

DOCUMENTATION

1961 SERIES

FOOD AND AGRICULTURE

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AGRICULTURAL DOCUMENTATION:

THE RESPONSIBILITIES

OF LIBRARIES

AND INFORMATION SERVICES

24(J):7.5N.N6
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**PUBLISHED BY THE EUROPEAN PRODUCTIVITY AGENCY
ORGANISATION FOR EUROPEAN ECONOMIC CO-OPERATION**

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AGRICULTURAL DOCUMENTATION:

THE RESPONSIBILITIES OF

LIBRARIES AND INFORMATION SERVICES

PROJECT No. 6/15 (FATIS)

Published by the EUROPEAN PRODUCTIVITY AGENCY
DIVISION FOR TECHNICAL ACTION AND PRODUCTIVITY IN AGRICULTURE AND FOOD
ORGANISATION FOR EUROPEAN ECONOMIC CO-OPERATION

The Organisation for European Economic Co-operation comprises the following Member countries: Austria, Belgium, Denmark, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey and the United Kingdom. The Organisation came into being with the signing of the Convention for European Economic Co-operation on 16th April 1948, when Member Governments pledged themselves "to combine their economic strength, to join together to make the fullest collective use of their individual capacities and potentialities, to increase their production, develop and modernise their industrial and agricultural equipment, expand their commerce, reduce progressively barriers to trade among themselves, promote full employment and restore or maintain the stability of their economies and general confidence in their national currencies". Representatives of each of the Member countries meet daily at the O.E.E.C. headquarters, Château de la Muette, Paris, to discuss their economic problems and work out common solutions. The United States and Canada participate in all the work of the Organisation as Associate Members. Yugoslavia is represented by an observer. Since 1957, she has taken part fully in the work of the O.E.E.C. European Productivity Agency. Moreover, since July 1959, she has participated on an equal footing with Member countries in the Organisation's work on agriculture and food.

The European Productivity Agency, which is responsible for the publication of the present report, was set up as a new branch of the O.E.E.C. in May 1953. Its task is to stimulate productivity, and thereby raise European standards of living, by influencing not only Governments but also industrial, agricultural and research organisations, private and collective enterprises and public services. One of its primary aims is to convince management and workers alike of the benefits of productivity and to enlist their co-operation.

Published in March 1961

FOREWORD

The rapid and continually increasing growth, since the end of the war, in the output of technical literature concerning the many disciplines which contribute to agricultural science has created a serious problem. How far are agricultural libraries and documentation centres succeeding in channelling the immense flood of information to the research scientists, industrial concerns, advisory workers, farmers and students whom they exist to serve? By what means can their service be made more efficient, comprehensive and rapid?

In order to study these questions the European Productivity Agency of the O.E.E.C. arranged a seminar on the subject of "Agricultural Documentation: the Responsibilities of Libraries and Information Services". It was organised by the Ministry of Food, Agriculture and Forestry and the Research Council of Food, Agriculture and Forestry of Germany in conjunction with the International Association of Agricultural Librarians and Documentalists (I.A.A.L.D.). The seminar was held at the Agricultural College, Stuttgart-Hohenheim on 20th-23rd April, 1960; the recommendations of the seminar and a list of the participants are given in an Appendix.

The present report, of which Mr. D.H. Boalch, Librarian to the Rothamsted Experimental Station in the United Kingdom, has acted as general editor, is based on papers submitted by the principal speakers at the seminar and at the discussions to which they gave rise.

In publishing this report the O.E.E.C. wishes to express its gratitude to the authorities in the host country, Germany, and especially the President and staff of the Agricultural College at Stuttgart-Hohenheim, for the excellent facilities provided for holding the seminar. Sincere thanks are also due to the guest speakers from many countries whose papers contributed greatly to the success of the event, and to the personnel of the I.A.A.L.D. for their continuous interest both in helping to plan and to carry out this activity.

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INTRODUCTION

At a time when conditions have developed under which it can prove cheaper to carry out a substantial piece of scientific research than to find out by searching the literature whether it has already been done, agricultural librarians and documentalists, as well as their colleagues in the other sciences, should ask themselves some searching questions. Recognition that today's rate of increase of the world population will present the next generation with a very serious problem has greatly stimulated research in food production and nutrition; but unless the results of this research are co-ordinated and made available for practical application, the work will have been done in vain.

