rest, they will print too dark or even punch a hole in the paper. Illustrations present special problems because they are large in area and if they are a fraction of a millimeter too low they may print too light. Before printing can begin, the press operator must make many small adjustments. This process, called *makeready,* may take an hour or more on a large press. If the printing run is only several hundred copies, the makeready may take as long as the printing.

Problems

Editors should be aware of other problems that can arise with letterpress.

- After many impressions, the metal letters get worn from hitting the paper. Their lines get ragged or broken. Watch for such broken letters and ask for them to be replaced.
- If the text is set in individual letters and they are not firmly locked in place, one or two letters may work loose. They may rise and print very dark. They may even fall out. Watch for worked-up or missing letters.
- Metal type is expensive and therefore costly to hold in storage. Type is also heavy and takes a lot of space. Printers do not like to hold metal type for a long time. They may charge a publisher who wants to hold type for a possible second printing. Even so, that may be less expensive than re-setting the type. This takes careful calculation.
- Some small printers using hand-set type may not have enough pieces for all of a large publication. Then the editor may have to complete all the work on part of the publication and have it printed before the next part can be set. This takes special care and supervision.
- Letterpress, at its best, can produce superb printing, with impressions that are crisp and sharp. But this takes great skill, and that is rare. Editors must encourage quality in letterpress printing.
- Letterpress equipment in most countries is getting old, In North America and Europe, where most printing equipment is manufactured, letterpress has largely been replaced by another form of printing, lithography. As a result, manufacturers there no longer make many of the types of equipment needed for letterpress. Even spare parts for repairs may be in short supply. Editors must be aware of this problem, seek printers who still have machinery in good running order, and sympathize with printers whose machines break down.

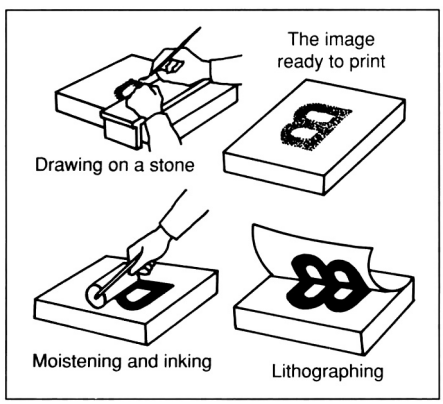
Advantages

Letterpress is still widely used in many parts of the world. It has several advantages:

- The technology and skills are well established. There is no need for major investment in new equipment and training.
- The process is straightforward. Printing is done directly from metal type, which may be assembled by hand. Small presses can be powered by hand. To that extent, letterpress does not even require continuous electricity.
- Corrections are relatively quick and easy to make. Type can be changed directly even after it has been locked up on the press ready to print. (Changes should not have to be made at that stage, of course, but sometimes they can't be avoided.)
- Letterpress is often the most economical way to print, especially if quantities are small or medium sized. In some situations where there is a choice between letterpress and lithography, letterpress may be cheaper even for runs of 3000 copies.

Lithography

Lithography was invented in the 19th century. It uses a smooth printing surface. The printing areas are not raised above the non-printing areas, as in letterpress. Instead, lithography separates the two kinds of areas by using a simple principle of physics: oil and water will not mix.



Oil and water repel each other. You can see this easily by putting water on a piece of paper that has been smeared with cooking oil or butter. The water tries to escape from the oil by forming into round drops that sit on the paper. Instead of oil or butter, lithographers use oil-based ink.

The first lithographers used smooth, porous stones as the printing surface. They drew on them with greasy crayons. Then they put a thin coat of water on the stone. The water clung to the bare stone but ran off the greasy image. Next the printers rolled a greasy, oil-based ink over the stone. The ink clung to the crayon marks but was repelled by the water everywhere else. The only place that had ink was where they had drawn. They then pressed a sheet of paper against the stone and picked up an impression of the drawing.

Platemaking

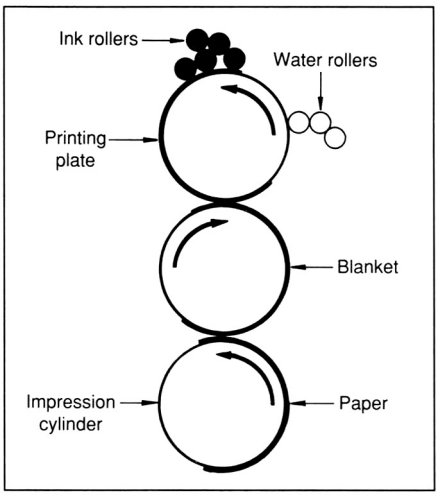
Modern lithographers no longer use stones. They print with thin plates that may be made of metal, plastic, or paper. Nor do they use crayons. The plates they use are specially treated with chemicals that are sensitive to light. The printing image is placed on them by photography.

The first step is to create a perfect copy (*camera-ready copy,* or CRC) of the words and any illustrations that are to be printed. This is photographed in a special large camera that produces a negative the same size as the image to be printed. This negative is pressed tightly against a blank printing plate in another machine and exposed to bright light. The image then appears on the printing plate; on it, areas that are light will accept water which repels ink, areas that are dark will repel water and accept ink.

This process is used in making metal plates. Plates of specially treated paper can be made much more simply in a machine that operates like an ordinary office photocopier.

Offset

The printing plate is clamped onto a cylinder in the press. The cylinder turns, first meeting one set of rollers that spreads water over the plate, then a second set of rollers that spreads ink. In most modem presses, this inked image does not come in direct contact with the paper. Instead the image is transferred onto a sheet of rubber which is wrapped around a second cylinder turning in the opposite direction. This rubber sheet is called a *blanket.* It in turn presses against a third cylinder (the impression cylinder) which carries the paper. The image thus is "set off' from plate to blanket to paper. The process is correctly called *offset lithography,* but it is most often referred to simply as *offset.*



Offset plates and presses come in many sizes. Small ones print only a single letter-size sheet of paper. Large ones print 32 or even 64 pages in a single impression. Offset presses can be sheet-fed or web-fed. But the principle is always the same.

Advantages

Offset has become the most popular form of printing in the last 30 years because it has many advantages over letterpress:

- Because the plates are light and easy to handle, they can be put on the press and taken off quickly.
- Because offset prints from a flat surface, there is little or no time lost in makeready.
- Because the image is flat and touches only the soft rubber blanket, the letters do not get worn by use. They remain sharp and clear over thousands of impressions. Economical paper plates can be used to print several thousand copies. Metal plates give better quality and can be used for much longer runs.
- Because the process is photographic, illustrations, especially halftones (see unit 8.5), are cheaper to reproduce.
- Because the soft rubber blanket is flexible, it can print sharp, clear images on a wide variety of papers or even other materials. It is no longer always necessary, for example, to print photographs on special glossy paper to get good reproduction. The rubber blanket will print on uneven surfaces.
- Because they work entirely with revolving cylinders, the presses are generally faster than platen or flatbed letterpress machines.
- Because the printing image is transferred twice, the image on the printing plate reads in the normal fashion. In letterpress, the text must be mirror-image and is more difficult to check before printing.
- Because they are light and thin, the plates and film are cheap and easy to store. (The plates must first be treated to protect the image and must be hung separately so they won't get scratched. The film can be stored simply in drawers, and many printers prefer that to keeping plates.)

Problems

Lithography is not, however, free of problems with which editors should be concerned.

- In the final stages, changes are expensive in time and money. To change even one letter at the last minute involves new film and an entire new plate.
- In making the film and the printing plates, the exposure to light may be too long or too short. In that case, the text and any illustrations will be too dark or too light. If the exposure is much too short, the letters look broken.
- Dirt can cause spots on the negative or plate. Most printers go over the negatives carefully. searching for any trouble spots and correcting them with opaquing fluid.
- In making the plate. parts of the film sometimes get covered and are not exposed. Check that all lines and letters are present, especially at the top, bottom, and sides of pages.
- The equipment is more complicated than letterpress, which means more things can go wrong, and repairs may take time.
- Good printing by any method requires skill. Too often in offset, the inking is not right and letters look gray instead of black.

Multiple unit presses

In both letterpress and offset, two or more printing units can be combined in a single press.

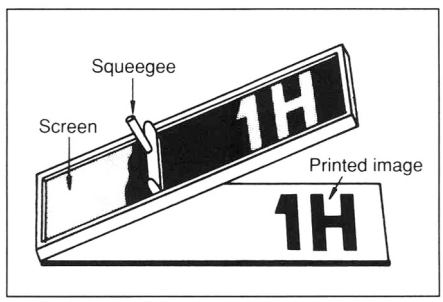
In some presses with two printing units, both sides of a sheet or roll of paper can be printed at the same time. These are called perfecting presses.

Two units may also be organized to print two colors of ink on the same side of the paper in a single pass. With four units, each with a different color, it is possible to print four-color illustrations in one pass.

Such multiple-unit presses save time but cost more to buy and operate than simpler presses. Many printers cannot afford them. Then it is necessary to print each side. or each color, separately.

Other kinds of printing

Three other kinds of printing can be useful for editors in research centers or extension agencies. All are economical and can often be used without going outside the organization.



Silk screen printing is good for posters and other simple printing jobs. The press is easy to make: a piece of fine porous cloth (silk or synthetic fabric) is stretched across a wooden frame. The fabric is made into a stencil using a special film: the areas to be printed are cut out of the film, and the film is then laid over and bonded with the fabric. Ink is spread on top of the fabric, and forced through the cloth and the cut-out areas of the stencil onto a sheet of paper. For jobs that are too complex for cutting, stencils can be made photographically using a specially treated fabric.

Office copiers (mimeograph or cyclostyle machines) use stencils cut on a typewriter. They are economical for printing reports, newsletters, and even small booklets. The stencils are commonly made of waxed paper and can be prepared on a standard office typewriter with the ribbon removed and the keys well cleaned. Illustrations can be drawn with a simple stylus. Publications produced in this way will not look as handsome as those printed by offset or letterpress, especially in the illustrations, but the process is cheap and quick. Better reproduction can be obtained with stencils produced electronically.

Photocopiers can be used for short printing runs, especially for publications to be read mainly within the home institution. Many kinds of photocopiers do not reproduce photographs or solid black areas well, however. This form of printing, sometimes called *xerography,* has the great advantage of being fast. In short print runs, photocopying may also be cheaper than other forms of printing. The quantity varies: in some couptries it may be cheaper to use a small offset press if more than 20 copies, are needed; in other countries, where offset plates are expensive, the photocopier may be cheaper than offset for as many as 150 or even 200 copies.

8.3 Composition

Before a text can be printed, the words must be gathered together in a form that can be used for reproduction. This is often called *typesetting,* but often today no metal type is involved. As a result, a more general term, *composition,* has grown up.

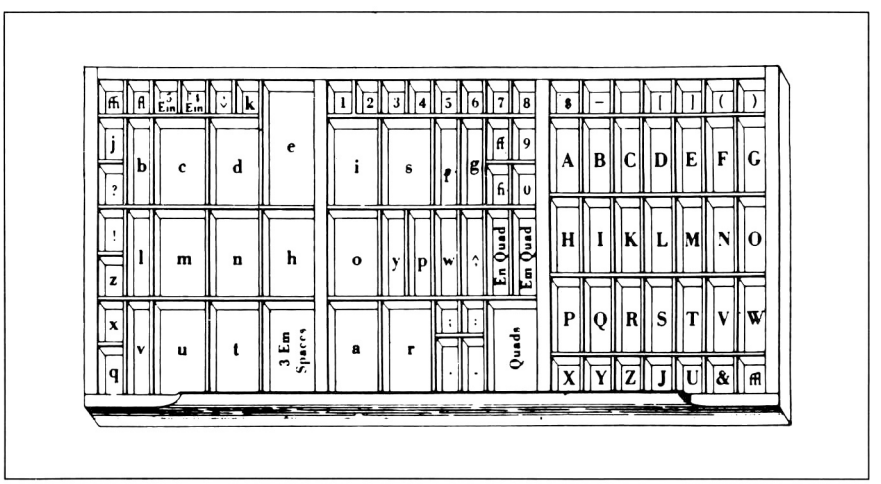
There are many methods of composition, some highly sophisticated. Whichever is used, every character to be printed—every letter, digit, punctuation mark, special symbol, and space—requires - a separate operation. Composition usually involves many thousands of operations, each of which must be accurate. Technology has increased the speed of composition, but has not removed the constant need to check the results.

Metal type

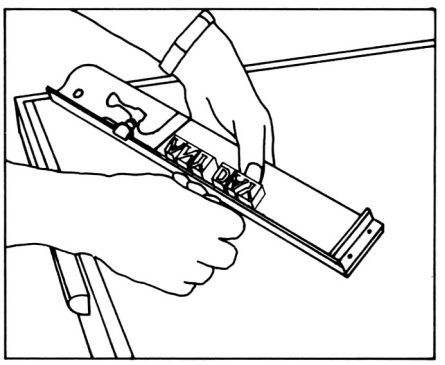
For most of the time since Gutenberg, texts have been printed from pieces of metal which have raised letters on their top ends. The letters are in mirror image so that they will print correctly. The pieces of metal are exactly the same height and can be cast from molds in quantity. The metal is a mixture of lead, tin, and antimony that melts and hardens quickly.

Hand setting

Traditionally, pieces of type are assembled by hand. The typesetter stands in front of a drawer, or *case,* which is divided into compartments. Each compartment holds a number of pieces of type cast with the same letter. Each case holds letters in only one size or style of typeface: the typesetter will have to move to another case to set in italic or boldface. If the text is in the Latin alphabet, each case has 89 compartments, one



for each of the 26 letters in uppercase and lowercase, plus punctuation marks, common symbols, and the low (non-printing) pieces used to leave between words. That sounds complicated; but in Chinese texts typesetters have to choose characters from 3000 compartments. (Uppercase and lowercase letters got their names because they originally were kept in separate drawers or cases, one above the other.)



The typesetter picks out the letters of the text, one at a time, with one hand and gathers them into words and lines in a small container held in the other hand. Every few lines the type is transferred to a larger metal tray called a *galley*. After printing is finished the process is reversed. The pieces of type are separated and distributed back into the cases.

Handsetting has disadvantages. It is slow and there is much chance of error. Characters may be upside down, or come from the wrong Compartment, or they may have been put in the wrong compartment when they were put back in the case. Because the type is used and re-used, the letters get worn and broken. Type is expensive and printers cannot always hold large stocks or many varieties. It is also heavy and bulky to store. The only way to increase production is to buy more type and hire more typesetters.

Still, handsetters can become surprisingly fast and accurate with practice. This style of typesetting is common, especially in small print shops, in many countries. In some, like China, it remains the most important form of composition.

Machine composition

For genarations, printers and typesetters dreamed of a machine that could assemble type quickly and accurately. About 100 years ago, two such machines were invented: the *Monotype* in Britain and the *Linotype* in the United States.

In both machines, an operator sits at a keyboard that looks something like a complicated typewriter. Both machines cast metal type following the instructions of the operator. They do this in very different ways, however, and the results are different also. Monotype produces individual letters that come out of the machine arranged in lines and columns of the right width. Linotype produces solid lines of type: the whole line is cast in a single piece of the specified width.

Monotype casting is generally better in quality and more versatile than Linotype, but Linotype is usually faster and cheaper. Typographic errors in Monotype can often be corrected by replacing a single letter by hand. With Linotype, even a small correction means resetting the entire line.

In both systems all letters are newly cast. However, the brass molds *(matrixes)* used to cast them can get worn over time. Even if the molds are in good shape the casting can be imperfect. Editors must continue to look for broken letters as well as typographic errors.

Strike-on and other simple forms of composition

With lithography, printing is no longer done directly from metal type. All that is needed is an image (the camera-ready copy) that can be transferred photographically to the printing plate.

People sometimes talk of *hot type* and *cold type*. By "hot type" they mean metal type that has been melted and cast. By "cold type" they refer to all the other means of composition now available, which need not involve setting with metal type. There are many kinds of cold type composition.

Pen and ink

The simplest form is composition with pen and ink. With offset, the author's own handwriting and illustrations, or someone else's, can be photographed and printed. The writing should be with a strong black pen on white paper: ballpoint pens, for example, do not usually reproduce well.

Transfer type

Very few people can draw letters neatly and attractively for reproduction. For those of us who can't, there is help. It is called *transfer lettering* or *transfer type*. The letters are printed on plastic sheets in a form that can be rubbed off and transferred to paper. This takes some practice and, because each letter must be rubbed separately, a long text takes a great deal of time. Transfer lettering is best used therefore for short amounts of type in large sizes, as in headings. It is also useful for lettering in graphs and drawings.

Transfer type comes in a variety of faces and sizes. Some special symbols are also available that might otherwise be hard to reproduce for printing.

A variation on transfer type is *transfer tone*. This provides screens of varying shades of gray that can be applied to graphs, maps, and other illustrations.

Print

The camera-ready copy can also be something that has already been printed. It is now common to reprint publications by offset even if the original was set in metal type. This works well as long as only text and line illustrations are involved: it can be more difficult if photographs must be reprinted. The original printing must of course be clear and clean; the reprint will never be better than the camera copy.

If cast-metal setting is easily available and cheap, the text may be set in metal type and printed once in a special *reproduction proof*. That becomes the camera copy. The inking should be done with special care, and the paper should be smooth and of good quality.

Strike-on

Camera-ready copy can also be reproduced by typewriter or by more complex machines that work much like typewriters. This type of Composition is often called *strike-on* because it is created by keys that strike the paper.

The more complex machines (Varitypers, Friden Justowriters, IBM Selectric Composers, and so on) may have small computer memories, making it easy to correct errors. They may be equipped with a selection of typefaces of different sizes and styles that look more like metal type than typewriting. They often can justify the text automatically, that is, adjust the spaces between words so that the right-hand edge is straight. The best ones produce camera copy, which looks almost like text set in the traditional manner.

An ordinary office typewriter can also produce camera-ready copy that is satisfactory for many purposes. But care must be taken. See unit 7.10.

Word processors or other computers can also produce camera-ready copy. The quality of the copy will depend on the nature of the printer that is used. Some computer printers use strike-on keys; others use a dot-matrix printer and do not produce as sharp, clean letters. For reproduction, the computer operator should use a fresh ribbon and the best quality of printing available. The best results come from laser printers, which produce, quickly and easily, pages that look almost as good as the products of photocomposition.

Finally, it is possible to type directly on paper offset printing plates, using a ribbon with special ink. With special pencils, it is also possible to draw directly on these plates. Then no photographing is necessary before printing.

Strike-on composition is economical and direct, and can be easy to control if the work is done in the office under the editor's immediate supervision. Especially with word processors, corrections or changes can be made easily in the camera-ready copy up to the last minute. Strike-on has its own limitations, however.

- Few typists understand the requirements of typesetting. To get best results, they need at least some special training or supervision. (See unit 7.10.)
- Standard typewriters cannot produce italic, boldface, or more than a few symbols. Typesetting is restricted to what is on the machine. Any other characters have to be drawn by hand.
- Some typewriters, like the IBM Selectric, do not operate with individual keys but have a sphere of type that can be changed to provide italic, boldface, or different type faces. But each time the text changes (for example, to italic and back again), the "golf ball" must be changed by hand. This interrupts the typist's rhythm and slows the operation.

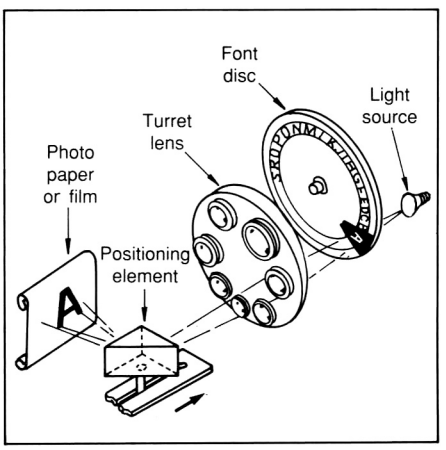
Photocomposition

The camera copy for offset printing can also be produced photographically. This is called *photocomposition,* and since it almost always involves a computer it is often described as computer-assisted photocomposition.

Several kinds of machines are used for photocomposition. The principles are the same.

First, the text is entered into a computer by an operator working at a keyboard. The text, as it is entered, is displayed on a cathode ray tube (a small television screen) and any errors can be corrected immediately. At the same time, the operator enters instructions for typesetting, including the size of type, typeface, column width, paragraph indents, and other commands. When the text has been entered and corrected, the computerized information is fed into the photocomposing unit.

This unit looks like a large closed metal box. At one end, it has a source of light that can be produced in short, strong bursts. At the other end is a roll of photographic paper. In between, in many models, the unit stores the characters of the typeface that is to be set. Typically, these characters are stored on negative film—the letters, numbers, punctuation marks, and symbols are transparent in a black background. This film *font* moves according to the commands in the computer, so that one character at a time lies in front of the light source.



If the computer says "Set *e,"* for example, the film font moves so that *e* is in front of the light source. The light flashes. The image of *e* passes through a series of lenses and then a mirror or prism, and finally exposes one small part of the roll of photographic paper with an *e* of the proper size and shape. Then the computer commands the font to move so that *d* is in front of the light source. The light flashes. The mirror or prism moves so that the image of *d* will be exposed on the paper next to *e.* And so the process continues until the word *editor* has all been exposed, a space is inserted, and the unit moves on to the next word. When it comes to the end of the line, the unit moves the mirror or prism and the paper so the next line can begin.

Once all the text has been set (if it is short) or the whole roll of photographic paper has been exposed (if the text is long), the paper is taken out of the unit in a closed canister and is developed like any other photographic print. The result is a long sheet of paper with the text in black letters on white.

The process is actually more complex than this. The machine thinks ahead, so that it can calculate the exact amount of space to leave between the words in each line if the line is to be justified. It also decides when and where to break words with hyphens at the ends of lines. And it does all this at high speed: up to 75 characters per second. The operator can change typefaces by putting different film fonts into the unit. In many models, the size of type is changed inside the machine by changing lenses automatically.

In the most modern models of photocomposing units, the characters are not stored on film. They are stored on a magnetic disk, as computerized data. The light source is a small, powerful cathode ray tube. Each letter

in turn appears on the tube, just as if it were on a TV screen, and that image is exposed onto the paper. This system is even faster than using film fonts.

Computer-assisted photocomposition is fast and the type is normally clean and sharp. Editors must still be aware of some problems that can arise:

- The paper can be creased in processing or bent afterwards. The result can be a broken or distorted image.
- The developing may be done improperly. Then the image is not a strong, contrasting black against white paper, and may be weak when printed.
- The photographic image may not be properly *fixed* by chemicals. In that case the image will fade if the camera copy is stored for some time before printing. I have seen most of a book disappear in this way; the whole text had to be reset.
- Corrections in proof need special attention. See unit 3.9.

Desktop publishing

Cornputex-assisted photocomposition units are expensive to buy and to operate. In many countries, this form of composition is too expensive for most research institutes or extension agencies. Moreover, the commercial typesetters who are most likely to own such equipment rarely are trained in the complexities of publishing the results of research. They are more used to setting advertisements and other commercial printing.

It is now possible, however, to produce professional camera-ready copy from a single desk in an editorial office, and to do so within the budget of many organizations. The equipment involved is a personal computer, a laser printer, and a few basic computer programs. With this it is possible to write and edit text, using a variety of typefaces, type styles, and type sizes. Then the text can be assembled directly into pages, in columns if desired. Still in the computer, the text can be combined with display type, page numbers, running heads, and line illustrations. What can be seen on the screen can then be printed on the laser printer, a relatively small unit that produces camera-ready copy.

The process is not perfect. The results from most laser printers are not quite as crisp and clean as from a full-scale photocompositor. The techniques take time to master. Page size is limited at the moment to letter size or foolscap (A4 or slightly larger). But pages that size can be pasted together to produce camera copy for larger ones, even for newspapers. The technology is improving rapidly, and the results are more than satisfactory for most research publications.

