

ARCHIV
LENDVA
no. 3

Primer

for agricultural libraries



Olga Lendvay

Primer for agricultural libraries

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International
Association of
Agricultural
Librarians and
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Olga Lendvay

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Introduction

Agriculture was once amongst the oldest practical arts; it is now recognised to be one of the youngest professions in the applied sciences. Scientific agriculture, like medicine, rests upon the fundamental principles of the physical sciences; it must draw upon not only botany, zoology, chemistry, mathematics and physics but also upon geology, meteorology, economics, statistics and engineering; it is a vital link in the production of the food, shelter and clothing of Mankind, and it incorporates a great diversity of practice and of specialisation.

Food is an indispensable need if populations are to survive. All over the world governments are keenly aware of the dangers which follow a shortage of food. There have been countless catastrophes in countries which have inadequate agricultural production, or a failure of crops. As populations increase, the problem becomes no less than a concern for survival.

The efforts of many governments and of private and international organisations have been concentrated on increasing agricultural production by the use of modern methods and by utilising the results of research into nutritional improvement; increased yields of crops; the protection and conservation of the natural environment; the improvement of animals, and the development of markets for and the distribution of agricultural products.

Research workers, policy-makers, planners, extension workers - all of those people who have been concerned with agricultural action, plans and programmes - have produced a vast amount of literature on many subjects in the agricultural field. The responsibility of the librarian is to collect as much of this literature as possible and to make it easily and rapidly available to other research workers, policy-makers, planners, extension workers - as well as to teachers and to subject-specialists. The librarian should have a clear and profound understanding of the needs of his clients: he should have a sound knowledge of the purposes and the interests of the institution which he serves; he should know of the sources which provide agricultural literature, and he should cooperate in any network designed to achieve national, regional or international action in the control and dissemination of the agricultural literature.

Throughout the world, there are many agricultural libraries which use modern methods and which cope efficiently with the demands of their clients; but

there are also many agricultural institutions which have not yet realised the important role their library can play in agricultural development; their libraries are either non-existent or severely deficient - they still remain mere depositories of a few publications and are without trained personnel to care for the collection and to provide services.

This manual, which is an updated combination of 'The Primer for Agricultural Libraries' and another short manual, 'Administration of Agricultural Libraries' (published in Spanish), has been designed to provide some idea about what is involved in the operation of a library. It is directed towards helping those people who must operate an agricultural library even though they have not had the benefit of adequate specialised training. It contains the basic concepts of library administration, and comments have been briefly offered on all the aspects of library practice. In addition, for those who would like to acquire, by reading, a more extensive knowledge in these fields, it provides a bibliography with references to publications which are used in library work, and others on various topics of library practice and the handling of information. Included as appendices are some guides to the more important publications which control the production of agricultural literature and the like because these are useful in the selection and acquisition of library material.

I would like to express my thanks to Mr. J.E. Woolston, Director of the Information Sciences Division of the International Development Research Centre, for allowing me to use some of my working time to complement my own time in the preparation of this edition. Special thanks are due to Mr. George Clement who so patiently edited the text.

May 1979

O.L.

The development, processing and organisation of collections

An agricultural library should attempt to collect and process, and then to make available to its clients, all the materials needed. However, agriculture is so vast a subject that it is almost impossible, both physically and financially, to acquire everything published on it.

The agricultural library serves the needs of teachers, students and practitioners in any or all of the branches of knowledge pertinent to the profession of agriculture. Some agricultural libraries may fulfil all of these functions; others, only one or two of them. A library may serve a regional institute, or it may be in a teaching institution such as an agricultural faculty, college, or university, or in a research centre. The clients of an agricultural library may be teachers whose courses will include general biology, botany, zoology, genetics, plant and animal breeding, physiology, anatomy, plant and animal pathology, taxonomy, mycology, entomology, general chemistry, inorganic and organic chemistry, milling and baking, mathematics, statistics, the design of experiments, analysis, and many other subjects; or they may be the students who must study these subjects. The clients may be diverse; as, for example, highly specialised scientists engaged in the study of the nutritional properties of a specific crop, or economists studying marketing or land tenure; or an agricultural library may contribute to a programme for the transfer of existing scientific knowledge to farmers who will put into practice new methods that are essential for increased yields of products of a higher quality.

An agricultural library is a special collection of books, journals, pamphlets, films and other material organised to serve the needs of those involved in agriculture, whether as growers of agricultural products, scientists who conduct agricultural research, or teachers and students of the subject. The library may range in size from very small to very large.

No matter what the size of a library may be, the first responsibility of the librarian is to collect relevant publications and other related material - using criteria which have been established to fulfil the purpose of the institution of which the library is a part.

It is imperative that the collection is well-balanced (see Appendix I); that it includes all kinds of materials including basic reference works; that it has an adequate number of important general books as well as books on specific or specialised subjects. Every agricultural library should subscribe to the more prominent journals in agriculture and related subjects, and also to indexes and abstracting journals, in order to be able to maintain control of the literary production in the various fields of agriculture, and to keep research workers informed about new advances in their special fields of interest. The need to develop a comprehensive collection of journals (rather than of books) in the libraries of research institutions must be emphasised.

Selection

Every agricultural library should have a policy of selection and acquisition which incorporates the following points:

- a. the objectives of the library;
- b. the needs of the users (for example, an educational institution must consider the needs of students and faculty in order to implement educational programmes);
- c. the usefulness of specific books;
- d. the proximity of other libraries and
- e. budget restrictions.

There is a mass of material in existence; that which is most relevant to the work of the library must be selected. The aim is to obtain as comprehensive a collection as possible with the funds available - or to be, or to become, as complete as possible in order to meet the regular probable demands of the clientele served.

The librarian creates and collects bibliographical tools fully to exploit his own collections; he must also collect all the other tools available so that he can readily locate material in other libraries which could provide an answer to some enquiry made by his clientele.

Aids to selection

Publishers and booksellers issue catalogues and lists of the titles which are currently available; these should be obtained, and arrangements made so that subsequent issues are also supplied as they are published. Government departments (or their central publishing offices); research organisations (universities, private or industrial and commercial); learned and scientific societies - all issue lists of their own publications either separately or in their annual reports or in progress reports which may appear at irregular intervals. The larger of these organisations, in addition to their general lists of

publications, may also issue separate lists covering the more specialised field of agriculture and the related life sciences.

In the early days whilst a library is being established, it is important to contact all likely sources to obtain these lists and catalogues and so to build up a live collection which is kept up-to-date and from which all superseded editions are removed - unless these latter have some historical or retrospective search value. Similarly, should the scope of an organisation - or the emphasis on some factors of its programme - change, then those sources specialising in the new aspects of the research programme must be sought.

In addition to the catalogues issued by individual organisations there are those produced by collective effort: from the national bibliography of a country; through a variety of book-trade publications; and the acquisition (or accession) lists and catalogues of periodicals and books which are issued by other libraries in the field of agriculture. Those of the largest agricultural library in any country approach national and international coverage in that field. A library in a highly specialised field (plant diseases), though numerically much smaller, also achieves an equally important degree of coverage of the literature available in its own field.

The list of titles of periodicals held by a library is an important aid to the selection of titles in similar libraries. Within a particular region such lists can be used to avoid wasteful duplication of titles, and to ensure an adequate provision within the area of all the important titles that may be needed: this can be done on a cooperative basis.

The national bibliography list, and the trade lists, should be scanned regularly; they are guides to current publications. When they appear weekly or monthly, they usually contain titles arranged in a systematic subject or dictionary order. Systematically-classified lists are usually equipped with alphabetical indexes of authors, titles and subjects. The amount of information given in any one entry varies, but it will usually provide details of authorship; the full title; a statement of the edition; the publisher's name; some degree of collation with at least the pagination, the date of publication and the price. In many cases, classification symbols and/or subject headings are given. The national bibliography is likely to give the maximum bibliographical information; it can often be used as a guide to the classification and cataloguing of a title in a library, with appropriate modification to suit established local practices.

Most of these lists cumulate progressively during the year, and over a number

of years; these cumulations facilitate subsequent reference, and they become basic guides to contemporary bibliography. In some cases, only the indexes to the lists may be cumulated over periods of a number of years; these are important bibliographical tools to acquire as they can accelerate subsequent searches of the literature.

There are also selective lists of new publications which are published by various bodies concerned in promoting the efficient exploitation of the literature, either in general or in special subjects (for example, *British Book News*, *Aslib Book List*). In addition to the normal bibliographical details already noted, these lists usually contain some descriptive annotations or indications of the standard or level of the contents of a book or the type of reader for whom it was written. The only serious drawback in using these lists as aids to selection is that they appear some months after the titles themselves are published; this is inevitable because it takes some time to compile and prepare them for publication.

Notices of new titles (of periodicals and books) and reviews appear regularly in the scientific and technical journals. They suffer from the delay mentioned above; nevertheless, they should always be scanned immediately on receipt by the librarian during his regular selection of books. The interval between the publication of a new book or journal and the review of it varies considerably; prompt reviewing is a great aid to the selection of stock. The review-sections of journals should always be scanned so that new publications are not overlooked. Some titles are deceptive; they may not adequately describe the contents of a book; a good review will remedy this defect. Not all reviews are free from bias; not all journals publish unfavourable reviews: these are points to remember.

It is important to note announcements of forthcoming conferences, congresses and workshops so that a more careful watch can be kept for the subsequent publication of the proceedings and reports. This kind of publication is often most difficult to trace because it usually escapes notice in normal book-trade lists; only in the technical press is its publication recorded.

In the professional press of the librarian new titles in the field of librarianship are noted, and also notices of new bibliographical sources are included. For example, in the *UNESCO Bulletin for Libraries* and *IAALD Quarterly Bulletin* there are regular features of this nature.

Of course, no listing of publications can be as satisfactory a guide to their suitability for a library as the actual handling and critical examination of the publications themselves. This can only be achieved by frequent visits to bookshops, and other libraries. Many publishers are willing to release a new

book 'on approval' to help towards a decision to buy. Sometimes another library may release a copy on loan; however, the local demand in any library for its own recent acquisitions is always heavy and it is unreasonable to expect any library to be willing to lend out its latest acquisitions to other organisations. Exceptions are likely to be made occasionally where a real need exists.

Specialists working in institutions publish papers; and they are often aware of papers being written by colleagues and acquaintances long before these are published. Close contact should, therefore be established with these technical colleagues and clientele in order to take advantage of these sources of advance information.

Acquisition

There are three ways of acquiring publications: 1) by purchase; 2) as gifts, and 3) by exchange.

Purchase

Commercial publications are acquired by purchase. They include most of the periodical publications and books which emanate from publishing houses and scientific institutions.

Periodical publications are acquired by subscriptions for one or for several consecutive years. Many libraries use the services of an agent who is responsible for all the procedures with publishers related to subscriptions. Alternatively, the library itself may take out subscriptions with publishers. The advantage of having an agent is that the librarian saves himself time because he does not have to maintain a voluminous correspondence related to the placing of orders and claiming journals; the small additional expense of an agent is well justified.

It is customary, however, to make the acquisition of books directly from publishing houses instead of using an agent. Every library must consider its own particular situation, not least the facilities which local bookstores may offer.

All acquisitions must be registered. In large libraries, requests for the purchase of publications are usually recorded on multiple slips in different colours which serve different elements of control. All the data which identify a publication (the author; the title; the place of publication; the publisher; the year of publication and the number of pages) including the cost, and the date on which the request was made, are entered on the slips. Small libraries usually make their requests by letter, or simple forms may be used. When the books and invoices are received, they must be compared with one another and, if correct, payment should be arranged.

Gifts

Many institutions produce various kinds of publications such as pamphlets, bulletins and reports, which are distributed free-of-charge. Reprints of articles from journals may be obtained from the authors if requests are made shortly after publication. Sometimes a gift is more of a problem than a benefit - as when the subjects of a donated collection are not those of the library collection. It is usual, then, to accept the gift with the understanding that those books which are duplicates, or which do not conform with the selection-policy, may be sold or exchanged with others, or simply passed to another library which would have better use for them.

Exchange

This is a most important source of material when an organisation publishes its own journal or serial publication of any kind - bulletin, leaflet or circular - which appears regularly. Exchanges are usually reciprocal, though most long-established organisations, and large, complex research institutes do not insist initially on reciprocity from small, specialised or newly established institutions, knowing that a publication programme will develop as work proceeds.

Exchanges can be initiated by a conventional letter stating what the originating library has to offer - for example, a monthly or quarterly journal - and asking for a similar publication to be sent regularly in return. To eliminate difficulties of language IAALD has designed some forms in several languages to be used instead of the usual letter. In Appendix II there are copies of these letters for every separate occasion. The 'application' form is sent in the language of the addressee with a copy of the 'reply' form in his own language for him to return to the originator. The forms contain all the information required to assess the value of the material offered on exchange. Notification of organisations wishing to arrange exchanges appear in such journals as the *IAALD Quarterly Bulletin*, and the *UNESCO Bulletin for Libraries*.

In some cases, publications are available *only* on exchange (for example, house journals and free publications) and cannot be purchased; it is important to bear this in mind when deciding on the publication policy of a new organisation. Without something to offer, one cannot hope to receive much in return. Furthermore, regular exchange will ensure that copies of publications will arrive promptly, and the disappointment of receiving notification that a title is out-of-print is avoided.

Having established an exchange, the prompt and regular dispatch of copies must be ensured, particularly in the early stages. A list of addresses must be

compiled, maintained up-to-date, and reviewed regularly for every title offered. This list can be filed and then used as every issue of the serial is made. When the list is short, envelopes can be typed for every separate issue; however, some form of duplication of labels or of envelopes will be required as the list of addresses grows. The final stage would be the use of an addressograph system or a computer.

Similarly, the regular receipt of incoming material on exchange must be controlled. A card-record for every title kept in a vertical file, or a visi-index, with appropriate signals, enables receipts to be recorded. Reminders are sent should some issues fail to arrive; a printed card can be used for this purpose. Many libraries use a printed card having suitable alternative phrases to request, acknowledge receipt, or declare the non-receipt of serial publications; these are usually multilingual.

List of new acquisitions (Accessions list)

It is important that agricultural librarians provide their users with adequate information regarding the new publications which they have received into their libraries. A convenient instrument is a List of New Acquisitions published regularly by the library.

Most Lists consist of groups of catalogue-style entries arranged in some systematic order of subjects; related topics are thus collocated. The system of classification selected for use in the library will have the same arrangement as that in the List.

The details to be included in this List are: the author(s)' name(s); the title of the publication; the place of publication; the publisher; the date; the pagination; the series of which a particular publication forms a part. There is some variation in the order of listing these details; in some libraries more emphasis is placed on the issuing organisation than on personal authorship; thus a corporate entry is preferred to a personal name entry. In such cases, the author(s) are listed after the title of the work, not in the heading. Anonymous works are entered under their titles.

In addition, every entry must show, in some way, the subject and content of the work; this is usually done by classification-symbols for every subject or topic dealt with in the work.

If the entries are made in the cataloguing style adopted by the library, then the List can serve as copy for the production of entries for the catalogues. This has many advantages, though some librarians prefer to adopt a less formalised style in the acquisition List than that prescribed for their

catalogues. Certainly a more 'narrative' style of entry enables a more attractive page-style to be used in the List.

Preparation of materials for users

After the selection and acquisition of materials have been completed comes the process of preparing them for the reader. This process consists of attaching labels to them, stamping them and compiling notes on their origin; then making entries in the inventory, finally cataloguing and classifying them; only then are they ready to be placed in the stacks.

The *inventory* is usually made as a loose-leaf record. The data include: the consecutive number of a book; the date when it was received; the name(s) of the author(s); the title; the place and name of the publisher; how it was received (whether by purchase, gift or exchange) and finally some comment.

Cataloguing

Cataloguing in an agricultural library (as in a general one) is to provide an adequate index to the resources of the library. This index must be available to all the users of the library. It analyses the collection according to author, title and subject-content; it describes the physical aspects (whether a book or some other document) and it is the key to the location of individual items. The system of classification adopted by the particular library provides this key, and systems in use in agricultural libraries are described in the following chapter. Library catalogues may be compiled in book-, card- or sheaf-form, but the card catalogue is so universally accepted that it is the only form considered here.

Descriptive cataloguing and subject-cataloguing are the two processes involved in the actual preparation of individual card entries for textbooks, manuals, monographs, reports, etc.