Librarians and documentalists constitute a vital link in the chain between research and practice; their responsibilities are therefore heavy. Techniques and procedures in documentation that were adequate thirty years ago will have to be revised or even abandoned; an example of progress in this field is provided by the method of automatic circulation of current periodical issues developed by the Canada Department of Agriculture Library system. Mechanical aids in the storing and retrieval of information and in other routine processes of documentation should be most carefully studied; but they are unlikely to be adapted to the needs of the average agricultural library for some time to come and will demand, for their successful use, a higher standard of professional expertise than is common among librarians today. Meanwhile a more intelligent use of existing resources coupled with the development of inter-regional and international co-operation could increase the efficiency of all types of documentation service to a quite unsuspected degree within a short time. The "Scandia" plan shows how well-planned co-operation can save shelf-space and avoid the wasteful duplication of labour at one blow.

Opinions are divided as to the best approach to the problem of classifying books, scientific papers and information; but there is a growing realisation of the importance of classification both to the documentalist and to the abstractor, and of the fact that its successful accomplishment may demand a much higher degree of scientific perception than has normally been associated with it.

An adjoining link, in the chain between research and practice, to the documentalist is the agricultural advisory worker. The liaison between these two is often still weak, and the tendency has been for the librarian and documentalist to regard this problem as his neighbour's rather than his own. But careful study of the advisory worker's requirements and

a well-planned effort to meet them could halve the time taken at present for valuable innovations to travel from the laboratory to the field.

The usefulness of the exchange of publications between libraries has long been recognised and is being increasingly exploited. But the exchanging of library staff, as a means of sparking off new ideas and stimulating increased efficiency, has lagged far behind. Determined efforts are required to meet this situation, since there are formidable obstacles to be overcome.

The time is past when the task of assembling, storing and distributing scientific information was left entirely to the librarian and documentalist. The scientist himself, realising the fundamental importance of these processes, has turned his attention to the problems involved in them, and can offer valuable advice, not least because of the difference of his point of view from theirs. Here, then, is yet another field in which co-operation offers results beneficial to all concerned.

AGRICULTURAL RESEARCH AND REFERENCE LIBRARIES AND THEIR ROLES AS AGENCIES OF INFORMATION

There is today a steadily increasing world-wide concern with the problems of population growth and the attendant needs for agricultural products. A dramatic presentation of the problem is given by Dr. Bernhard Grzimek in his recent book Kein Platz für Wilde Tiere. He points out that by this time tomorrow the population of the earth will have increased by 100,000. Within one month the accumulated increase of 3,000,000 people will result in food needs requiring new arable land equal in size to the entire area of Württemberg. He then adds that of all the earth's surface only two per cent is arable land. All the rest is water, mountains, deserts and ice. From this we can understand the great pressures today for increased agricultural information and research.

If full use is to be made of the arable land to meet the needs of the explosive population growth, scientists must exploit every avenue of research. The library does not itself conduct agricultural research. What part then do librarians, documentalists and information specialists have in this significant area?

"Next to scientists themselves, perhaps the most important prerequisite of successful and productive research is availability of scientific literature. Many people think of scientific publications as products of research. But they are also one of the scientist's most important tools". Dr. Byron T. Shaw, Administrator of Agricultural Research Service, made this statement recently in support of the United States Department of Agriculture Library at Budget Hearings in the United States Congress. This answers in essence the question concerning our responsibilities in the total research programme. We represent only a small part, from a numerical or fiscal standpoint, of the total research activity. However, a measure of the significance of our work is shown by the lively interest of national and international scientific societies in the problems of information control, storage and retrieval.

Scientists and the Problem

Scientists and management experts look with apprehension at the increasing proportion of the research worker's time that is spent in the search for information. A recent United States study showed that in the field of chemical research the average scientist spent over 50 per cent of his time in information activities (searching for information, reading reports, preparing reports, studying abstracts,

discussing problems with fellow scientists, and exchange of information at scientific meetings). The National Science Foundation discovered that the average research scientist and engineer in the United States spends 20 per cent of his working time in searching literature. The Agricultural Research Council (representing all research activities of the United States Department of Agriculture) recently completed a brief informal survey to provide a rough estimate of the worker's time used to keep abreast of scientific developments. They estimated that U.S.D.A. research workers "utilise an average of 13 per cent of their official time in library research". The Committee then converted this 13 per cent into dollars and found that "\$7,000,000 of the Department's salaries expenditures (are) used for this work". In other words, they estimated that of the Department's total salary payments to scientists, \$7,000,000 is paid for the time they use in searching, locating and using scientific information.