The process is commonly called *desktop publishing,* but the description is inaccurate. It is desktop composition. It links the editor directly to the printer.

8.4
Assembly for printing

Once the text is composed, it is normally held while it is proofread and any errors are corrected. Usually more than one cycle of reading and correcting is needed. (For proofreading, see units 3.8–3.9.)

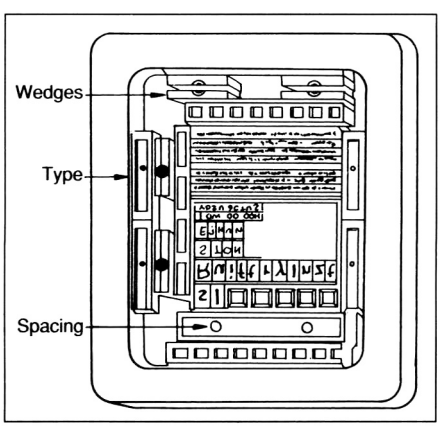
In the days when metal type was the only means of composition, the text was stored in long metal trays called galleys. Proof printed from that type was called *galley proof*. That name is still used for the first, long strips of proof–even when no metal type is involved. Galley proofs are relatively easy to correct, because lines can be added or removed without causing problems.

After the text is corrected it is assembled into pages, along with any tables, illustrations, headings, footnotes, page numbers, running heads, and other matter that has been prepared separately. All this material must fit into a space whose height and width have been decided in advance. This may be relatively easy if there is only straight text; it grows increasingly complex as the amount of other material increases. An article that has graphs, photographs, tables, and footnotes can be difficult to fit efficiently into exactly the right page area. (For some of the difficulties that can arise in making up pages, see unit 7.12.)

When the pages are corrected, they are assembled together for printing. Once again, there may be an opportunity to proofread and correct, but changes now are still more costly and should be avoided unless essential.

Assembly into pages and for printing can be done in three ways, depending on the kind of printing and the nature of the publication. It can be done in metal type, in camera copy, or in film.

Lock-up (metal type)



With metal type, all the pieces that are to fit on one page are gathered on a smooth, high table. Low pieces of metal must be inserted wherever there are to be blank spaces. The pieces of type must fit together exactly right. If they are loose, or if they are forced into place, there will be problems in printing.

After final corrections are made, all the pages to be printed at one time are brought together inside a heavy metal frame. There they are locked firmly into position with metal wedges. This assembly is called a *form* (sometimes spelled *forme*). A form may hold one or two pages or as many as 32 if the press is large enough. The form is then transferred to the press for printing.

Paste-up (camera copy)

In offset lithography, camera copy (whether produced by strike-on or photocomposition) may be made into complete pages by cutting the galley proofs and pasting them into position on a larger sheet. This sheet may be lightly printed with a grid to guide the compositor. Type, line drawings, and screened halftone prints can all be assembled in this way.

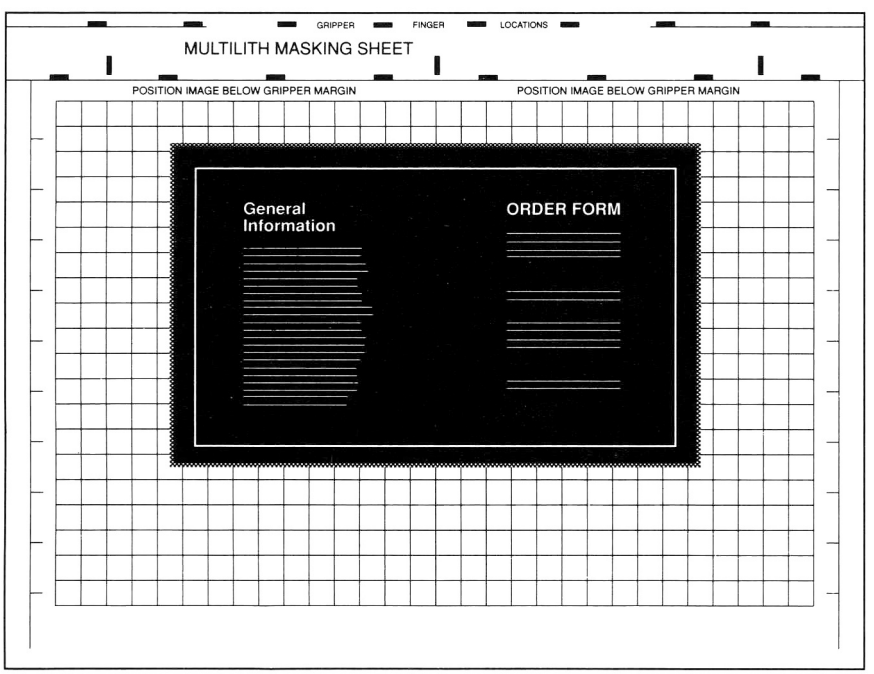
The process is called *paste-up,* but no paste is used because it can be messy. Instead, a special wax is recommended, or rubber cement which can be removed easily, or tiny pieces of transparent adhesive tape. Paper is obviously much easier to work with than metal. Care must be taken, however, that all lines are straight, and that no small pieces of text are lost.

In some photocomposition systems, pages can be made up automatically. The computer divides the text into pages with the right number of lines, adds running heads and page numbers, and leaves space for illustrations. Most printing shops in developing countries, however, still use manual paste-up.

Pasted-up pages may be photographed separately or as a group for making an offset plate. Two pages may be joined on a single paper plate, for example, or as many as 32 on a large metal plate.

Strip-up (offset film)

For the best quality work, if there are halftones, printers are rarely satisfied with making plates directly from pasted-up assemblies. Instead they photograph the type and illustrations separately, so as to get the best results from each. They check the negative film carefully for any tiny holes in the black areas that will affect the printing; any such holes are covered with a red *opaquing fluid.*



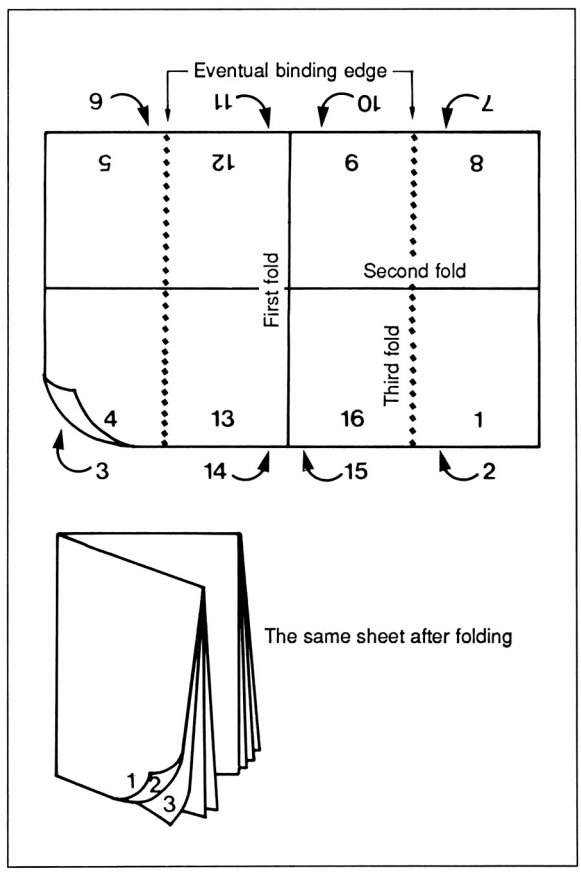
Then the pieces of film, both text and halftones, are assembled on sheets of plastic or masking paper. Printers who use paper cut windows in it where the film is placed, so that light can pass through. The process of assembly is called *stripping,* and the whole assembly is called a *flat.* Usually a flat contains many pages. Care must be taken that no parts of the printing area are covered with paper in the flat. Whole paragraphs can be lost in this way. If not quite enough paper has been cut away, the edge of a column of type may be covered and some letters in each line will be lost.

The film is then used to make a printing plate.

This method is essential in four-color printing. Four flats are used, one for each color. The film must be placed precisely in the flats or the images will not mesh (*register*) properly.

Imposition

Whichever of these three methods is used, the pages in a form or flat must be arranged in a special order. This is called the *imposition,* and is designed so that when a sheet of paper with a number of pages printed on each side is folded, the pages will appear in the right order. Here is an imposition for 16 pages, to be printed by offset lithography, with eight pages on each side of a sheet.



8.5 Reproducing illustrations

There are two basic kinds of illustration.

Line illustrations

Line illustrations consist only of pure blacks and pure whites. Graphs and pen and ink drawings are examples of line illustrations. Do not be fooled by the name. The black does not have to be a line. It can be a large solid area. However, in a line illustration there is nothing between the two extremes of color. Any shading between black and white is created by fine black lines drawn close together, or by a series of black dots drawn or laid down with transfer tone.

Continuous tone illustrations

Continuous tone illustrations may run from pure black to pure white, but have a continous scale of gray in between. Black and white photographs are continuous tone.

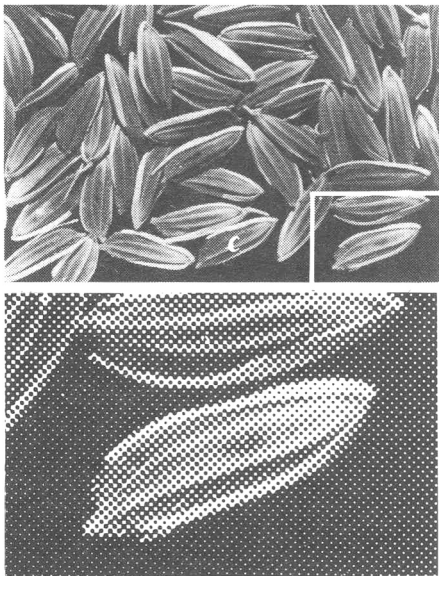
A printing press works with black ink (normally) on a printing surface and white paper. Where there is ink, it prints black. Where there is no ink, it leaves the paper white. This is the way it prints line illustrations.

How is it possible then to print different shades of gray?

Halftones

It is done by breaking the gray surface into many small dots, so small that they cannot be seen easily without a magnifying glass.

Where the dots are large and close together, we get dark gray; where they are small and farther apart, we get light gray. When they are very tiny, with a great deal of space around them, we get almost-white; where the space between them is very small so they almost come together, we get almost-black. This is called *halftone* reproduction, using halftone engravings or halftone film.



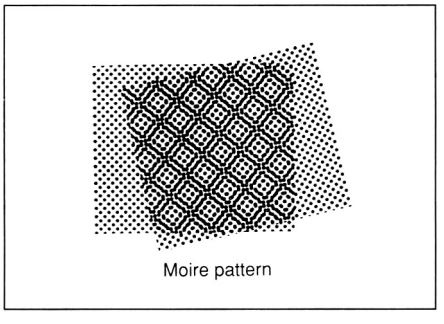
The *halftone* that is to be used in printing is produced photographically. A special camera takes a photograph of the picture that is going to be reproduced. It does this through a special cross-ruled *screen* that breaks the picture into dots.

Screens come in different sizes. For rough paper like newsprint, the screen may have only 65 dots to the inch. The reproduction then is fairly coarse, and detail may be lost. For accurate reproduction (for example of photomicrographs) we need finer screens—150 or more dots to the inch—and good quality paper. It is possible to produce halftones with as many as 300 dots to the inch, but these can be reproduced satisfactorily only with high quality paper and printing.

Preparation for printing

When an illustration is sent for printing, the first step normally is to photograph it. The result is either a line negative or a halftone negative. For better quality reproduction of line illustrations, the editor may specify *fine-line* negatives, which are slightly more expensive than the normal variety.

In photographing, the printer can enlarge or reduce the size of the illustration. In that way. the printer's negative will be exactly the same size as the picture is to appear when printed. Editors must tell the printer the size that is wanted, either as actual dimensions or as a percentage of the existing size (see unit 6.10).



Moire pattern

It is difficult to make a halftone from a photograph that has already been printed with a screen. The new screen battles with the old screen, and they combine to form a *moiré* pattern. This effect can be reduced with care, but it rarely disappears. One way to avoid this is to photograph the halftone as a *fine-line* negative and reproduce it in its original size, using the old screen. The original printing must be sharp, however.

If printing is by letterpress. the next step is to make a metal *engraving* (also called a *cut* or *block)*. The image is exposed through the negative onto a metal plate that has been coated with special chemicals. The plate is then treated chemically so that the image area (the part to be printed) becomes hard, and the chemicals elsewhere wash away. The plate is next put in acid, which eats away the unprotected areas and leaves the image area raised. Finally, the plate is mounted on a wooden block to make it the same height as the text type. Engravings may be line or halftone. Normally they are made from magnesium or zinc, but finer screens require copper, which is harder and more resistant to wear.

If printing is by offset lithography, the line or halftone negative is usually stripped with the text negatives in flats for platemaking. In offset it is not always necessary to work with negatives at this stage. If assembly is by paste-up, the printer can work with photographic prints of the illustrations that are the exact size the illustrations are to appear when printed. These can then be pasted into the assembly and used for making plates. The process works best with line illustrations, but

satisfactory results can be obtained with photographs by making prints through a coarse halftone screen (no more than 100 dots per inch).

Color illustrations

Color illustrations can also be line or continuous tone.

In color *line* printing, each color is printed separately. Comic books may be printed this way, as are some newspaper advertisements or the covers of scientific journals. The color may be laid down as a line, or as a solid block, or as a screened block. By using different densities of dots, it is possible to print different tones of the same color—for example, pink, light red, and dark red with one dark red ink. Maps are often printed as line art, using four or more colors and different tones. In the past, in very complicated, high-quality work there could be as many as 18 or more different colors in an illustration, each printed separately.

Today, we can reproduce color photographs or complex color drawings with halftones. The illustration is separated into the primary colors. Then separate halftone negatives and plates are made for yellow, red, blue, and black. When the four halftones are printed in combination, the tiny dots blend together in a pattern so that they look like the continuous color of the original. Under a magnifying glass, you can see the dots. This is called *process printing or four-color printing.*

Actually, the colors are not the primary colors in the rainbow. Printers use a light blue called cyan and a bluish red called magenta; the third color is pure yellow.

Cyan, magenta, and yellow together can produce a color picture, but the black adds important crispness and depth. For extra quality, sometimes printers will use five or even six colors.

In the same way, printers can obtain extra quality in black and white photographs by using two halftones with slightly different dot patterns and two shades of black ink, or black and a second color. This is called a *duotone.* It should not be confused with two-color printing, which simply lays a solid or screened color over or under a black-and-white photograph.

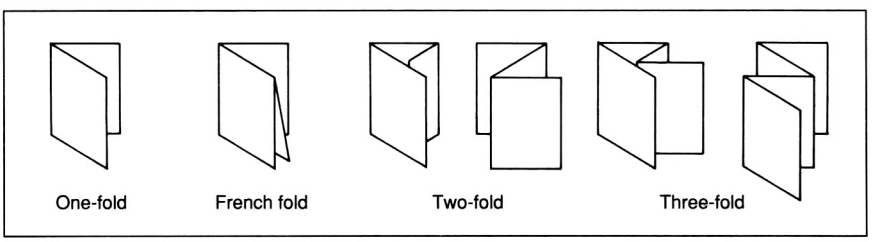
Line, halftone, and four-color printing can be done by letterpress or offset. All three are more expensive and more difficult by letterpress, however. Four-color letterpress printing has almost disappeared because of the cost.

8.6 Binding

If the publication is a single sheet to be distributed flat, production is complete as soon as it is printed. If it is more ambitious, further steps are needed. Simple binding may be carried out by the printer or even in the editorial office. Otherwise, it may be necessary to use a bindery, which is often a separate business from the printer.

Folders

A folder is a single sheet that may be folded one or more times to get a desired effect. The folding can be done by hand or machine. Some of the simpler kinds of folder are shown below.



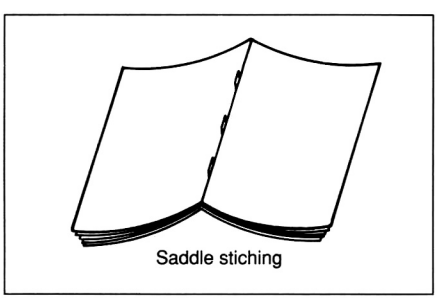
Booklets

If more than a single sheet is involved, the pages are usually bound together.

The first step is to fold the sheets, as determined by the imposition. The folded sheets are called *signatures.* A signature can never have fewer than four pages, and may have as many as 64. The signatures are *gathered* to form complete booklets. This process (also called *collating)* can be done by hand or machine. If there is a cover of a different kind of paper, it is added.

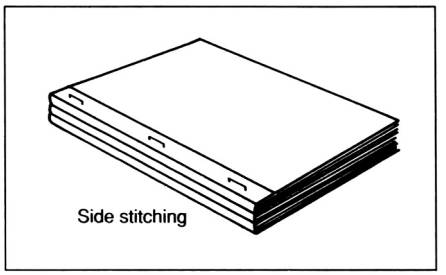
Stitching

The cheapest and fastest way to bind booklets is by *stitching.* This is a confusing word: it has nothing to do with needle and thread. It involves a machine fed by a coil of thin wire, and the result is the same as that from an office stapler.



In *saddle stitching,* the booklet is laid partially open on an angled piece of metal, somewhat as a person sits on a saddle on a horse or pony. The staples are inserted from the outside of the book and close in the middle. Saddle stitching is fast and efficient, and has the advantage that the pages lie flat when the booklet is open. Saddle stitching is normally useful for booklets of up to about 64 pages. Beyond that, the publication may be unpleasantly bulky and will not close properly.

Side stitching is best for longer booklets, or for booklets printed one sheet at a time (for example, on letter-size paper on an office duplicator or small offset press). The booklet is laid flat, face up, and the staples are forced through to the back along the binding edge. They are usually about a quarter of an inch (6 mm) in from the edge: as a result the book will not lie flat when open, and if enough space is not allowed on the side margins some of the text will be hidden. Often the bound edge is covered with cloth tape to make it look neater and add strength.



Trimming

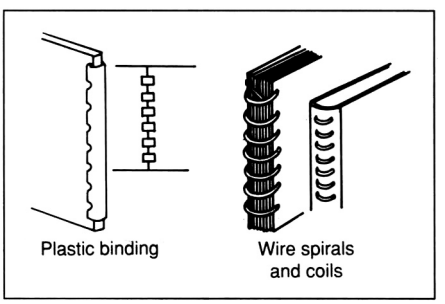
Once they are stitched, booklets are usually trimmed along the three unbound edges in a large guillotine or paper-cutter. This is necessary if the signatures are folded more than once; otherwise pages would not open. Even if it is not necessary, trimming may be desired to make the page edges even.

Books

Book-sized publications that are published in several thousand copies and are expected to last for some years require other forms of binding. The first steps, however, are the same: folding and gathering of the sheets to make complete copies.

Mechanical binding

Several kinds of binding are classified as *mechanical binding.* In all variations, the first step is to punch or drill holes in the gathered pages. Then metal spirals, plastic coils, or rings are inserted. The operation is simple and can be done by hand using simple machines.



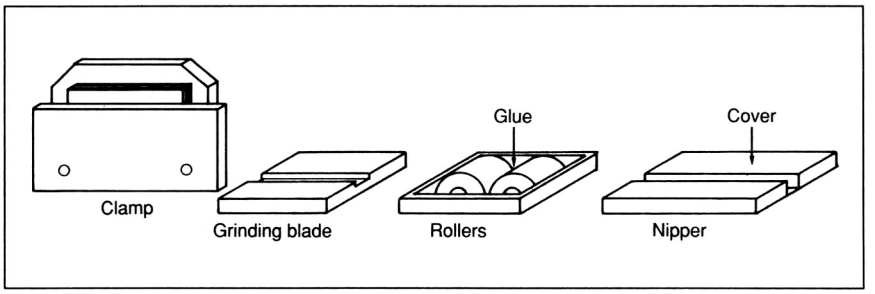
This is a good way to bind books that must lie flat when open. It is also useful for books printed one page at a time, as on an office duplicator. A special form of mechanical binding — the looseleaf binder — is particularly well adapted for publications that must be revised frequently: pages are easy to add, remove, or replace. Particularly bulky publications of several hundred pages can be bound mechanically using long screws instead of side-stitching.

Adhesive binding

A fast, economical form of binding holds the pages together with a *plastic adhesive.* This kind of binding is common for mass-market paperbacks. It is sometimes called *perfect binding.* Once that name was a joke, because the binding was anything but perfect: books bound in this way too often came apart. That problem has been solved by using improved flexible adhesives instead of glue. Books bound in this way now last for many years.

Adhesive binding can be used with folded signatures or with sheets printed one page at a time.

The process requires special equipment. The pages for one copy of a book are clamped between two metal arms. The binding edge is trimmed or perforated and roughened by a grinding blade. The book then passes over rollers that apply the liquid adhesive to this edge. Before the adhesive has had a chance to set, the cover (already printed) is stuck on. Then the book is trimmed along the three open edges.



Adhesive-bound books still sometimes come apart. If that happens, check with the binder. The adhesive may not have been liquid enough, or too little adhesive may have been applied.

Because the adhesive is forced in among the pages along the binding edge, books bound this way will not open flat. If they are forced open, they may crack along the binding.

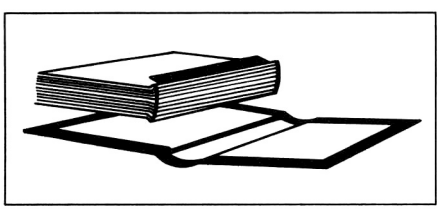
This type of binding affects design as well. Enough space must be left on the inside margin to permit some of the page to be ground off and a little more to be lost to adhesive. If the inside margin is not wide enough, it may be difficult to read the inside ends of lines.

Smyth sewing

Traditionally, books were bound by sewing their signatures together, at first by hand, and now by a special Smyth sewing machine. The process is more expensive than adhesive binding, but sewn books are long-lasting and open flat. Smyth-sewn books can have paper or hard covers.

Hardcover binding

Hard covers are the longest-lasting form of binding and the one most favored by librarians. They are particularly good for reference books, which must withstand heavy use over long periods.



Folded and gathered signatures are first sewn. Then the back binding is reinforced with cloth. After that a cover (front, spine, and back) is attached. The cover, or case, is usually made of cardboard covered with cloth or heavy cloth-like paper. The case may be printed or stamped with the title of the book and the name of its author. It may be covered with a dust jacket, which can be attractively printed.

Hardcover books are prestigious, but they are beyond the budgets of most research institutes and extension agencies. More often, librarians who want hard covers add them in their own binderies.

9
Production management

Some editors have little or no responsibility for the production of the manuscripts they edit, or for controlling the costs of production. They prepare the manuscripts and turn them over to experts in production. Other editors, particularly in small publishing departments, have full responsibility for organizing production, dealing with printers, and controlling costs.

Responsibilities differ, but every editor should have some idea of how to estimate the size of a manuscript, of how the costs of production mount, and of how to control those costs. Publishing is not only an intellectual activity; it is an extremely practical exercise in manufacturing.

This module is a brief introduction to a complex subject. It assumes a familiarity with the printing terms and production processes described in Modules 7 and 8. It concludes with a look into future methods of publishing the results of research.