Descriptive cataloguing consists of registering the following main bibliographic data of a book which will describe it adequately and so identify it among the other books in the library:

1. the call number, which consists of the class number and the author symbol, and serves to locate the book in the collection;
2. the author - that is, the person or organisation responsible for the book;
3. the title as it appears on the title-page, including any references to editions, and possibly containing information about other persons who contributed to the book;
4. the imprint - that is, the place of publication, the name of the publisher, and the date of publication;
5. the collation or physical description of the book, including such items as pagination or volumes; illustrations, and its height in centimeters; and
6. series note, if any.

In addition, some books require notes on the materials found in the book and others.

These data are registered on 7.5 x 12.5 cm (3" x 5") white cards according to the cataloguing rules chosen by the library: the most commonly used are Anglo-American Cataloguing Rules.

In contrast to descriptive cataloguing (which is concerned with the identification of items in a library's collection) subject-cataloguing is concerned with the accessibility of the subject-content of those items. This includes both classification and determination of subject-headings.

Subject-entries are as essential in an agricultural library catalogue as author-entries, for, while many library users have an exact title in mind, and need only an author-index to the collection, others are searching for material on a particular subject. Subject-entries in the card-catalogue do one or all of three things: 1) they show where material on any specific subject can be found; 2) they show, as nearly as possible in one place, everything that is available on that subject: 3) through cross references, they indicate any mention of the subject in places which would not be immediately apparent.

There are no general rules for the assignment of *subject-headings* (as there are, for example, for cataloguing). The only recommendation to the librarian would be to keep in mind the user of the collection who needs to find the publications he wants! Large numbers of subject-headings are important in large libraries, especially if they have limited access to collections. The terms chosen for subject-headings should be understood by regular users of the library. There should be a 'see' cross reference from subject-headings which are *not* used to those which are used. Furthermore, the attention of the user should be called to related publications in the collection by means of the 'see also' reference-card.

To ensure consistency in the use of subject-headings there should be an official list of those adopted by the library. For agricultural and related subjects there is the list of the National Agricultural Library of the United States. The commonest general subject-headings are found in the list of the Library of Congress of the United States and the Sears' list. Many libraries have been using two or three lists in combination because of the unsatisfactory results obtained by using only one list of subject-headings.

In addition to the printed lists of subject-headings, there are many publications which may be consulted by cataloguers for information on terms. Indexes, abstract journals and periodical publications are valuable sources of new subject-terms.

Most of the data needed for the main entry card (also called the author-card) can be found on the title-page of a book. These cards can be reproduced by the use of simple duplicating equipment like the Chiang duplicator to give secondary cards for added entries for any joint-author; the editor or compiler; the title; subject-topics, series and/or other data as required.

A shelf-list card, a copy of the main entry, should also be made for every work. These cards are filed by call-numbers in the same order as that of the volumes standing on the shelves. This catalogue is usually kept in the office of the cataloguer.

Each main entry card should include a tracing of all secondary entries which have been made for the title. This tracing may appear on either the front or back of the card. It is suggested that subject headings be listed first, followed by added entries for persons or corporate bodies, then title, and finally the series entry.

Classification

Before he adopts any system of classification, a librarian should study several; and only then decide upon the one which is the most suitable for his own collection. In that study, it is important that he consider provisions for new topics in the general pattern and in the basic organisation of the system. This will make possible continuous revision in the development of both the agricultural and the related sciences. Moreover, the classification scheme should have a detailed analytical subject-index so that it may be applied to the evaluation of the literature.

There are two types of classification systems: 1) the general, which includes subjects covering all human knowledge, and 2) the specialised, which is designed for specific subjects.

A specialised system for agricultural sciences designed by Sigmund von Frauendorfer has been little used. Libraries of educational and research institutions have frequently to cope with other subjects related to agriculture and the Frauendorfer system does not provide for those subjects. Some libraries use it in combination with some other system.

The Dewey Decimal classification is 'pure', which means that it is composed only of numbers. It is the most simple one, and it does not require long sequences of numbers. It seems to work satisfactorily for small and for medium-sized libraries. All human knowledge is divided into ten classes:

- 000 Generalities
- 100 Philosophy and related disciplines
- 200 Religion
- 300 The social sciences
- 400 Language
- 500 Pure sciences
- 600 Technology (Applied sciences)
- 700 The arts
- 800 Literature (Belles-lettres)
- 900 General geography and history

Everyone of these ten classes is subdivided into ten more classes; for example, '600' represents Technology (Applied sciences), and its ten divisions are:

- 610 Medical sciences - Medicine
- 620 Engineering (and allied operations)
- 630 Agricultural and related technologies
- 640 Domestic arts and sciences (Home economics)
- 650 Managerial services
- 660 Chemicals and related technologies
- 670 Manufactures
- 680 Miscellaneous manufactures
- 690 Buildings

The number '630' is the number assigned to Agricultural and related technologies and is subdivided in the following way:

- 631 General agricultural technologies, apparatus, equipment, materials
- 632 Plant injuries, diseases
- 633 Field crops
- 634 Orchards, fruits, forestry
- 635 Garden crops (Horticulture), vegetables
- 636 Animal husbandry
- 637 Dairy and related technologies
- 638 Insect culture
- 639 Non-domesticated animals and plants

Everyone of these numbers has decimal subdivisions. For example, the number '632' (which represents plant injuries, diseases of cultivated plants) is decimally subdivided as follows:

- 632.1 Environmental injuries
 - .2 Galls and pathological development
 - .3 Bacterial diseases
 - .4 Fungus diseases
 - .5 Harmful plants
 - .6 Animal pests

- .7 Insect pests
- .8 Viral and rickettsial diseases
- .9 Pest control

- .93 Plant quarantine
- .94 Control methods and apparatus
- .95 Control materials (Pesticides)
- .951 Insecticides, rodenticides, vermicides
- .952 Fungicides and algicides
- .953 Bactericides
- .954 Herbicides (Weed killers)
- .96 Biological control

The Library of Congress of the United States Classification divides human knowledge into twenty-one groups by using twenty-one letters of the alphabet; because it uses letters and numbers together it is a 'mixed classification' (for example, 'SB271' represents the subject of tea-growing). Agriculture is represented by the letter 'S' and is subdivided into:

- SB Plant culture and horticulture
- SD Forestry
- SF Animal culture
- SH Fish culture and fisheries
- SK Hunting sports

The Universal Decimal Classification is based on the Dewey Decimal Classification but is more developed, and is suitable for large libraries.

The classification-symbols are usually transferred to the spines of books, pamphlets, etc. and thus form a system of arranging this material on shelves or in pamphlet boxes; similarly, those 'class marks' can be typed or written on reprints or similar fugitive materials to facilitate their systematic arrangement in filing systems.

Author number

After assigning the classification-number to a book, the call-number has to be completed with the author's number. The Cutter Table is used to assign a specific number to every author (or book) within the different classification classes. This number facilitates placing every book on the shelf in a perfect alphabetical order, by author, within a given subject. For example: assuming that in the stacks there are three books on botany by the following authors: Andrews, E., Andrews, M., Anderson, D.. The Dewey Decimal Classification number for all three books would be '580' because this is the number for 'Botany'. Using the Cutter System for authors, these books would be placed on

shelves in the following order:

580	580	580
.A546	.A566	.A568

(.A546 = Anderson, D.) (.A566 = Andrews, E.) (.A568 = Andrews, M.)

The Catalogue

The card catalogue comprises 5" x 3" standard size catalogue cards, one for each entry, filed vertically in drawers in a cabinet, one behind another. Nothing is more uninviting than a drawer full of such cards with no indication of what they represent or how they are arranged. Labels are provided on every drawer indicating its contents, and tabbed guide-cards are inserted in the card-sequence itself to break down the card-sequence into manageable groups. The tabs on these guide-cards project $\frac{1}{4}$ " or so above the level of the catalogue cards and these carry terms or numbers indicating the filing sequence.

There are several types of catalogues:

The *Author catalogue*, as its name implies, is a collection of catalogue-entries arranged alphabetically by authors' names. It usually contains entries under title for any anonymous works, and sometimes contains entries under the personal names of subjects of books (people written about) when it is known as a name-catalogue. It will also contain added title-entries for publications with striking or memorable titles. Sub-arrangement is alphabetical by title - there are additional refinements detailed in various cataloguing codes and text books. In general libraries, this is the main catalogue of the library containing the 'main' or basic entries for all the works filed in a library. In an agricultural library it is far less important and far less used; the subject-catalogue reigns supreme.

The *Subject catalogue* is a collection of catalogue-entries arranged in subject order; this may be alphabetical or systematic. The former is much preferred because of its direct approach to subjects.

The subject-catalogue contains main entries for every publication in the library under their major subject-interest with additional entries for subsidiary subjects or topics which are also covered. Sub-arrangement is either alphabetical by author within each topic, or it may be inverse-chronological, which means presenting the latest information first at each topic. It is the function of the author-catalogue to provide an author-approach; the inverse-chronological sub-arrangement of subject entries may be preferred, and considered complementary to the author-catalogue.

The *Dictionary catalogue*, attempts to combine the author, title and subject-approach in one alphabetical sequence. There are inherent complications in such an undertaking, but 'dictionary order' is said to be readily understood by almost everyone. Complications can arise, for example, when the same name can represent an author (personal and corporate), a subject and a title. Many such complications are avoided in practice by strict rules for style of entry and for filing sequences. To facilitate a normal subject-approach, a system of subject-headings is evolved, with cross-references to and from related topics. Such a system is most complex and difficult to compile where a dictionary catalogue is used. It is best to purchase a standard list of subject-headings which has been compiled and published as a guide to the comprehensive selection of main and added subject-terms with appropriate cross-references:

The dictionary catalogue contains all the various catalogue-entries made for any publication - main author and subject entries as well as added entries for either variety, in one alphabetical sequence; sub-arrangement is primarily alphabetical by title, in the author sequences and by author's name in the subject sequences. Whatever form of catalogue is adopted it is important to remember that whereas a book or monograph can physically occupy one place only in the library, the many facets of authorship, secondary subjects, outstanding or otherwise memorable title, can all be recorded in the catalogue by the use of additional or 'added' entries, inserted at their appropriate place in the sequence.

Besides the main and secondary entry cards, the provision of reference cards in a catalogue is important. By the word 'see' these cards refer the user from one entry which is not used to one which is used - mainly with reference to subject-headings. The 'see also' cards indicate to the user that there are other subjects in the catalogue related to the specific one he is consulting.

Some important libraries which have a card-catalogue also have a reproduction of it printed in the form of a book. Usually this consists of many basic volumes but is maintained up-to-date by the addition of supplements. Libraries can buy them. They are expensive but they are an excellent source for checking data on books, subject-headings, classification and so on. There are also catalogues in the form of computer print-outs which list all the publications of a library which have been entered into the data-base. These are gaining acceptance; they have already replaced the traditional card-catalogue in many libraries.

Journals (Periodical publications)

Journals are usually controlled in a 'kardex' equipped with cards especially designed for that purpose. These cards are for the registration of the principal data of journals, such as the title, frequency and publisher, and also for the checking of individual issues as they are received.

There are two ways of arranging journals on the shelves in the stacks:

1) simply in alphabetical order by titles (with no consideration given to the article); or 2) according to the classification used by the library. The first arrangement is simpler, and is preferred by many librarians and users. In the stacks, the journals must always be separated from the books. When the volume of a title is complete with all issues, and the corresponding indexes present, it should be bound. New issues of journals should be exhibited in order to attract the attention of users. They may be arranged on special (inclined) shelves in the reading-room or in the periodicals-room (if the library has one).

Pamphlets, bulletins, circulars

The organisation of this material presents a problem. When it arrives at the library it has to be assessed according to its value to the collection. Pamphlets which are considered important are usually reinforced with cardboard covers and then treated as books. Other pamphlets are treated according to the policy established by the library. They are usually placed on shelves, in boxes, arranged by subject or in alphabetical order of the authors, or by countries or by institutions.

Many libraries catalogue pamphlets in an abbreviated form, assign appropriate classification numbers to them and place them in boxes or vertical files under pertinent subject-headings - or simply in the order of the accession numbers, in which case individual pamphlets are identified from the catalogue.

Maps

The registration of maps differs. Those included in a book are mentioned in notes on catalogue-cards. Maps which form part of a publication, and are of great value to the library, are catalogued analytically. The principal entry for individual maps is made by the author or the responsible body, the cartographer, publisher, government agency or society. It is followed by the title, footnotes, measures and scale-notes, projection, methods of reproduction and data complementary to the title.

Maps need special furniture for their storage. Commercial houses specialising in furniture for libraries offer metallic vertical or horizontal drawers.

Films and filmstrips

There are specially designed metallic shelves for the storage of rolls of films; filmstrips are usually stored in cardboard boxes with divisions for the accommodation of individual rolls. Both should be catalogued under the title, and their physical description should include 1) the width of the film; 2) whether black and white or colour, 3) sound (if any) and 4) the duration (in minutes).

Slides

Slides are usually stored in special boxes which are provided with dividers to accommodate individual slides. A number is assigned to each unit or to a series of slides as they are received in the library. To distinguish them from other materials, an abbreviation for slides, such as 'SL' should be added to the number. In any series of slides, individual ones can be identified by placing in parenthesis their consecutive numbers (example: SL 25/5).

Microfilm, microfiche and microcard

Microphotography of documents saves space; it is economical, the products can be preserved, and their wide distribution is simplified. Browsing, however, is difficult with microforms; hence some material, such as reference works, is not suitable for reproduction. The reading of microforms requires special equipment now readily available in the market. Special metallic cabinets are recommended for their storage. The cataloguing of microforms differs very little from the cataloguing of the original documents, but a few special notes have to be introduced.

Services to readers

A library usually has a pamphlet which describes its services and which is distributed free. Ideally, these services consist of circulation and loan; reference and information; the compilation of short bibliographies; the reproduction and delivery of documents; current awareness; and a question-and-answer service.

Circulation and loan

The principal function of the Circulation and Loan section is to make available to the user the books, pamphlets, periodicals, serial publications and the other materials held in the library.

In many ways, the circulation-desk is the 'reception room' of the library, and the centre for the distribution of publications and for information. Users who are not in contact with other sections of the library often judge the whole library by the ambience and the services offered at the circulation-desk.

The responsibility of the circulation staff is to loan - and to receive in return - various materials held by the library; to issue claim slips for overdue returns; to collect fees (if the library decides to collect fees); to supervise stack-areas and promptly to place returned books on the shelves. (Users should not be allowed to place returned books on the shelves themselves.)

In libraries where the stacks are closed to users, a member of the circulation staff looks for a publication in the stack room and then hands it to the user. In libraries where the stacks are open, the user himself looks for the publication he needs. Having found the publication the user wants, it must then be registered. This is done on a slip which has provision for the author's name, the title of the book, and the call number; it requires the borrower's signature. Additional information may be required when other kinds of material are borrowed. The circulation staff registers on the slip and also on a card which remains in the book, the date of return. All of this procedure can now be done mechanically, using special equipment, which saves the time of the circulation staff.

Who is entitled to use loan services? In a library which is a department of an agricultural educational institution, publications may be borrowed by students, faculty-members and other persons associated with the institution. The library maintains a register of the students, sometimes with photographs

on the registration cards. Loans outside of the library are arranged through inter-library loans; this means that the material is loaned only to another library (not to an individual); the library is responsible for its return in good condition. There is a set of forms for this kind of loan.

The period of a loan is usually two weeks for books. Library journals are usually allowed to circulate only in the library; some can be borrowed overnight and returned early in the morning of the following day. Reserve books have limited circulation within the library, but can also be borrowed during the night. Pamphlets can be borrowed for the same period of time as books, or less; or they may circulate only in the library.

Users should be warned that when a book is lost the librarian should be notified immediately. For every publication lost the library may charge the user with the cost to the library of replacement, plus shipping and any other charges.

Union catalogues (produced manually or by computers) are used to identify the location of publications in a library system for the purpose of inter-library lending and exchange. Exchanges are easily made by small libraries since they have only a small number of publications to be catalogued. However, as they grow, it becomes essential for them to belong to a system, particularly if they are special libraries. This operation will require adherence to rules governing the presentation of data (such as titles, holdings and codes for libraries) in a homogeneous manner and in a simple format.

The Worldwide Network of Agricultural Libraries of the FAO called 'AGLINET', aims at the promotion of the rational and mutually beneficial exploitation of library resources to the advantage of the agricultural development of the world. At the present time, seventeen larger libraries and documentation centres form the network, all representing wide geographical areas.

In a close cooperation between the AGRIS Coordinating Centre and the various AGLINET Centres, FAO is coordinating the production of a List of Serials in the AGLINET Centres which is based on periodical publications (about 6000 titles) which have been contributed to the AGRIS common data-base by participating countries.