This illustrates the importance of effective library information in scientific research and development - importance for the administrator as well as the individual scientist. Both look to use for improvements which will provide quicker and more effective access to scientific information, and will enable the scientists to use more of their time for active research.

The voices expressing greatest concern over the inadequacies of libraries and documentation centres in meeting the impact of scientific publications were for many years those of librarians and documentalists. Now, however, the scientists themselves are very active in efforts to assess the problem, develop new programmes and devise new techniques for handling scientific publications. Within the United States the American Institute of Biological Sciences, which embraces most of the sciences covered by the broad field of agriculture, organised an ad hoc committee of experts known as the "Biological Communications Study Group", which aims at providing direct aid to biologists in three ways: by assessing the present and future needs of biologists for communications services, by analysing and evaluating present facilities and services available to biologists, and by formulating a co-ordinated programme of communication services for the biological sciences. This is cited as one of the many groups representing special scientific interests in the information problem.

Developments since 1937

To visualise the urgent need for such committees we must be aware of the changes that have taken place in the past quarter of a century. An accurate picture of the status of scientific bibliography earlier in the twentieth century can be found in reports by scientists and librarians.

In 1937 Dr. L. Bultingaire of the Musée National d'Histoire Naturelle, Paris, reported "We can say that, provided he knows how to find his way among retrospective and current bibliographies, the scientific worker finds easily enough the notices of work which has been done on the subject

which interests him, with exact bibliographical reference"(1). This is no longer true. Even if the scientist has available all the retrospective current, national, regional and specialised bibliographies - and in the biological sciences these would be a small library in themselves - he cannot keep completely abreast of his particular subject. There is no certainty that he could even find his specific reference to a known article.

What has happened since 1937? First, the annual production of scientific books and journals as well as the output of specialised reports has more than doubled. The rate of growth continues unabated. New research each day generates research papers and the new research papers are the grist for additional research. This is the scientists' continuum. We are faced in the field of agriculture with such expanding research interests that we must be aware of scientific developments and publications in every country of the world.

The intensified interest in agricultural research is common to every country, from the so-called under-developed to the self-styled highly developed country. A significant by-product of all research is scientific information and publication. All who have followed the recent studies on scientific information know that estimates of the growth of scientific information seem to be readily prepared and available for any emergency. Unfortunately many of the data are based on prior estimates whose scientific reliability is highly dubious. One should be careful, therefore, not to muddy further this stream of information or misinformation. However, from a collection of separate studies made within the Library of the United States Department of Agriculture we can conservatively estimate that the output of scientific journals in agriculture, in its broadest sense, has increased by 100 per cent in the past 20 years, and by at least 25 per cent in the past ten years, and is still growing each year. It is large enough to challenge all of us and to make us ask how long we can independently try to handle this mass of publications. To illustrate the problem more specifically, we know that there are at least 100 countries today publishing significant agricultural information. We know that this information appears in at least 50 different languages. We know further that there are at least 25,000 different serial publications that contain data necessary for our research workers. We know that there are at least 50 different scientific fields whose reports are important to the agricultural research worker. An examination of studies in progress in the United States Department of Agriculture in veterinary medicine showed work based on such scientific fields as: bacteriology, biology, chemistry, cytology, helminthology, immunology, microbiology, mycology, pathology, physiology, physiopathology, protozoology, rickettsiology, serology, toxicology and virology.

Technology and Libraries

Libraries and the bibliographic apparatus have not been able to keep pace with the plethora of publications. As Professor Ridenour pointed out ... "We live in a technological

society, and the most prominent aspect of that society is change. This change is profound and rapid. It is wrought entirely by technological advance. It is irresistible, in the sense that change is produced by the preference of individuals for the goods and services which an improved technology can bring. Libraries have suffered from this social change, but to date they have benefited little from it. By this remark I mean that the new technologies have created new literature for the libraries to store and index, while the techniques of that storing and indexing have changed very little despite the past decades of flourishing technology"(2).

This is a fact that must be faced. Technological advances have not given us any major assistance in our work. For most of us working in medium-sized or small libraries, there is little evidence that we can expect immediate help from new mechanical developments.

Our Present Task

The elements of our work are not formidable. As we approach them individually, however, in the framework of published information today, we find a developing complex of great magnitude. Most of our responsibilities are traditional and universally recognised. They include: current knowledge and awareness of published scientific information in all parts of the world; acquiring as many publications as possible needed by our immediate users; rapid and effective organisation of the publications; and effective service to our clientele.