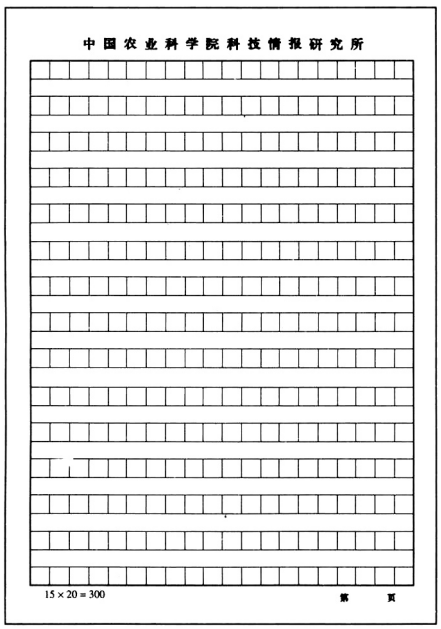
1 Estimating the length of a manuscript
2 Costs in general and one-time costs
3 Variable costs
4 39 ways to reduce production costs
5 Choosing a printer
6 Innovations in information transfer

9.1
Estimating the length of a manuscript

Editors sometimes must know how long a manuscript is in order to plan for its publication. They must know whether a short manuscript will fit in a two-fold pamphlet, for example, or whether a longer manuscript will need 12 or 16 pages if it is published as a booklet. Sometimes they must be able to estimate how many hundreds of printed pages a long manuscript will make in order to know whether their institution can afford to publish it. The editor of a newsletter or a journal must be able to estimate how many columns or pages each article will fill; otherwise there is no way to know whether there is enough material, or too much, to fit in the available number of pages. Sometimes, too, an editor may know that only an exact number of pages is available and must be able to calculate how much text can be fitted into that space.

Often it is possible to make a rough estimate, based on experience. A veteran editor may be able to glance over the pages in a manuscript and predict, with reasonable accuracy, how many pages of print they will fill. The following method is more precise.

Counting by characters



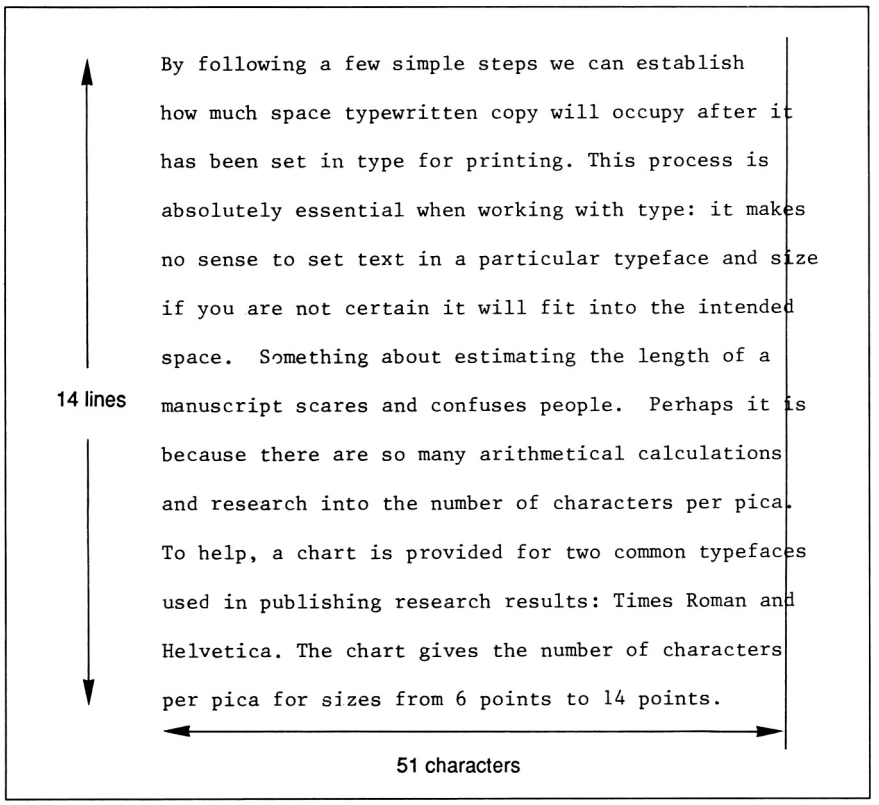
It is based on *character counts.* Authors and editors usually talk of a manuscript being "so many words" long. But how long is a word? To be accurate, editors, designers, and printers count characters. That is, they count every letter, number, punctuation mark, space between words, space between sentences, and every other keystroke in the manuscript.

In China, this is easy. Chinese publishers give their authors sheets of paper ruled into squares — 15 double-spaced lines of squares, with 20 squares in each line. The authors write their manuscripts neatly, one character in each square. One page equals 300 characters. In type the characters fit in the same square shape, so it is easy to calculate the exact area of type the manuscript page will fill.

In the latin alphabet, typeset letters are different widths. An *i* is narrower than an *h,* which is narrower than an *m,* which is narrower than an *M.* This complicates the process of estimating the length of a manuscript. Instead of working in neat multiples like 300, we must either count every character (which would be exhausting) or work with averages.

An example

Here is a simple example. An editor has a single paragraph and wants to know how much space it will take when it is set in type.



First, the editor counts a few lines and finds that, on average, there are 51 characters in each line of the typescript.

Next, the lines are counted: 14. That means there are approximately 14 x 51 or 714 characters in the typescript.

The design calls for the manuscript to be set in 10/12 pt Times Roman, 12 picas wide. So the editor goes to a handy table that tells the average number of characters of Times Roman that will fit in one pica at different sizes. In 10 pt, on average, 2.68 characters fit in one pica. That means each 12-pica line can hold 12 x 2.68 or 32 characters.

Average number of characters per pica at different sizes of Times Roman and Helvetica

Point size	6	7	8	9	10	11	12	14
Times Roman	4.46	3.82	3.35	2.97	2.68	2.43	2.23	1.91
Helvetica	4.39	3.76	3.29	2.93	2.63	2.40	2.20	1.87

Now the total number of characters in the manuscript (714) is divided by the average number of characters in a typeset line (32). The editor finds the manuscript will fill 22.3 lines of type. That really means 23 lines, because even a short line takes a full line of vertical space.

The editor knows, moreover, that there will be 35 lines of type on each full page in the publication for which the paragraph has been written. That means the paragraph will take up two-thirds of a printed page.

This was a simple problem, solved simply. Using the same methods, if is possible to estimate the length of the longest and most complex manuscripts. The process may look difficult. It really isn't. It just takes patience and care and common sense, qualities needed at every other stage in editing as well.

These are the steps to follow.

Characters per line

1. ***Estimate the number of characters in an average line.*** This must be done carefully because the average may be multiplied hundreds or thousands of times in the course of the estimate, and even a small error can be serious.

Lines of typewritten copy vary in width. The simplest way to find the average length is to draw a line down the right side of the page, midway between the longest and shortest full lines, and take that as an average. A safer way is actually to count the number of characters in several lines and take a mathematical average. The counting can often be done with a ruler: on standard typewriters, pica type consistently has 10 characters in 1 inch or 25 mm, and elite type has 12.

To get an accurate estimate, count characters in at least 20% of the lines on a page and count several pages. On long manuscripts count 5% of the pages; on short manuscripts count that many or more.

If the manuscript has been typed by more than one person, or on more than one size of typewriter, the process must be repeated each time the line width or type size changes.

If the typescript is justified, with uneven spacing between words, you will not be able to use a ruler. You will have to count actual characters in order to get an average, counting only one space between words. You will also have to count actual characters to find an average if the text has already been set in type or has been prepared on a typewriter or word processor with letters of different widths, similar to type.

Major text

2. ***Estimate the number of lines in the manuscript of continuous major text.*** Major text is text that will be set in the normal body type. Continuous text runs on line after line, as opposed to lists or poetry or other text that is broken by line. (Text broken by line will be counted separately.)

In many manuscripts, each page has the same number of lines of typing. Find this number or a close average.

Some typed lines will be short because they come at the end of a paragraph. Count them as full lines if they are half or more the full width.

Count the number of full pages of manuscript. Multiply that number by the number of lines on a normal page of typing. To the total add the number of lines on short pages. Such short pages may come at the beginning and end of chapters or sections.

If the pages vary greatly in length, count the total lines in the manuscript or get a true average per page. (Once again, a ruler can help. On most typewriters, there are three lines of double-spaced typing in 1 inch or 25 mm.)

If the manuscript is dirty—has lots of deletions, insertions, handwriting, etc.-each page must be considered carefully. Sometimes a manuscript must be retyped.

3. ***Estimate the total number of characters of continuous major text.*** Multiplylthe number of characters in an average line by the total number of lines.

In a long manuscript, this may be done chapter by chapter or section by section. Breaking the total into parts makes this kind of calculation easier to do and easier to check.

Minor text

4. ***Estimate the number of characters of continuous minor text and sub-text.*** Make a character count, as above, of continuous text that may be set in smaller type, or in italic, or in a narrower measure (indented), or in any way different from the normal body type. Such material includes

- extracts(quoted material not set as part of the text)
- appendices
- notes

For definitions of major text, minor text, and subtext see unit 7.6.

Keep track of the number of extracts, appendices, tables, and other elements involved. You may need to know how much blank space, in total, to allow around them (see Step 12). This can add up to a sizable amount of space.

5. Count line-for-line any copy that will definitely begin a new line on the printed page and will definitely not extend beyond a single line. If the copy will definitely fit in two lines, it may be counted in the same way. Examples:

- tables
- lists
- headings
- references
- poetry

Remember that such material may be set in smaller type than the main text, and that this will affect the number of characters in the printed line.

Tables

6. Estimate the amount of space required for any tables. Count the number of lines in each table. Allow one line for each horizontal rule. Allow for any extra line spacing or footnotes. Remember that tables are normally set in type smaller than the major text.

Calculate how wide the table will be. Normally this is simple. In a publication with one column on a page, will the table fit in that column? If not, must it be turned on its side, or spread across two pages? In a publication with more than one column on a page, will the table fit in one column, or will it need two or more columns? Usually this kind of question can be decided at a glance.

Occasionally it is impossible to guess. Then it's necessary to make an accurate estimate. Here is how to do that:

- Calculate the width needed for the sideheadings. Count the number of characters in the longest line and estimate how wide it will be when it is set in type. (See step 11 for the way to do this.)
- Allow 2 picas space between the sideheadings and the first column of the field of data.
- In each column of the field of data, find the longest line. It may be in the heading or in the data.
- Count the longest lines across the field. In headings, count characters and estimate the width in type as you did for sideheadings. In the data, allow 1 en of space for each digit.
- Count the space between columns as 2 ens.
- Translate the total into picas and points.

For example, a field with three columns with a maximum of five, three, and six digits in each will require 5+2+3+2+6 = 18 ens. If it is set in 10 pt type, this translates into 18 × 5 pts (one 10 pt en = 5 pts) or 7.5 picas.

This estimate gives the minimum width for the table; extra space could be added between columns to make the table wider if desired.

Illustrations

7. ***Estimate the space required for illustrations.*** Illustrations may present special problems, but can usually be grouped as full-page, half-page, third-page, etc. Calculate how many of each approximate size are involved.

Full pages

8. ***Allow for material that can be counted page by page.*** Some parts of the manuscript will take a full page, no matter how few words are involved. If there is a title page, for example, it will require a full page even if there are only 25 words on it. The back of the title page will also be a full page. Tables of contents usually take a full page, no matter how short they are. (If they are long, of course, they may take two or more pages.) A long table of data can also be counted as a full page.

Blank space

9. ***Allow for empty space in the printed publication.*** Estimate the number of pages that will be blank or partly blank because they come at the beginning or end of sections or chapters.

Keep track as well of the number of lines of space before subheads or around extracts and tables.

10. ***Tabulate all these components.*** A useful form appears on page 349.

Characters per typeset page

11. ***Calculate the number of characters of type on an average full printed page of the planned design.*** Your typesetter may have tables that will provide this information. Be sure the information is correct for the typesetting equipment being used. Typefaces with the same name may have different set widths on different equipment.

If no tables are available, calculate the number of characters in a line in the same way you calculated the number of characters in a manuscript line. Count at least 10 lines to get an average number of characters in a line, and multiply by the number of lines on a page.

For minor text and subtext, which will rarely fill whole pages, calculate the number of characters in a line for each face and size used.

The calculation can be reversed to estimate how many picas a given number of characters will take in the typeface being used. For example, if you have found that on average there are 56 characters in a line of 10 pt Times Roman 21 picas wide, then you can figure that, in a table set in that face and size, a column heading with 14 characters in it will be about $21 \times 14/56 = 5.25$ picas wide.

Number of typeset pages

12. ***Estimate the number of printed pages.*** There are seven steps in the process.

- Establish the average number of lines and the average number of characters of main text on a printed page. Establish the average number of lines and characters of minor text on a printed page.
- Divide the number of characters of continuous major text in the manuscript by the average number of characters on a printed page. Divide the number of lines of major text counted line-for-line by the number of lines on a page. Add the results. This will give the number of printed pages needed for the major text.
- Repeat this for all other material set in each size and width of type (appendices, extracts, references, etc.)
- Add allowances for tables and illustrations.
- Add the number of pages that can be treated as units regardless of the amount of type on them: the title page, part titles, copyright page, table of contents, and so on.
- Add allowances for blank space: blank pages, blank space at the beginning and end of chapters or sections, line spaces around extracts, line spaces before and after headings, etc.
- Add the total.

Review

13. ***Review the result.*** If the estimate shows a publication that is longer than you want, or longer than you can afford, consider changing the type specifications. You may decide on a smaller type size, a wider measure, a longer type page, narrower line spacing, or a face with a narrower set. (You may also have to adjust in the other direction if the publication looks as if it will be shorter than you want, but this is an unusual type of problem.)

Don't adjust the type if the estimate is only 1–3% over the desired length, because there is enough room for error in the calculations to cover that small a discrepancy. Wait until you have type, and then plan, if necessary, to cut text or illustrations or increase the number of lines on a page.

To fit copy to available space reverse the process. Calculate how many characters there are in the space available for text. Then make sure the manuscript has only that many characters.

Checklist for estimating manuscript lengths

Major text	number of characters number of printed pages
Extracts	number of characters number of extracts number of printed pages
Appendices	number of appendices number of characters in each number of printed pages
Notes	number of characters number of printed pages
Tables	number of lines number of tables number of full-page tables (in addition to above) number of printed pages
Lists	number of lists number of lines number of printed pages
References	number of characters *or* number of lines number of printed pages
Subdivisions	number of part titles number of 1st level subheads number of 2d level subheads
Blank spaces	number of blank pages number of chapter/section openings (allow appropriate space) number of chapter/section endings (allow half a page each) number of lines above/below extracts number of lines above/below tables number of lines above/below headings number of line spaces to show divisions number of lines above/below illustrations/captions
Full pages	number of display pages number of others (back of title page, etc.) not counted above
illustrations	number of full-page number of half-page number of third-page (etc) number of printed pages (total)
Captions	number of lines

9.2
Costs in general and one-time costs

Some editors have little or no responsibility for the production of the manuscripts they edit, or for controlling the costs of production. They prepare manuscripts and turn them over to the production experts. Other editors may have full responsibility for organizing production, dealing with printers, and controlling costs. Responsibilities differ, but every editor should have some idea of how the costs of production grow, and of how to save money.

Costs come in two kinds.

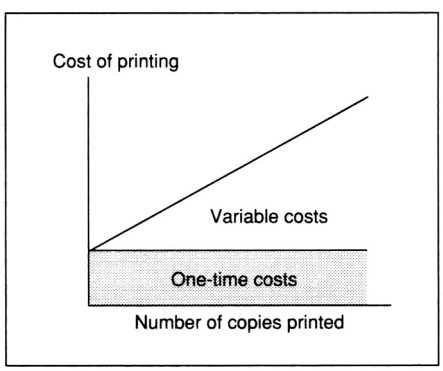
Cash vs time

Some costs must be paid in cash. These *direct* costs include printers' bills, postage charges, and other out-of-pocket expenses.

Some costs involve only staff *time*. Because staff members must be paid in any case and are usually paid from a separate salary or wage account, this expense is too often ignored. But it costs money for an editor, or any other staff member, to spend an hour on a particular job. If that person could be doing something more useful, the cost of that hour may be wasted.

One-time vs variable

The costs of publication involve both cash and time. They can also be divided in another way.



Some publishing costs have to be paid no matter how many copies are printed. They are, essentially, all the costs that arise before the printing press starts running. They should not have to be repeated if the publication is reprinted. These *one-time* costs are discussed in this unit.

Other costs vary directly, or almost directly, with the number of copies printed. They are principally the costs of printing, paper, and binding. These *variable* costs are discussed in the following unit.

This division of publishing costs is shown by the simple graph in the margin.

One-time costs

The main one-time costs of printing production are

- editorial
- planning
- design
- production supervision
- illustrations
- composition
- proofreading
- changes in proof
- page assembly
- filmmaking
- imposition
- platemaking

Editorial

Editorial costs include all the time spent acquiring and appraising manuscripts, helping authors with the writing, editing the result, and handling proof. Much of the cost is likely to be staff time.

Some direct costs may be involved as well. Examples are fees for expert readers or translators, and postage for sending manuscripts and letters.

Editing involves direct costs if it is done by a freelance editor paid a fee. Even if it is done by a staff member, it is useful to keep track of the time required to prepare any single publication. Some publishers expect editors to fill out daily or weekly reports on how much time they spend on each manuscript. This makes it possible to tell which publications (and perhaps which authors) require the most investment in time and effort. Keeping track of time and hourly costs also makes it easier to defend the need for financial help for any given title. The cost of editing is too often ignored or considered insignificant.

To calculate how much an editor's time is worth, take the number of hours the editor is expected to be at work in a year. Deduct time for lunch, rest periods, vacation, sick leave, nonproductive meetings, travel, and other activities that are not directly editing. Divide the balance into the editor's salary to get an hourly cost for the editor's time. Add an allowance for the cost of the office: the individual editor's share of the cost of rent, light, telephones, secretarial service, administrative supervision, etc. The cost will be much higher than at first imagined.

Planning

In large publishing organizations, the managers and other staff of all departments may be involved in planning the most effective means of publishing a given manuscript. Meetings of senior staff are expensive. Even if all the planning is done by a single person, the cost in time can be significant.

Design

Time spent on design may be tracked in-house just as for editing, and for the same reasons. If a design is bought from a freelance, that of course is a cash expense.

Production supervision

Someone in the publication house must act as liaison with the compositor, printer, and binder. It may be the editor, or it may be someone else. That person will have to explain the publisher's requirements to the suppliers and the suppliers' needs to colleagues in the publishing house. The same person will have to police the job — making sure that both the author and editor on the one hand, and the suppliers on the other, meet agreed-upon standards and schedules.

The time of such a person may usefully be tracked, as for editing, and the cost of production supervision calculated. This is another expense that can be too easily ignored.

Illustrations

Photographs, drawings, graphs, maps, and other illustrations may be supplied by the author. If they can be used without further work on them, as far as the publisher is concerned those illustrations come free of charge. (Editors and production staff will have to spend time checking them and preparing them for the printer, but those costs are part of staff functions, already discussed.)

If illustrations are prepared by the publisher's staff, the costs in time and money deserve to be noted. Otherwise, an author or an editor may want more illustrations than are needed, or than can be afforded.

If photographs or drawings are bought from outside sources, this is a cash expense.

In production, illustrations involve further one-time costs. If they are to be printed by letterpress, metal engravings must be made—line or halftone. If they are to be printed by offset, they may need halftone or high-quality fine-line negatives. Even when cost can be kept to a minimum, illustrations require special handling.

The cost depends on the number of illustrations, their size, and the number of times the supplier must adjust the camera to provide different reductions. (It is cheaper to get six halftones all at one reduction than the same six halftones at six different reductions.)

Color and halftones are particularly expensive.

Composition

Whether composition is by hand-setting, hot-metal machine setting, photocomposition, or typewriter, the compositor is likely to use one of three ways of charging for the service:

- by area: the number of ems of type set, or the number of square inches or square centimeters of type set in a particular size.
- per page: a set charge for a standard page of a specified type size and type area.
- by keystrokes: the number of characters set.

No matter which system is used, the realities behind it are the same. Let us take a hypothetical example. A printer has bought typesetting equipment and wants it to pay for itself in five years. If he had to borrow money, then each year he must pay one-fifth of the cost of the loan, including interest. Even if he did not have to borrow, he should set money aside each year to buy new equipment when this machine wears out.

He also has operating expenses. He has to pay someone to run the equipment. There are also the costs of keeping the machine in good running order, including repairs. Then there are rent and taxes on the space it occupies, and electricity and supplies for it, and the general costs of dealing with the customers who use it, including bookkeeping and management. All these costs, plus any profit, must be recovered from operating the equipment. They amount, let us say, to $16,000 a year in the local currency.

The printer estimates that the equipment will be working 32 hours a week, 50 weeks a year. He would like to have it operating more, but he knows that there may be hours when there is no business, other hours when the equipment needs maintenance, and a couple of weeks when the operator will be on vacation. He can budget therefore on 1600 hours (32 x 50) when the equipment is actually working. To recover $16,000 a year, he must charge customers $10 per hour for the use of the machine.

He knows that, on average, his operator sets 5000 characters, or keystrokes, per hour. The operator actually works faster, but sometimes she stops, and she must spend time correcting what she has set. The printer therefore must charge the customer $10 for every 5000 keystrokes, or $2 per 1000 keystrokes. Or he can establish a standard page with 2500 characters and charge $5 per page. Or he can calculate how many keystrokes it takes to fill a certain area in a certain type size, and charge by that.

But all this is based on the operator being able to average 5000 characters an hour. Anything that slows down the operator will change the calculations. As a result, compositors charge extra for anything that takes extra keystrokes or extra time. This usually includes

- dirty copy (many handwritten corrections and insertions)
- setting in foreign languages
- mathematical and chemical formulae
- tables
- any deviation from a standard type page, if charges are by the page (deviations include notes or extracts set in smaller type)

Proofreading

Proofreading is usually done by the author and the editor. The editor's time may be tracked.

If there is money to hire an outside proofreader, this is a direct charge. Even so, it may be cheaper than using staff time. Proofreaders usually cost less per hour than editors. Because they come to a manuscript with a fresh eye and no other concerns, they may also be more accurate.

Changes in proof

Whether made by author or editor, changes in proof are expensive. Each change involves several steps: setting the new copy, replacing old type with new type, making a new proof, and reading it for accuracy. Changes in proof — if the printer charges accurately" — can easily add 10% to 15% to the original cost of composition. Changes should not be made unless they are truly necessary.

Correction of errors made by the compositor should involve no extra charge to the publisher, provided the manuscript was clear. If the manuscript was dirty, or if the editor's writing was unclear, the compositor may charge such corrections to the publisher.

Page assembly

At some point, the text and illustrations are assembled in pages. Costs will depend on the complexity of the job.

Filmmaking

Filmmaking is one step in the process of making plates for printing by offset. Costs will depend on the area of film exposed and the quality or complexity of the camera copy. Any camera copy that requires special attention, because it is difficult to reproduce well or has been poorly prepared, will add to the cost.

Imposition

In letterpress, type and engravings are locked up and imposed in pages in a single form. In offset, film is stripped up and imposed in flats.

In both cases, again, the complexity of the material will affect costs. Pages of straight text are the least expensive to impose or strip. Pages with many illustrations, which must be put in place separately, are more expensive.

Platemaking

Platemaking is a final process in offset. Costs depend on the size and quality of the plate. Often small paper plates will be most economical. Sometimes, however, larger metal plates and a large press will reduce the cost of long runs.

Plates may have to be made each time a publication is reprinted. Some printers hold plates for possible reprinting; but plates are expensive and awkward to store. Many printers hold only the film or camera-ready copy, and have to make new plates if the work is reprinted.

Influences on one-time costs

There is one further important point to recognize. We have been talking about one-time costs that are met before printing begins and that do not vary with the number of copies that are printed. But these same costs may be influenced in advance by the purpose of the publication, the intended readership, and the likely print run.