Reference and information

Any organised collection requires someone to interpret the information it contains. For this purpose a professional librarian, with some additional subject-training, would be the most suitable.

The service should provide answers to specific questions, undertake bibliographic research and prepare bibliographies. Users are often incapable of identifying the information they want, and may present questions on the subject

in which they are interested which are too vague or general. The reference librarian should, nevertheless, be able, in time, to find the answers to those questions.

In the field of the agricultural sciences there are specialised tools which are indispensable to a reference service. The most important indexes which control the literary output in all branches of agriculture (and in some related fields or parts of them) are the *AGRINDEX* of the Food and Agriculture Organization of the United Nations, and the *Bibliography of Agriculture* of the National Agricultural Library of the United States. Abstracting services include those of *Chemical Abstracts*, *Biological Abstracts* and many other specialised productions in horticulture, soils and fertilisers, forestry, and so on, published by the Commonwealth Agricultural Bureaux (Appendix VI.). The reference librarian should know what these publications contain and how they are organised; and he should be able to teach his clientele how to use them.

Compilation of bibliographies

The reference librarian is not always responsible for the service of bibliographic compilation. In the more important libraries, this is undertaken by a separate section which is responsible for the compilation of extensive bibliographies on specific crops or subjects, and also short bibliographies to satisfy users' requests. These bibliographies can be compiled from the publications received in the library, or from secondary publications such as indexes, bibliographies and abstract journals, or from a combination of both.

For a book, the individual references should include data, in a uniform sequence, on the author(s); the title; a note on the edition (if it is not the first one); the place and name of the publisher; the year of publication and the total number of pages. If the publication is one of a series, this should be indicated in parentheses. For an article in a periodical publication, the reference should contain the author(s); the title of the article; the name of the periodical publication; the volume; the pages of the article and the year of publication.

The bibliographic compilation service is free in some libraries; in others, a fee must be paid.

Reproduction services

Two separate services exist: first there are those which are offered by libraries which include the supply of photocopies (instead of a loan): see under Circulation. This may be free-of-charge for out-of-town borrowers, or only for certain other categories of borrowers; all others would pay a service-fee.

A library may also offer a paid photocopy-service. This is available to anybody willing to pay for copy made from an original publication in the library's collection. These requests would come mainly from industry, and from persons

conducting research. If possible, such a service should be self-supporting.

A wide variety of photocopying equipment is now on the market. If the rental or purchase of equipment is being considered, several factors should be investigated; they are: the initial cost, any available local servicing and the ability to meet any special needs.

The question of copyright protection also arises. Inexpensive but good photocopying devices have only recently become available, so that the question of making multiple copies from an original has never really been raised in the past. It has been generally felt that making a single copy for research purposes is not a violation of copyright, and libraries have operated copying services on this understanding. However, with the increased demand for copying this question will require further consideration.

A library may also wish to operate a programme of photocopying-for-preservation. Special libraries often have materials in their collections which are difficult, if not impossible, to locate elsewhere. If these materials begin physically to deteriorate - either becoming too brittle to bind, or coming apart even though bound - it may be best to consider some type of photoreproduction as a means of preserving the contents. Microfilm or microfiche are most often used for preservation. If the equipment is available, this programme is best undertaken in the library. Copies of the original films may be sold to any libraries wishing to enlarge their collections but unable to obtain originals.

The other reproduction services consist of the large variety of materials now available by purchase in microforms and Xerox. It is now possible to obtain many older out-of-print monographs in the form of either Xerox or microfilm. Older sets of periodicals are also available on microfilm. These services enable newly-formed libraries to build up very good collections of older out-of-print materials. They may also be a more economic way of filing back issues of periodicals than binding the printed format.

Current awareness service

Agricultural libraries usually publish frequent lists of new acquisitions which notify all those whom the library is designed to serve of all new arrivals. The serial publications will form the bulk of the contents of these lists. In addition, some libraries provide a service of 'tables of contents' to selected users. The 'tables of contents' of important journals are reproduced and circulated to groups of users, or to individual users. For some subjects, commercial services are also available. A library may also have an arrangement with individual local users by which users are notified, personally or by telephone, of new arrivals in which they may be specifically interested.

Question-and-answer service

Some agricultural libraries specialised in certain subjects also offer a Question-and-answer service. Questions on various limited subjects, which require specific data, come to these libraries from research workers who are not within easy reach of the library, as well as from scientists working in the same institution as the library. An agricultural specialist on the library staff is usually in charge of this service, and he, in turn, is in contact with local scientists who can help him to answer those questions which are beyond him. The answer will identify the published sources which deal with the subject, or will provide a short description of the subject under question, with or without some indication of additional sources where more precise information can be obtained. This service is usually conducted by correspondence or, in urgent cases, by telephone, telex or cable.

Instruction on the use of the library

It is important that users of the library should know how to avail themselves of the resources it offers. To enable them to do so, they must be properly instructed. There are several methods of instruction in the use of a particular library.

1. *Formal courses.* These may be of variable duration, and will include both theoretical and practical classes. In many educational institutions these form part of the regular curriculum. The classes should include instruction in the basic library subjects; a study of the tools of reference, indexes and abstracts; the provision of data about catalogue cards and the arrangement of the public catalogue; the composition of bibliographical entries; information about the arrangement of a library and its special collections; and so on. Every theoretical class should be followed by some practical exercise. The librarian may assign a topic to the student, asking him to make preliminary bibliographical research for the preparation of a scientific work. Finally, students should sit for a graded examination. In Appendix III there are several examples, with specific questions, pertaining to different subjects. Some of the data in the questions should be provided by the librarian, others by the student who found the information which answers the questions posed. Similar questions pertaining to individual exercises can be repeated on separate sheets.
2. *Manuals and guides of libraries.* These are given to users when they are being initiated into the use of a library. These documents generally contain information about the number of books and journals; the different kinds of collections; diagrams showing the arrangement of the publications; some explanation of the classification-system used; instructions on the use of the catalogue; information about the data on catalogue cards; an explanation of the circulation-system, and other data of interest to the user. A simple plan of the library-areas, together with the time-schedule of the services, should also be included.
3. *Brief explanations to groups of users.* These are made on a guided tour by the librarian and cover the installations of the library, and provide indications of the locations of the various collections and of the catalogue, and some instruction on their use.

4. *Individual instruction to users.*

There is no doubt that the first method is the most effective and most suitable for educational institutions, especially if it is combined with the second method. In addition to these instructions on the use of the library, the user should also receive the *Regulations* (by-laws) of the library which should clearly define the users' privileges and obligations.

Maintenance of the collection

After materials have been acquired, processed and shelved comes the responsibility of preserving and repairing the collection for continuous use. The preservation of the books, the volumes of journals and groups of pamphlets is usually done by binding them. There are several types of binding materials, such as paper, cloth, leather and synthetics. As costs rise, more use of microforms may be made in future rather than binding up original copies.

Libraries generally employ the services of commercial binders; however, the volumes themselves are prepared for binding by the library staff. In the case of journals, this means the arrangement of the individual issues forming a volume in the correct sequence of page-numbers, and adding to this the title page, the page of contents and the indexes in the proper uniform sequence for all of the volumes having the same title. Those pages which contain advertisements and are not numbered are usually removed in order to maintain the sequence of page-numbers throughout the entire volume. When the preparation of a volume has been completed, the instructions to the binder are attached on a slip which specifies the quality of the binding material; the colour; the title of the volume; the year and any other special instructions, if any.

If the library does its own binding, the person in charge also prepares the materials for binding, so saving the time of the library staff. An advantage in having the binding done on the premises is that the volumes, even whilst in the process of binding, are in or near the library and can be consulted if needed.

In either case, records must be maintained in the library of all publications which are in the process of binding. This is accomplished by using cards or lists which show the titles which have been sent for binding, and when they were sent. The public catalogue should also show that there are some volumes which are temporarily missing from the collection because they are being bound.

Repairs to books, journals and pamphlets can be done in the library. These are simple and may merely require adhesive tape, glue, scissors, and a knife.

The inventory

The purpose of an inventory is to establish where the books and the other materials in the collection can be found. Books which have been lost or have disappeared are identified; these have to be replaced, but they should be temporarily removed from all corresponding records. Volumes which need repair or new binding are discovered. Notes are made of all the discrepancies among the various registers: these may be books in the stacks which do not have corresponding cards in the catalogue, or there may be incorrect accession numbers, and so on.

The procedure for making an inventory is as follows:

1. the shelf-list cards are compared with the books actually on the shelves; every book is treated individually;
2. all those books in the stacks which do not have cards in the catalogue should be separated, and the appropriate cards for them prepared;
3. the cards for any books which are not in the stacks should be removed, and a search for these books should be made amongst other records such as publications-on-loan, volumes-in-binding, books required outside the library and so on;
4. any books which are not found after a thorough search should be replaced, or their cards removed from the catalogue if they are not to be replaced; and
5. any damaged books should be removed from the stacks and repaired or bound.

Inventory work is heavy and costly, but it must be performed at least once every two or three years. The work can also be done in instalments; two persons need to be working together, one reviewing the books in the stacks, the other controlling the shelf-list. Every card which is correct (with its corresponding book on the shelves) should be marked - in pencil - with the date of the review.

Statistics and reports

Statistics are important tools in the work of libraries: they are used to produce both the immediate and the regular reports required by an institution to record the performance of the library; they are used in the evaluation and analysis of the services offered so that improvements can be introduced; they serve to measure the results attained in the pursuit of the objectives of the library; and finally, they can be used for publicity purposes. The evaluation of the costs of services, personnel and materials can also be made using statistics.

The major areas of statistical control are:

- a. *the reading-room and the circulation-desk*; this covers the control of readers and the circulation of materials, whether books are used in the library, or on loan or are in reserve; statistics are recorded daily on simple forms; from them are prepared monthly, quarterly- or semi-annual reports, or reports of other frequencies;
- b. *the reference service*; this covers the number of persons attended; the reference books consulted; the questions answered (which may be divided into (i) questions answered immediately; (ii) questions which required extensive searches; and (iii) questions answered by telephone); the libraries which offer bibliographic compilation services should include the number of bibliographies compiled and the total number of bibliographical entries;
- c. *the acquisition of materials*; this covers three activities: 1) purchase (which includes subscriptions to journals); 2) exchange; and 3) gifts; all relate to books, serial publications and pamphlets; if the Acquisition Section is in charge of exchange, it should be responsible for recording the number of institutions making exchanges and the publications exchanged; in many institutions, however, exchange is organised by some section other than the library, and the library merely receives the publications;
- d. *classification and cataloguing*; this covers the number of books registered in the accession list; the catalogued and classified books; discarded volumes, and sets of cards which have been adapted for the catalogue if the library receives printed cards from the Library of Congress of the United States, or from some other source; and

e. *other activities* which require statistical control; these are: inter-library loans; the binding of books and journals; any publications prepared by the library; the number of documents and pages reproduced; and also the weekly, monthly and yearly expenditures made according to the budget if these are made by an administrative unit within the institution of which the library is a part.

Carefully prepared statistics can have still other uses in a library. They can assist in the evaluation of the costs of services and can justify general increases in staff salaries, or increases in salaries because of increases in services.

Reports on performance and annual reports present an account of the progress made by the library. The reports are first presented to the management of the institution to which the library belongs, and then to the public. The librarian who writes it should be concerned not only with past performances but also with future projections. The report should deal with facts, and should avoid any acknowledgements and glorification of the facts. It should be an account of the year's work and the impact of these services on the users. The author of the report should express his personal opinions, illustrating them with local examples from the year under review. The report should summarise what the library has accomplished during the previous year and what it is hoped to accomplish in the years to follow.

The functions of the report are to document the tasks of the library; to interpret statistics; to bring the public up-to-date in relation to the objectives and the achievements of the library; to justify expenses and to make recommendations and suggestions for improvements in the future.

The physical appearance of the report is important. The annual report should be printed and illustrated. The contents should be divided into chapters and sections according to the topics concerned.

Public relations

The purpose of public relations in libraries is to ensure an enthusiastic coordination between the staff of the library and the people who come to seek help. Its intention is also to promote an extension of this spirit of friendship and cooperation to all who are or should be interested in the well-being of the library.

One of the best definitions of public relations is: "Public relations is the function of management which evaluates public attitudes, identifies the policies and procedures of an organisation or an individual with the public interest, and executes a programme of action which has public understanding and acceptance". Applying this definition to libraries means that a public relations programme should provide a rapid, competent service and be of interest to all users for which the library was established.

The essence of a public relations programme is a thorough organisation of the staff. The attitude of librarians towards users is reflected in the public assessment of the degree to which the purposes of the library are accomplished. Low morale in the staff reflects inefficiency and poor public relations.

The personality of a staff-member is as important as his efficiency; both factors should be considered. The requirements for new positions to be filled should stress both the attitude towards and service to the public as the prerequisites of successful employment.

The Chief Librarian should be in close contact with his staff and he should be sure that the staff understands and appreciates the programme of public relations which is to be launched.

The programme should not promise anything that it cannot offer. A small library should not try to give the kind of elaborate services which large libraries can give but for which it is itself not prepared.

In the execution of a public relations project the librarian should dedicate much of his time to the study of the users. First consideration should be given to the professional group because on this group the success of the whole organisation depends. The following factors should be considered: the librarian should be familiar with the educational and research programmes of

the institution; he should be consulting the persons in charge of projects, and the committees on the selection of publications. Users should be notified about any new publications received by the library. Special privileges require judgment and tact and they should be determined with discretion.

Extra copies of the most frequently used books should be acquired, if possible, so that there is always one copy in the library. The circulation of some material can be prohibited so that it will always be available when needed. Opening hours of the library should be convenient to all users.

Through the procedures related to the loan of publications, the public becomes aware of the activities of the library and perceives its attitude and cooperative spirit. The circulation-section should be the show-window of the library. For many users, it is the only section with which they come into contact. If the circulation staff deals with the users in a pleasant way, the impression gained is agreeable.

Inter-library loan services are important in public relations. These services are a problem to small libraries, which have constantly to request them, and to large libraries which have to spend much time providing them. Librarians of both kinds of libraries should try to maintain a balance between a justified service and possible abuse of privilege. Those of large libraries should remember that their collections are often the only resource of small libraries.

Instruction in the use of a library is one of its essential functions. The relationship of the library to all of its clientele depends on this service. For this reason, every library should try to find the best way possible to give instruction on the use of its bibliographical resources. The different methods are mentioned under the heading "Instructions on the use of the library".

Among the important public relations techniques is the publicity, which includes all the written communications leaving the library. Librarians should be efficient in their preparation. The principal purpose of publicity is to promote realistic knowledge about the library and its good works. This knowledge permits readers to make a better use of the library; the administration and the committee to understand and sympathise with its problems, and the staff itself to increase its interest in its work and to be inspired towards a better service.

The main means of publicity are reports. Every library should prepare an annual report in some form. (For more details see 'Statistics and Reports'). A bulletin, published regularly, providing in simple language information about developments in the library, and calling attention to special items such as gifts, new equipment and new processing methods and lists of

acquired materials, is an effective tool of public relations. Other means are exhibitions, projections of films, radio and television. The librarian should take advantage of all of these in order to make the library and its services known.

Administration and management

Library structure Organisation is the establishment of an authoritative structure which should be carefully defined and coordinated in order to achieve final objectives. The library is a unit of an institution; hence its principal objectives are identical with those of the other units of the institution. However, these objectives differ from one agricultural library to another. A library which is a part of an educational institution has objectives which are not the same as those of the library of an agricultural society.

In any case, the Chief Librarian is subject to the authority of the institution; this authority may be in the person of a president of a university; a dean; a director; or a committee; but he is also concerned with the library staff, and the way in which the authority, and its responsibilities, affect the rest of the staff.

There are several useful tools which help in the organisation of a library. The most common is the graphic representation of the organisational structure, called an *organogram*. This is the final product of the process of organisation. An organogram should clearly demonstrate 1) the major responsibilities of every officer; 2) the lines and levels of authority; 3) the relationship between every officer and his superior, his subordinates and his associates.

There are two types of organograms: 1) those representing functions and 2) those representing assigned tasks. Both are drawn in the form of blocks and lines which link those blocks in a way which shows which are the principal sections or departments of the library; what are the various positions, who is responsible to whom, and who exercises control.

Small libraries, especially those in the charge of one person, do not need organograms because all the work has to be done by just one person. Large libraries need organograms, well-prepared, showing large divisions and sub-divisions; the hierarchy of the positions; who is responsible to whom, which functions are assigned and where. Each section or department should also have its own organogram.