Three specific items will be examined here with the aim of providing scientists with better access to scientific information: (1) acquisitions - we must locate, select and acquire currently those publications which are important to our clientele; (2) processing - we must process these printed materials and make them readily available for use; and (3) serving - we must provide personal service through abstracts, bibliographies, photocopying and reference and loan facilities. The responsibilities of an agricultural library and its capacity for service can be better understood when we look in detail at some of these activities.

Acquisitions

Strange to say, many libraries have never defined their specific fields of interest and their policy for the selection of publications. The time is long past when a library could hope to acquire publications with completeness in any comprehensive scientific area. Even if space, finances and staff were unlimited, it would be neither desirable nor economical for a library to attempt to accumulate the world's published output in its field. The ability to exercise judgement is a basic quality in good librarianship. Not only must we know how to locate and how to obtain those publications which are needed by our institutions, but we must be able to discriminate, to weigh, to evaluate, to judge and to eliminate those materials which do not meet our selection standard. We should

deplore the library which permits itself to become an institutional wastepaper basket, which accepts anything published, and which does not exercise a high degree of selectivity. We require, then, to be aware of world-wide developments in publications of scientific information, alert in locating and acquiring important publications and, finally, selective in determining what publications deserve our professional skills and attention.

Some of our activities can be assisted by mechanical aid and others through international co-operation; but the qualities of awareness, alertness and judgement cannot be mechanised.

Processing

The mechanics of acquiring publications are generally determined by local conditions and procurement regulations. There are at times inconvenient delays in the acquisition process, and often these delays are due to causes beyond our control.

Once the publication has been received, however, the processing responsibility is in our hands and we must assume full responsibility for the speed with which it is classified, catalogued and prepared for the reader. Our users are anxious to have access to publications as soon as possible after they are received. We must then tailor our methods to fit our staff and the publications we have to process, rather than attempt to conform to some pre-established traditional procedure. It is here that documentalists have made their most substantial contribution. They have been willing to break away from long-established and sometimes cumbersome methods of bibliographical and cataloguing procedures in order to expedite the availability and so increase the usefulness of information. Simplification and streamlining are being forced upon us, and it is important for us to establish methods that make maximum use of local resources.

Many librarians and documentalists have hoped that some newly developed machine, or some adaptation of data-processing equipment would solve our problems in the processing field. We must now face the fact that within the next few years data-processing and automation will have little to offer for smaller libraries. The very cost of these machines eliminates them from consideration either by the manufacturers or by the librarian as possible solutions to the problems of any but the largest libraries. All of our processing activities should be simplified without delay.

Service to Readers

Although service to the reader is examined last here, in actual practice it should be the first interest in library operation. We must study our clientele and know their needs. Our whole library system should be built around the user. This is not to imply that we merely question the users as to what they want and then find means to fill these wants. Our job

is much more imaginative and creative. We must, from our own background of experience and training, try to assess what the reader says he wants and then determine whether or not this coincides with what he really needs. It is much like the process of answering a reference question. Anyone with experience of reference work realises how difficult it is to find out what the questioner really desires.

Most of the studies that have been made in the past few years to determine the needs of research workers have neglected to point out to the worker the possibility of new and unusual methods which might be developed to meet his needs more adequately than currently available techniques. When we have questioned the scientist concerning the usefulness of bibliographic tools his judgement has naturally been based on the publications he has used. There is in this field a fine balance to be maintained between providing the fullest service to our clientele and becoming completely subservient to demands for personal attention. We must avoid the danger of meeting the needs of the most vociferous users and ignoring the requirements of the general reader.

Future Developments

Documentalists in many countries are exploring new and unconventional methods for organising and arranging publications for library use. Semantic factoring, uniterm systems and a variety of other methods for classifying information are now being tried in experimental programmes. However, most of us will be compelled to continue with modifications of our present systems until we have available far more specific and extensive information than is now available on the value of these new classification systems.