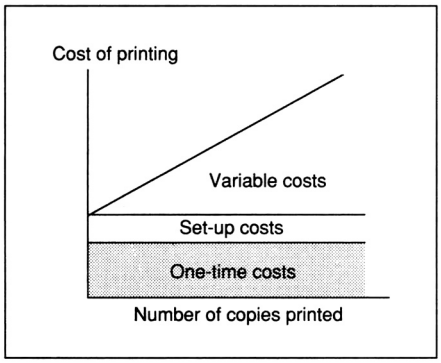
Consider two extremes: a booklet introducing a major institution to the general public and a technical bulletin aimed at a few hundred specialists. If we have the money, we may decide to print the general booklet in four colors. We may also spend many hours designing the format, taking the best photographs, and making sure the text is convincing and easy to read. The technical bulletin, on the other hand, will likely appear only in black and white; it may fit in a standard design; we can use the author's illustrations; we will edit the text only for detail. We may even be able to print the bulletin using paper plates instead of the metal plates needed for a long-run color booklet.

In both cases, we have reached certain decisions early in the production process that affect the one-time costs. But given those decisions, the one-time costs will be the same no matter how many copies we print.

9.3
Variable costs

The most important variable costs are for presswork, paper, and binding. To these may be added the cost of shipping finished copies from the printer to the publisher.

These four costs vary with the number of copies printed, but they do not vary directly. Press time, paper. and binding for 2000 copies will not cost twice as much as for 1000 copies. The ratio will be somewhat less than 2 to 1. The reason is *set-up time:* the time it takes to get a press ready for printing. Binding equipment may also require set-up time.



These set-up costs are the same no matter how many copies are involved, but they are usually included in the variable costs for two reasons. First, they are rarely shown separately when printers send estimates and bills. Second, they are not true one-time costs because they must be repeated every time a publication is reprinted. We should therefore refine our graph of publishing costs, as in the margin.

Presswork

The cost of printing any publication depends on the kind of press used and the amount of time the job requires. Printers establish an hourly rate for their presses, just as they do for typesetting equipment. Big presses, which cost more to buy and need more than one operator, have higher hourly charges than small presses that can be run by a single person. A job that takes three hours to print will cost three times as much as a job that requires only one hour on the same press.

Set-up time (also called *makeready)* takes longer in letterpress than in offset. In letterpress, the heavy form must be positioned on the press, and then individual areas of type have to be adjusted to give a perfectly level surface that will print well. In offset, it is only necessary to put on a plate and ink it. In both kinds of presses (but more so in letterpress), makeready takes longer for a larger printing area than a small one. It is more complex if there are halftones as well as type because inking must be adjusted to meet the needs of both kinds of impression.

Running time, the time the press is actually printing, is directly proportional to the number of copies printed.

In short printing runs, the makeready cost can be a large part of the total cost. In long runs, it shrinks proportionately. As a result, when the number of copies printed is increased, the total cost of press time goes up, but the cost per copy (the *unit cost*) grows smaller.

For example, imagine a press that costs the local equivalent of $60 an hour to operate and that can print 5000 copies an hour, and a printing job that need:; half an hour for makeready. To print 1000 copies will cost $30 for makeready and $12 for 12 minutes (one-fifth of an hour) in actual printing time, a total of $42 and a unit cost of $0.42. To print 5000 copies will cost $30 for makeready and $60 for actual printing, a total of $90 and a unit cost of $0.18. (But of course there will be no economy unless all 5000 copies are really needed.)

In preparing estimates of costs, printers often give only one figure for presswork, lumping together both set-up and running costs. It is still possible to separate the two if you ask for costs on two quantities. For example, a printer may estimate that to print 1000 copies of a booklet will cost the local equivalent of $100, and to print 1500 copies will cost $130. You then know that the *running cost* for presswork, paper, and binding on the additional 500 copies is $30 ($130-$100). The running cost for 1000 copies then would be $60. Of the $100 charge for 1000 copies, therefore, $40 is for set-up and $60 is running costs.

Printing costs also depend on the speed and size of the press, the number of plates or forms, and the number of colors to be printed.

A large, last press will print a publication in less time than a small, slow one. But because such a press is expensive to buy and operate, the charge per hour for using it is also high. Thus, for short runs or few pages a small press may be more economical.

Ink may not be a major cost, if labor and equipment are relatively expensive. But printing ink is petroleum-based, and its cost has increased in recent years. Especially in countries where it must be imported and paid for in scarce foreign currency, ink can be a significant factor.

In such cases, the cost of printing can increase if a design calls for large areas of ink—for example, if there is much use of reverse type (white letters on a solid black background).

More often, cost goes up because the color of ink is changed. Most printers use black ink most of the time. If a color other than black is used, the printer will charge for the extra time involved in cleaning (washing up) the press and all its rollers before and after printing with the other color.

Printing a publication in two or more colors adds further to the cost. Each extra color requires an extra form (in letterpress) or plate (in offset). If the colors are printed separately, the printer must stop the press and wash it up between each color. If they are printed in one pass, the printer requires a larger and more expensive two-color or four-color press. In addition, printing in more than one color is expensive because of the care that must be taken in *registration* (making the colors come

together exactly right). This is particularly important in four-color halftone reproduction: an error of one-tenth of one millimeter can make a brilliant photograph look muddy.

Paper

The total cost of paper depends on the size of the publication (page size and number of pages) and the number of copies printed. These two factors determine how much paper will be used. The price per ton of paper usually drops when the quantity ordered is large enough.

Paper costs are based on weight and quality. In most of the world, weight is measured in grammage: the weight in grams of a sheet of paper 1 meter square (g/m^2). The heavier the sheet, the more expensive it will be. (North America uses a more complicated system of weights, but the result is the same.)

Qualities of paper are discussed in unit 7.2. Those most affecting cost are

- finish and texture
- strength
- color
- bulk

Opacity is closely connected with weight and bulk. It is possible to save money by choosing a lighter or thinner paper, but this may result in loss of opacity and a less attractive or less readable publication.

If many copies of a publication are going to be mailed by air, a publisher may want to use thin, light paper to save postage costs. In that case, it may be necessary to accept less opacity—or to find a paper that is light in weight but high in opacity. Such papers may be more expensive than other papers, but the added expense still may be less than the savings in postage.

The cost of paper can also be affected by the design of the publication. Paper comes in standard-sized sheets. A format that uses less than an entire sheet is wasteful. The printer will trim off the part of the sheet that is not used, but will charge for the entire sheet. (See unit 7.2.)

There is another loss in paper that a publisher cannot easily control. This is *spoilage* on the press. Some sheets will always be wasted during the set-up time, when the press is being adjusted for pressure and/or inking. A printer often will use sheets that are already spoiled in making a press ready: that saves money. But every printer allows for some spoilage. If the printing job is in two colors, there will likely be twice as much spoilage as with one color: that is another reason why it is more expensive to print in more than one color.

Binding

In general, binding costs are proportionate to the number of copies involved. Set-up costs are not as important as in printing, although they may be noticeable in short runs.

Binding operations involve

- folding the sheets to the required size
- gathering the signatures into complete books
- binding
- wrapping or packing in cartons

Binding costs will vary with the method of binding:

- side-stitched
- saddle-stitched
- spiral or other mechanical binding
- adhesive binding (perfect binding)
- sewn

Binding costs will also depend on the kind of cover used:

- self-cover (the same paper as the inside text pages)
- cover paper (plain, coated, or laminated)
- paper covering cardboard
- cloth covering cardboard

The cover will usually have to carry some information—at least the title of the publication and name of the author on the front, and perhaps also on the spine. It may also have an illustration. The back cover may contain information about the contents and author. Information can be added to the cover in various ways, each involving different costs:

- printed in one color, perhaps on colored paper (usually cheapest for paperback books)
- printed in more than one color, on white or colored paper
- stamped with metal foil on the front and spine (may be cheapest for hardbound books)
- printed on the hardcover, with a printed paper dust jacket added

It is possible to produce two-color covers economically for journals or other serial publications (even individual volumes in a series) by pre-printing one of the colors as a standard element that will appear on all covers. The common element may be a background design or even the name. A year's supply of covers can be prepared in this way. Then the information that is unique to a particular issue (the date, the contents, etc.) can be printed, when ready, on the preprinted covers. (Note: Care must be taken in storing preprinted covers, to avoid damage from negligence or natural causes.)

Shipping

It costs money to ship the finished books from the printer/binder to the publisher's warehouse or office. The cost will depend on weight, distance and method of shipping.

Sometimes it is cheaper to pay the printer to mail publications from the bindery, using address labels supplied by the publisher, and thus save shipping costs.

9.4
39 ways to reduce production costs

Planning

1. Plan well in advance. Set realistic schedules and keep to them. Allow for the fact that people travel, mails are slow, equipment breaks down, and you have to spend time on other projects. Publications rushed together at the last minute are not usually as effective as ones that are carefully planned. Also, they usually cost more.

Typeface

2. Find out what typefaces are regularly available at the printers you may use. Then use those faces. That will give you greater choice of suppliers. An unusual typeface may limit your choice to one company, the only one that has that face on hand.

3. Choose a typeface that is legible but is also compact. A face with a wide set will require more space (and therefore more press time and more paper) than one with a medium set. Times Roman and the faces copied from it are good examples of economical, compact type.

4. If the setting is by mechanical means (Linotype, Monotype, or typewriter), try to limit the number of times the type changes in size or style. Every time the operator has to shift to italic or to a smaller size, to take two examples, it costs time and money. This is less important a consideration in computer-assisted photocomposition.

5. Never experiment with a new typeface when sending a complicated manuscript for setting. Only a few typefaces have a full range of characters, symbols, accents, Greek letters, etc. A new typeface may not meet all the needs of a complex manuscript, and its letterforms may create unexpected problems. With a complex manuscript, check with the printer beforehand about the best face for the job.

Paper

6. Choose materials that are generally available. In particular, find out what makes and weights of paper are stocked by printers you may use. These may not be standard sizes or weights. Sometimes a printer will have bought a large quantity of non-standard paper at a bargain price.

7. Before you start designing the publication, find out what sizes of paper are available. Find out also what size is most economical on the press that is likely to be used. Use a page size that cuts economically from a standard sheet. Otherwise you will be paying for paper that has to be trimmed off the sheet.

8. If your printer regularly stocks a particular kind of suitable paper, use it. You know it will be available when needed. Also, the printer probably gets a lower price by buying the paper in large quantities, and should pass some of this saving on to good customers.

9. If your publishing program is big enough, plan to buy your own paper and supply it to the printer. That will avoid the printer's mark-up on the paper. The printer may even agree to store the paper for a small charge; otherwise you will need special storage space free of moisture and insects. If you work for a government or international agency, you may also be able to avoid taxes that the printer would have to pay in buying the paper (and which you would eventually have to pay).

10. Examine the paper stock you are using. Can you use a lighter weight without losing opacity? A lighter weight will cost less; it will also save money in mailing and shipping.

Format

11. Use a standard design for page size, paper, and typography. That is, plan one economical design for similar publications and use it every time. This saves time and cost because each publication will not have to be designed separately. It also reduces costs because both editor and printer are used to working within this format.

12. Consider whether it is possible to increase the number of words on a page in a current design without making the page harder to read. Can one line be added to the page, or one pica to the width of the column? Can the space between lines be reduced slightly? In a book of any length, this could be an important saving, especially if it makes it possible to fit the publication into even forms.

13. Notes at the bottom of a page are generally an added expense, since it is more complex to make up the pages to accommodate them. Group notes at the end of an article or publication instead.

14. Avoid frills. Think twice before using four-color covers on research publications, second colors in text, complex designs, fancy folds, or other design elements that cost extra and are not needed for clear communication. Especially watch for design details that may create difficulties in registration on the press — for example, two-color rules that run parallel or close to the edge of the page, or large blocks of solid ink.

15. If a publication is likely to be reprinted, be specially careful about using extra colors in type or illustrations. The extra cost of color printing will have to be repeated every time you reprint.

Editing

16. Make sure copy sent to the printer is clean. Dirty copy costs more to set. There is also more chance of errors in the setting.

17. Reduce the number of tables and mathematical equations in the copy as much as possible. Editors must never weaken the author's argument by deleting the evidence for it, but they may cut tables or equations that are not essential. Sometimes they can simplify tables that must appear. Tables can cost twice as much to set as regular text; complex equations can cost ten times as much.

18. Make sure the editing is careful and complete before copy is sent to the typesetter. Editing in proof is expensive.

19. Show the manuscript to the author before sending it for setting, and make sure the author approves the text as it stands. Warn the author that any changes made after this stage will be expensive in time and money, and may be refused by the editor or may be charged to the author. Even if changes in proof do not cost the author money, they will delay publication—perhaps seriously.

Composition

20. If there is a choice, find the most economical local form of composition and printing. It may not be photocomposition and offset. In some locations and for some jobs, the older technology—hot metal and letterpress—may be more economical.

21. Send all the copy for any publication to the typesetter at one time. Sending it in bits and pieces adds to the cost and the possibility of error.

22. Consider reproducing from typewritten camera-ready copy. This saves composition cost. If typewritten copy is reproduced at the original size, it usually requires more pages than type would; but if it is reduced to 85% of the original size it is still readable and about as many characters fit on the page as if the text were set in normal-sized type. (See units 7.10 and 8.3.)

23. Reproduce tables, equations, and other complex matter from typewritten copy instead of having them set in type. Supply the printer with clean typing that can be pasted into the camera-ready page assemblies. (This works best with offset. Even in letterpress it may be cheaper to have line engravings made from typewritten copy than to have large and complicated tables set in type.)

Imposition

24. Plan the publication so that it fits in even forms, usually a multiple of four pages. One extra page over even forms will add at least three blank pages to the publication; and the extra pages (especially if the press and paper are designed to print 16 or 32 pages) are expensive. The number of pages in a form varies with the size of the page and the size of the press. Ask the printer how many pages there are in a form for the design you are using.

25. If you are printing in color, plan the publication so that the color can be grouped on as few plates or forms as possible. Each plate or form with color involves extra press runs: the fewer times this happens, the

better. Just how you plan this will depend on how the pages are imposed: check first with the printer.

Proof

26. Keep the stages of proof to a minimum. Each extra set of proofs adds to the cost. It may be necessary to see several sets of galley proofs before all typographical errors are corrected, but after that it should be possible to require only final galley proofs, page proofs, revised page proofs (if needed), and final proofs (in offset, blueprints). Sometimes even one of these stages can be omitted.

27. Allow the author to see and make changes on only one set of proof. Changes cost more at each successive stage of proof. The author will have to see page proof to prepare an index, if there is one, but should be discouraged from making further changes in the text at this point. Authors may also be asked to check final page proofs if the publication has many illustrations; but at that point they should not be re-reading text.

28. Don't make many changes in proof yourself. Don't let the designer make many changes either.

29. Make any changes in proof as economically as possible. Try to revise the words so that only one line is affected. This is particularly important in hot-metal setting. Try to make changes as near to the end of a paragraph as possible, to reduce the amount of re-setting.

Printing

30. Try to group similar printing jobs. If two or more publications are going to be ready for printing at about the same time, and if they have the same page size and general design, have them printed together. The printer should charge less because the press can be set up for both jobs at the same time.

31. Plan the number of copies required as carefully as possible. Printing too many copies is wasteful. Printing too few can force you into an expensive reprinting.

32. Insist within your organization on realistic print runs. The author or the department may want to print more copies than are needed or are likely to be used. Try to obtain a detailed distribution list to help determine how many copies really are needed.

Binding

33. Consider the method of binding planned or in use. Can adhesive binding be used instead of sewing? Can booklets be saddlestitched? Can you use a self-cover?

Suppliers

34. Choose your typesetter and printer carefully. Always get comparative quotations. Bargain for the best price and best quality.

35. Try to find suppliers that are close to you. That saves time. It also makes it easier to discuss ways to save money.

36. Ask the typesetter and printer about ways to save money. They may be able to suggest a different system of marking typographic instructions, a more economical grade of paper which they stock, a mare economical trim size for their presses, or a short cut you didn't know.

37. Don't change suppliers with every job. Try to work with only a few typesetters and printers on a regular basis. It will save time, because you and the supplier will know how each other operates and thinks. It won't be necessary to explain every detail as carefully as it would with someone who doesn't know you. Also, a new printer may build extra costs into the estimates as a precaution, expecting problems that won't occur. A printer who knows you can give you the best possible estimate of costs from experience. Through friendship, such a printer will also work extra hard to meet your needs. The easiest way to save money is to find a printer who thinks economically and whom you can trust.

38. Consider signing an agreement guaranteeing you will send a certain amount of work to a particular printer in the next budget year, in return for a substantial discount on the printer's regular price. But make sure you know the printer and from experience have confidence in the quality of his work.

Review

39. Keep re-examining your publications for ways to reduce costs.

9.5 Choosing a printer

Here are some questions to ask when choosing a typesetter and/or printer. (For convenience, both services are included in the term "printer.")

Location

Are there good reasons to use a local printer? Or do I need to go to a more specialized or larger printer who may be some distance away? It is usually more convenient to use a local printer, and it is always easier to deal with someone face-to-face. As a local customer, also, you may get preferential treatment.

On the other hand, the local printer may not stock the kind of paper you want, or may not be able to handle the specialized typesetting you need.

Sometimes you may wish to use a local printer for some jobs, and another printer for specialized work. Or you may decide to split the work, sending the typesetting to one company and the printing to another.

Capabilities

Can the printer provide specialized services we require? In typesetting, some jobs involve mathematical equations, chemical formulas, or foreign-language setting. In printing, you may need high-quality reproduction of halftones, for example, of photographs taken through a high-power microscope. Or you may want high-quality four-color reproduct ion.

If you have any doubts, ask for samples of the printer's work. You might even test the ability of the printer with some difficult materials in a trial run, if the printer is willing.

Schedules

Can the printer meet the schedule we want for delivery? Many jobs must be delivered at a certain time. The job may be a special program or report, or the issue of a journal. How much time will the printer require to produce the publication?

Does that meet your own schedule?

Does the printer have a reputation for meeting promised schedules?

Will the printer agree to pay a financial penalty if the delivery is late?

Is there a local agency to maintain and repair the printer's equipment? If a machine breaks down, is it likely to be repaired quickly? If the service agency is far away—or in another country—a minor problem could disrupt schedules.

Reputation

What is the printer's reputation generally? What other work do you know from this printer? What do other customers report? Are they satisfied?

One of the best ways to find a printer is by reputation. Ask colleagues which printers they use. Look for the name of the printer on publications that impress you.

Staff

How big a trained staff does the printer have? How many people? How experienced?

Is the shop clean? Is it modem? Does the staff seem fully occupied?

Specialties

What kind of work does the printer usually produce? A printer who normally produces newspapers may have trouble supplying a high-quality annual report. A printer who usually produces long-run color magazines may give very low priority to a short-run booklet from a research institute. A printer who normally produces stationery, business forms, and similar jobs may have great difficulty printing a scientific report to acceptable standards. A printer who normally produces scientific reports may not have the equipment to print business cards economically.

Try to match the printer and the publication as closely as possible.

Services

What services does the printer offer? Will the printer provide proofreading? How good is the proofreading? Get some sample proofs and check the number of errors missed.

Can the printer provide binding in-house? What kind of binding?

Will the printer store some of the finished copies, if you do not have space to store them all easily?

Will the printer mail publications to subscribers or other recipients for an extra fee, and save you the job? (This also saves time if it is done quickly, since the publication doesn't have to be shipped to your office or warehouse.)

Quality

How does the printer control quality? Does a senior staff member check the quality of work as a regular practice? If so, do the results look as if this control is effective?

Knowledge

How much instruction does the printer require? Some typesetters need only a small amount of editorial marking in order to provide what the editor wants in the way of headings, column width, indentation, set-down material, and so on. Other typesetters require detailed instructions on every page of the manuscript, and this takes editorial time.

Some printers will know that a certain photograph with considerable detail requires a 100-line or 130-line screen, even if they normally use a coarser screen. Other printers will need to be told to use the finer screen.

Throughout the manufacturing process, some printers require more attention than others. It is easier to work with a printer who tries to obtain high quality without detailed instructions at every step.

Personality

What kind of personal relations do you think you would have with the printer and the printer's staff? This may be hard to answer, but it is important. A friendly printer who will make extra efforts to serve you is better than a printer who is only efficient.

Cost

What with the printer charge? It's wise to get estimates of cost from more than one printer. This can be done by asking printers to estimate what they would charge for a job that is already complete, or for a job you plan to send out soon.

If you are sending out a manuscript for estimating, give the typesetter/printer detailed specifications, including

- size of page
- quality and weight of paper
- type of binding
- type face, size, and leading—for all parts of the publication
- color(s) of ink if not black or more than black
- type area on the page (length of lines, number of lines, number of columns)
- number of halftones and line art supplied with manuscript, and approximate size in which they will appear (so many full-page, so many half-page, etc.)
- number and kind of any illustrations not provided with the manuscript
- detailed description of any manuscript material not provided
- special requirements (e.g., four-color cover)
- number of proofs required
- quantity required (ask for two quantities to help analyze costs; or ask for run-on costs for an extra 100 or extra 500 copies)
- schedule for delivery
- place of delivery

Ask for a breakdown of costs by operation or material: typesetting, filmmaking, platemaking, press preparation, press time, paper, binding, shipping, etc. Some printers may not want to give details of costs, but get as many as you can.

You can compare estimates from printers only if they quote on *exactly the same specifications.*

You may, however, ask a printer to suggest changes in specifications that will save you money. These suggestions should be in addition to the estimate on the standard specifications. Suggestions of this kind tell you how the printer thinks.

You may find that one printer is the most economical for one kind of job, and another printer (with different equipment perhaps) is more economical for another kind of job.

Balance

Remember that price is only one of a publisher's concerns. Few printers are perfect. Some compromise is always necessary. Choose your priority.

A sign in a printing shop read:

PRICE
QUALITY
SERVICE

Pick any two
of the above

9.6
Innavations in information transfer

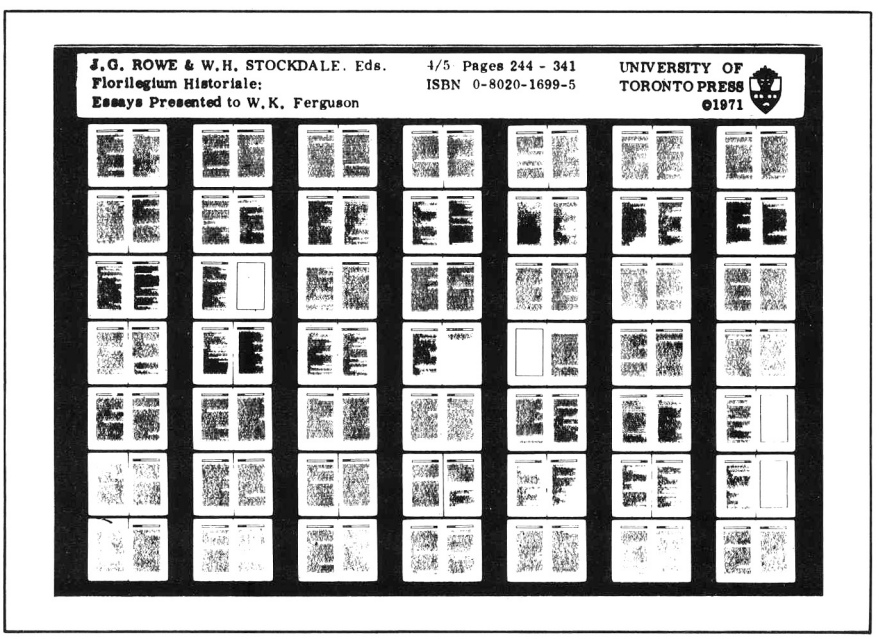
Advancing technology is opening new routes in the communication of science, as in every other field. Here are some of the possibilities that have opened, or are opening. Not all may be available today everywhere in the world; but most are on their way.

Microfiche

Microfiches are sheets of film, usually about 100 × 150 mm (4 × 6 in.), usually holding 98 miniature images (pages) in 7 rows of 14 images. They are compact and cheap to produce. Microfiches are particularly useful for storing large amounts of data, or for storing data that will be in limited demand.