Another means used by libraries to promote their organisation is a manual. This should include all the sections of the library, and the functions they perform. A manual can be very valuable, providing it is up-to-date. It includes the organograms, descriptions of the tasks, and other data which

might be required by the staff of the library.

Administration

There are various definitions of 'administration' the essence of all of which is: "the management of people and of activities in order to accomplish objectives".

Administration is essentially the establishment of effective working relations between people and resources in order to employ all available energies in a continuous and dynamic process. Administration analyses situations in order to produce agreements between people and to reach decisions between various alternatives, and then to put them into effect.

The specific functions of administration include planning, organisation, management, personnel, coordination and finance (these are discussed in more detail below); and these are the functions which occupy the person in charge of a library. In order to do this, the librarian must understand the purpose, goals and services of his library. He (or she) must be familiar with the users of the library and their specific needs; and he must know the history, philosophy, values and beliefs of the institution of which the library is a part, and its policies, procedures and programmes; finally, he or she must also know what are the resources (both available and lacking).

The efficiency of the administration can be judged by two criteria: 1) how far have the objectives been accomplished and 2) how far have the people in charge of the various duties become competent and skilled? These two criteria - which are the aims and the means - become inseparable under good administration.

Management

Libraries may operate under a Committee, or may be in the sole charge of a librarian. Such a Committee is formed of persons who operate as a group to perform certain functions: the Committee is responsible for formulating policy, and for its administration; and also for the acquisition of adequate funds for the library. The Committee has no executive function; this is the proper domain of the Chief Librarian. It is often difficult to draw an exact line between the duties of a Committee and those of the Chief Librarian; nevertheless it is necessary to define them with the greatest possible precision. A Committee tends very often to interfere in the executive functions which are in the charge of the Chief Librarian, - a situation which disturbs his work and upsets the good relationship which should exist between his Committee and himself. A Committee will frequently exercise overriding authority if the Chief Librarian has not (or is considered not to have) the ability to direct the library alone. If, however, a Chief Librarian does possess the necessary education and qualifications for managing a library, he should be in complete charge of it; it can then be assumed that he would have a proper place in the administrative hierarchy of the institution of

which the library is a part, and he would thus be a member of the body responsible for the formulation of policies.

The characteristics of a Chief Librarian are: the intelligence, courage and energy clearly to understand problems; the knowledge of how to identify the important and the necessary; the ability to reach conclusions; the knowledge of how to obtain cooperation from others; the knowledge of how to make decisions and to support them, and the ability to delegate.

The Chief Librarian should have an attractive personality, an interest in all the members of his staff; capable of friendship, sympathy, understanding, serenity, and appreciation and respect for others.

The Chief Librarian must know how to help his staff in the development and preparation of processes. He must provide appropriate conditions for productive effort by the total staff.

Staff

The number of persons required in a library depends on its size, and on the programmes and the activities which are to be developed according to its budget, and to the hours during which the library remains open to the public. There are three categories of personnel: a) professional, b) semi-professional, and c) support staff.

The Chief Librarian assumes major responsibilities concerning his staff: he should have clear, written policies on the positions, the work, supervision, obligations and rights and similar subjects. There should be a detailed description of the work required of every position; there should be procedures for selection and employment, and for the orientation of a new member. He should review salaries periodically, and he should be sure that all positions are assigned according to appropriate attainments.

Salaries should be such as to allow a staff member a decent living; there should be possibilities for his personal improvement by higher study and also for him to associate with his professional organisations and to participate in a variety of cultural activities.

The Chief Librarian must establish a system of supervision and of working time for all members of his staff. He should cultivate intercommunication and cooperation with his staff so that they feel they belong to a community; he should develop a plan for the evaluation and measurement of work done, and allow for adjustments according to changing circumstances.

Furthermore, he should be able to help the staff to develop methods and processes; he should create conditions for the encouragement of productive efforts by any of his staff needing (and seeking) his leadership. When it is competent and skilful, a staff will produce more, but it must be assigned work within its competence, and it must understand the purpose or goal to be

accomplished - but it must also know, from the start, what is expected of it.

When the work in a library becomes excessive it is logical to seek additional staff; then the librarian must separate his services into those which should still be provided by the existing staff and those new tasks to be assigned to the new staff. He should then discuss the new pattern with the members of his staff to discover how the proposed adjustments would affect their current work. Based upon these discussions, the librarian confirms the responsibilities which will be assigned to the new positions, indicating whether a position is professional, semi-professional or support staff, eventually determining the level of the position and identifying the necessary qualifications which will produce effective work.

The next step is consultation between the librarian and his superior officer when the need for the additional position has to be justified. When the necessary authorisation of the position is obtained, it is classified in relation to the other positions in the library; the salary is determined according to that classification.

When these steps have been completed, the librarian then proceeds with the *hiring: the selection; the engagement; then employment, perhaps for a probationary period.*

People may be hired through advertisements in the press, or through employment agencies, or simply by personal contact. The details of the position (the salary and working conditions) should be made readily available.

When a person is to be hired, the librarian should endeavour to interview all the candidates personally; this gives him the opportunity to observe the candidate in library surroundings, and the candidate the opportunity to see the library and its organisation, and to meet the librarian and the staff. In a personal interview, the librarian and the candidate have greater opportunity fully to discuss their points of interest.

Once a candidate is accepted for the new position, he will receive a contract the terms of which will cover the salary, the nature of the work and the conditions of employment, the title the position carries and the commencement date of the appointment.

When the process of hiring has been completed - the selection, engagement and employment - the process of training begins. This includes a period of orientation during which the employee is made familiar with the background of the library, its regulations and its current practices; all this is usually contained in a manual. Then he is shown over the library itself, the services are explained to him, and he is given the opportunity to become familiar with the collection.

'In-service' training is the next step. The person is instructed on how to

apply the knowledge acquired through his education and experience in a given working situation.

The new employee has both rights and obligations to assume. The librarian will expect from the employee a desire to give his best possible service at all times; to display a cooperative, friendly attitude, respect and courtesy, and the ability to relate his work to the purpose and objectives of the library.

A wise approach to some of the inherent problems in human relations is a code of ethics, prepared, accepted and adopted by the staff. This code would require the members of the library staff to seek recognition for the institution, not themselves. The staff-members are *interpreters* of the library to the public. The staff should be friendly and courteous with all the clients of the library; any direct criticism either of clients or of colleagues should be avoided; if it is justifiable, criticism should be directed towards the appropriate authority. The staff should recognise the fact that many decisions in the management of a library are reached under circumstances over which the administration has no control and of which the critic has no knowledge. Any suggestions for improvements in the services, or any criticism of policies or complaints about adjustments of work should be presented to the immediate supervisor. Constructive criticism, and corrections made by responsible superior officers, are necessary to ensure the effectiveness of the services; they should be accepted by the staff without resentment. The library atmosphere will remain undisturbed if the staff preserves harmony and a cooperative spirit among themselves; hence, the relationships between the various members of the staff should be friendly, good-natured and free from egotism.

Planning

The purpose of planning is to decide (with the proper reasons) the course to be followed. A Chief Librarian needs to understand the process of planning because effective work is always based on a plan which has been prepared with care and reflection.

In planning, a librarian must have (i) a clear conception of intention and strategy; (ii) the people to do the work and (iii) the appropriate organisation; then he must supervise and coordinate the work. Finally, finance, and a budget, which are related to the objectives, are essential.

The main features of a plan are those which answer questions about 1) *objectives* (what is to be done, when and where); 2) *responsibilities* (who will do what and where); and 3) *procedures* (how will it be done and what it will cost). The answers to these questions will clarify or condemn a plan from its inception and so will save the effort which may have been wasted because of some lack of knowledge or adequate means for the successful accomplishment of the plan.

Planning is a difficult task, especially when it is long-term. It is difficult to foresee at any given moment what interferences may occur during the course of a project within some particular period. Planning, therefore, should be in stages. This means that the projected time for attaining the final objectives of a plan should be divided into three constituent periods, and distinctive objectives determined for every period. There are three kinds of objectives 1) the final ones which, in reality, are those which initiated many of the preliminary decisions; 2) the intermediate ones which contribute to the final ones; and 3) the *primary* objectives which include a number of the initial steps which are necessary to attain the intermediate objectives. The concept of three kinds of objectives and periods provides a tool for attacking the immediate problems with which a librarian may be confronted - and which often seems to be the most difficult.

Planning must be dynamic. Changing conditions and new developments have to be taken into account and corresponding adjustments have to be made accordingly in order to accommodate the changes. A plan must be sufficiently firm to provide a guide, but it must also be sufficiently flexible to accommodate the need for change.

Coordination

Coordination is an important part of the Chief Librarian's duties. It is his responsibility to help the members of his staff to understand how their own work fits into the organisation as a whole, and how their functions affect operations in other sections and in the whole organisation.

Large libraries are organised into departments or sections, with the work distributed so as to ensure the increased efficiency of the services offered. Related functions are grouped into systematic and harmonious operations in order to provide structure and coordination; coordination is the interrelation of the various parts of the work of the library.

Finances

The financial needs of a library will depend on the services to be offered; on the methods of education; on any research activities; on the production of publications with their costs, and any outstanding accounts. Hence, in order to devise an adequate financial budget, it is essential, first, to define clearly the objectives of the institution, and to identify the role of the library in any educational programme; second, to decide how specific functions may be accomplished. The costs should be segregated for all of these separate needs. Only in this way may the amount of money necessary for the successful operation of a library be determined.

The experience of some college and university libraries indicates that 50-60% of the budget is assigned to personnel; 30-40% is assigned to the acquisition of books, journals and binding; and 10% to supplies and other miscellaneous purposes. Naturally, these percentages vary from one library to another.

Those libraries which place much emphasis on services have to spend more money on staff, - in some cases up to 90% of the total budget.

Several methods are used by libraries in the preparation of their budgets. Budgets can be based on 'service units'; for example, the monies which will be spent for personnel, supplies and the like for the reference 'unit' during one fiscal year are calculated. Then similar calculations for the other 'units' are made separately.

Other methods for preparing budgets consist of comparisons between the expenditure planned and the expenditures of previous years; or comparisons between the expenditures planned and those of other libraries which have better financial support; or comparisons between the library budget and the total budget of the institution. A study of the budgetary situation undertaken by the library itself can be very useful. It would consist of ascertaining the cost of supporting a student or a professor or a research worker.

The method of comparing previous budgets with planned expenditure can have dangerous results if improperly handled because there is always the possibility of perpetuating inadequate budgets.

One thing is certain: the cost of education and of research is high. Hence, the cost of an agricultural library having a collection adequate enough for teaching and research work and a large enough staff having the appropriate education and skills for collecting, organising and interpreting that collection will be high. A large proportion of the agricultural collection consists of journals and these are costly and require special care and adequate binding.

Whatever the budget may be, up-to-date information about its components, and the running expenses, should be available at any moment with all the details required. The following pattern is useful for budgeting and planning future budgets:

Salaries

Professional

Sub-professional

Support staff

Equipment

Supplies

Books

Journals

The sources of funds for libraries depend upon the kind of institution of which the library is a part. Thus, they can be from government (national or federal); from a state or province; from a municipality or community; from private enterprise, or they may be funds contributed by various countries in the case of an international institution.

Donations and overdue fines can also be taken as income, but they are not regular in time or constant in amount; hence they are used mainly to finance special projects.

It is wise to insure the collection against all risks, and to protect the building and other possessions against fire. The most important insurances are: against fire, damage by water, explosions and injuries to staff. An evaluation for insurance purposes of the building, equipment and furniture is not difficult, but this is often not the responsibility of the librarian, though the collection is.

The accounting should be able to indicate at any moment the amount of money available to the library for expenditure, the amounts disbursed or committed, and those not yet appropriated. This activity is usually undertaken by an administrative department of the institution of which the library is also part; it is often convenient, however, for the library to keep simple accounts of some items - a typical case would be the acquisition of publications.

New library building

The planning of a new building for a library should involve the librarian as much as the architect and the management: the librarian knows what is needed. He alone is able to provide qualitative and quantitative data about the readers, the collection, the staff and the relationships between all three. The librarian can prepare himself effectively for the task of planning a library by reading the literature on the subject. He should also visit as many libraries as possible in search of ideas which could be useful - and others to avoid. Finally, he should study his own library after having formed a clear definition of the objectives.

The location of any new building for a library should be central and near the other buildings of the institution of which it forms part. Its *architecture* should be in the contemporary style, in harmony with the other buildings of the institution and the topography of the place. It is preferable that the library consists of one floor - and that it be the ground floor. If it is to have several floors, the reading-room and the circulation and reference areas should be on the ground floor. The arrangement of these areas should be strictly functional and should permit control of the public by a small staff both inside the building and when leaving it. Functional inter-relations in the working areas of the staff are also important. The internal organisation of the building should provide for the simple and direct processing of publications, in different sections of the library, from the time they are received until they become available to the reader.

The physical conditioning of the building demands careful attention in order to ensure a suitable environment for the user and the collection. Adequate illumination, whether natural or artificial, throughout the working and reading areas is very important. It should be a special study for the architect.

If excessive heat and or humidity is to be expected, the ideal solution would be the installation of air-conditioning. If this is not possible for the whole building, then it would be desirable to have it installed in the reading-room and the working areas.

If the installation of air-conditioning is not to be considered, it would be advisable to construct the building in such a way that natural cross-ventilation would help to reduce the heat. Ventilators would also be necessary.

Excessive humidity in the stacks-room can be reduced by the use of dehumidifiers.

It is advisable, to minimise noise, to consider the acoustics of the reading-room and of those areas having much traffic.

The surroundings of the library should be quiet, and roads which raise dust should be avoided.

Once the internal distribution of the library areas has been completed, and the necessary fittings arranged on the plans, *electrical installation* should follow with the location of central and local switches and a system announcing the closure of the library and an alarm system against fire.

Provision has to be made in the plans for *sanitary services*. It is useful to have separate units for library users and for the staff; both should be located discreetly but they should be easily accessible.

For good *functional relationship*, the reading-room, the catalogue- and the stacks-room should have direct communication. The catalogue should be close to the workroom of the people who catalogue, classify and file new cards in the catalogue.

The calculation of *stacks-space* should be made both for the existing collection and for its future expansion according to the rate of acquisition. The deposit-capacity for books can be calculated allowing 200 volumes for every double-faced stack unit (36" wide and about 7' high).

It is preferable to have metal shelves, double-faced, collapsible and vertically adjustable - if possible, with adaptations for tables to facilitate the consultation of publications. They should be of standard height permitting easy access to the books on the top shelves. Wooden shelves, if the wood is good, can however, ensure prolonged use.

Individual tables or *cubicles*, open or closed, are essential for readers who seek tranquillity and isolation. Individual tables can be located in the reading-room and in the stacks-room. Cubicles are always situated in the stacks-room and may be located as extensions to the shelves, or standing separately.

The reading-room should provide: 1) good natural and artificial light; 2) temperature-control and 3) a comfortable and quiet atmosphere. It should be provided with facilities to accommodate 20-30% of the total number of readers. There should be visual supervision from the Circulation and Loan desk, and from the Reference Librarian. A two meters square (42 square feet) should be calculated for every reader. Windows with indirect illumination and artificial fluorescent light in panels would be adequate. The reference collection and the latest issues of journals should be on exhibition (on inclined shelves) and are usually located in separate sections in the reading-

room if no provision is made for separate rooms.

Other rooms for *study* or for *seminars* are desirable for some individuals and groups of library-users.

The space assigned for offices should be sufficient to accommodate all sections, preferably in one large room adequately furnished and equipped. The Chief Librarian should have his own office, preferably located close to the different sections, and also to the areas of public services. If he is to assume direct control of a major part of the library areas, half-glass walls between his office and the other areas should make this possible.

Every library requires a place for storing weeded books, duplicates, and for repairing damaged books.

Besides the areas already mentioned, the plans should make provision for a laboratory for the reproduction of documents and; if considered necessary, for other rooms, such as one for audiovisual materials, a typing office, a language laboratory or a conference room.

To complete the library, furniture and equipment for the staff must be included. Any existing inventory, detailed according to work areas, should include a tentative list of the furniture and equipment required for the new library. This will help to simplify the planning for the electrical and mechanical services.

When the *furniture* is to be purchased the following factors should be considered: function, appearance, flexibility, adaptability and cost. The material used for the manufacture of the furniture can be wood, metal, or a combination of both. The cost of the furniture will rest on this choice and every library should consider the respective advantages or disadvantages before making final decisions.