The fields of bibliography, abstracts and dissemination of information demand our co-operative efforts and ingenuity. We are indeed fortunate in having the abstract journals of the Commonwealth Agricultural Bureaux as the nucleus for our dissemination work. For current awareness and searches we have, of course, the Bibliography of Agriculture which, although broad in scope, is limited to those publications which are acquired by the United States Department of Agriculture Library. Yet this bibliography falls further behind each year in its attempt to give full coverage of agricultural information. We must have both national and international co-ordination and co-operation in the field of scientific agricultural information. In a paper presented at a recent meeting in Paris of the Organisation for European Economic Co-operation, Dr. S. von Frauendorfer made some interesting comparisons of various agricultural libraries throughout the world and illustrated the twenty-year growth of a few(3). Although in every case there had been an increase of two to five times in the number of periodicals received currently in these twenty years, the growth in staff in most cases was negligible. We must all face the unpleasant fact that library support has in no way kept pace with the amount of publications to be covered nor with the responsibilities placed upon the library for support of research. We may optimistically hope for an eventual improvement in our status, but we must

find immediate means to solve some of our pressing problems. Strong international co-operation among agricultural librarians in the collection, organisation and dissemination of information is the nearest approach to a panacea.

We must recognise that, in every case where machines are used effectively in the information processes, the libraries or information centres have already had available an adequate basic staff of librarians and scientific specialists. Most of us who have seen the advanced automation devices for information work are convinced that these will only aid us when we have reached a higher stage of professional development and have available more adequate staff and facilities. Meanwhile our effort should be, by developing our existing resources and promoting co-operation in all its aspects, to contribute something to the general advancement of agricultural research.

The Student's Point of View

So far we have considered our problem mainly from the point of view of research and the research worker. But many agricultural libraries serve primarily the student of agriculture. The agricultural student is less used to literature than the average science student. He comes from a farm and often goes back to practical farming. The need for books is less evident to him than to the student of history or philosophy. We have to accept this fact and guide him accordingly. We must make access to books as easy as possible for him. From this it follows that the library should be the information centre or - one may say - the heart of a college. It should also be located in the centre of the college area. To continue the analogy: the more strongly this heart is beating the better it is for the teaching, studying and research activities of the college.

The agricultural college library will naturally differ in many aspects from the library designed to meet the needs of the agricultural research worker. It may therefore be valuable to examine this type of library in some detail, with particular reference to a specific example - the library of the Agricultural College at Stuttgart-Hohenheim, Germany.

The Reading Room should be equipped in such a way that it encourages readers to stay and study. It should invite the student to make use of the books. It should be able to accommodate about ten per cent of the total students. From the library of the reading room books are loaned to those working in the reading room, but are not to be taken out. From this it follows that important publications have to be obtained in duplicate in order to make them available on loan. The Library of the reading room should include reference books and lexicons as well as the main texts, and standard reference books on the specific subjects studied in the university /as well as literature of general interest.

There should also be a room for periodicals where the most recent issues of the main technical periodicals, a number of periodicals of general interest, and also newspapers

are available. Today, Hohenheim offers about 400 periodicals. A technical library should however have between 1,200 and 1,400 periodicals if it is to contain most of the periodicals of importance for agricultural research of today. About 200-300 of these should be available in the reading room.

The "open access" type of library is so far almost non-existent in German scientific libraries. It is only recently that the library of the Technical University of Munich has applied open access to a limited part of its stock; the system will be operated in the libraries of the technical universities of Stuttgart and Karlsruhe which are still under construction. It is planned that about 20 per cent of the present stock of the Hohenheim library - which means about 10,000 volumes - should be made available under the open access system. This will include the last ten volumes of the more important periodicals and the principal technical literature of the past 20 years.

In addition to the open access library, there must be a library for text books. As long as the universities do not provide free text books to the students the latter will often be unable to obtain expensive text books. The library should consequently have at its disposal a sufficient number of the principal study books used in, or recommended by the faculty. There should be one copy of each text book for about every ten students. After the issue of a new edition the necessary number of copies should be acquired.

Use of the library should be further simplified by the availability of technical aids. Sound-proof cubicles, in which the reader can use a typewriter for making extracts and summaries, are desirable. For regular readers who use card-index boxes, there must be drawers which can be locked. Photo-copying facilities should also be provided.

Besides the main college library (this is true of Hohenheim as well as elsewhere) the various departments have their own libraries whose stock is not normally lent out. These libraries serve the requirements of the departments concerned. The majority of the publications they contain should also be available in the main library of the university, and a central union catalogue should be maintained.

If the library is to be an effective information centre for the college, it must not only make its own stock easily accessible to the user but must also try to make available the holdings of other libraries. The staff of the library must be in a position to advise the user how to make use of available bibliographies, catalogues and other reference books. Courses should be held regularly for students on how to use the library.