Fiches are easier to use than roll microfilm: it is possible to go directly to any page on a fiche without unrolling film. On the other hand, roll microfilm is preferred for newspapers and some other serials or records where it is important that a long series of publications be complete.

Microfiches require special equipment to use. But the hardware is generally available, simple, and easy to maintain.



Microfiches can be generated directly from a computerized database (COM: computer output microfiche). They can therefore be used to distribute information that must be kept up to date. The advantage is that the user needs only the relatively simple fiche reader, not a computer terminal with access to the database. COM fiche is therefore a stage between expensive, bulky print and the completely flexible access to data of a computer.

On-demand publication

If publishers could print books only when they have orders, they could avoid having warehouses full of publications as well as the risk of printing too many copies. They could also afford to print books that have a very small demand.

It now is technically possible to print single copies of publications as the orders arrive. One way is to use microfiche: either by duplicating the fiches and publishing in that way, or by using the fiches to make printed full-size copies of the original.

It is also possible to create camera copy from electronic digital data using one of the new laser printers. This camera copy can be reproduced in short runs by offset.

We have reached a point where, increasingly, publishers can produce publications tailor-made for the individual customer and printed only when the customer wants them.

Author as typesetter

More and more authors are getting access to word processors, either through their institutions or through their own personal computers. The output of the word processor usually is a floppy disk storing the text in digital data form.

More and more typesetters are using photocomposition machines that are run by computers. The input of these machines is a text stored in digital data form.

It seems economical, therefore, to use the author's data (stored on a tape or disk) to drive the photocomposition machine.

This is fairly easy in a closed system within a single institution, where all the equipment was chosen and matched with this in mind. It is more difficult when the author is outside the institution, and is using a word processor that is not compatible with the typesetter's photocomposition equipment. There are other problems, too.

Using the author's disks does not, in practice, seem to save a great deal of money. It does save time. The compositor may still have to go through the copy inserting typographic commands, but there is no need to re-type the text into the composition machine. It also saves time in proofreading. But it puts extra work on the author, who must type in any changes the editor wants so that the final disk that goes to the

compositor is complete and accurate and ready for setting. And the editor must check to make sure the author has done that extra job properly.

Electronic databases

Computers have been used for some years now to store bibliographic data and abstracts. These databases may be used to produce printed bibliographies. They may also be used to seek information on-line: that is, researchers may plug into a database from their own offices or homes, and get a list of all the publications on a particular subject, possibly, with abstracts.

There is now growing interest in storing full text in these databases. All the articles in a journal would be stored in a computer and be available through a computer search. Readers could have the article printed out on their own computers, on-demand. There would no longer be any need to subscribe to printed copies of the journal.

There is talk now in the United States of paperless libraries. They would simply be gigantic databases, with all the "books" and "journals" available from the computer. This still seems to be a long way into the future, however.

Optical disks

An optical disk (CD-ROM: Compact Disk, Read-only Memory) looks something like a long-playing record. But it is a digital storage tool, which can hold on one disk 10,000 to 20,000 pages of text.

An entire library of articles on a particular subject, large bibliographic database, or multivolume encyclopedia can be stored on one of these disks. The disk can hold pictures as well as text, and sound as well as visual material. It can be played on a computer monitor using a special record-player. And because these disks are not expensive to copy, the publication can be brought up to date every year and sold annually to subscribers.

The first optical disk reference works are available. They promise a revolution in the publication of knowledge.

Electronic publication

Imagine a journal without paper. Everyone connected with it has a computer terminal, and they are all linked together by telephone wires or radio. An author writes a paper on a personal word processor. It is transmitted electronically to the editor of this "electronic journal." The editor sends the article, again electronically, to referees, who reply in turn through the electronic network. Their comments are passed to the author by computer. The author revises on the word processor, and sends the revision back to the editor. If the editor accepts the revised article, it goes into the "journa1" which means it becomes available to readers who have subscribed to the journal and receive articles on their own computers at home or in the office. They may reply in "letters to the editor" electronically.

This idea is being discussed vigorously in North America and Europe. Experiments with electronic journals have not yet been very successful. For one thing, the systems have not been easy to use. Also, administrators do not give as much credit for "electronic publication" as they do for publication in a respected printed journal.

There are other problems. Not everyone has access to a computer; this means that many scholars will not be able to submit papers, or will not be able to read them if they appear only in electronic form. The costs are also hard to establish, but at the moment electronic publication still seems to be more expensive per reader than traditional means.

Concerns for developing nations

There is every reason to believe that more and more information is going to be stored electronically in North America and Europe. The information may be stored in giant information databases (many of them operated purely for profit) or as electronic publications.

Less industrialized countries may lack the hardware and support services to make full use of these databases. Almost certainly, most of them lack the dollars. CD-ROM technology will make much information available eventually, but will not solve the problem entirely.

The threat exists, therefore, of an increasing gap between the nations that have information and those that cannot obtain it. With journals, it is possible, even if expensive, to obtain copies for libraries in the industrially developing nations. We now may face an increased monopoly of knowledge based on the computer database.

The death of print?

But print will continue in use. It has to. Most people alive today will never own a computer. They will have to depend on print.

In any case, the printed book or journal or pamphlet remains the most economical means of distributing information in a form that can be carried anywhere; read at leisure and considered carefully; re-read easily, checking back to what was written earlier; and enjoyed for its beauty as well as its information. The book remains the most compact, portable, economical form of randomly accessible information.

Limits of the computer

The computer can help editors to produce publications more quickly, and sometimes (but not always) more cheaply. The computer can also help us to maintain good business records, good sales records, and good mailing lists. It can help us to decide how many copies to print and how to distribute them more effectively.

But it cannot help us to decide what we will publish. And it can be only a partial help in reaching the intended reader with what we publish. Those are acts that require lire human, creative intelligence. They are the acts that lie at the heart of publishing.

10
The business side

Editors attached to research institutes, extension agencies, and similar large organizations usually are supported by financial, legal, and administrative departments. These specialists look after much of the business side of publishing.

Editors cannot ignore the business side, however. This module deals briefly with some of the business concerns which are especially close to editors. It is a brief introduction to complex subjects.

1 Principles of copyright
2 Responsibilities of author and publisher
3 Keeping track and keeping in touch
4 The budget for a publication
5 Evaluating publications

10.1 Principles of copyright

Publishers must be aware of national laws concerning obscenity, libel, sedition, the right of privacy, and other matters—but these rarely affect publishers of scientific research. However, most publishers need to know about copyright.

The law of copyright varies from one country to another. The following are general principles, stated very simply. For any question of importance, check your own national copyright law.

Intellectual property

Copyright is a form of property. We are used to people owning physical property, like a house or clothing. Copyright does not exist in a physical form. It is *intellectual property*. But, like other property, it can be bought, sold, divided, and licensed.

In most countries and under most circumstances, a person who creates an intellectual work automatically owns the copyright in that work. To protect the copyright, however. the creator may have to go through some process of formal registration, set out in the country's copyright law. An intellectual property may be a painting, musical composition, book, film, poem, or article. Here we are concerned only with writing and authors. Copyright establishes the ownership of what is created. Only the copyright owner (at first, usually, the author) can publish, or can allow to be published, what has been written.

Authors may give full copyright to a publisher. Or they may keep the copyright for themselves, but give someone the exclusive right (a license) to publish their work. Or they may permit one publisher to issue the work in English, another in the language of Indonesia, a third in Thai, and so on. They may divide the publishing rights geographically, allowing one publisher to issue it in Southeast Asia, another in East Africa, a third in India, a fourth in the United States, and so on. They may also make separate arrangements to have the work made into a movie, or published in magazines, or in an anthology. Alternatively, they may leave the sale of such *subsidiary rights* (translation, magazine publication, movies, and so on) to be arranged by the principal publisher.

Publication in a journal or magazine may involve only *first serial rights.* In that case, the creator or copyright owner has the right to publish the same material in another serial after it has appeared in the publication that has first rights. Here, as elsewhere, authors and publishers should be clear exactly what rights they are negotiating.

In all these examples, someone receives an exclusive right to publish the work in one form or another. In return the person giving that right usually receives a fee or royalty.

To reward authors

Copyright recognizes that authors deserve to be paid for their work. The first copyright law was passed in England in 1709. It said that the works of many writers were already being reprinted without their permission, and that, as a result, the authors were losing money. That law was passed for "the encouragement of learned men to compose and write useful books" and to prevent unlawful reprinting of those books. It gave authors the exclusive right to publish (make copies of) their work for a certain period of time.

International agreements

Copyright gradually became the subject of international agreements. International agreements gave copyright protection in one country to writers in other countries.

These are two main international agreements: the Berne Union Copyright Convention and the Universal Copyright Convention. The Berne Convention gives somewhat greater protection. Most major publishing countries belong to at least one of these agreements.

Duration

Copyright does not last forever. It lasts only for a set period of time. In many (perhaps most) countries, copyright remains in force during the lifetime of the author and for 50 years after the author's death. If the work is published after the author's death, copyright in those countries usually lasts for 50 years after the work was first published.

After copyright runs out, a work goes into the *public domain.* This means that it can be reprinted by anyone without need to get permission from the, original owner.

Until the United States passed a new copyright law in 1976, copyright in that country was for only 28 years, with a possible renewal for another 28 years, This can complicate matters when it's necessary to decide whether or not an American publication is still in copyright.

Fair use

Copyright is not absolute. A person may copy parts of a work that is in copyright for *personal* use or study, for example, in doing research.

A person may also reprint *short* quotations from a work that is in copyright for special purposes — for example, in a review of a book or article, or to support an argument by quoting from the work of someone else. This is called *fair use* or *fair dealing.* The amount that can be quoted in this way varies from country to country, and also depends on the nature of the quotation.

Basically, copying of short passages is allowed provided that

- the passage is being used for educational purposes (as in a review or to support an argument) and not for commercial purposes (as in advertising);

- the passage is only a small part of the entire text from which it is taken;
- reprinting it will not interfere with the sales or value of the publication in which it first appeared.

The last two conditions may be hard to judge. In a short text, even a few lines (especially the most important ones) may require permission to reprint.

Fair use does not cover illustrations, or quotation for its own sake, as in an anthology or book of readings. Nor does it necessarily cover even a few lines of poetry or music.

Originality

Copyright exists in the expression of ideas, not in the ideas themselves. Copyright exists in the actual words the writer uses. Another writer may express the same idea in different words without infringing copyright, so long as there is a significant difference between the two versions. (It is not enough to change only a few words.) The second writer should, however, always give credit to the original author for the idea or information.

Similarly, one author may re-draw a map or figure used by another author, and may do so legally as long as there is a significant difference and proper credit is given. If there is any question how much is owed to the original author or artist or illustrator, it is always best to err on the side of generosity.

A distinguished British judge explained this point about as clearly as it ever can be explained:

> The word original in this connection does not mean that the work must be the expression of original or inventive thought. Copyright Acts are not concerned with the originality of ideas but with the expression of thought and in the case of "literary work" with the expression of thought in print or writing. The originality which is required relates to the expression of thought. The Act does not require that expression must be in the original or novel form but that the work must not be copied from another work—that it should originate from the author. (University of London Press v. University Tutorial Press, 1961)

Moral rights

The author has moral rights in addition to copyright. Moral rights are sometimes part of a copyright law. They prevent an author's work from being quoted out of context or published without permission, and other abuses of the author's personal rights.

Author's rights

Copyright at first belongs to the author. In many countries, authors hold copyright in a work as soon as it is written. They then can assign it to a publisher.

Under some circumstances, an author may be hired to write a particular work on the understanding that the employer, not the author, will own

the copyright in the work. To avoid misunderstandings later, the author and employer should agree to these terms in writing and in advance.

There are many ways to arrange publishing rights. At one research institute in South America, the institute claims copyright on its employees' work when it is first published. Once that first edition goes out of print, authors are free to negotiate an agreement with any other publisher.

Publisher's responsibilities

A publisher accepts certain responsibilities in return for publishing rights. These responsibilities are usually listed in a contract between author and publisher.

The publisher must put the proper copyright notice in every copy of the printed work. The notice should follow the form set out in the copyright law of the country where the work is published. Usually this is the symbol © or the word "Copyright" followed by the year of publication and the name of the copyright owner (publisher or author). Check the style required by your country's copyright law. The notice should be in a prominent place, most often the back of the title page. In some countries, the law says exactly where the copyright notice must be placed.

The publisher may have to register all works formally under procedures set out in its country's national law, and also may have to deposit copies in its country's national library or national archives.

The publisher must also take responsibility for protecting the copyright. This means dealing with requests from other authors to use the material, charging a fee when appropriate, and sharing any fees with the author. Rarely does a publisher have to take action because someone has infringed the copyright.

Permissions

An author who wants to quote material that is in copyright must obtain permission, if the quotation is not covered by fair use. Most publishers consider this an author's responsibility. It can be a long process if many permissions must be obtained from copyright holders. Editors should advise authors to begin the process early. When they can, authors should explain in seeking permission that the material is needed for a non-profit publication and that they have no budget to pay permission fees.

Changes

The world has been changing faster than copyright law. Technology has made it cheap, easy, and fast to copy material that is in copyright. The photocopier, the offset press, and the computer have made it possible for scholars, teachers, librarians, businessmen, and others to make legal and illegal copies of works that belong to other people. (The piracy in audio and video tapes is even greater than the piracy in print.) Nearly everyone these days infringes copyright at one time or another.

The nations of the South cannot afford to buy, at Northern prices, all the books and other copyright materials they need. One answer to this problem is *compulsory licensing*. Under such arrangements, the original publisher is usually given a chance to license a local firm to publish a cheap edition; if the original publisher does not do so, the national government may step in and give the local firm the right to publish a local edition. Usually the local publisher pays a small royalty to the originating publisher. An edition published under compulsory license normally may be sold only in the country that issues the license.

Non-profit publishing

Even non-profit institutions should protect the copyright in their publications. If an institution does not copyright its works, its authors have no legal protection against improper use of their material by other people. Nor does the institution have any legal protection against another publisher reprinting its publications, possibly for commercial purposes.

Copyright does not stop the originating publisher from granting other institutions the free use of published material. It only prevents others from using the material without permission.

A carefully worded copyright notice can even encourage non-commercial reproduction of the work, with permission. The copyright notice at the front of this manual is an example.

Piracy

Piracy works against national interests. Much of the illegal copying and publishing of books occurs with titles that come from a few major publishing nations in North America and Europe. Such piracy makes profits for a few people: the pirating publisher, and the booksellers who have cheap copies to sell. But it robs the original authors and publishers of any income they might earn from those copies.

More than income is involved. Money and paper are used to print these illegal copies. Then those scarce resources are unavailable for local publications.

A nation will have difficulty building a strong local publishing industry as long as its resources are drained by pirates. Without a strong local publishing industry, no nation can hope to have books and journals that are written specially for its people and to meet its needs.

Importance of copyright

We need copyright to encourage authors and publishers. Authors and publishers must have some legal protection so that they can hope to recover the effort and the money they must invest in a publication. Otherwise they will not continue writing or publishing.

If so many people infringe copyright that author and publisher do not recover their investment, author and publisher will go bankrupt. In that case, less will be written and less published, and we will all be losers.

10.2
Responsibilities of author and publisher

Good relations with authors are essential for good publishing. One way to encourage good relations with authors is to make sure they know, from the very beginning, what is expected of them, and what the editor and publisher will do in return.

Most book publishers do this in a formal legal contract, which sets out the most important responsibilities on each side. In some circumstances, anything so formal may seem untrusting or unfriendly. In that case, it can be done in a letter, with a request that the author agree in writing to what has been suggested. (An easy way to do that is to send two copies of the letter and ask the author to sign one, indicating agreement, and return it.) The understanding may first be reached in conversation. However, people leave jobs, and memories fade. Any agreement that may last for some time is best made in writing.

No matter how it is done, there should be a clear agreement setting out the responsibilities of the author and the publisher. The basic responsibilities can be divided by stages in the publishing process.

Writing

Author: Create an original manuscript that meets legal requirements. The manuscript should be the author's own work. If it contains text or illustrations created by other people, proper credit should be given. If the quoted or reprinted material is protected by copyright, the author should secure formal, written permission to use it.

If there is more than one author, all must have agreed to publication. Authors must also secure pre-publication approval from their institutions if that is a condition where they work.

Authors must ensure that their manuscripts break no laws of libel, obscenity, privacy, or other matters covered in law.

Publisher: Encourage, advise, appraise. The creative role is the author's. Often the writing will be complete before the publisher sees the manuscript. The publisher has no direct responsibility during this period. But wise publishers encourage their authors, and may offer advice on how to deal with creative problems. Publishers also sometimes suggest subjects to authors.

When a manuscript is complete and submitted for consideration, the publisher should evaluate it promptly and fairly. Often the publisher

will advise the author how a manuscript can be revised to make it more suitable for publication, or more effective as a communication.

The publisher must be as alert as the author to possible infringements of copyright, libel, or other violations of the law. The publisher will usually be more expert than the author in such matters.

Transfer of rights

Author: Give the publisher exclusive rights to publish the manuscript. The author must assure the publisher that no competing publisher will issue the same publication.

The author may give the publisher full rights to publish the work in all languages anywhere in the world. On the other hand, the author may give the publisher only the exclusive right to publish it in one language, or in one territory (one country, or one group of countries), or in one format (hardcover or paperback or magazine). In that case, the author may give exclusive rights to other publishers to publish in other languages, or in other territories, or in other formats.

This grant of publishing rights may include the transfer of copyright from the author to the publisher, but it is not essential. Some authors prefer to keep the copyright in their own works.

Publisher: **a)** ***Publish the work promptly and effectively.*** The publisher must invest time and money to publish the work. This should be done promptly, or the author will suffer. It should be done as effectively as possible, or the author and the publisher will both suffer, for neither side will achieve its goals. This is true whether those goals are to make money or simply to communicate a message.

b) ***Protect the author's legal rights.*** The published work should meet the requirements of the copyright law of the country in which it is published. The publisher should ensure that every copy has the correct copyright notice. The publisher should also meet any requirements for registration of copyright or deposit of copies of the work.

c) ***Reward the author suitably.*** The author frequently receives a royalty. This is most often a percentage of the retail price or a percentage of the money the publisher receives on every copy of the work that is sold. In some countries, the publisher may pay a royalty based on the number of copies printed or the number of pages in the book. Alternatively, the publisher may pay the author a flat fee for the right to publish the work. Sometimes the publisher pays part of the royalties in advance of publication.

The publisher must keep full accounts of all royalties earned, provide the author with regular (usually annual) statements, and pay royalties promptly.

Standards

Author: Meet the publisher's standards in preparing the manuscript. The manuscript should be

- accurate in all details
- complete, including illustrations and references
- typed properly to the publisher's specifications, or at least in a form acceptable to the publisher
- consistent with house style, if that has been requested

Manuscripts that meet these standards are more likely to be published quickly.

Publisher: Provide adequate instructions. Many publishers have printed instructions or guidelines for authors. These may be a brief paragraph or several pages long. They may say exactly how a manuscript is to be typed, which style of citations and references to follow, what system of abbreviations to use, how to prepare illustrations, and so on.

It takes work to prepare such instructions, but it saves editorial time later.

Review and revision

Publisher: Seek expert opinions and advise the author on revision. Publishers may depend solely on their own judgment about the merit of a manuscript. But if the subject is specialized, most publishers seek expert opinions about its originality, importance, and accuracy.

If revision is needed, the publisher should advise the author how to go about it. Sometimes this means helping the author decide between conflicting sets of expert advice.

Author: Revise the manuscript if necessary to meet standards. The editor or the publisher's expert advisers may feel that the manuscript needs revision—for example, to develop certain points or to support certain statements. If these improvements are important, the publisher may refuse to work on the manuscript until revision is complete.

Editing

Publisher: Edit the manuscript carefully and reasonably. An editor should go through the manuscript carefully, making changes necessary for consistency and suggesting changes that would make the writing more effective. The editor should ask questions if the author's meaning is unclear, or if there is any doubt about the author's accuracy.

The editor should avoid making changes unless they are necessary. In returning the edited manuscript, the publisher should make it clear that this is the last chance the author will have to make changes in the text easily. Changes in type cost time and money.

Author: Review the edited manuscript carefully and reasonably. Prudent publishers give the author a chance to read the manuscript after

it has been edited and before it is set in type. If any changes have to be made in the text, it is cheaper to make them before it is set in type.

The author should be ready to check the edited manuscript, to answer any questions the editor may raise, and to return the manuscript promptly. The author should be reasonable in considering suggestions.

Proofreading

Publisher: Supply proof and instruct the author in proofreading. The publisher should check the proof to make sure that it is reasonably accurate. Sometimes the first proof received from the typesetter has so many errors that the publisher must read it and have it corrected before sending anything to the author.

Authors should be told how to read proof accurately, and how to mark corrections clearly. Many publishers send authors a sheet of standard proofreading marks.

Authors should be warned that they may be charged for any changes they make in the text at this point, other than correcting printer's errors.

Author: Read proofs carefully and return them with corrections. Most publishers give the author a chance to read proof. This is best done at the galley stage, since changes are usually more expensive after the type is organized in pages.

Authors should read proof carefully against their manuscript and mark corrections clearly. Apart from correcting printer's errors, they should make as few changes in the text as possible. This is not the time to revise or recalculate.

Authors should not make any changes on the manuscript.

They should return proof promptly.

In a manuscript with many illustrations or that is complex in other ways, the author may also be asked to check final proof to guard against any last-minute errors.

Index

Author: Prepare the index, if there is to be one. This responsibility will depend on the nature of the publication and the policy of the publishers.

Some publishers may arrange to have the index done by an editor or a professional indexer. Others feel that the author is the best person to prepare an index, especially a subject index. The author probably knows the subject best and is therefore best able to say what is important and how topics should be organized.

Publisher: Advise the author and edit the index. The publisher may need to advise the author what kind of index is needed and how best to prepare it. When it is ready, the editor will have to check the index with the same care given the rest of the manuscript.

Schedules

Author: Meet reasonable schedules. The publisher should establish deadlines that make it possible to publish the work as quickly as is practical. The author should be consulted, and should do everything possible to meet these schedules.

Schedules can be established with authors for

- delivery of the manuscript
- delivery of illustrations if they do not come with the manuscript
- return of revisions to the manuscript
- return of the edited manuscript
- return of proof
- delivery of the index

Publisher: Establish reasonable schedules and keep to them. Schedules should be set with the author's convenience in mind as well as the publisher's interest. The amount of time allowed at each stage in the work will depend on the nature of the publication, the amount of revision needed in the manuscript, the number of new questions raised by the editor, the length of the publication, the location of the author, the state of the mails if the author is not nearby, the quality of the proof, the author's other commitments and possible travel plans, and other such matters. The publisher should consult the author before making the schedule, and be reasonable in setting dates.

The publisher must meet the deadlines in the schedule as well. Otherwise, the author can't be expected to do so.

Subsidies

Author: Assist in securing financial assistance if necessary and appropriate. This is only occasionally an author's responsibility. But sometimes extra money is needed to publish a manuscript that cannot be expected to recover all its costs from sales. In that case the author may have an idea where the money can be found and can help obtain it. If a publication reports the results of research, for example, the author may be able to approach the agency that funded that research. Sometimes the author's own institution will help with the costs of publication. The author may not think of this; the publisher may want to suggest it.

Publisher: Provide all necessary data for securing financial assistance. The publisher may take the full responsibility for obtaining a subsidy toward publication. Or, if the author is involved, the publisher may be able to offer advice on the basis of past experience.

In any case, the publisher must prepare an accurate estimate of the costs of publication and of probable revenue, to show why a subsidy is needed and how large it must be. This title budget should be detailed enough to be convincing.