In acquiring equipment, the important factor is its durability. It should have a long life and should remain serviceable with little maintenance. Machines which reproduce one or several copies are essential parts of the work-system in libraries. They are not only used by the offices, but also provide an immediate duplication service for library materials.

Automation

Automation in a library is the use of automatic and semi-automatic data-processing machines to perform some of the traditional library activities such as the control of acquisitions, cataloguing, serials and circulation. It may be distinguished from related fields such as information retrieval, automatic indexing and abstracting, and automatic textual analysis.

Proper consideration of the following three areas of concern is basic to decision-making in the automation of a library; 1) the economics of the system and benefits to the user; 2) changes in the occupation of the staff and 3) management requirements. First, the systems should be economic; that is, running costs should not be appreciably higher than those of the more conventional systems after the initial investment in 'start-up' costs. Second, these systems should release staff from some of the routine operations so that they can devote substantially more of their time to users. Third, these systems (or their practical extensions) should generate data about management and administration which are not available from conventional library systems.

Much effort has been expended in the mechanisation and automation of cataloguing. The Library of Congress in the United States conducted an original study of automation and established standards for computerised cataloguing in the MARC (Machine-Readable Cataloguing) program.

The mechanisation of acquisition has been very popular; libraries are attracted to mechanised and automated acquisitions because of (i) the elimination of the typing of orders for books; (ii) the production of copies of current consolidated files; (iii) automatic claims and (iv) the provision of statistics. Other obvious advantages are the saving of time and money.

Many of the existing systems of acquisition and cataloguing include provision for handling serials; but there are many separate systems which have been devised solely to handle serials. The simplest type of system for serials is the straight listing of information about titles. This information is key-punched, and then printed-out by title, by subject, or any other arrangement provided for by the design of the system. The advantage of doing this by machine is that the list can be readily updated for subsequent editions, without having to re-key the information which has not changed.

Automated systems for circulation control have been more successful than any other kind of library system. The operations to be performed are repetitive, and the information used is not complex or extensive. It includes information 1) about the borrower; 2) about the material being borrowed and 3) about the loan itself. After the three basic categories of information have been entered, circulation systems can perform various functions such as 1) the provision of information about the location of items in circulation, 2) the identification of items on loan; 3) the recording of reserved items on loan; 4) the printing of recall notices; 5) the renewal of loans; 6) notification of overdue items and printing overdue notices; and 7) printing statistics of various kinds.

In the technical sense, librarians must face the problem of converting the existing records into a store of machine-readable forms. This requires the adherence by all of the contributing units to certain standards and to the basic structure of the system. Once this has been accomplished, all the units - and the whole system - benefit greatly. Newer equipment for input is helping to produce more accurate records by permitting the recognition and correction of errors.

The process of control is applicable to technical functions, administration and public services. It concerns personnel, funds and equipment and it is closely related to administrative processes. Personal data; data about budgets and funds; equipment inventories, and so on - all of which are stored in the computer - can be sorted, rearranged and summarised in order to yield any information needed.

Output from the computer-record can be in the form of printed 'hard copy'; but this, if used only occasionally, can become more costly than 'soft copy' - which is displays which use cathode-ray tubes or television-like devices. The storage of print-images on microforms and ultramicroforms is much more compact than the storage of 'hard copy'; it also simplifies a wider distribution of material.

Agricultural data-bases

Important agricultural indexes like the *Bibliography of Agriculture* of the National Agricultural Library (NAL) of the United States and the many abstracting journals of the Commonwealth Agricultural Bureaux (CAB) are now products of computerised data-bases and are available on tapes. *AGRINDEX* of the Food and Agriculture Organization (FAO) of the United Nations has been a computer-product since it was first published (1975); it is a cooperative effort of contributing countries.

CAB ABSTRACTS is a comprehensive file of agricultural information containing all the records in the twenty-five journals published by the CAB: this is a leading scientific information service in agriculture and certain fields of applied biology. Fourteen abstracting units contribute to CAB ABSTRACTS: all of these units are located close to a leading research organisation in the United Kingdom; in some instances, less accessible literature is abstracted by scientists working in other countries. Over 8,500 serial journals in 37 languages are scanned, as well as books, reports and other publications. Over 10,000 records are available on monthly tapes and are covered in the 'hard-copy' publications of journals of abstracts.

The AGRICOLA system of NAL started in 1970 as the CAIN (Cataloguing and Indexing) system. It covers the material collected by NAL. A computer-tape is produced every month; it consists of the records of the items that have been catalogued or indexed during that period. From this tape several different products are printed, including cards for NAL's catalogue, the *Bibliography of Agriculture*, the *National Agricultural Library Catalogue* and the *Catalogue of the Food and Nutrition Information and Educational Materials Center*.

Copies of these monthly tapes are also available to interested users outside of the NAL. These tapes can be used for direct bibliographical searching either in batch-mode or in an on-line retrieval mode. The services available from this system range from SDI (the Selective Dissemination of Information) and retrospective searches of the literature 'on demand', to the retrieval of catalogue-copy and the verification of citations for inter-library loans.

The idea of creating an international Information System for Agricultural Sciences and Technology - AGRIS - was introduced at a meeting sponsored by the FAO in 1969 when the participating experts on information agreed that the

existing services for dealing with the large volume of scientific and technical literature in the agricultural field were not sufficient. In order to improve the situation, they called for international cooperation, the pooling of resources and a co-ordinated sharing of responsibilities. Thus was AGRIS established, and FAO invited all its member-countries to accept the responsibility of reporting the agricultural literature generated within their own territories.

To test the system, an experimental publication was produced in 1973 with the participation of a limited number of countries. After it was proved to be a success, the inputting operation started on a regular basis in January 1975 when the first regular issue of *AGRINDEX* was produced. Now, over eighty countries submit their bibliographical entries in a standard format, which may be magnetic tape, punched paper-tape, optical character recognition (OCR) forms or input-sheets. A computer collates and arranges all of the contributions and then generates a data-base from which a photo-composition tape is created every month. Output services are provided by 1) a printed monthly bibliography, *AGRINDEX* (there is now a total of three volumes - 1975-1977 - and 5 issues of vol. 4(1975-1978) amounting to 275652 references); 2) a magnetic tape which can provide SDI, retrospective searches and on-line retrieval services. Cumulative subject indexes to the complete volumes are now published.

Training in the methods of AGRIS data-input has been provided in some measure for the people responsible for the data-input operations in some of the national centres in order to ensure that the reporting of data is correct and uniform. The inputters have also been provided with two basic manuals: *AGRIS Guidelines for Bibliographical Description* and *AGRIS Subject Categories*. Every document included in the data-base is described on individual input sheets (Annex IV) according to the instructions outlined in the manuals.

The FAO is responsible for (and coordinates) the collection, organisation and processing of the bibliographical data received from the countries participating in the system; and also for making the total data-base available to anyone who needs information.

AGRIS is one of the systems envisaged by the international programme - UNISIST - sponsored by UNESCO. It is the aim of UNISIST to combine the efforts of governments and scientists in order to guide the evolution of systems of scientific information intended to meet more adequately the needs of all who need information.

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55. Special libraries: a guide for management with revisions through 1974. New York, Special Libraries Association, 1975. 73 p.
56. Specialized science information services in the Unites States. Washington, D.C., National Science Foundation, 1962. 530 p.
57. Strauss, L.J., V.M. Stricky & A.L. Brown, Scientific and technical libraries; their organization and administration. New York, Interscience Publishers, 1964. 398 p.
58. Subject headings list. Prelim. ed. Washington, D.C., National Agricultural Library, 1963. 4 v.
59. Taylor, R.S. The making of a library; the academic library in transition. New York, Becker and Hayes, 1972. 250 p.
60. Turner, A.C. Comparative card production methods. *Library Resources and Technical Services* 16(3):347-358, 1972.
61. U.S. Library of Congress. Classification, class S: agriculture. 3rd ed. Washington, D.C., Government Printing Office, 1954.
62. U.S. Library of Congress. Filing rules for the dictionary catalogs of the Library of Congress. Washington, D.C., 1956. 187 p.
63. U.S. Library of Congress. Subject headings used in the dictionary catalog of the Library of Congress. 6th ed. 1957. 1357 p.
64. Universal Decimal Classification; abridged English edition. 3rd rev. ed. London, British Standards Institution, 1961. 245 p.

Appendix I

TYPES OF PUBLICATIONS AND OTHER MATERIAL CONSTITUTING A COLLECTION

Reference books are those which are consulted when specific, brief information on a given subject, or alternatively general orientation on a topic, is needed. These books form a separate section in the library to which the user has free access. In order to distinguish them from the rest of the books in the collection, the letter R is added to their call-number.

- *Encyclopaedias*. There are two types of encyclopaedias: 1) those like the 'Encyclopaedia Britannica' which contains information on all human knowledge arranged by topics in one alphabetical order, and 2) those which are specialized by subject like the 'Standard Cyclopedic of Horticulture'.

- *Dictionaries*. There are several types of dictionaries: 1) etymological, which explain the origin, formation and transformation of words; 2) general, which indicate the meaning of words in their different senses, and 3) encyclopaedic which provide concise information on things which the words represent. They can be in one language like 'Webster's New Collegiate Dictionary'; bilingual as 'Appleton's new English-Spanish and Spanish-English Dictionary', or polyglot (usually on one specific subject) such as the 'Elseviers Dictionary of Soil Mechanics in Four Languages' (English, French, Dutch and German).

- *Biographical manuals* contain biographical information about important persons. There are general ones such as 'Who's Who'; special ones, by subject, such as 'American Men of Science', or regional and national ones such as 'Who is Who in Latin America'.

- *Annual publications* are contemporary; they contain facts which document and reflect opinions on the subject they treat, for example, the 'Yearbook of Agriculture' of the U.S. Department of Agriculture.

- *Atlases and geographic sources* contain geographic data such as on surface, vegetation, population and agriculture, for example 'Encyclopaedia Britannica World Atlas', 'Marine Climatic Atlas of the World'.

- *Directories and Guides* contain the addresses of and often additional information on the institutions, associations and societies of a country or region such as 'American Universities and Colleges', 'Adult Education Associations of the USA - Directory'.

- *Almanacs and Statistical Manuals* contain concise information, usually tabulated, for example, the 'Yearbook of Forest Products Statistics'.

Text books are basic manuals which contain the fundamentals of a subject, for example, 'Principles of Genetics'.

Specialized books or treatises are more advanced manuals of interest to those who specialize in a subject, for example, 'Isotopic Carbon'.

Bibliographic publications are the basic publications which control literary production in different subjects. They can be divided into indexes, bibliographies and abstracts. A *bibliography* is a list which contains bibliographic entries (citations) with complete information for the identification of the publications on any subject or published by a given author, for example 'International Bibliography on Rice Research'. Indexes, for example, the *AGRINDEX* and the *Bibliography of Agriculture* are also bibliographies. The entries they contain are arranged under specific topics. An abstracting journal not only gives the data which identify a publication but also includes a brief description (an abstract) of the content of publications, e.g. *Forestry Abstracts*, *Plant Breeding Abstracts*.

The publications which contain reviews of the literature including *Annual reviews...*, *Advances in...* can also be considered of bibliographic value. These publications contain articles in which authors make critical evaluation of the literature which appeared during a given period of time on a topic or on a specific subject, for example, the *Quarterly Review of Biology*.

Journals or periodical publications can be weekly, semi-monthly, monthly, quarterly, and so on. They are published in parts (issues) and, in general, the parts corresponding to one year constitute a volume. According to their subject, they can be:

scientific, general, for example, *Science*;
scientific, specialized, *Food and Nutrition*;
agricultural, general, *Journal of Agricultural Science*;
agricultural, specialized or one-subject oriented, *Rice Journal*;
agricultural, popular, *Popular Gardening*;
literature reviews, *Botanical Review*;
bibliographical: indexes, *AGRINDEX*, *Bibliography of Agriculture* and abstracts, *Biological Abstracts*.

Serial publications are published with some frequency (often irregularly) under a distinctive common title, for example *Technical Bulletin*. Many librarians make no distinction between periodicals (journals) and serial publications; call them all 'serials'.

Pamphlets are usually considered to be publications not exceeding one hundred pages and emanating from government departments, experimental stations, research centres and extension departments. According to their content and purpose, they can be divided into 'technical' and 'popular'. Some pamphlets are published singly, others belong to numbered series.

Reprints are reproductions of original articles which have already appeared in published journals.

Microforms include microfilm, microfiche and microcard and are reduced photographic reproductions of printed pages which need to be magnified and read with the assistance of a 'reader'.

Films, filmstrips and slides are often used as teaching aids mainly for special groups of audiences. They need special storage facilities and equipment for projection.

Appendix II

SUGGESTIONS OF FORM-LETTERS USED FOR ESTABLISHING EXCHANGE OF PUBLICATIONS

EXCHANGE OF PUBLICATIONS Proposal Form

From: (Name of library) To:
.....
..... (Address)
.....
.....

No.: Date:

Dear Sir/Madam,

We would like to arrange an exchange of publications with your library.

We can offer you one or more of the following series or periodicals, copy(ies) of which are enclosed/sent separately*.

Titles: 1.
2.
3.
4.

Languages: 1. with summaries in
2. with summaries in
3. with summaries in
4. with summaries in

Frequency: 1. weekly, monthly, bimonthly, quarterly, irregular*,
2. weekly, monthly, bimonthly, quarterly, irregular*,
3. weekly, monthly, bimonthly, quarterly, irregular*,
4. weekly, monthly, bimonthly, quarterly, irregular*,

Class: 1. scientific, reviews, abstracts, advisory*,
2. scientific, reviews, abstracts, advisory*,
3. scientific, reviews, abstracts, advisory*,
4. scientific, reviews, abstracts, advisory*,

Number of 1.
pages per 2.
annum: 3.
4.

We would be pleased to receive from you the following series or periodicals on an exchange basis:

1.
2.
3.
4.

If you have other publications available for exchange, would you be so kind as to give us details of these publications on the reply form or send a specimen copy? The duplicate copy is for your retention.
Thanking you in advance for your co-operation,

* Delete whatever is inapplicable.

Yours faithfully,

..... (Signature)

..... (Name in block letters)

..... (Post held)



EXCHANGE OF PUBLICATIONS
Reply Form

From: (Name of library) To:
.....
..... (Address)
.....
.....

No.: Date:

Dear Sir/Madam,

We acknowledge receipt of your proposal for the exchange of publications no. dated

We are willing *
..... to accept your proposal.
We are unable *

Dating from (date) the following series or periodicals will be forwarded to your address regularly:

1.
2.
3.
4.

We shall be pleased to receive the following series or periodicals from your institute regularly from the same date.

1.
2.
3.
4.

In addition to this exchange arrangement we can offer you on an exchange basis the following series or periodicals and shall be pleased to hear from you which series or periodicals you could supply on the same basis.

.....
.....
.....

* Delete whatever is inapplicable.

Yours faithfully,

..... (Signature)
..... (Name in block letters)
.....
..... (Post held)
.....



Appendix III

EXAMPLES OF EXERCISES USED IN THE COURSE OF INSTRUCTION IN LIBRARY USE

Exercise No. 1 - Use of the catalogue

For the completion of data for a book:

Call No. Subject _____
Author _____
Title _____
Publisher _____
Other information _____

(translation, series, 2nd or 3rd ed.)

The librarian provides only partial information (author's name or title); the student completes the information with data which he finds in the catalogue.

Exercise No. 2 - Finding location of publications

Find in the stack room the following publications:

I. Books

1) (call no.) _____ Author _____
2) _____ Author _____
3) _____ Author _____
4) _____ Author _____

II. Journals

1) (name of journal) _____ Location code _____
2) _____ Location code _____
3) _____ Location code _____
4) _____ Location code _____

The call numbers for books and titles of journals are provided by the librarian; names of authors of books and location codes for journals are supplied by the student.

Exercise No. 3 - 'See' and 'See also' reference cards in the catalogue

1. What are the 'See' references in the catalogue for the following subject headings:

- | | |
|----------|----------|
| 1) _____ | 4) _____ |
| a) _____ | a) _____ |
| 2) _____ | 5) _____ |
| a) _____ | a) _____ |
| 3) _____ | 6) _____ |
| a) _____ | a) _____ |

2. What are the 'See also' references in the catalogue for the following subject headings:

- | | |
|----------|----------|
| 1) _____ | 2) _____ |
| a) _____ | a) _____ |
| b) _____ | b) _____ |
| c) _____ | c) _____ |
| d) _____ | d) _____ |
| e) _____ | e) _____ |

Exercise No. 4 - Use of reference tools

Select and indicate in an abbreviated form the titles of the most important dictionaries, encyclopaedias, manuals, tables, specialized bibliographies, etc. of the following subjects:

Agriculture

- | | |
|----------|----------|
| 1) _____ | 5) _____ |
| 2) _____ | 6) _____ |
| 3) _____ | 7) _____ |
| 4) _____ | 8) _____ |

Botany

- | | |
|----------|----------|
| 1) _____ | 3) _____ |
| 2) _____ | 4) _____ |

Other subjects e.g. bacteriology, biology, genetics, horticulture, can be added for this exercise.

Exercise No. 5 - Use of reference collection

Biographic tools

In which of the following publications (indicate with x in appropriate boxes) did you find information on:

- (subject) _____
- | | | | |
|------------------------------------|--------------------------|----------|--------------------------|
| 1) (American Men of Science) _____ | <input type="checkbox"/> | 4) _____ | <input type="checkbox"/> |
| 2) _____ | <input type="checkbox"/> | 5) _____ | <input type="checkbox"/> |
| 3) _____ | <input type="checkbox"/> | 6) _____ | <input type="checkbox"/> |

Geographic tools

In which of the following publications did you find information on the location of:

- (City or county, or territory, etc.) _____
- | | | | |
|----------------------------|--------------------------|----------|--------------------------|
| 1) (Hammond - Atlas) _____ | <input type="checkbox"/> | 3) _____ | <input type="checkbox"/> |
| 2) _____ | <input type="checkbox"/> | 4) _____ | <input type="checkbox"/> |

Similar questions can be prepared for dictionaries, directories of institutions, etc. The librarian prepares the themes (subjects) of information which students will look up in indicated titles.

Exercise No. 6 - Use of periodical publications

I. Selection

Select 10 important journals in 1) the subject of your specialty, 2) in its related subject.

- | | |
|----------|-----------|
| 1) _____ | 6) _____ |
| 2) _____ | 7) _____ |
| 3) _____ | 8) _____ |
| 4) _____ | 9) _____ |
| 5) _____ | 10) _____ |

II. *Description of the journal*

Describe only the titles indicated in 1), 2) and 3). Look up the data of the journals directly in their recent issues, and in one complete volume which you find in the library.

- | | |
|--|--|
| a) _____
title | b) _____
City, County (State) |
| c) _____
publisher | d) _____
Subscription cost |
| e) Frequency
Weekly _____
Semi-monthly _____
Monthly _____
Quarterly _____
Others _____ | h) Indexes
Authors _____
In each issue _____
In each vol. _____
Subject
In each issue _____
In each vol. _____
Others _____ |
| f) Table of contents
In every issue _____
In complete vol. _____ | i) Level of treatment
Scientific _____
Technical _____
Extension _____ |
| g) Sections with literature reviews
Books _____
Journals _____
Others _____ | |

In addition, the student should provide data for journal titles of 2) and 3).

Exercise No. 7 - Use of bibliographic and abstract journals

Review all titles indicated below and place an asterisk (on the left side) of every title of your specialty. In each title examine table of contents, indexes and read prefaces.

1. Agricultural and Horticultural Engineering Abstracts
2. Animal Breeding Abstracts
3. Biological Abstracts
4. Bulletin Signalétique, 17. Biologie et Physiologie végétales
5. Chemical Abstracts
6. Dairy Science Abstracts
7. Dissertation Abstracts
8. Field Crop Abstracts
9. Forestry Abstracts
10. Helminthological Abstracts
11. Herbage Abstracts
12. Horticultural Abstracts

13. Index Veterinarius
14. Meteorological and Geostrophysical Abstracts
15. Nutrition Abstracts and Reviews
16. Plant Breeding Abstracts
17. Review of Applied Entomology
18. Review of Plant Pathology
19. Sociological Abstracts
20. Soils and Fertilizers
21. Tobacco Abstracts
22. Tropical Abstracts
23. Veterinary Bulletin
24. Weed Abstracts
25. World Agricultural Economics and Rural Sociology Abstracts

These and other titles can be listed, making sure that they are available in the library for examination.

Exercise No. 8 - Use of current review publications

Describe briefly what type of publications are 'Advances' and what is their purpose:

Revise tables of contents, indexes and read prefaces of the titles indicated below; and indicate with an asterisk (on the left side) which 'Advances' contain material of your subject specialty.

Advances in:

- 1) Agronomy
- 2) Applied Microbiology
- 3) Biochemical Engineering
- 4) Botanical Research
- 5) Carbohydrate Chemistry
- 6) Comparative Physiology and Biochemistry
- 7) Environmental Science and Technology
- 8) Food Research
- 9) Genetics
- 10) Insect Physiology
- 11) Lipid Research
- 12) Marine Biology
- 13) Microbiology of the Sea

- 14) Parasitology
- 15) Pest Control Research
- 16) Protein Chemistry
- 17) Veterinary Science and Comparative Medicine
- 18) Virus Research

Describe briefly what is an 'Annual Review' and what is the purpose of their publication:

Indicate with an asterisk (on the left side) which 'Annual Reviews' contain material of your interest.

Annual Review of:

- 1) Biochemistry
- 2) Entomology
- 3) Genetics
- 4) Microbiology
- 5) Mycology
- 6) Nuclear Science
- 7) Physical Chemistry
- 8) Physiology
- 9) Phytopathology
- 10) Plant Physiology

Exercise No. 9 - Use of periodical bibliographic publications. Bibliographical research

I. Subject to investigate: _____

II. Sources to consult:

- 1) *AGRINDEX*

Subject headings consulted in the table of contents:

a) _____ b) _____ c) _____

Terms consulted in the Commodities Index:

a) _____ b) _____ c) _____

- 2) *Bibliography of Agriculture*

Subject headings consulted in the table of contents:

a) _____ b) _____ c) _____

Terms consulted in the table of contents:

a) _____ b) _____ c) _____

3) *World Agricultural Economics and Rural Sociology Abstracts*

Subject headings consulted in the table of contents:

a) _____ b) _____ c) _____

Terms consulted in the subject index:

a) _____ b) _____ c) _____

The first two sources are used to initiate research in agriculture and related fields in general; the third source should be for a specific subject of interest to the student.

Exercise No. 10 - Use of periodical bibliographic publications

1. *AGRINDEX*

a) Starting date of publication: _____

b) Name of publisher: _____

c) Frequency: _____

d) What type of indexes has each volume: _____

Authors _____

Subject _____

Geographic _____

Cumulative _____

Others _____

e) How many references are included in the complete volume of (year): _____

f) What is the arrangement of references: Alphabetical _____ Subject _____

This type of exercise is recommended for all indexes and abstract journals in the library. The student fills out all data directly from individual issues which he has to review in detail.

Exercise No. 11 - Preparation of bibliographic references. Use of indexes and abstract journals

1. Select 3 bibliographic references of the subject of your interest (preferably, choose a general subject) from the following titles:

a) *AGRINDEX*

b) *Bibliography of Agriculture*

c) _____

(Select one abstract journal of your specialty)

2. Register data of the 3 selected references separately in the following order:

- a) Index _____
Subject _____
Author _____
Title of the article _____
Name of the journal _____
Volume _____ Pages _____ Date _____
(Init. & final) (Month) (Year)

Repeat this exercise for b) and c).

3. Use the data to prepare bibliographic references according to the data order found in a).

1. _____

Exercise No. 12 - Use of bibliographic publications. Preparation of a bibliography

Compile a bibliography on the subject indicated below. Proceed in the following way:

- 1) Consult at least 5 different bibliographic sources (indexes and abstract journals);
- 2) Select from those sources 10-15 references on the subject;
- 3) Copy references on cards as they appear in sources you consulted;
- 4) Order elements of references according to the sequence used in AGRINDEX;
- 5) If the journal title is abbreviated, register it in full. To do so use the following reference tools:
 - a) Union List of Serials, b) World List of Scientific Periodicals, c) British Union Catalogue of Periodicals, etc.
- 6) Organize the bibliography: a) alphabetically by author, b) number references in consecutive order.

Exercise for bibliographic compilation

(Subject) _____

Appendix V

CURRENT REVIEWS

- Advances in agriculture
1971-
UP Institute of Agricultural
Sciences
Kanpur, India
- Advances in agronomy (American
Society of Agronomy)
1949-
Academic Press
New York, N.Y., USA
- Advances in analytical chemistry
and instrumentation
1960-
John Wiley & Sons
New York & London
- Advances in applied microbiology
1955-
Academic Press
New York, N.Y., USA
- Advances in biochemical engineering
1971-
Springer Verlag
Berlin, New York & Heidelberg
- Advances in bioengineering and
instrumentation (Instrument
Society of America)
1966-
Plenum Press
227 West 17 Street
New York, N.Y., USA
- Advances in biological and
medical physics
1948-
Academic Press,
New York, N.Y., USA
- Advances in botanical research
1963-
Academic Press
New York, N.Y., USA
- Advances in carbohydrate chemistry
and biochemistry
1945-
Academic Press
New York, N.Y., USA
- Advances in cell and molecular
biology
1971-
Academic Press
New York, N.Y., USA
- Advances in cereal science
and technology
1976-
American Association of Cereal
Chemists
St. Paul, Minn., USA
- Advances in chemical engineering
1956-
Academic Press
New York, N.Y., USA
- Advances in chemical physics
1958-
Interscience Publishers
605 3rd Avenue
New York, N.Y., USA
- Advances in chemistry series
1950-
American Chemical Society
Washington, D.C., USA
- Advances in chromatography
1965-
Marcel Dekker Inc.
New York & Basel
- Advances in comparative physiology
and biochemistry
1962-
Academic Press
New York, N.Y., USA
- Advances in ecological research
1962-
Academic Press
New York, N.Y., USA
- Advances in environmental science
and technology
1969-
John Wiley & Sons
New York & London
- Advances in enzyme regulation
1963-
Pergamon Press
New York, Oxford & Paris

- Advances in enzymology and related areas of molecular biology
1941-
John Wiley & Sons
New York, London, Toronto & Sydney
- Advances in experimental medicine and biology
1967-
Plenum Press
New York & London
- Advances in food research
1948-
Academic Press
New York, N.Y., USA
- Advances in genetics
1947-
Academic Press
New York, N.Y., USA
- Advances in horticultural science and their application
Proceedings of the XVth International Horticulture Congress, Nice, 1958. Oxford, Pergamon Press, 1962. 3 vol.
- Advances in inorganic chemistry and radiochemistry
1959-
Academic Press
New York, N.Y., USA
- Advances in insect physiology
1963-
Academic Press
New York, N.Y., USA
- Advances in lipid research
1963-
Academic Press
New York, N.Y., USA
- Advances in macromolecular chemistry
1968-
Academic Press
New York & London
- Advances in marine biology
1963-
Academic Press
New York, N.Y., USA
- Advances in microbial physiology
1967-
Academic Press
New York, N.Y., USA
- Advances in optical and electron microscopy
1966-
Academic Press
New York, N.Y., USA
- Advances in organic chemistry
1960-
Wiley-Interscience Publishers
New York & London
- Advances in parasitology
1963-
Academic Press
New York, N.Y., USA
- Advances in protein chemistry
1944-
Academic Press
New York, N.Y., USA
- Advances in radiation biology
1964-
Academic Press
New York, N.Y., USA
- Advances in research and technology of seeds
1975-
PUDOC
Wageningen, the Netherlands
- Advances in steroid biochemistry and pharmacology
1970-
Academic Press
London, England
- Advances in veterinary science and comparative medicine
1953-
Academic Press
New York, N.Y., USA
- Advances in virus research
1953-
Academic Press
New York, N.Y., USA
- Advancing frontier of plant science
1962-
Institute for the Advancement of Science and Culture
New Delhi, India
- Animal health yearbook
FAO
Rome, Italy
- Annual fertilizer review
1951-
FAO
Rome, Italy
- Annual review of biochemistry
1932-
Stanford University Press
Palo Alto, Calif., USA

- Annual review of biophysics and
bioengineering
1972-
Annual Reviews Inc.
4139 El Camino Way
Palo Alto, Calif., 94306, USA
- Annual review of ecology and
systematics
1970-
Annual Reviews Inc.
- Annual review of entomology
1956-
Annual Reviews Inc.
- Annual review of genetics
1967-
Annual Reviews Inc.
- Annual review of microbiology
1947-
Annual Reviews Inc.
- Annual review of nuclear science
1952-
Annual Reviews Inc.
- Annual review of physical chemistry
1950-
Annual Reviews Inc.
- Annual review of physiology
1939-
Annual Reviews Inc.
- Annual review of phytopathology
1963-
Annual Reviews Inc.
- Annual review of plant physiology
1950-
Annual Reviews Inc.
- Fortschritte der Veterinärmedizin
1958-
Verlag Paul Parey
Berlin & Hamburg
- Fortschritte im Acker- und
Pflanzenbau
1973-
Verlag Paul Parey
Berlin & Hamburg
(Supplement to Zeitschrift für
Acker- und Pflanzenbau)
- International review of cytology
1952-
Academic Press
New York, N.Y., USA
- Mise au point de chimie analytique
pure et appliquée et d'analyse bromo-
tologique
1953-
Masson et Cie.
120 Boulevard St Germain
Paris 6, France
- Progress in the physiology of
farm animals
1950-
Butterworth & Co. Ltd.
88 Kingsway
London, England
- Residue reviews - Residue of pesti-
cides and other foreign chemicals
in foods and feeds
1962-
Springer Verlag
Berlin, Göttingen & Heidelberg
- Veterinary annual
1959-
Wright - Scientifica
Bristol, England
- World review of nutrition and
dietetics
1959-
Pitman Medical Publishing Co.
New York & London

Appendix VI

CURRENT BIBLIOGRAPHIES, INDEXES AND ABSTRACT JOURNALS

1. *Guides to Indexing and Abstracting Services*

Abstracting service. Vol. I. Science and technology. Vol. II. Social sciences. Humanities. The Hague, the Netherlands, International Federation for Documentation, 1969.

ASLIB Directory. Vol. I. Information sources in science, technology and commerce. London, ASLIB, 1970.

Bibliography of directories and sources of information. The Hague, the Netherlands, International Federation of Documentation, 1960. 22 p.

Collison, R.L. Bibliographical services throughout the world. Paris, UNESCO, 1961. 228 p.

Directories of science information sources. International bibliography. The Hague, the Netherlands, International Federation of Documentation. 1967. 163 p.

Directory of information resources in agriculture and biology. Beltsville, Md., National Agricultural Library, 1971. 523 p.

Frauendorfer, S. von, ed. Survey of abstracting services and current bibliographical tools in agriculture, forestry, fisheries, nutrition, veterinary medicine and related subjects. München, Basel, Vienna, BLV, 1969. 192 p.

A guide to the world's abstracting and indexing services in science and technology. Washington, D.C., National Federation of Science Abstracting and Indexing Services, 1963. 183 p.

Sources of information on veterinary medicine. New Haw, Weybridge, Surrey, U.K., Central Veterinary Laboratory, 1967. 19 p.

Specialized science information services in the United States. Washington, D.C., National Science Foundation, 1962. 530 p.

United Nations Industrial Development Organization. Information sources on the agricultural implements and machinery industry. New York, United Nations, 1973. 109 p. (UNIDO Guides to Information Sources No. 8)

2. *Important Current Abstract Journals, Bibliographies and Indexes in Agricultural and Related Fields*

Abstracts of entomology. 1970- m. BioScience Information Service of Biological Abstracts, Philadelphia, Pa., USA

Abstracts of mycology. 1967- m. BioScience Information Service of Biological Abstracts, Philadelphia, Pa., USA

Abstracts of scientific and technical papers, published in U.A.R. and papers received from Afganistan, Cyprus, Iran, Jordan, Iraq, Lebanon, Pakistan, Saoudi-Arabia and Sudan. 1955- m. National Research Centre U.A.R., Cairo, Egypt

Abstracts on tropical agriculture. 1975- m. Royal Tropical Institute, Mauritskade 63, Amsterdam, the Netherlands. (Formerly: Tropical Abstracts)

Agricultural engineering abstracts. 1977- m. CAB, England. (Continues Agricultural and horticultural engineering abstracts; ceased in 1966)

Agricultural literature of Czechoslovakia; an abstracting journal of the agricultural literature in CSSR. 1956- q. Institute of Scientific and Technical Information, Slezska 7, Prague 2, Czechoslovakia

Agronomy abstracts. 1954- y. American Society of Agronomy, 2702 Monroe Street, Madison 5, Wis., USA

Air pollution abstracts. 1970- m. U.S. Environmental Protection Agency, Air Pollution Technical Information Center, Research Triangle Park, N.C., 27711, USA

Animal breeding abstracts. 1933- q. ★ CAB, England

Apicultural abstracts, 1949- q. International Bee research Association, Woodside Chelfont Heights, Gerrards Cross, Bucks, England

★ For information and subscriptions to *CAB Abstracts* write to: Central Sales, Commonwealth Agricultural Bureaux, Farnham House, Farnham Royal, Slough SL2 3BN, U.K.