Promotion and distribution

Publisher: Promote the publication effectively. The details of sales, promotion, and distribution are rarely spelled out in any agreement. This is mainly because it is in the interest of the publisher, even more than of the author, to distribute as many copies as fast as possible. If copies are for sale, the publisher cannot recover costs or make a profit until they are sold. If copies are to be given away without charge, no one benefits while they are in the warehouse.

The publisher has taken the financial risk in publishing the work. Therefore the publisher usually takes full responsibility for deciding how many copies to print, when to publish, what price to set, how to advertise or promote the work. and so on.

Publishers use many ways to reach the intended reader, including direct mail, catalogs, news releases and other forms of publicity, distribution of copies for review in selected media. advertising, exhibits at meetings and book fairs, and personal calls on booksellers, librarians, and teachers.

Author: Help the publisher reach the intended readership. Authors should not be expected to carry publications around to distribute or sell (although some volunteer to do so). But they may be expected to suggest ways the publisher can reach the intended readership, especially if that readership is specialized and better known to the author than to the publisher.

Authors can help by providing lists of publications that should receive review copies or news releases. They can tell the publisher about meetings at which the publication should be exhibited. Some will be prepared to speak in public, or to appear on radio or TV interviews. The author can be an active participant in the promotion of the publication, and is often the best salesperson for it.

Revised editions

Author: Prepare a revised edition if requested by the publisher. Unfortunately, this isn't always necessary. But a publication that proves to be successful may need revision after a few years to keep it up to date. The author is probably the best person to write the revised edition.

If the author cannot or will not write a revised edition, someone else should be found who will receive credit and a share of the royalties.

Publisher: Decide on any revision and advise the author. Either author or publisher may see the need for a revised edition, but the publisher is the one who must take the financial risk and therefore usually decides when a new edition should appear.

The publisher usually will advise the author on the need for revision, and on how much revision can be afforded. For example, the author may want to make changes on every page, which is expensive. The publisher may find ways to limit the changes to one part of the book.

Lawsuits

Authors: Accept responsibility for errors. Most publishing agreements provide for the author to pay all penalties and legal costs if the work contains libel, infringes copyright, or in other ways breaks the law. In practice, however, the publisher cannot help but be involved, and may be the only one with the money to fight a lawsuit or pay a penalty.

Business practices

Publisher: Follow sound business practices. Publishers should follow standard accounting practices, including audit. Authors should be able to inspect sales and other accounts relating to their works.

Many publishers insure the manuscript and any illustrations against damage or loss while in their possession.

Out of print

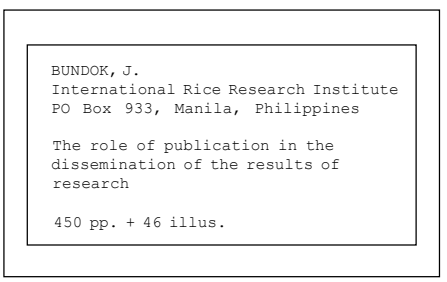
Publisher: Inform the author when the publication is going out of print. Most publications go out of print eventually, either because all copies are sold or because demand has died. In many agreements, the publisher is required to inform the author when this happens. If there are still copies in the warehouse, the author can usually buy those copies, or the printing plates, at a discount. The author should also recover rights to the publication. Then sometimes another publisher can be found who will reprint the work.

10.3
Keeping track and keeping in touch

Editors need to know where things are, especially manuscripts. They also have to let other people know what is happening. The editor is a partner in a complex team that stretches from the author to the reader. For much of the process of publication, the editor is at the center of things. Here are some further guidelines in this connection.

Manuscripts

Keep track of the manuscript. Make a record as soon as a manuscript arrives in the office. This is for your own protection, in case of loss or complaints. Keep a log book that gives the name of the author(s), full title of the manuscript, number of manuscript pages, number of illustrations, date of arrival, address of senior author, etc.



Open a file to keep track of the manuscript. Many editorial offices have a card for each manuscript. On it they record the route the manuscript takes: to referees and back, to production and design for specifications and back, to a copy editor, to the author for checking any necessary revision, to production for setting.

Keep a file as well of all correspondence, editorial or referees' reports, etc. Write memos (and keep a copy) each time the manuscript leaves your office, even if it is to another department on the same floor.

It is usually most convenient to keep track of manuscripts by the name of the author, or of the senior author if there is more than one. Titles of articles or books may change, but the author remains the same.

Manuscripts do get lost, and there is nothing more embarrassing to an editor. For safety, make sure that the author has kept a copy.

Time

Keep track of time. Establish schedules for manuscripts: for referees to report, for designs to be prepared, for type composition and printing. In planning schedules, always allow some extra time for accidents, late changes, or other unexpected delays.

Try to keep to schedules. Keep a diary that reminds you of what should be happening on every day: that a proof is due, a report should arrive, etc. Remind people if the material doesn't arrive.

Of course, this means you must keep schedules, too. And it is good business practice to answer mail promptly.

Authors, referees, and readers

Keep people outside the office informed. The most important person to keep informed is the author. Sometimes editors get so involved in manuscripts they forget who wrote them.

Acknowledge receipt of a manuscript at once. You can use a simple form or postcard.

After that, let the author know things are happening. Report if the manuscript goes out to referees, when one report is back, and so on. Let the author know the schedule you have for publication as soon as you have one; that way, the author can plan ahead.

Keep in touch with referees if you are using them. Let them know what you have decided. As a courtesy, and to say thanks, you may wish to send referees a copy of the publication they have read for you, once it appears from the printer.

Whenever you have a chance, tell possible readers or purchasers about forthcoming publications.

Colleagues

Keep colleagues informed. In small publishing operations, one person may be responsible for all the duties: editing, design, production, and promotion. There is still a need to keep track of the manuscript at every stage, preferably with a checklist of things that must be done. Otherwise, something important may be forgotten. Once a second person is added, or a second department, or more, problems in communication can arise. From the moment a manuscript comes under consideration, people in the publishing office must keep each other informed.

The editor probably knows more than anyone else in the office about the author, the publication, and perhaps the subject and the intended readers. The editor therefore has a special responsibility to help all the other people in the office do their jobs with the manuscript.

In a large publication office, the editor who is responsible for the manuscript may have to prepare a report for the management. The editor should also describe the manuscript to the design or production staff so they can establish specifications and get estimates of manufacturing costs, and to the promotion department so that they can suggest a realistic print run and plan a promotional campaign. To these people, the editor must describe the strengths and weaknesses of the manuscript, its nature, the intended readers, and so on.

The production staff must in turn coordinate the manufacturing process with the editor (who communicates with the author), with the printer, and with other departments of the publishing office.

Promotion staff tell their colleagues what they plan to do to announce the publication, and may ask for ideas and help. The author will want to know about plans, too.

Everyone must be sure that the order department or the people who send out the publications know well in advance that a publication is to be printed. Otherwise, they won't be able to answer correctly if they get requests for it.

If the publishing office is part of a larger organization, such as a research institute or extension agency, it should keep senior management informed of plans and coming publications. It should also inform colleagues in other departments of the organization.

All this requires constant attention from everyone in the publishing process, to make sure that everyone else knows what is happening and what is expected to happen.

Memos are useful tools. So is a dayfile, which routes copies of all correspondence to those who need to know.

So are regular status reports, which track progress of a publication through the stages of appraisal, editing, manufacture, and sales.

Publications

Keep track of the publication. Publishers need some easy way to identify every publication once it has been accepted for publication until it goes out of print. Traditionally, they have used authors' names; but this can be confusing if one author has several books or if there are several authors with the same last name. In that case the title must be used as well, but titles can be long and sometimes two titles are almost identical.

Fortunately, there is an international system of numbering publications — actually, two systems, one for books, the other for journals. They were developed so that booksellers and librarians could order titles easily from publishers, using only numbers. Many publishers use the same systems to identify books in their own records.

The International Standard Book Number (ISBN) is a 10-digit number printed in books on the page after the title page. The first digit identifies the language of the book (for example, 0 means English). The last digit is a check number with which computers can automatically confirm that there are no typing errors in the other nine digits. The middle eight digits are broken into two groups of varying length; the first group identifies the publisher, the second group identifies the title. A publisher with thousands of books in print has a short number to identify the firm in order to have many numbers for individual titles. A small publisher has a long identifying number, and only a short number for titles.

Here are two examples:

ISBN 0-226- 10390-0 ISBN 0-870554-43-3

The first belongs to a large English-language publisher. The fact that it has five digits in the third block means that the publisher can list almost

100,000 titles—a truly gigantic backlist. The second is a small English-language publisher. The two digits in the third block mean that it never expects to have more than 100 books in print.

ISBN numbers are administered through national agencies in each country, usually the national library or a branch of the ministry of education. Publishers can apply to the national agency and will receive a number to identify themselves. The size of the number will depend on the size of their operations. They will also be given a block of numbers for individual titles, and are responsible for assigning those themselves.

The International Standard Serial Number (ISSN) operates in much the same way. Serials include journals and newsletters, but also annual reports and any other publications issued as part of a consecutively numbered series that will be continued indefinitely. Publishers can apply for serial numbers to the national ISSN agency, which may be the same as the one that administers the ISBN. The ISSN is an eight-digit number (for example, ISSN 0115-3862) and is the same for all issues of the serial. It should be printed where it can be found easily, usually on the front cover or contents page.

10.4
The budget for a publication

There are many ways to draw up a budget for a single publication. This is one approach that has proved useful. Some of the elements will not apply to every publishing office; any that are inappropriate may be omitted.

The basic budget for a publication consists of

COSTS
1. Production costs
   - fixed
   - variable
2. Other publication costs
   - marketing
   - orderfulfillment
   - administration and other overheads

REVENUE
1. Sales (if the publication is sold)
2. Advertising (in journals)
3. Grants
4. Institutional budget and other sources

Costs

If publications are distributed free of charge, costs will be the major concern. Revenue will consist of only one item: the figure allowed in the annual budget to produce the publication. That figure will already be decided. Editors must simply make sure the costs stay within that figure.

Production costs

Production costs have been discussed in detail in Units 9.2–9.3.

One-time production costs are met before the actual printing begins. They do not vary with the number of copies printed. They can be grouped in four categories.

1. Copy preparation includes

   - editing
   - design
   - illustrations

Many publishing offices do not keep track of time spent by their own staff in copy editing or in preparing illustrations. They include these costs, and production supervision, in a general category of costs called overhead. But it can be useful to know how staff time is spent, and how much time any particular project needed. If the number of hours is known, a cost can be assigned, based on salary and supporting costs.

2. One-time production costs include

- composition (hot metal, photocomposition, typewriter)
- proofs and proofreading
- author's alterations (if permitted)
- engravings or film for illustrations, including color separations if any
- assembly into pages
- imposition into forms (letterpress) or flats (offset)
- final page proof (blueprints for offset)
- platemaking

3. Production supervision must continue throughout the production process, and some costs will be added here after platemaking. They will not vary with the print run, however; publishing staff is unlikely to stand by the press during an entire printing, for example. It is proper therefore to include this among one-time costs.

4. Press preparation is often (as in unit 9.3) included in presswork. But if the cost of press preparation is known, or can be calculated, this is a more convenient place to put it for budgeting. Removing it from the variable costs makes it easier to consider publishing options, because variable costs then can be adjusted directly to reflect changes in the number of copies printed. (See the examples at the end of this unit.)

Variable production costs do not always vary precisely with the print run, but there is always a strong correlation. There are again four categories, discussed in unit 9.3:

1. Paper
2. Presswork
3. Binding
4. Shipping from the printer

Other publishing costs

The costs of production-especially the cash payments to typesetters, printers, and binders—are the most obvious expenses in publishing and tend to attract the most attention. But publication does not stop with finished books. Other costs may not appear in any budget for a single publication; they may be buried in the general administrative or staff budgets of the publishing department or its parent organization. Nevertheless, if publication is effective, they are present, and they may be greater than the costs of production.

1. ***Promotion and distribution*** may include any or all of

- publicity
- advertising
- direct mail
- catalogs
- order fulfillment (including warehousing and shipping)

Even if a publication is given away free, some costs are involved. Readers must be told the publication is available. Orders must be checked and copies must be wrapped and shipped to customers or regional centers. If the publication is sold, costs for promotion and advertising may increase, and invoices will have to be prepared. Promoting books takes time and money; so does filling orders.

2. ***Royalties*** are usually calculated as a percentage of the retail price or a percentage of the money the publisher receives from sales. They are paid only on copies that are actually sold. They do not have to be paid until the publication is actually on sale, but they must be remembered when the budget is being drawn up, because they will have to be taken from sales revenue.

Sometimes authors are paid fees instead of royalties. These are one-time costs and should be included at that point.

In some countries, royalties are based on the number of copies printed or the size of the publication.

Many non-profit institutions do not normally pay royalties to authors.

3. ***Administration and other overhead expenses*** include

- business activities (including accounting)
- administration
- editorial costs that cannot be charged to individual titles
- production costs that cannot be charged to individual titles
- promotion and order fulfillment costs that cannot conveniently be charged to individual projects

Overhead

Overhead may be the most difficult kind of expense to calculate. It may also be a very large part of a publisher's true costs.

Overhead expenses are the costs of doing business that are not assigned to a particular project.

There will always be some expenses that cannot be charged directly to an individual publication. For example, editors spend a certain amount of time in meetings that are not connected with any one particular publication. They also spend time developing new ideas and discussing projects that may never reach actual publication. The head of the

publishing department may spend a considerable amount of time in administration, without being able to separate time spent on individual projects. The accountant and the purchasing officer who look after publishing also cannot easily say how much time they spend on each individual title. The cost of time spent on such matters may simply be lumped into the general expense called overhead.

Overhead does not consist only of staff time. Many costs, including cash payments, can be lumped into overhead. One example is a catalog or folder that advertises several publications. Should its cost be divided among all the publications, with each charged a fraction of the total? That can be done for bookkeeping purposes, but it's not very convenient or practical. In the same way, the cost of warehousing can be divided among all the publications according to the amount of space each publication requires; but, again, that is neither convenient nor practical. It's easier to add catalogs and warehousing to overhead.

On the other hand, some costs of marketing and distribution can be assigned quite specifically. It is possible to tell exactly how much it costs to advertise a publication in a journal, or how much to print and mail a folder promoting a single title. It is also possible to determine exactly how much it costs to wrap and ship a copy of a publication to a customer.

Each publisher must decide how best to divide costs between assigned charges and overhead. Some put everything in overhead except what they pay directly to the typesetter, engraver, printer, and binder for production. Others assign as many costs as possible to the specific publication.

Once a publisher decides what will be included in overhead, it becomes fairly easy to budget the total cost of overhead—the cost of doing business.

The publishing wing of a research institute or extension agency (or for that matter, of any other institution) may have all its overhead paid by its parent organization. In that case, the publisher's only responsibility would be to stay within the budget for staff and general expenses.

If the publishing wing is expected to recover part of its overhead costs from sala of publications, then a further calculation is needed. The publisher must decide what price to charge in order to recover that much of the overhead costs—plus, usually, part or all of the costs of production. To do this properly, the publisher must be able to estimate how much money is likely to be earned from sales of the publication.

Sales revenue

Publications can be sold without the revenue reaching the publishing office. In many government departments and in some other public agencies, all revenue, from any source, goes into a general fund that helps pay the overall costs of the institution's operation. Even then, the

publishing wing should know how much revenue comes from sales of its publications, and should ask to have that considered when the annual budget is being prepared. In some institutions all sales revenue is credited directly to the publishing office, to be used in producing future publications.

Sales revenue depends on the number of copies sold and the price charged.

Be realistic in estimating the number of copies that will be sold. Remember that some copies will always be given away, and in a research institute this may be a large number. Free copies are sent for review to journals; presented to visitors, donors, and policymakers; given to the author; distributed to staff; exchanged with libraries at other institutions; and so on.

Setting a price

Deciding what price to charge is almost as much an art as a science.

One way is to set a price that will recover the cost of manufacture, without worrying about overhead. If a publication costs the local equivalent of $1.00 to manufacture and 20% of the copies will be given away, then the sales price must be $1.25.

That simple calculation is based on two assumptions: (1) all copies available will be sold; (2) they will all be sold at the price of $1.25.

Neither assumption may be true. (1) Publishers' warehouses around the world are full of unsold books. Customers only sometimes meet the publisher's hopes. (2) Some books usually are sold at less than the suggested price. Any that are sold to booksellers will likely be sold at a discount of up to 40%, because booksellers need money to operate. Bulk orders may also be given a discount; this is partly to attract large orders, and partly because it costs the publisher less to handle one order for 100 copies than 100 orders for one copy. Moreover, unless the publisher insists on cash with each order, some orders will never be paid for. The price of this particular publication may therefore have to be set at $1.50 or even higher.

If the publishing organization must recover overhead costs, the calculation is a little more complicated.

The simplest way is to consider the total overhead cost in relation to total manufacturing cost. Let us say that a publisher expects to spend $10,000 in the coming year in direct production costs, and an equal amount in overhead costs. (The overhead costs will include the cost of producing all the copies that are given away.) To break even, the publisher then must receive $20,000 from the books that are sold. That is, sales revenue must be twice the production costs. A book that cost $1.00 to manufacture must produce $2.00 in revenue.

-But the $2.00 is only what the publisher must receive. If there is a bookseller involved, the price to the consumer will have to be higher. The bookseller must also have money to operate. If the bookseller needs an operating margin of one-third the retail price, then the price to the consumer will be $3.00: $1.00 for the bookseller, $1.00 for production, and $1.00 for the publisher's overhead.

After making this calculation, the publisher can use a simple rule of thumb in, setting retail prices: take the direct costs of production and multiply them by three.

That is probably the most common method of setting sales prices. The multiplying factor may vary, depending on costs. There are more complicated ways of setting list prices, but this one has proved its worth, so long as publishers include all the costs of doing business and actually sell all the copies they expect to.

The same calculation cm be turned around to start with a desired retail price. Then the publisher deducts one-third of that price as a discount to the bookseller. The balance goes to the publisher, and is called *net proceeds*. Of all net proceeds, this publisher knows, 50% must go to overhead and 50% to the costs of production. Again, the percentages will vary from publisher to publisher, depending on production and overhead costs and the way costs are divided between those two categoriqs.

Here the art enters. The sales price that comes from this type of formula may be higher than many buyers will pay. In that case, the publisher must thir& again—and perhaps reduce the price by cutting costs or seeking extra money from outside.

Other revenue

Journals sell subscriptions and single orders. They may also sell advertising to companies that want to reach the journal's readers.

Grants can be an important source of extra revenue, making a publication possible. They may come from government, public or private agencies, charitable foundations, corporations, or private individuals.

The budget of the institution may pay all or part of the costs of publication or overhead, or may make special funds available to help one particular publication.

Budgeting

All this information can be summarized on a form. It should then be possible to see easily whether there is likely to be enough revenue to balance the costs, or even to make a small income.

If costs and revenue do not balance, the budget will have to be adjusted in one or more of the following ways:

- raising the price of books sold
- finding a way to sell more copies (but it is important to be realistic)
- finding a grant from some outside agency
- getting more money from the institutional budget
- cutting costs, either by reducing some one-time costs (giving up color separations, perhaps) or by printing fewer copies

Nothing has been said till now about profits. This manual is intended for editors at non-profit research institutes and extension agencies. Profits can be included in the budget easily enough, however, by adding an extra line.

For profit or not, the problem remains the same: establishing a budget for a publication that meets the goal, and then keeping within that budget.

Two examples

Here are a couple of budgets, using purely hypothetical figures.

Example 1. Promotional mailing piece prepared by one publisher and cooperatively by two publishers.

	1	2
Number of presses		
Quantity	5000	5000
Style	8-page folder	12-page folder
Production: one-time costs		
Copy preparation	$ 100	$ 150
Design	50	75
Production supervision	40	40
Illustrations	25	40
Composition, film, plates	400	600
Author's alterations	20	30
Other one-time costs		
Total one-time production costs	$ 635	$ 935
Production: variable costs		
Press work	$ 200	$ 300
Paper	500	750
Binding	100	200
Shipping	5	25
Other variable costs		
Total variable costs	$ 805	$1275
Total production costs	$1440	$2210
Other publishing costs		
Promotion and other selling costs		
Mailing lists, envelopes, postage	$2000	$2300
Royalties		
Administration and other overheads (50 per cent of net profits)		
Other costs		
Total costs	$3440	$4510
Cost per publisher	$3440	$2255

In Example 1, a publisher planned to print a small catalog promoting books in one subject and mail it to 5000 major libraries and senior researchers with interests in that field. There were too many books to fit in four pages, so the designer spread them out to fill eight pages. The cost of preparing the catalog was going to be the local equivalent of $1440 and the cost of mailing would be $2000—an average of 40 cents per catalog for addresses, envelopes, and postage. This seemed too much.

Fortunately, the publisher knew another publisher with books in the same general field. The two houses did not compete directly with each other, and so they decided to cooperate in one catalog, splitting the costs equally. The first publisher's books could be catalogued comfortably in six pages. The second publisher also had six pages of catalogue entries, so the result was a twelve-page booklet.

Of course, with more pages and more entries, it cost more to prepare the text for the typesetter and to set it; there was also extra cost in film and plates. As a result, copy preparation and one-time production costs went up 50%. Design and changes in proof rose a bit, too, and illustrations were added. Presswork and paper went up 50% with the jump from eight to twelve pages, and binding went up 100% because there was extra hand work in gathering twelve pages (eight pages would have come out of a single sheet.) Even so, production costs were considerably less than twice the original amount.

The big saving came in mailing. The postage went up a little, because twelve pages weighed more than eight, but the increase was only six cents per piece and other costs (addresses and envelopes) remained the same. By combining forces, the two publishers presented a more impressive catalog to their potential customers, and did so for two-thirds of what it would have cost them to send catalogs individually.

Example 2 concerns a book published by a commercial house for a research institute. The author was an important person and wanted a four-color cover to make the book look impressive. The head of the author's department thought that the institute could easily sell 2000 copies, even after it gave away its usual 500. To make sure that the book did sell well, the author wanted a low price, the local equivalent of $3.75. Luckily, a granting agency had promised $2000 to support publishing costs, and the director of the research institute promised an additional $1500. Even so, the editor guessed there might be problems, but worked out a budget with the commercial house (Column 1). After allowing 50% of net proceeds for the publisher's overhead, the budget showed a big loss.

The editor and the publisher sharpened their pencils and got to work (Column 2). They began by dropping the four-color cover. That saved a considerable amount of money in the budgeted costs of binding (which included the cost of printing the cover). It also saved $100 on the cost of an illustration for the cover: black-and-white drawings are cheaper than color ones. Then they agreed to raise the price to what similar books cost—almost twice what the author wanted. They did not think that would harm sales, because the people who wanted this book would buy it at any reasonable price.

The author and the head of the department didn't like the new price, but the editor pointed out that only part of it would reach the publisher. Booksellers would have to receive a discount on any copies they bought. The publisher gave booksellers a 35% discount; but they would likely buy less than half the books and the rest would be sold through mail orders or at the institute at the full price. As a result, the average discount overall would be 15%. At that rate, net proceeds per copy would be $5.95 ($7.00 less 15%).

The publisher thought the original estimate of sales at any price was too optimistic, and suggested cutting the press run from 2500 to 2000 copies, of which 500 would still be given away. That reduced the amount and cost of paper and presswork by 20% (2000/2500 = 80%), and with fewer copies further reduced the cost of binding. Shipping costs from the printer, and order fulfillment costs at the publisher's, dropped because there were fewer books to handle. The one-time costs for the inside of the book weren't changed by the new quantity, of course. Neither was the allowance for promotion, because the publisher expected to need all the money available just to sell 1500 copies. The grants from the agency and the institution stayed fixed.