- Aquatic sciences and fisheries abstracts. 1971- m. Compiled by FAO, published by Information Retrieval Ltd., 1 Falconberg Court, London, England
- Asher's guide to botanical periodicals; a three-weekly announcement of their lists of contents. 1973-1975. Asher & Co., Keizersgracht 526, Amsterdam 1002, the Netherlands
- Australian science index - Index of articles published in Australian scientific and technical periodicals. 1957- m. Commonwealth Scientific and Industrial Research Organisation, Melbourne, Australia
- B.A.S.I.C.: key to the world's biological research published in Biological abstracts. 1962- semi-m. Biological Abstracts Inc. Philadelphia, Pa., USA
- Berichte über die gesamte Biologie - Abt. A. 1926- semi-m. Springer Verlag, Berlin, Germany
- Berichte über die gesamte Biologie - Abt. B, Physiologie. 1920- semi-m. Springer Verlag, Berlin, Germany
- Bibliographie der Pflanzenschutzliteratur. Bibliography of plant protection. 1914/1958; n.s. 1, 1970- . Biologische Bundesanstalt für Land- und Forstwirtschaft, Berlin, Germany
- Bibliography of agriculture. 1942- m. National Agricultural Library, Beltsville, Md., USA
- Biological abstracts. 1926- semi-m. Biological Abstracts Inc., Philadelphia, Pa., USA
- Biological and agricultural index; a cumulative subject index to periodicals in the field of biology, agriculture and related sciences. v. 50- 1964- Wilson Co., 950 University Ave. New York 25, N.Y., USA. (Supersedes the Agricultural Index, published monthly, 1916-64)
- Bioresearch today: pesticides. 1972- m. BioSciences Information Service of Biological Abstracts, 2100 Arch Street, Philadelphia, Pa., 19103, USA
- Botanical review. 1935- p. The New York Botanical Garden, New York, N.Y., USA
- British technology index - a current subject-guide to articles in British technical journals. 1962- m. The Library Association, London, England

- Bulletin analytique d'entomologie médicale et vétérinaire. 1953- m. Office de la Recherche Scientifique et Technique d'Outre-Mer, Service Central de Documentation, 93140 Bondy, France. (Formerly: Bulletin signalétique d'entomologie médicale et vétérinaire)
- Bulletin bibliographique de pédologie. 1951- q. Office de la Recherche Scientifique et Technique d'Outre-Mer, 80 rue d'Aulnay, Bondy (Seine), France
- Bulletin bibliographique international du machinisme agricole. International farm machinery abstracts. (Text in English, French, German and Spanish) 1966- q. Centre National d'Etudes et d'Experimentation de Machinisme Agricole, Parc de Tourvoie 92160, Antony, France
- Bulletin of entomological research. 1910- q. CAB, England
- Bulletin signalétique du Centre National de la Recherche Scientifique. Sec. 16: Biologie et Physiologie Animales. 1961- m. C.N.R.S., 15 Quai Anatole France, Paris 7, France
- Bulletin signalétique du C.N.R.S. Sec. 17: Biologie et Physiologie Végétale. 1961- m.
- Bulletin signalétique du C.N.R.S. Sec. 18: Sciences Agricoles. 1961- m.
- CCABES (Current contents, agriculture, biology and environmental sciences) 1970- w. Institute for Scientific Information, 325 Chestnut Street, Philadelphia, Pa., 19106, USA. (Reproduction of the tables of contents of approx. 850 internat. journals)
- CDIUPA. Bulletin bibliographique. 1967- m. Centre de Documentation Internationale des Industries Utilisatrices de Produits Agricoles. Association pour la Promotion Industrie-Agriculture, 35 rue du Général Foy, 75008 Paris, France
- Chemical abstracts. 1907- semi-m. American Chemical Society, Easton, Pa., USA
- Chemisches Zentralblatt. 1830- m. Verlag Chemie, Berlin, Germany
- Coton et fibres tropicales. Bulletin bibliographique. v. 28, 1973- Institut de Recherches du Coton et des Textiles Exotiques, 34 rue des Renaudes, Paris 17e, France
- Cotton and tropical fibres abstracts. 1977- m. CAB, England
- Crop physiology abstracts. 1975- m. CAB, England

- Dairy science abstracts. 1939- m. CAB, England
- Dissertation abstracts. 1938- m. University Microfilms Inc. Ann Arbor, Mich., USA
- Entomology abstracts. 1969- m. Information Retrieval Ltd., 1 Falconberg Court, London, England. (Also: Information Retrieval Inc., Suite 907, 1911 Jefferson, Davis Highway, Arlington, Va., 22202, USA)
- FAO documentation. Current bibliography. (Text in English, French and Spanish; summaries in English) 1967- m. Food and Agriculture Organization of the U.N., Documentation Centre, Via delle Terme di Caracalla, Rome, Italy. (Formerly: FAO Documentation. Current index)
- Fertilizer abstracts. 1968- m. Tennessee Valley Authority, Fertilizer Abstracts Service, Muscle Shoals, Al., 35660, USA
- Field crop abstracts. 1948- q. CAB, England
- Food science and technology abstracts. 1969- m. CAB, England
- Forest products abstracts. 1978- m. CAB, England
- Forestry abstracts. 1939- p. CAB, England
- Fruits - fruits d'Outre-Mer. Documentation analytique. 1946- m. Institut Français de Recherches Fruitières d'Outre Mer, 6 rue du Général Clergerie, Paris, France
- Helminthological abstracts. 1932- q. Series A - Animal helminthology, v. 39. 1970-m. Series B - Plant nematology, v. 39, 1970- q. CAB, England
- Herbage abstracts. 1931- q. CAB, England
- Horticultural abstracts. 1931- q. CAB, England
- Hungarian agricultural review. 1952- q. Országos Mezőgazdasági Konyotor és Dokumentációs Központ, Budapest, Hungary
- Indeks biologi dan pertanian di Indonesia. Indonesian biological and agricultural index. (Text in English and Indonesian) 1969- bi-m. Indonesia Central Library for Biology and Agriculture, Djalan Ir. Hadji Djuanda 20, Bogor, Indonesia
- Index of current research on pigs. 1955- y. Agricultural Research Council, London, England

Index veterinarius. 1933- q. CAB, England

Indian agricultural index. v. 4, 1972- m. University of Agriculture and Technology. Pantnagar (Nainital), Uttar Pradesh, India

Industries alimentaires et agricoles. Documentation analytique (Rubrique de la Revue) 1947- 10 times a year. 156 Boulevard Magentan, Paris, France

International abstracts of biological sciences. 1956- m. Pergamon Press, 122 East 55th Street, New York, N.Y., USA

International bibliography of rice research. (1951-61 in one volume publ. in 1963. Kept up-to-date by yearly supplements). International Rice Research Institute, Los Baños, Laguna, Philippines

Irrigation and drainage abstracts. 1975- q. CAB, England

Journal of economic literature. 1963- q. The American Economic Association, Cambridge, Mass., USA

Journal of the science of food and agriculture. Abstracts section. 1957- m. 14 Belgrave Square, London, S.W. 1, England

Key to economic science. v. 23, 1976- . Martinus Nijhoff, 9 Lange Voorhout, the Hague, the Netherlands. (Continues Economic Abstracts, published since 1953 fortnightly.)

Landbouwdocumentatie. 1945- w. Centre for Agricultural Publishing and Documentation (PUDOC), Wageningen, the Netherlands

Landwirtschaftliches Zentralblatt, Abt. I. Landtechnik. 1955/56- 6 times a year. Akademie Verlag, Leipzigerstrasse 3-4, Berlin W1, Germany

Landwirtschaftliches Zentralblatt, Abt. II. Pflanzliche Produktion. 1955/56- m.

Landwirtschaftliches Zentralblatt, Abt. III. Tierzucht, Tierernährung, Fischerei. 1955/56- nine times a year.

Landwirtschaftliches Zentralblatt, Abt. IV. Veterinärmedizin. 1955- m.

Maize quality protein abstracts. 1977- q. CAB, England

Meteorological and geostrophysical abstracts. 1950- . American Meteorological Society, Boston, Mass., USA

Die Milchwissenschaft. 1946- m. Verlag Hans Carl, Nürnberg, Germany

Nutrition abstracts and reviews. 1931- q. Series A - Human and experimental, Series B - Livestock feeds and feeding. CAB, England

Nutrition reviews. 1942- m. The Nutrition Foundation Inc. New York, N.Y., USA

Oléagineux. Sec.: documentation analytique. 1946- m. Paris, France

Ornamental horticulture. 1977- m. CAB, England

Plant breeding abstracts. 1936- q. CAB, England

Plant growth regulator abstracts. 1975- m. CAB, England

Plant protection abstracts. 1965- q. Makhteshin Chemical Works, Beer-Sheva, Israel

Pollution abstracts. 1970- six times a year. Pollution Abstracts Inc., 620 S. Fifth Street. Louisville, Ky, USA

Potato abstracts. 1977- m. CAB, England

Poultry abstracts. 1977- m. CAB, England

Protozoological abstracts. 1977- m. CAB, England

Pudoc bulletin (Current bibliography of recent publications of Dutch agricultural institutions) 1960- q. Centre for Agricultural Publishing and Documentation (PUDOC), Wageningen, the Netherlands

Referativnyi zhurnal. Pochvovedeniye i agrokhimiya. 1963- m. Akademiya Nauk SSSR. Institut Nauchnoi Informatzii, Baltiskaya Ul. 14, Moscow A-219, USSR

Resumenes analiticos sobre yuca (Manihot esculenta Crantz) 1975- . Centre Nacional de Agricultura Tropical, Cali, Colombia (Also published in English - "Abstracts on Cassava (Manihot esculenta Crantz)")

Review of applied entomology. Ser. A. agriculture. 1913- m. CAB, England

Review of applied entomology. Ser. B. medical and veterinary. 1913- m.

Review of medical and veterinary mycology. 1943- q. CAB, England

Review of plant pathology. 1922- m. CAB, England

Revue internationale des industries agricoles. Bulletin analytique. 1939- m.
Commission Internationale des Industries Agricoles et Alimentaires, Centre
de Documentation; 18, Avenue de Villars, Paris 7e, France

Rice abstracts. 1978- m. CAB, England

Rural development abstracts. 1978- q. CAB, England

Rural extension education and training abstracts. 1978- q. CAB, England

Rural recreation and tourism abstracts. 1977- q. CAB, England

Satra: agricultural sciences (Science and technology research abstracts)
1974- q. G.K. Hall & Co., 70 Lincoln Street, Boston, Mass., USA

Small animal abstracts. 1977- q. CAB, England

Seed science and technology abstracts. 1978- m. CAB, England

Sociological abstracts. 1953- q. L.P. Chall, New York, N.Y., USA

Soil Science Society of America. Proceedings. 1936- bi-m. Ann Arbor, Mich., USA

Soils and fertilizers; abstracts of world literature. 1938- bi-m. CAB, England

Sorghum and millets abstracts. 1977- m. CAB, England

Soyabean abstracts. 1978- m. CAB, England

Tobacco abstracts. 1957- m. Tobacco Literature Service, I.H. Hill Library,
North Carolina Experimental Station, Raleigh, N.C., USA

Triticale abstracts. 1977- q. CAB, England

Tropical oil seeds abstracts. 1977- m. CAB, England

Uit de pluimveepers. 1945- m. Spelderholt Institute for Poultry Research,
Spelderholt, Beekbergen, the Netherlands

Veterinary bulletin. 1931- m. CAB, England

Virology abstracts, 1967- m. Information Retrieval, London & Washington, D.C.

Water pollution abstracts. 1928- m. Department of the Environment. HMSO, Box
569, London, England

Weed abstracts. 1951- m. CAB, England

Wildlife review; an abstracting service for wild life management. Patuxent
Wildlife Research Center, Laurel, Md., 20810, USA

World agricultural economics and rural sociology abstracts. 1959- q. CAB,
England.

World's poultry science journal - Reviews of poultry publications. q. World's
Poultry Science Association. Columbus 10, Ohio, USA

Appendix VII

GUIDES TO LITERATURE SOURCES AND DIRECTORIES

A. General

Besterman, T. World bibliography of bibliographies. 2nd ed. London, 1950. 3 v.

Bibliography of African bibliographies South of the Sahara. 4th ed. Cape Town, 1961

Bibliography of publications issued by UNESCO or under its auspices. Paris, UNESCO, 1973. 385 p.

Directory of periodicals published by international organizations. 3rd ed. Brussels, Belgium, Union of International Associations, 1969.

Irregular serials and annuals; an international directory. 5th ed. 1978-1979. New York, London, R.R. Bowker, 1068 p.

Malclès, L.N. Les sources du travail bibliographique. Tome 3. Bibliographies spécialisées (Sciences exactes et techniques). Genève et Paris, 1958.

Paylore, P. Arid-lands research institutions; a world directory. Tuscon, Univ. of Arizona Press, 1967. 268 p.

Sheehy, E.P. Guide to reference books. 9th ed. Chicago, Ill., American Library Association, 1976, 1015 p.

Ulrich's international periodicals directory; a classified guide to current periodicals, foreign and domestic. 17th ed. 1977-1978. New York & London, R.R. Bowker (A Bowker Serials Bibliography)

Walford, A.J., ed. Guide to reference material. 3rd ed. Vol. I. Science and Technology. London, The Library Association, 1973. 615 p.

B. Agricultural fields

Agricultural research index; a guide to agricultural research including dairy farming, fisheries, food, forestry, horticulture and veterinary science. Guernsey, G.B., Francis Hodgson, 1970. 2 v.

- Alvear, A. Bibliografía de bibliografías agrícolas de América Latina. Turrialba, Costa Rica, Instituto Interamericano de Ciencias Agrícolas, 1969. 121 p.
- Basic library list for forestry. 3rd ed. Oxford, Commonwealth Forestry Institute, 1963. 56 p.
- Blanchard, J.H. Literature of agricultural research. Berkeley, University of California Press, 1958. 231 p.
- Boalch, D.H. Current literature on agriculture in tropical and subtropical countries. *British Book News*, Jan. 1961. No. 245.
- Boalch, D.H., ed. Current agricultural serials; a world list of serials in agriculture and related subjects (excluding forestry and fisheries) current in 1964. Oxford, International Association of Agricultural Librarians and Documentalists, 1965-67. 2 v.
- Bush, E.A.R. Agriculture; a bibliographic guide. London, Macdonald, 1972. 2 v.
- Catalogue of annuals currently received by the library. Rome, Italy, FAO, 1968. 314 p. (The Catalogue is up-dated in: FAO library list of current accessions)
- Catalogue of serials in the Indian Agricultural Research Institute Library. New Delhi, Indian National Scientific Documentation Centre, 1967. 660 p.
- Curtis, J.M. & R.J. Beiter. Publications issued by the Department of Agricultural Economics, University of Maryland, 1923-1968. College Park, Md., 1968. 25 p. (Agr. Econ. Infor. Series. College of Agriculture, Univ. of Maryland, No. 48)
- Hemmings, E.F., ed. Basic library list for forestry. Oxford, U.K. Commonwealth Forestry Institute, Oxford University, 1967. 60 p.
- Horticultural research international: directory of horticultural research institutes and their activities in 54 countries. (2nd ed. revised) Wageningen, the Netherlands, PUDOC, 1972. 538 p.
- Howse, J.S. List of periodicals and series in the Forestry Library of the University of Oxford. Oxford, U.K. Commonwealth Forestry Institute, 1968. 187 p.
- International directory of agricultural engineering institutions. Rome, Italy, FAO, 1968

Koster, G. Bronnenmateriaal op het gebied van de landbouw en aanverwante gebieden. (Source material in the field of agricultural and related subjects.) Wageningen, the Netherlands, Centrum voor Landbouwpublikaties en Landbouwdocumentatie, 1967. 57 p.

Lauche, R. Internationales Handbuch der Bibliographien des Landbaues. München, Germany, Bayer. Landwirtschafts Verlag, 1957.

Serial publications indexed in Bibliography of Agriculture. Washington, D.C. National Agricultural Library, 1968. 94 p.

Series providing source documents in the field of food and agricultural sciences and technology. A reference list. Part 2. Geographic list. Rome, Italy, FAO, AGRIS Coordinating Centre, 1976. 319 p. (FAO/AGRIS 13)

Singhvi, M.L. & D.S. Shrimali. Reference sources in agriculture. An annotated bibliography. Udaipur, Rajasthan College of Agriculture. Consumers Co-operative Society, Ltd., 1962.

U.S. Department of Agriculture. List of available publications of the United States Department of Agriculture. List No. 11, 1976. Washington, D.C., Superintendent of Documents, U.S. Government Printing Office.

Velasquez, P. & R. Nadurille. Obras de consulta agrícolas en español. México, Instituto Nacional de Investigaciones Agrícolas, 1967. 263 p.

c. Related fields

Blackwelder, R.E. Guide to the taxonomic literature of vertebrates. Ames, Iowa State University Press, 1972. 259 p.

Blake, J.B. & Ch. Roos. Medical reference works, 1679-1966; a selected bibliography. Chicago, Ill., Medical Library Assoc., 1967. 343 p. Suppl. 1, 1970. 46 p. Suppl. 2, 1973. 174 p.

Bottle, R.T. ed. The use of chemical literature. 2nd ed. London, Butterworth [Hamden, Conn., Archon Books], 1969. 294 p.

Bottle, R.T. and H.V. Wyatt. The use of biological literature. 2nd ed. Hamden, Conn., Archon Books, 1971. 379 p.

Brewer, J.G. The literature of geography; a guide to its organisation and use. London, Bingley [Hamden, Conn., Linnet Books], 1973. 208 p.

- Crane, E.J., A.M. Patterson & E.B. Marr. A guide to the literature of chemistry. 2nd ed. New York, Wiley, 1957. 397 p.
- Fletcher, J., ed. The use of economics literature. London, Butterworths [Hamden, Conn., Archon Books], 1971. 309 p.
- Grainger, T.H. A guide to the history of bacteriology. New York, Ronald Press, 1958. 210 p. (Chronica Botanica, No. 18)
- Grogan, D.J. Science and technology; an introduction to the literature. 2nd ed. rev. London, Bingley [Hamden, Conn., Linnet Books], 1973. 254 p.
- Guide sommaire des ouvrages de référence en sciences sociales. Paris, A. Colin, 1969. 61 p.
- Hoselitz, B.F. A reader's guide to the social sciences. Rev. ed. New York, Free Press, 1970. 425 p.
- International catalogue of scientific literature. London, Harrison, 1902-19. 14 v.
- Kerker, A.E. & H.T. Murphy. Biological and biomedical resource literature. Lafayette, Indiana, Purdue University, 1968. 226 p.
- Levine, H.M. & D.B. Owen. An American guide to British social science resources. Metuchen, N.J., Scarecrow Press, 1976. 293 p.
- Lewis, P.R. The literature of the social sciences; an introductory survey and guide. London, Library Association, 1960. 222 p.
- Mackay, J.W. Sources of information for the literature of geology; an introductory guide. 2nd ed. London, Geological Society of London, 1974. 59 p.
- Mellon, M.G. Chemical publications, their nature and use. 4th ed. New York, McGraw-Hill, 1965. 324 p.
- Smith, R.C. Guide to the literature of the zoological sciences. 6th ed. Minneapolis, Minn., Burgess, 1962.
- Smith, R.C. & W.M. Reid. Guide to the literature of the life sciences. 8th ed. Minneapolis, Minn., 1972. 66 p.
- Ván der Leeden, F. Ground water; a selected bibliography. Port Washington, N.Y., Water Information Center, 1971. 116 p.

Ward, D.C. & M.W. Wheeler. Geologic reference sources. Metuchen, N.J.,
Scarecrow Press, 1972. 453 p.

Whitford, R.H. Physics literature; a reference manual. 2nd ed. Metuchen, N.J.,
Scarecrow Press, 1968. 272 p.

Wood, D.N., ed. Use of the earth sciences literature. Hamden, Conn., Archon
Books, 1973. 459 p.

Appendix VIII

SPECIALIZED AGRICULTURAL BIBLIOGRAPHIES

- Anderson, W. *The strawberry; a world bibliography, 1920-1966*. Metuchen, N.J., Scarecrow Press, 1969. 731 p.
- Barton, L.V., ed. *Bibliography of seeds*. New York, Columbia University Press, 1967. 858 p.
- Bibliography, A, of contributions to natural rubber research from the Rubber Research Institute of Malaya, 1927-1967. Comp. by J.S. Soosai and Kow Hun Wook, Kuala Lumpur, 1968. 140 p.
- Bibliography of corn [prepared for the International Maize and Wheat Improvement Center, Mexico]. Metuchen, N.J., Scarecrow Press, 1971. 3 v.
- Bibliography of potato diseases through 1945; with common and scientific names. Washington, D.C., U.S. Department of Agriculture, 1970. 243 p. (Miscellaneous publications. Agricultural Research Service, USDA, No. 1162)
- Bibliography of wheat [prepared for the International Maize and Wheat Improvement Center, Mexico]. Metuchen, N.J. Scarecrow Press, 1971. 3 v.
- Blumenbach, D. *Pestizide in der Umwelt; eine Bibliographie über Nebenwirkungen, Rückstände und Schutzmassnahmen*. Berlin, 1971, 146 p. (Mitteilungen aus der Biologischen Bundesanstalt für Land- und Forstwirtschaft, Heft 141)
- Drew, J.V., ed. *Selected papers in soil formation and classification*. Madison, Wis., Soil Science Society of America, 1967. 428 p. (SSSA Special Publication Series, No. 1)
- The economics of fertilizer use. CBAE, Oxford, 1971. 22 p. Annotated bibliography. (Commonwealth Bureau of Agricultural Economics, No. 4)
- Effects of fertilizers on water quality; a collection of abstracts and references dealing with the relationships between fertilization and agricultural lands and chemical composition of surface and ground waters. Muscle Shoals, Alab., National Fertilizer Development Center, Tennessee Valley Authority, 1969. 107 p.

The green revolution. CBAE, Oxford, 1971. 17 p. Annotated bibliography.
(Commonwealth Bureau of Agricultural Economics, No. 1)

Guide to the literature of sugar industry; an annotated bibliographical guide to the literature on sugar and its manufacture from beet and cane. Comp. by M. Schalit. Amsterdam, 1970. 172 p.

Ingram, J.S. Selected bibliography on cassava (*Manihot esculenta* Crantz). London, 1970. 35 p. (Tropical Products Institute Report No. 51)

Jadhav, P.S., Jain, T.C. & Prasonnalakshmi, S. Sorghum-Millet-Peas; a bibliography of the Indian literature, 1969-1973. Hyderabad, ICRISAT, 1975. 116 p.

Knight, R.L. Abstract bibliography of fruit breeding and genetics. Prunus. CAB, Farnham Royal, 1969. 649 p. (Technical communication. Commonwealth Bureau of Horticulture and Plantation Crops, No. 31)

Land reform; annotated bibliography; author and subject index. Rome, FAO, 1971. 226 p.

Littleton, I.T. The literature of agricultural economics: its bibliographic organization and use. North Carolina, A.E.S., 1969. (Technical Bulletin No. 191)

Marin, C.M., comp. Tobacco; bibliography of books at the D.H. Hill Library. Raleigh, North Carolina State University, 1968. 50 p.

Marin, C.M. Tobacco literature; a bibliography of publications in the United States Library of Congress. 1970. 303 p. (Bulletin. Agricultural Experiment Station. North Carolina State University, No. 439)

Millet; a bibliography of the world literature covering the years 1930-1963. (George Washington University, Washington, D.C. Biological Sciences Communication Project). Metuchen, N.J., Scarecrow Press, 1967. 154 p.

Montaldo, A. Bibliografía de raíces y tuberculos tropicales. (Bibliography of tropical roots and tuber crops.) Maracay, 1967. 595 p. (Revista de la Facultad de Agronomía de la Universidad Central de Venezuela, No. 13)

Paardekooper, E.C. Abstract bibliography of hevea rubber. Kohong, 1969-1970. 5 v. (Library information bulletin. Rubber Research Centre, Hat Yai, Thailand, 1969)

Rachie, K.O. Millets and minor cereals; a bibliography of the world literature on millets pre 1930 and 1964-1969; and of all literature on other minor cereals. Metuchen, N.J., Scarecrow Press, 1974. 202 p.

Ramos, M.M. International bibliography on cropping systems 1973-1974. Los Baños, Philippines, International Rice Research Institute, 1976.

The response of tropical herbage species to nitrogen fertilizers. Maidenhead, 1971. 31 p. Annotated bibliography. (Commonwealth Bureau of Pastures and Field Crops, No. 1251)

Rural development literature. An annotated bibliography 1969-1975. [Prepared for the National Agricultural Library, Beltsville, Md., 20705, USA] Washington, D.C., Rural Development Service, USDA, 1976.

Sorghum; a bibliography of the world literature covering the years 1930-1963. (George Washington University, Washington, D.C., Biological Sciences Communication Project), Metuchen, N.J., Scarecrow Press, 1967. 301 p.

Sorghum; a bibliography of the world literature, 1964-1969. (Rockefeller Foundation. India Agricultural Program). Metuchen, N.J., Scarecrow Press, 1973. 393 p.

Appendix IX

SOME IMPORTANT CURRENT AGRICULTURAL JOURNALS

Agricultural engineering (monthly)

The American Society of Agricultural Engineers, 420 Main Street, St. Joseph, Mich., USA

Agricultural research journal of Kerala

Agricultural College Research Institute, Trivandrum, India

L'agronomie tropicale (monthly)

Serie II.: Agronomie Générale Tropicale et Institut de Recherches Agronomiques des Cultures, Paris, France

Agronomy journal (monthly)

American Society of Agronomy, 2702 Monroe Street, Madison, Wis., USA

Alexandria journal of agricultural research (irregular)

University of Alexandria, Faculty of Agriculture, Alexandria, Egypt

American journal of agricultural economics

University of Kentucky, Department of Agricultural Economics, Lexington, Ken., USA

American journal of veterinary research (monthly)

American Veterinary Medical Association, 930 N Meacham Road, Schaumburg, Ill., USA

Animal production. Journal of the British society of animal production (2 times.a year)

Oliver & Boyd Ltd., Tweeddale Court, 14 High Street, Edinburgh, Scotland

Annales agronomiques

Institut National de la Recherche Agronomique, Paris, France

Annales de Gembloux (quarterly)

Faculté des Sciences Agronomiques, 5800 Gembloux, Belgique

Annales de génétique et de sélection animale (quarterly)

Institut National de la Recherche Agronomique, Versailles, France

Annales de la Société Entomologique de France

Nouvelle série: Revue d'Entomologie Générale et Appliqué, v. 13- 1977-
(quarterly). Société Entomologique de France, 45 rue Buffon, Paris, France

Annales de l'amélioration des plantes

Institut National de la Recherche Agronomique, Paris, France

Annales de recherches vétérinaires (quarterly)

Institut National de la Recherche Agronomique CNRA, Route de Saint-Cyr,
Versailles, France

Annals of applied biology (quarterly)

Association of Applied Biologists, 200 Euston Road, London N.W. 1, England

Australian journal of agricultural research (monthly)

Commonwealth Scientific and Industrial Research Organisation, 314 Albert
Street, East Melbourne C.2, Victoria, Australia

Coton et fibres tropicales (bi-monthly)

Institut de Recherches du Coton et des Textiles Exotiques, 29 rue d'Artois,
Paris 8e, France

Economic botany (quarterly)

Monumental Printing Co., 32 W. Street and Elm Avenue, Baltimore 11, Md.,
USA

Experimental agriculture (quarterly)

Oxford University Press, London, England. (Supersedes: Empire Journal of
Experimental Agriculture)

Extension service review (monthly)

Cooperative Extension Service, U.S. Department of Agriculture, Washington,
D.C., USA

FAO plant protection bulletin (monthly)

FAO, Via delle Terme di Caracalla, Rome, Italy

Farm mechanization and buildings (monthly)

Bowling Green Lane, London E.C. 1, England

Horticultural research (semi-annual)

Oliver & Boyd, Ltd., Tweeddale Court, 14 High Street, Edinburgh, Scotland

Indian journal of agricultural sciences (quarterly)

Indian Council of Agricultural Research, New Delhi, India

Indian journal of agronomy (quarterly)

Indian Society of Agronomy, New Delhi, India

Indian journal of genetics and plant breeding (three times a year)

Indian Society of Genetics and Plant Breeding, New Delhi, India

Indian journal of nutrition and dietetics

Sri Avinashilingam Home Science College, Coimbatore, India

International pest control (monthly)

Rhodes Ind. Services Ltd., 36 Charges Street, London, England

Journal of agricultural and food chemistry (bi-monthly)

American Chemical Society, 1155 16th Street, N.W., Washington, D.C., USA

Journal of agricultural economics (monthly)

Reading, England

Journal of agricultural science (quarterly)

Cambridge University Press, London, England

Journal of dairy research (3 times a year)

Cambridge University Press, London, England

Journal of dairy science (monthly)

American Dairy Science Association, Station A, Box 718, Champaign, Ill.,
USA

Journal of economic entomology (quarterly)

Entomological Society of America, 1530 P Street, N.W., Washington, D.C.,
USA

Journal of food science (bi-monthly)

Institute of Food Technologists, 221 N LaSalle Street, Suite 2120, Chicago,
Ill., USA

Journal of horticultural science (quarterly)

Horticultural and Agricultural Research Station, Long Ashton, Bristol,
England

Journal of soil science (semi annually)

Commonwealth Bureau of Soil Science, Rothamsted Experimental Station,
Harpenden, England

- Journal of the American veterinary medical association (semi-monthly)
930 N Meacham Road, Schaumburg, Ill., USA
- Journal of the science of food and agriculture (including abstracts) (monthly)
Society of Chemical Industry, 14 Belgrave Square, London, England
- Malaysian agricultural journal (2 times a year)
Ministry of Agriculture and Rural Development, Kuala Lumpur, Malaysia
- Monthly bulletin of agricultural economics and statistics
FAO, Via delle Terme di Caracalla, Rome, Italy
- Nature and resources (quarterly)
UNESCO, Natural Resources Research Division, Paris 1, France (Supersedes:
Arid Zone. Available also in French as: Nature et ressources)
- Nematologica (quarterly)
International Journal of Nematological Research, Dr. P. van der Laan,
Marterlaan 18, Bennekom, the Netherlands
- Netherlands journal of agricultural sciences (quarterly)
PUDOC, Wageningen, the Netherlands
- New Zealand journal of agricultural research (bi-monthly)
Department of Science and Industrial Research, Wellington, New Zealand
- Oléagineux. Revue générale des corps gras et dérivés (monthly)
Institut de Recherches pour les Huiles et Oléagineux (IRHO), 8 Square
Petrarque, Paris 16e, France
- Philippine agriculturist (bi-monthly)
University of the Philippines, College of Agriculture, Los Baños, College,
Laguna, Philippines
- Phytopathologische Zeitschrift. Journal of phytopathology (quarterly)
Verlag Paul Parey, Berlin & Hamburg, Germany
- Phytopathology (monthly)
The American Phytopathological Society, Baltimore, Md., USA
- Plant and soil (quarterly)
Koninklijk Genootschap voor Landbouwwetenschap, P.O. Box 269, The Hague,
the Netherlands

Plant pathology (quarterly)

HMSO, London, England

Poultry science (bi-monthly)

Poultry Science Association, College Station, Texas, USA

Proceedings of the American society for horticultural science (2 times a year)

Cornell University, Ithaca, N.Y., USA

Rural sociology (quarterly)

Rural Sociological Society, Texas A & M University, College Station, Texas,
USA

Soil science (monthly)

Williams and Wilkins Co., 428 East Preston Street, Baltimore 2, Md., USA

Sols africains. African soils

Inter-African Information Bureau for Soil Conservation and Land Utilisation,
Paris, France

Tropical agriculture. The journal of the College of Tropical Agriculture
(quarterly)

University of West Indies, Faculty of Agriculture, 88 Kingsway, London
W.C.2, England

Tropical science (quarterly)

Tropical Products Institute, 56-62 Gray's Inn Road, London, W.C. 1, England
(Formerly: Colonial Plant and Animal Products)

Unasylva. An international review of forestry and forest products (quarterly)

FAO, Via delle Terme di Caracalla, Rome, Italy

World crops. The international journal of agriculture (monthly)

The Tower, Shepherds Bush Road, Hammersmith, Riverside 3071, London W.6,
England

Yearbook of agriculture (yearly)

U.S. Department of Agriculture, Washington, D.C., USA

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