This budget allowed the publisher to recover the full percentage of net proceeds required for overhead, with a small balance left over. The author and the head of the department thought that meant the price could be dropped, but the publisher showed them that the difference would be only 30 cents per copy. They finally agreed, reluctantly, that the couple of hundred dollars of projected net income could be a little bit of protection for the publisher if sales turned out to be less than they all hoped.

Example 2. Title budget for a book with different covers and quantities.

Quantity	2500 copies	2000 copies
Style	4-color cover	1-color cover
COSTS		
Production: onetime costs		
Copy editing	$ 300	$ 300
Design	80	80
Production supervision	60	60
Illustrations	160	60
One-time production costs	2350	2350
Author's alterations	150	150
Other one-time costs		
Total one-time production costs	$3100	$3000
Production: variable costs		
Press work	$1000	$ 800
Paper	2500	2000
Binding	1000	500
Shipping	100	70
Other variable costs		
Total variable costs	$4600	$3370
Total production costs	$7700	$6370
Other publishing costs		
Promotion and other selling costs	$1000	$1000
Order fulfillment (postage and shipping)	$ 500	$ 400
Royalties		
Adminstration and other overheads (50 per cent of net proceeds)	$3190	$4463
Other costs		
Total costs	$12390	$12233
Revenue		
Free copies (no revenue)	500	500
Sales		
Suggested retail price per copy	$ 3.75	$ 7.00
Average discount	15%	15%
Net proceeds per copy sold	$ 3.19	$ 5.95
Estimated sales in copies	2000	1500
Estimated total sales revenue (net proceeds)	$6380	$8925
Other revenue		
Grants	$2000	$2000
Institutional budget	$1500	$1500
Other		
Total other revenue	$3500	$3500
Total revenue	$9880	$12425
Net income (shortfall)	($2510)	$192

10.5
Evaluating publications

Complete communication involves feedback. For the publisher, this means some information to judge the success of any publication and the publishing plan.

Feedback can come in many ways.

A commercial publisher may judge success by the profit made on any single title or publishing program.

A non-profit publisher may judge success by the number of copies sold, or the number of free copies requested.

By these means the publisher can measure how successful the publication was, but still may not know *why* it was successful.

Some of the reasons for success or failure can be found by talking to readers or potential readers, analyzing any letters they write, and reading reviews. But such informal, unstructured information gathering is rarely entirely satisfactory. It is a poor basis for planning future publications or publishing programs.

A formal survey gives more information and is more credible to management. Surveys are a precise science on which many books have been written. The subject cannot be covered in any detail in a short unit; but here are a few guidelines.

Decide goals

1. *Decide exactly what you want to know.* For example:

- Who exactly are the readers? (See unit 1.6.)
- How is the publication used? What parts are most used? What parts are least used?
- Does the publication meet the readers' needs? How can it do so better?
- How much of it do they actually read? What parts do they read first? What parts do they read last? Which parts do they never read?
- What is the readers' attitude toward the publication? toward the publishing organization?

Plan a sample

2. *Decide on the design and the size of a sample.* It is possible to send a questionnaire to everyone who receives a publication, but it is usually inefficient or expensive. Unless the number is small, the cost is likely to be prohibitive.

For this reason, most readership surveys are made on a sample of the entire readership. Sampling readers is much like sampling any other universe. If you have not had training in this area, ask for help from a statistician or a researcher who is familiar with statistics and sampling.

Write

3. ***Write the questionnaire.*** This is more difficult than it sounds. Again, whole books have been written on the subject. Here are some further guidelines.

Make sure questions are short and easy to understand. Avoid words that can have two or more meanings. Be specific. Remember that people like to tell you what they think you will want to hear. Avoid loaded questions that beg for a particular answer, or that are likely to produce answers that give little information. Do not ask questions like "Do you like our publication?" or "Could we do a better job?"

As much as possible, use multiple-choice questions that can be answered quickly and tabulated easily and clearly.

Avoid "either/or" questions that cannot be answered "yes" or "no." ("Would you prefer a red cover or a green cover?")

Design questions that measure the intensity of an opinion. ("Which part of the newsletter do you read first? second? third?"; "How do you rate this publication: Excellent? Good? Fair? Poor? Not worth reading?"; "State preference on a scale of 1 to 5.")

In multiple-choice questions, include a category of "Don't know" or "No opinion." This will produce more accurate results.

Do not assume the respondent knows your publication as intimately as you do. Make sure you spell out all details.

Limit the number of questions. One authority suggests that there should be no more than 20 questions, and they should be in only a few topics. Otherwise, answering them may look like too much work and discourage the response.

Test

4. ***Test the questionnaire on a small sample.*** Show it to some friends or a few typical readers. Make sure they understand all the questions clearly.

If possible, test the questionnaire on a small sample of the people who will eventually be surveyed.

Keep testing until you are satisfied. It may take three tests to get a good questionnaire.

Distribute

5. ***Send out the questionnaire.*** A questionnaire can be inserted in copies of a publication relatively cheaply. This method is unlikely to attract enough responses, however, and those that do arrive are likely to come only from the most concerned readers. They will not be truly representative of the readers. Nor will you have reached another important group: members of the intended readership who have decided not to read the publication

A questionnaire that is mailed separately is likely to attract more responses. In North America, at least, questionnaires sent by first-class mail attract more responses than questionnaires sent by cheaper means.

The questionnaire should be sent soon after the publication appears, preferably within two weeks. That way, impressions of the publication will still be fresh.

Include a letter explaining how important it is to get a reply from the person receiving the questionnaire. The letter need not be individually addressed; in fact, that may make readers suspicious that their replies will be checked for some hidden reason.

The letter can look like a form letter. But it helps if it is signed by someone with prestige, for example, a director rather than an editor. Include a self-addressed envelope for the reply.

The best way to get responses is by personal interview—by asking the questions directly, face-to-face. Sometimes this can be done cheaply by cooperating with university departments and sending out teams of student interviewers.

Follow up

6. ***Follow up with reminders.*** For useful results from a small sample, at least 50% of mailed questionnaires must be returned.

Some people send a postcard after three days to each person in the sample. The postcard reports that the questionnaire has been sent, hopes it has been received, and asks for a reply. If the sample is only 100 or 200 people, this is not overly expensive.

In any case, send a reminder and a second copy of the questionnaire after a reasonable time (weeks, not months) to everyone who has not replied. If the responses are meant to be anonymous, the reminder will have to be sent to all the people in the sample, asking them to be sure to return the questionnaire if they have not already done so. Sometimes a third request may be needed.

Analyze

7. ***Analyze the responses and act on them.*** The last three words are most important. There is little reason to go to the trouble of a survey unless you are willing to use the information to improve your publications.

11
Reaching the reader

Far too often, much effort goes into creating the best possible book, booklet, journal issue, or folder, and then attention moves on to something else. Activity peaks when the publication comes from the printer: everyone is pleased, free copies are distributed, orders are filled. But then newer projects demand time and energy. The publication which has arrived lies in the storage room or warehouse — sometimes in thousands of copies, sometimes for years.

Editors may feel they have little time to plan and run promotional campaigns. But someone has to do it, or all the effort up to that point is wasted. If there is no one else, this too becomes the editor's job. At the very least, editors should be aware of possible ways to promote their publications; then they can help others who have that responsibility.

This short module is the briefest of introductions to a major function in publishing.

1 Promotion
2 Enlisting the author
3 Direct mail

11.1 Promotion

It is not enough to edit, design, and manufacture a publication. Intended readers must know about the publication, and must be able to obtain it easily. "Publish" means "to make public."

Publications can be publicized or promoted in many ways. Here are some of the major ones.

Catalogs

Catalogs list the publications an organization has in print or will be publishing in the next several months. They may be published annually or twice a year, or even every two years. If they are published more infrequently, they go out of date.

A catalog may be a simple list of authors, titles, and prices, usually with an order form.

More effective catalogs contain several paragraphs about each new title. They describe the content, identify the author, and explain who will find the book most useful. This type of catalog may even have illustrations to make it more attractive. A catalog that has descriptions of the publications becomes a reference work. It is more likely to be saved—especially by librarians—and not thrown away.

The most useful catalogs

- separate new publications from those that have been announced in earlier catalogs. New publications appear at the front of the catalog. Most readers will be anxious to know about the publications they haven't had a chance to order before.

- organize the publications by subject. That way, people can easily find the publications that interest them most. Some large publishers issue separate catalogs for their books and journals in each subject area.

- give all the details a potential reader or buyer needs. For new publications (especially books or booklets), these include the name of the author(s); full title, including the subtitle if any; a brief description of the contents, indicating their significance; a sentence or two about the author(s); the series in which the publication fits, if any; the number of printed pages; the page size; the number of illustrations, if any; the price (for both hardcover and paperback, if there is more than one version); the probable month of publication; and the International

Standard Book Number (ISBN). For publications that have already been described in earlier catalogs, the description can be shorter and may simply be a quotation from a favorable review.

- include an order form, designed for easy use. (See unit 11.3.)

The section of new publications should include every one you feel confident will appear in the next several months. Also include books that have been published since the last catalog was issued and that were not announced in it.

Include books only if you are sure they will be printed within the next several months. Librarians and readers get impatient when books that are promised in catalogs do not appear. If that happens too often, the whole publishing operation loses credibility.

Do not claim a publication is better than it is. That eventually destroys credibility too.

Publicity

Publicity is sometimes called "getting something for nothing." It is getting space in a newspaper or magazine, or time on radio or television, without paying for it. In that way, it is like a free advertisement.

One way to do this is through a press release. Make press releases straightforward, just as if they were going to be printed the way you write them. Don't fill them up with too much enthusiasm. Pretend you are a newspaper reporter yourself, and write that way. Don't forget to include the author and title of the publication, the name of the publisher, the price (if any), and the person who should be called if more information is needed. (For more about press releases, see unit 5.12.)

Choose the newspapers, magazines, and journals that are most likely to print news about the publication you are publicizing. Don't waste your efforts sending material to other periodicals. You can get lists of magazines and journals from reference works like *Ulrich's International Periodical Directory,* which is organized by subject. The 1987/8 edition, for example, has more than 70,000 entries from 59,000 publishers in 197 countries, divided into 534 categories, in 2000 pages.

Send releases to organizations and professional associations that work in the field of your publication and may mention it in their newsletters.

Don't forget radio and TV, especially regional stations. They are often willing to interview the author or a representative of the publishing institute.

Review copies

Scientists are greatly influenced by the reviews that appear in journals. It is worth sending out a reasonable number of copies for review. Choose the review media carefully: there is no point in wasting copies.

Build your own lists of review media, and keep them up to date. Journals die. Others are born. Review editors change. Make personal contacts with review editors when you can.

In addition to reference works like *Ulrich's,* you can find likely review media by inspecting your library shelves, or by asking authors to make suggestions. (See unit 11.2.)

Keep track of where you send copies. If one journal consistently does not review your publications, stop sending copies to it.

Good reviews not only sell books. They add to the reputation of the organization that publishes the books.

Advertising

Many marketing managers believe that it is a good investment to advertise scientific and technical books in specialized periodicals. It is a policy that should be approached with caution. Advertising can be expensive. In most cases, it does not sell many books. It does keep the name of your institution before the public, however. And it flatters the author.

Again, choose the journal or magazine with care. Try to make the advertisement as effective as possible, using the principles of good design.

Many journals agree to exchange advertisements with other journals. Each journal publishes an advertisement about the other journal without charge. The only expense is the cost of typesetting and the loss of one page that might have been used for editorial matter. Obviously, journals should be chosen that reach appropriate readerships.

Exhibits

Display your publications at meetings of scholarly or professional associations, or at meetings of extension workers. The exhibits attract interest. It may be possible to sell a large number of copies if the publication is for sale, or to give copies to the people who can use them best.

Book fairs are a special kind of exhibit. They provide a chance to show your publications to a special audience of booksellers and other publishers.

Direct mail

Direct mail may be the most important method of promotion for most scientific publications. It is dealt with separately in unit 11.3.

Booksellers

In China, booksellers may be the single most important way of distributing publications, largely because China has a highly centralized and effective bookselling company that covers the entire country. This is not typical of most other countries, unfortunately.

When we try to get publications in bookstores, we meet one of the most discouraging facts about publishing. Thousands and thousands of new publications are issued every year. Most countries have only a handful of good bookstores. And those stores can stock only a small fraction of the books that are published. Publishers, especially those issuing specialized works, must fight to get any publications in the bookstores.

Publishers must give bookstores a discount off the regular price (assuming the book is for sale) so that the booksellers can pay their own expenses, Some publishers use sales representatives to approach the bookstores for them, and the representatives must also get a salary or commission.

Sometimes booksellers will take publications on consignment. That means they keep the books in the store but pay nothing until the books are actually sold. Then they pay the price less a discount.

Even so, it is hard to keep specialized books in the stores. Because booksellers operate a business, they must use the space they have to stock the books that are most likely to sell—even if that means romances or murder mysteries instead of the results of research.

Library wholesalers and subscription agents

In North America, libraries buy most of their books from wholesalers (also called "jobbers") who buy books direct from the publisher. An institution that wants to sell more copies to North American libraries should do more than send direct mail to the libraries. It should also send catalogs and advance publication sheets to the wholesalers. A list of wholesalers can be obtained from *Literary Market Place or International Literary Market Place*—annual publications that also list publishers, retailers, major libraries, and trade organizations—or a similar reference work.

Other countries have library suppliers, though not always on the large scale of the North American companies. In India, for example, library suppliers are usually one-person or family businesses, operating out of a home or small shop. They don't keep many books in stock but they do keep in touch with libraries, collect orders, and pass them on to publishers. They are worth knowing.

Many libraries in North America and Europe buy journals through subscription agents, who act in much the same way as library wholesalers do for books. Journals should send full information about themselves to these agencies, which are also listed in *Literary Market Place.*

Free copies

Send free copies of publications to teachers who might use them in class (and who might tell their students to buy copies). Or send free copies to people who are influential, and who might advise other people to get copies. Send free copies to members of the board, officers of funding agencies, and others who may want to know of your organization's work.

Copublication

Look for copublishers in other countries where you cannot distribute effectively. Every country has its own network of distribution; usually, someone in that country can do a better job than someone outside.

It may be possible to make arrangements with a publisher in another country to take a certain number of copies of a publication to sell or distribute there. Obviously, this is easier if both countries use the same language and if the same kind of conditions exist in both of them. If languages are different, it may be possible to arrange for a second publisher to issue a translation of the original publication. This will spread the author's message wider. If the second publisher pays for the rights to copublish or translate, this will also help with the costs of original publication.

Things to watch

All the good promotion in the world won't work unless the publisher remembers other things. Some of them are discussed here.

The publications promoted must be basically good. If they are not, people will order once and then distrust further claims.

If a book, booklet, or journal contains accurate and useful information, clearly and effectively presented, and appears when it is needed or when it is promised, there should be no problem in this connection. There should also be no need to write catalog descriptions that praise the publication too much or suggest that it is more important than it truly is.

The best way to promote publications is to build a reputation for good work.

Publications must be ready at the appropriate time. A book on harvesting should appear a month or so before the harvest, not two weeks after. A textbook must be available before classes begin. In fact, a new textbook must be available many months in advance so that teachers can examine it.

The timing of other events may help in promotion. For example, national policies may tie in with a publication already available. Watch the newspapers. If a government official speaks about a subject in which you have a new publication, it can help sales.

At some times in the year, libraries and institutions run out of money. Approach them early in the budget year.

If the publication is to be sold, try to find a price that will be attractive to the purchaser but still be high enough to return your costs (possibly including some overheads). This can be done only by trial and error.

Remember to allow for a discount to booksellers and for bulk purchases.

Some international research institutes have a policy of charging a low price to industrially developing countries and a higher price to other countries, That makes sense: the more developed countries are used to paying fairly high prices for books. Find out what is a reasonable price by checking in publications like *Books in Print.*

When you get a request or order for a publication, see that it is filled promptly. Good service is important to a publisher's reputation.

Be ready for orders that have the title wrong. Try to figure out which publication the person meant.

Send publications in packages that will protect them in the mail.

Use an economical system of delivery.

Make sure your order fulfillment is friendly and helpful. People are more likely to come back.

Cooperation in marketing

Unless you issue many publications, the efforts of promotion and order fulfillment may be expensive. Look for publishers who have similar lists, and with whom you can cooperate in marketing. Perhaps you can buy joint advertisements, or mount joint exhibits, or publish joint catalogs. You might even set up a joint warehouse and mailing operation.

The more you can join forces with others, and so spread the cost of promotion and order fulfillment, the more effective your efforts may be.

Note: *Ulrich's International Periodical Directory, Literary Market Place, International Literary Market Place,* and the U.S. *Books in Print* are all published annually by R.R. Bowker Company, 205 East 42nd St., New York, NY 10017, USA. Many good libraries have copies.

11.2
Enlisting the author

The author is often the best source of information that will help in promoting a publication. Many publishers have forms they send the author as soon as editing begins. Here are some questions they ask:

- How do you wish your name to appear on the title page? (Some people do not want their full name.)
- Please supply the following information (full name, age, citizenship, etc.) that we need to register the copyright or to deposit your publication in the national library or archives.
- Please give a brief description of your publication, including important points to emphasize in promotion.
- What major publications have you written in this field?
- Please supply names and addresses of any organization or association that might be interested in the subject of your publication. Is it likely it would allow us to mail promotional material to its members, or announce your publication in a newsletter?
- Will your publication be of special use to teachers? Are there any training courses related to this specific material? Please give us a list of people who might use it for training.
- We will send copies for review in professional journals, newsletters, and other publications. Please give us a list of those journals you think will be most likely to review your work.
- Have you edited a journal in this field or been associated with it in other ways? Should we send it a review copy?
- What journals do you feel would be most appropriate for advertising your publication? (List two or three only.)
- Are you willing to take part in radio or television interviews if the possibility arises'?
- Please give us a brief biography of yourself.

- Can you suggest one or more persons whose endorsement would encourage people to read and use your publication? Do you think they would agree to comment if approached? Please supply addresses.

- Please supply a short list of special people to whom we might send the Publication in the hope they will recommend it to others.

- Please suggest any further ways we might promote and distribute this publication.

Note: The use of these questions will depend on your publication program. Not all of them will be appropriate for all programs. In some cases, it may not be appppropriate to follow this approach at all.

11.3 Direct mail

One way to tell an intended reader about a publication is to mail an announcement directly to that reader. This has several advantages over other methods of promotion:

- The publisher can control what is said.
- The publisher can control the timing to coincide with the seasons, the opening of a school year. the time when libraries have the most money to spend, and so on.
- The mailing can be sent only to people who are most interested in the publication. The technique is therefore economical.
- The response to a mailing can be measured by counting how many people order or ask for the publication.

Direct mail is particularly valuable in areas where there are few bookstores. It is also valuable for publications that are unlikely to be sold by those bookstores. Direct mail, in fact, is tailor-made for promoting specialized publications to readers with those special interests.

In North America, millions of dollars have been spent on research into direct mail, looking for ways to make it as effective as possible. This suggests how important direct mail can be in any promotional campaign. From that research have come a number of guidelines. Here are some of them, applied to promotion of books and journals.

Design for impact

Direct mail pieces should be designed for maximum impact. They are in direct competition with every other advertisement the intended reader receives. If they are not effective they will be thrown away unread.

Select typefaces, ink, and paper that will make the mailing piece as readable as possible.

If there is much text, use white or a light-colored paper. If there is very little text, you may be able to use a colored stock, but not one that is too dark. A dark stock makes the type hard to read.

Use black ink or, if you want to escape from black, use brown or blue inks that are almost black in color. The farther you get away from black, the harder it is to read the type. If you want to use a colored ink, it's a good idea to increase the size of the type, or to use boldface.

Use a readable typeface, and one that is familiar to your readers. In direct mail, you want the reader to

- read what you have sent
- feel convinced that you are offering something worth asking for
- order it

To do all that, you must make the reader feel comfortable. This isn't the place for fancy designs and fancy difficult-to-read typefaces. Designers of direct mail material recommend that you use

- a typeface with serifs, which is easier to read than sans serif type.
- a large type: pica typing if you are using a typewriter, or perhaps 12 pt type. You can use smaller type if the readers are likely to *want* to read the text because it is close to their professional interests, but even so the larger type is better.
- unjustified right-hand margins, for greater ease in reading.
- headings to give greater impact, best set in uppercase and lowercase.

You may want to use your institution's logo or crest.

You may also want to use illustrations or photographs to capture the attention of the reader, tell the reader what the mailing piece is about, and encourage the reader to go on to the text. But don't use too many illustrations: one big picture is more dramatic than a cluttered page of small ones.

If you are using illustrations, make sure they are close to the text. If illustrations and text are on separate pages, the reader may look at the pictures but never find out what the publication is. Don't split your material.

Make it easy for the reader to order the publication. Be sure to include an order form the reader can return to get the publication. You can use check-off boxes in it. Put your address on the order form. Repeat it on the mailing piece, in case the order form gets lost.

Try to make sure that all the main message appears in one place on the mailing brochure—the place the reader is most likely to see first. Sometimes people ignore other pages; use them to reinforce the main message

Direct mail pieces can be designed to go inside envelopes, or they can be self-mailers (used without envelopes). If you go to the expense of an envelope, consider making it part of the package by printing a message on the front.

Study what others have done and learn from their successes.

Write to persuade

The direct mail piece should be planned to convince the reader. In a piece announcing the publishing of research, the writing must be informative. But the purpose is not only to inform: it is to attract as many of the potential readers as possible. Even with publications that are given away, the person who receives the announcement must be persuaded that the publication is worth ordering. If the publication is for sale, or if it is for the general public, persuasion is even more important.

A direct mail piece should therefore contain the following things:

- a description of the publication.
- the reasons why the reader will benefit by having the publication. (It contains important new research results, it shows how to grow larger crops, etc.) Make sure this message comes through loud and clear.
- evidence that the publication really is what is claimed. (The name of the publishing institution may be enough; or you may wish to quote an authority. In promoting journals, you may want to include a list of published or future authors and articles. In promoting the proceedings of a conference or any other kind of book with many authors, consider including a full or partial table of contents in the mailing piece.)
- a way for the reader to respond quickly and easily to the mailing piece—usually an order form that is easy to fill out.

Sometimes the mailing piece will make a special offer, promising a bargain if the person orders the publication right away. This may be a discount from the normal price if the publication is sold. Or it could be a copy of a second publication given without charge.

Direct mail pieces should be written simply. They will be read quickly. Follow the rules for effective writing. Work to capture the reader's attention and hold it. (See units 2.3–2.5 and 5.3–5.4.)

The text does not have to sound like advertising. Often the only heading needed is the title of the publication, especially if it is a research report. In other cases subheads may give the text added impact and make it more readable.

If the mailing piece is for a book, the contents may be much the same as a description in a catalog (see unit 11.1). If the mailing piece is for a journal, it should give the full name of the journal, a brief description of its purpose, the name of the editor, the addresses of the editorial and business offices, the number of issues per year, the subscription cost, and the International Standard Serial Number (ISSN). In addition, the mailing may include

- a sample table of contents
- a list of forthcoming articles
- names of well-known contributors
- favorable comments from reviews or experts
- names of members of the editorial board, with the places where they work

- citation and abstracting services receiving the journal
- a selected list of special issues already published
- and, of course, an order form

Here are some common errors to avoid in writing material for mailed announcements.

- Don't waste a lot of space saying how important or experienced your institution is. If you must explain such things, do so briefly. Give most of the space to the publication or publications you are promoting.
- Don't be negative. Tell what your publication does that is useful. Be positive.
- Don't make claims that can't be proven. Don't "tease" the reader with headings that ask questions or don't mean anything. You are writing for busy people. Get to the point.

The order form is the most important part of a direct mail piece. Yet often we don't spend much time planning it. Make sure it contains all the information both you and the reader need:

- identity of the publication (author, title, volume, ISBN or ISSN if any)
- name and address of the person placing the order
- price (if the publication is sold)
- method of payment (if publication is sold: by money order or cash, and in what currency)
- address to which the order should be sent
- language of publication wanted (if the publication is available in more than one language)
- handling charge for postage (if shown as extra)
- number of copies ordered
- other special information for this mailing

Catalogs are a special kind of direct mail piece.

Build lists

The key to direct mail is deciding who will receive the material. Be as selective as possible. Postage is expensive, and mails are not always dependable. By being selective, you are likely to increase your rate of response (the number of responses divided by the number of pieces mailed). You are also likely to reduce your losses because fewer pieces will be last in the mail.

You will likely want to build your own mailing list of people who

- should know what you are doing.
- have said they are interested in what you are doing.
- have shown their interest by ordering publications in the past.

Many publishers send questionnaires to readers and to people who express interest in their publications. They want to know who these people are and their interests. They ask them their main discipline;

languages spoken; level of education; sex and age; citizenship; percentage of time spent in different areas of work (policymaking, research, teaching, farming, extension, etc.); principal professional interests. The best questionnaires use check-off boxes so they are easy to complete, and have the publisher's address printed on them so they are easy to return by mail. (For more about this, see unit 1.6.)

With this kind of information, the publishers build mailing lists that are highly selective. They know the people who are likely to be most interested in any one aspect of their publishing program.

Each time they receive an order for a publication (whether it is free or sold), they add the person's name to the list, if it's not already there. People who have asked for one publication in a subject are the people most likely to want another one.

Publishers also rent or borrow lists. Several firms in the United States and United Kingdom keep lists of specialists, broken down by discipline and specialty. It is sometimes also possible to rent the subscription list of a journal that is closely related in subject to a new publication.

When publishers rent lists, they receive a set of addressed labels and pay a fee based on the number of addresses. The addresses may be used only once. There are usually traps in the list, which will show up if the lists are used a second time without paying. Journals sometimes will not release the names of their subscribers, but will mail a promotional piece to them for a fee. The firms that rent lists also will often mail the piece. Renting lists is expensive, but building the lists and keeping them up to date is also expensive.

Publishers who cannot afford to rent lists can build their own by checking directories of specialists or of institutions. Names also come from the literature: check to see who is writing in the subject area of a new publication, and assume those authors will want to know about any new publication in that area.

The problem is not in building lists. It is in keeping them up to date. Researchers and other specialists move to other jobs. Institutions change addresses or close their doors. People die, or change interests.

Mailing lists should be checked regularly. One way to do this is to use them regularly and check responses, or to check mail that is returned because it cannot be delivered. Another way is to "clean" the lists every so often (perhaps annually) by asking the people on the list whether they still want to receive mail from you.

Remember also that any directory is out of date before it is published. By the time you take names from it, the addresses may be two or three years old. Try to check the accuracy of the information in such books. One way to do this is with a test mailing of a sample. In the same way, you may wish to test any list you rent.

Target mailings

Send each mailing only to people who are really likely to be interested in the publication. Direct mail costs money. Postage is expensive. So are paper and printing, envelopes, and address lists. Make every piece you send out work. Don't waste any of them.

If the mailing is a general catalog of publications, it might go to everyone on the publisher's list; if it is about one topic such as resistance to insects, then it should be sent only to people who have expressed interest in that topic.

Be as specialized in mailing as possible. If a mailing can be sent only to the 400 people in the world who most need a new publication, most of them may actually order it.

If more than one list is used in a mailing, watch for duplication of names. If the list is stored in a computer, there are "merge/purge" programs to do this. Don't worry if someone does get two copies of a mailing piece: it may just increase the chances the person will order.

Even if libraries are likely to order most of the copies of a publication, send mail' to specialists at the same institution. The librarian may not want to buy the publication, but a subject specialist may ask for it. In many institutions, the specialist is more important than the librarian in deciding what publications get ordered.

Obviously, it is useful to store the mailing lists on a computer, in order to achieve greatest flexibility in selecting names. But cards can be used, and so can addressograph plates.

A cheap way to distribute direct mail pieces—in addition to a planned mailing—is through the members of an editorial board. Ask the members to enclose mailing pieces in letters they write to colleagues in the same field. Also, put mailing pieces in any letters from your own office going to appropriate people.

Test the results

Test the response to every mailing. You can't know what you are doing right, or wrong, unless you check what response comes from each mailing. Keep track of what lists you use, of how many mailing pieces are sent, and of how many replies come in. Did one group of recipients reply more often than other groups? If so, they are people you should keep mailling to.

If you plan a large mailing, test a sample first. You may find your mailing list is not very good. You may find ways to improve the message in your direct mail package.

Don't be afraid to mail more than once. Send a second piece about the same publication—perhaps when you are promoting another one. Often a second mailing reinforces the first, and brings in more orders. If the mails are undependable, that may be another reason for a second mailing.

Remember also that you will receive some responses that are not on your official order form. Libraries may have to use their own purchase-order forms. Individuals may write to you personally. This is called the "echo effect." It means that you cannot be accurate in estimating the rate of response from any mailing: it will always be greater than the number of order forms that return. You may be able to recognize the echo effect if total sales increase after a mailing has gone out.

If you are using several lists, you may wish to code the order forms, either with a code letter or simply by color marker, so that you can tell which list produces what results.

Don't be discouraged if the response seems disappointing. In direct mail, a response of 1% is not unusual. A 2% response is considered satisfactory. Orders from academic libraries may take a year to arrive.

Budget carefully

Plan the budget for any direct mail campaign carefully, long before anything for it is written. Analyze the costs that will be involved: paper, printing, mailing lists, envelopes (if used) and the cost of inserting pieces in the envelopes, addressing, and postage.

Assume that less than 2% of the people who receive the mailing will order copies. Calculate the number of orders you can expect and the average value of those orders. Multiply to get an estimated total revenue.

Subtract the estimated cost from the expected revenue. If the result is negative, make a new plan.

Direct mail is expensive. So are publications that have been printed but lie in the warehouse unread.

Further reading

Hundreds of books have been published about writing, editing, and publishing. Most editors have their own favorites. The books listed here are likely to be useful for editors working in research institutes and extension agencies in developing countries. Most of them I know personally and have used. The others come highly recommended by people I respect.

As far as I know, all are in print. Where I know of a paperback edition, that is noted. Publishers' addresses are provided for convenience. Some of the large multinational publishers, like Oxford and Cambridge University Presses and McGraw-Hill and Prentice-Hall, have local branches or agents in many countries and orders should be placed through them; however, even for these I have provided one address, the head office. Where I have known of two publishers for the same title, both are listed.

General

Albatch, Philip G., Amadeo Arboleda, and S. Gopinathan. Publishing in the Third World: Knowledge and Development. 1985. Heinemann Educational Books, 70 Court St., Portsmouth, NH 03801, USA; Mansell, 6 All Saints St., London NI 9RL, UK. 240 pp.

> Overviews and national studies of publishing in Asia, Africa, and Latin America, with a useful annotated bibliography.

Geiser, Elizabeth A., ed. The Business of Book Publishing: Papers by Practitioners. 1985. Westview Press, 5500 Central Ave., Boulder, CO 80301, USA. 458 pp.

> A collection arising from courses given at the University of Wnver Publishing Institute. Treats all aspects of publishing, from acquisition through to marketing, including several chapters on specialized types of publishing. Excellent but strongly oriented toward North American conditions.

Jacob, Henry. A Pocket Dictionary of Publishing Terms. 1976. Macdonald and Jane's, 8 Shepherdess Walk, London N1 7LW, UK. 70 pp.

One Book/Five Ways: The Publishing Procedures of Five University Presses. 1978. William Kaufmann, Inc., 95 First St., Los Altos, CA 94022, USA. 337 pp. Paperback.

> Five U.S. and Canadian university presses show how they would go about publishing the same book. Most valuable for the various forms they use but also an insight into different approaches to editing, design, and promotion.

Page, Gillian, Robert Campbell, and Jack Meadows. Journal Publishing: Principles and Practices. 1987. Butterworth Scientific Ltd., Westbury House, Bury St., Guildford GU2 5BH, UK. 190 pp.

> Detailed, sound advice on all aspects of publishing learned journals. Separate chapters on editing, production, marketing, order fulfillment, legal and financial aspects, titles and other bibliographic aspects, and help for ailing journals.

Smith, Datus C., Jr. A Guide to Book Publishing, revised edition. 1988. University of Washington Press, PO Box 50096, Seattle, WA 98145-5096, USA. 282 pp.

> In its first edition in 1966, this was the first book on its subject written especially for the Third World. This edition has been revised and brought up to date. It provides an exceptional overview of the fundamentals of all aspects of book publishing. Full of straightforward common sense and sound advice.

Editing

Anderson, M.D. Book Indexing. 1971. Cambridge University Press, PO Box 110, Cambridge CB2 3RL, UK. 36 pp. Paperback.

> One of several useful booklets in the series of Cambridge Authors' and Publishers' Guides. Several others are listed below.

Bishop, Claude T. How to Edit a Scientific Journal. 1984. ISI Press, 3501 Market St., Philadelphia, PA 19104, USA. 150 pp. Paperback.

> Written by the editor-in-chief of a large journal publishing program within a national research institute. Systematically considers the role of the editor, procedures attached to the office, and policies and politics of the job.

Bly, Robert W. and Gary Blake. Technical Writing: Structures, Standards and Style. 1982. McGraw-Hill, 1221 Avenue of the Americas, New York, NY 10020, USA. 128 pp. Paperback.

> A slim paperback full of good examples and practical advice about rules, formats, and standard usage. First-rate chapters on simple, concise language are valid for all other writing. One of the best of its kind.

Butcher, Judith. Copy-editing; the Cambridge Handbook, 2nd edition. 1981. Cambridge University Press, PO Box 110, Cambridge CB2 3RL, UK. 343 pp.

A thorough description of all an editor must do in preparing manuscripts and illustrations for publication, through to handling proof and preparing a revised edition. Explains the processes briefly and clearly. Full of good advice.

CBE Style Manual, 5th edition. 1983. Council of Biology Editors, 9650 Rockville Pike, Bethesda, MD 20814, USA. 344 pp.

One of many specialized style guides, but an outstanding example of the species. Its recommendations are generally accepted. After good general descriptions on preparing manuscripts (including excellent chapters on prose style, and references), it offers special advice on style in plant sciences, microbiology, animal sciences, chemistry, biochemistry, geography, and geology. Easy to read.

The Chicago Manual of Style, 13th edition. 1982. University of Chicago Press, 1225 East 60th St., Chicago, IL 60637, USA. 748 pp.

An encyclopedia of editorial practice that will provide the answer to almost any editorial question. Oriented mostly toward books, but useful also for journals. Provides thousands of examples of usage as well as clear, full descriptions of the technology of printing and the procedures of editing. The oldest and probably most widely used of all North American style guides.

Day, Robert A. How to Write and Publish a Scientific Paper, 2nd edition. 1983. IS1 Press, 3501 Market St., Philadelphia, PA 19104, USA. 195 pp. Paperback.

More than 100,000 copies in print. Highly useful on all aspects of scientific articles. Readers beware, however: the author has a highly developed sense of humor and does not always announce that he is exercising it. His Ten Commandments of Good Speaking and Good Writing, for example, are rules of what *not* to do; more than one reader has taken them seriously.

Gordon, Michael. Running a Refereeing System. 1983. Primary Communications Research Centre, University of Leicester (order from Taylor Graham, 500 Chesham House, 150 Regent St., London WlR 5FA, UK). 60 pp. Paperback.

Covers general issues, administrative practices, and the use of the computer for this purpose.

Gross, Gerald. Editors on Editing, revised edition. 1985. Harper & Row, 10 East 53rd St., New York, NY 10022, USA. 352 pp. Paperback.

> The content is mostly Western and little of the editing is of research, but editors anywhere can enjoy and learn from the experiences and advice in this collection of articles, letters, and other materials.

Hart's Rules for Compositors and Readers at the University Press Oxford, 39th edition. 1982. Oxford University Press, Walton St., Oxford OX 6DP, UK. 186 pp.

> Deals with such matters as alternative spellings, punctuation, division of words, capitals, and abbreviations. A vest-pocket style guide following British preferences.

Huth, Edward J. Medical Style and Format: An International Manual for Authors, Editors, and Publishers. 1986. ISi Press, 3501 Market St., Philadelphia, PA 19104, USA. 220 pp.

> Largely based on recommendations of the "Vancouver group" of international medical editors, this is a basic reference for anyone publishing in its specialized field.

Huth, Edward J. How to Write and Publish Papers in the Medical Sciences, 2nd edition. 1986. ISI Press, 3501 Market St., Philadelphia, PA 19104, USA. 220 pp. Paperback.

> Written by a veteran medical doctor and editor. For authors, but equally useful as a guide to editors in these fields.

O'Connor, Maeve. How to Copyedit Scientific Books. 1986. ISI Press, 3501 Market St., Philadelphia, PA 19104, USA. 150 pp. Paperback.

> One of the most respected scientific editors describes the tasks of copy editing, step by step. O'Connor's "first edict" suggests her practical approach. It is: "Leave well enough alone."

O'Connor, Maeve. The Scientist as Editor: Guidelines for Editors of Books and Journals. 1979. Pitman Medical Publishing, 39 Parker St., London WC2B 5PB, UK; and John Wiley & Sons, 605 Third Ave., New York, NY 10016, USA. 224 pp.

> Written for scientists who edit journals and books, but equally valuable for professional editors. Explains how to deal with books by several authors and conference proceedings as well as monographs and journals. Examines editorial procedures and printing processes. Provides sample contract with authors and sample guidelines for authors, referees, book reviewers, and advertisers. First rate.

The Oxford Dictionary for Writers and Editors. 198 1. Oxford University Press, Walton St., Oxford OX 6DP, UK. 462 pp.

Successor to eleven editions of Collins' Authors' and Printers' Dictionary, this is not a dictionary in the normal sense but a gold mine of help and rulings on a variety of words, names, expressions, and abbreviations from A. to Zwingli.

Skillin, Marjorie and Robert M. Gay. Words into Type, 3rd edition. 1974. Prentice-Hall, Englewood Cliffs, NJ 07632, USA. 585 pp.

A highly regarded editorial reference book. Covers manuscript preparation and editing, typography, printing style, punctuation, and English usage.

Stainton, Elsie Myers. Author and Editor at Work: Making a Better Book. 1982. University of Toronto Press, 5201 Dufferin St., Downsview, Ontario M3H 5T8, Canada. 96 pp. Paperback.

A short book of common-sense advice to authors and editors, including how best to work together, from a veteran editor who has met most of the problems. Includes an annotated bibliography of dictionaries and style guides.

Stapleton, Paul. Writing Research Papers: An Easy Guide for Non-Native-English Speakers. 1987. Australian Centre for International Agricultural Research, GPO Box 157 1, Canberra, ACT 260 1, Australia. 53 pp. Paperback.

Stapleton worked in Indonesia, launching a fully refereed English-language journal and, during that time, lecturing on writing of research papers. Most other books on this subject were written for English speakers. This was written specially for people who use English as a second language. It is full of straightforward, simple, step-by-step instructions and advice.

Strunk, William, Jr. and E. B. White. Elements of Style, 3rd edition. 1978. Macmillan Publishing Company, 866 Third Ave., New York, NY 10022, USA. 92 pp. Paperback.

Slim paperback guide to clear writing in English. One of the best short books on this subject ever written, though somewhat oriented in rules and examples to North American usage.

Design, production, illustrations

Chicago Guide to Preparing Electronic Manuscripts. 1987. University of Chicago Press, 1225 East 60th St., Chicago IL 60637, USA. 154 pp. Paperback.

Instructions and advice for authors and publishers on how to prepare manuscripts on a computer so that the disks or tapes can be used for typesetting. Includes the important new development of generic coding.

The Copy Book: Copyright-free Illustrations for Development. 1988. Intermediate Technology Publications Ltd., 103–105 Southampton Row, London WC8 4HH, Uk. 110 pp.

A source of illustrations that can be copied or adapted for your own publications. The contributiing artists have agreed that the drawings are all free of copyright restrictions.

Council of Biology Editors. Illustrating Science: Standards for Publication. 1988. Council of Biology Editors, 9650 Rockville Pike, Bethesda, MD 20814, USA.

Describes the qualities of good illustration in scientific books and journals. Covers computer graphics as well as the more traditional forms of graphs, maps, and photographs; deals also with instructions to authors, materials, and legal and ethical considerations.

Craig, James. Designing with Type, revised edition. 1980. Watson-Guptill Publications, 1515 Broadway, New York, NY 10036, USA. 176 PP.

A basic textbook, widely used in North America. Starts with basic terms and works through to phototypesetting.

Hargrove, T.R., R.C. Cabrera, and F.E. Manto. Copublication: IRRI Design, Procedures, and Policies for Multilanguage Publication in Agriculture. 1983. International Rice Research Institute, PO Box 933, Manila, Philippines. 21 pp. Paperback.

A well-illustrated explanation of how to publish heavily illustrated books in several languages at minimal cost.

IFSEA/Ciba Foundation/ELSE. Model Guidelines for the Preparation of Camera-ready Typescripts by Authors/Typists. 1980. Ciba Foundation, 41 Portland Place, London W1N 4BN, UK. 48 pp. Paperback.

Provides model instructions for authors and typists, which can be adapted to any publication.

International Paper Company. Pocket Pal: A Graphic Arts Production Handbook, 13th edition. 1983. Pocket Pal Publishers, PO Box 100, Church St. Station, New York, NY 10008, USA. 216 pp. Paperback.

Small in format and densely packed with information about all stages of print production. A standard reference in North American production departments. Good value for the money but provides so much information in a small space that beginners may find it a little difficult to understand.

Lee, Marshall. Bookmaking: The Illustrated Guide to Design/ Production/Editing, 2nd edition. 1979. R.R. Bowker, 205 East 42nd St., New York, NY 10017, USA. 506 pp.

A standard text. Particularly good on production processes, which are described in detail step by step.

MacGregor, A.J. Graphics Simplified: How to Plan and Prepare Effective Charts, Graphs, Illustrations, and Other Visual Aids. 1979. University of Toronto Press, 5201 Dufferin St., Downsview, Ontario M3H 5T8, Canada. 64 pp. Paperback.

A no-nonsense guide, full of examples of what to do and not do in making graphs, selecting photographs, and preparing graphics for slide shows or television as well as print.

Morison, Stanley. First Principles of Typography. 195 1. Cambridge University Press, PO Box 110, Cambridge CB2 3RL, UK. Paperback.

After nearly four decades, this booklet by a major British typographer is still useful. It was written for non-experts facing the problems of choosing typefaces and designing printed matter.

Tufte, Edward R. The Visual Display of Quantitative Information. 1983. Graphics Press, Box 430, Cheshire, CT, 06410, USA. 198 pp.

A beautifully produced study of what can be done with graphs and maps, as well as what should never be done. Not by any means an essential item but one to cherish.

White, Jan V. Editing by Design: A Guide to Effective Word and Picture Communication for Editors and Designers, 2nd edition. 1982. R.R. Bowker, 205 East 42nd St., New York, NY 10017, USA. 248 pp.

An often recommended work that concentrates on the coordination of text and illustrations.

Williamson, Hugh. Methods of Book Design: The Practice of an Industrial Craft, 3rd edition. 1986. Yale University Press, 92A Yale Station, New Haven, CT 06520, USA.

A classic study, brought up to date to include new technology. Well-written explanations of planning design, methods of composition, styles and history of typefaces, selection of paper, and preparation of copy.

Business

The ABC of Copyright. 1981. UNESCO: order through your national office. 73 pp. Paperback.

A brief overview from the agency responsible internationally for the Universal Copyright Convention, one of the two major international copyright agreements.

Clark, Charles. Publishing Agreements: A Book of Precedents. 1984. Allen & Unwin, PO Box 18, Park Lane, Heme1 Hempstead, Herts HP2 4TE, UK. 230 pp.

Useful for anyone drafting a new publishing agreement with authors.

Council of Biology Editors. Economics of Scientific Journals. 1982. Council of Biology Editors, 9650 Rockville Pike, Bethesda, MD 208 14, USA. 106 pp.

Covers subscriptions and other revenue, editing and production, subscription fulfillment, budgeting, accounting, and marketing.

Searles, Christopher. Copyright. 1980. Cambridge University Press. 42 pp. Paperback.

There are many long books on copyright. This one is short and written specially for people in publishing. It concentrates on U.S. and U.K. laws.

Singleton, Alan. Societies and Publishers: Hints on Collaboration in Journal Publishing. 1980. Primary Communications Research Centre, University of Leicester (order from Taylor Graham, 500 Chesham House, 150 Regent St., London W1R 5FA, UK). 60 pp. Paperback.

Short, practical guide to why groups should cooperate, possible arrangements, and details that should be covered in any agreement. Intended primarily for learned societies publishing journals, especially in Britain, but applicable more generally.

Smith, Datus C. Jr. The Economics of Book Publishing in Developing Countries. 1977. UNESCO: order through your national office. Editions in English, French, Spanish. 44 pp. Paperback.

Although the specific figures are out of date, the principles remain sound.

Promotion

Collins, Joyce. Direct Mail Marketing for Scholarly Publishers: A Beginners Guide. 1983. Primary Communications Research Centre, University of Leicester (order from Taylor Graham, 500 Chesham House, 150 Regent St., London W1R 5FA, UK). 95 pp. Paperback.

> Step-by-step instructions on how to build mailing lists, plan budgets, and prepare mailing pieces for direct mail — the most useful form of promotion for research publishers.

Bodian, Nat G. The Book Marketer's Handbook. Vol. 1, 1980; vol. 2. 1983. RIR. Bowker, 205 East 42nd St., New York, NY 10017, USA. 509 and 638 pp.

> Many hundreds of tips from a veteran of marketing professional and technical books and journals. Covers direct mail, advertising, publicity, and other techniques. Practical, hard-nosed advice.

Bodian, Nat G. Copywriter's Handbook. 1984. ISI Press, 3501 Market St., Philadelphia, PA 19104, USA. 297 pp. Paperback.

> Hundreds more tips, specifically on writing the headings and text for direct mail, catalogs, advertising, and other ways of promoting specialized and scholarly books and journals.

Useful periodicals

African Book Publishing Record. Hans Zell Publishers, PO Box 56, Oxford OX1 3EL, UK. Quarterly.

> Mainly lists and reviews new books, but also provides the best articles about current publishing on that continent.

Asian Book Development. Asian Cultural Centre for UNESCO, 6 Fukuromachi, Shinjuku-ku, Tokyo 162, Japan. Quarterly.

> Datus Smith calls this the best journal in the world on book publishing in developing countries.

CBE Views. Newsletter of the Council of Biology Editors, 9650 Rockville Pike, Bethesda, MD 20814, USA. Six times a year.

> Contains thoughtful articles on scientific publishing as well as CBE official news.

European Science Editing. Bulletin of the European Association of Science Editors, c/o Secretary-Treasurer, 13 Wimpole St., London W1M 7AB, UK.. Three times a year.

> Contains thoughtful articles and reviews as well as official association business.

IASP Newsletter. International Association of Scholarly Publishers, PO Box 2595, Toyen, N-0608 Oslo 6, Norway. Six times a year.

> Full of information about publishing developments throughout the world. Nothing else quite like it.

Scholarly Publishing: A Journal for Authors and Publishers. University of Toronto Press, 5201 Dufferin St., Downsview, Ontario M3H 5T8, Canada. Quarterly.

> The only journal of its kind devoted to the writing, editing, publishing, and use of serious nonfiction.

Proceedings of the Annual Meeting of the Society for Scholarly Publishing, 2000 Florida Ave., Washington, DC 20009, USA. Annual.

> An uneven but frequently helpful annual collection of papers touching on all aspects of publishing, with considerable attention to developments in electronic technology.

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