Books which are not available at the library have to be obtained by borrowing from other libraries. The librarian should therefore be well informed about the stocks of other libraries, and should obtain as many catalogues of other libraries as possible. The Deutscher Gesamtkatalog which was destroyed during the war reached the letters A and B only.

Instead of a general union catalogue, today we have regional catalogues (a catalogue for South-western Germany is located in Stuttgart, for example). These catalogues help readers to obtain books from nearby libraries. Close contact between the librarians, particularly of the technical libraries, is becoming increasingly essential.

Several difficulties confronting agricultural research- and reference- libraries were emphasised in discussion. The adequate covering of marginal subjects is a perennial problem; and even after published material has been collected its dissemination is frequently delayed by staff shortage, by financial difficulties, and by the language barrier - especially as regards publications from eastern Europe. Comprehensive abstracting and bibliographical services are essential, both to meet the problems outlined above and to help agricultural scientists and advisers to keep abreast of publications in their special fields. Delays in publication of scientific material are outside the documentalist's control; but prompt indexing and abstracting are essential to the rapid spread of important information once this has been published. To this end, indexing must be selective, particularly in view of the wide subject range and indefinite policy of many journals.

In smaller countries the development of a bibliographical service in one large special library is important, whereas in larger countries a co-operative, regional (or national) scheme is more economical.

Thought should be given to ascertaining more precisely the needs of the various readers served by libraries and documentation services - e.g. teachers, students, advisory and research workers, etc. All these vary, but all have to be catered for as economically as possible.

Most agricultural librarians hope that the coverage of the excellent United States Department of Agriculture Bibliography of agriculture will be extended *pari passu* with the continually increasing number of periodicals. As far as possible this is already done, but it is hampered by limitations of staff, and in any case it should be remembered that the Bibliography is primarily a tool for the staff of the Department of Agriculture and cannot cater specifically for outside interests. The proliferation of serials is appalling, but as long as personal promotion depends on the publication of papers there is little hope of reducing it. The repetitive publication of the same article in a number of journals is more reprehensible and should be firmly combated.

- (1) Bultingaire, L. 1937. L'Extension de la documentation scientifique par une utilisation plus rationnelle des périodiques. Rev. sci. 75, 448.
- (2) Ridenour, L.N. 1951. Bibliography in an Age of Science. Univ. of Illinois Press; p. 13.
- (3) Frauendorfer, S. v. 1959. The Exchange of documentation and the promotion of multilingual glossaries. Fatis Review No. 5, 1959.

TYPES OF ENQUIRY FROM VARIOUS KINDS OF READERS IN AGRICULTURAL LIBRARIES, AND TOOLS FOR ANSWERING THEM

Types of Enquiry

Analysis of a number of agricultural studies reveals that they very often show an ecological pattern. They frequently examine the plant or animal in its environment, and more especially those environmental factors which might (under certain influences) increase yield. Agricultural studies are the results of agricultural enquiries. It is easily understood that the enquiries, and the studies or documents resulting from these enquiries, have similar patterns and can be treated together in this context.

This ecological pattern may be called the "star" pattern. The centre of the star is the problem, or the concept or combination of concepts describing the problem, which usually has a compound structure. The terms describing the central problem will be termed the central components. The ecological or peripheral factors are the aspects. These aspects may, according to circumstances, be influencing factors, facets, properties and so on. The terms describing these aspects will be termed peripheral factors. Thus we have the subject matter of agricultural enquiries and the relevant documents described in a two-level-system: central components at the problem level and peripheral factors at the aspect level. For example, an enquiry may be about tomato diseases (these two terms being the central components) and all the possible factors influencing the occurrence of these diseases - factors such as sunlight, moisture, wind, soil structure, different fertilizers, rotation, seasonal influences, nearness to other crops and so on (all these terms being the peripheral factors).

The Tools for answering Enquiries

First we have the usual subject catalogues in the familiar classical form of vertical file (card index); then there are the various newer systems, to which we may give the collective name "co-ordinate-indexing systems". At this point we have only to ask, what is the essential tool? It is a series of entries giving a more or less complete analysis of documents, in terms describing the subject of these documents. And what we have to study at the moment is the way of matching our enquiries with these entries in our tools.

The Matching of Enquiries and Entries (see diagram 1)

What exactly is matched? Terms present in the entries in the tools, describing the subject matter (document analysis), are matched with the terms describing the enquiries. In the literature of documentation such terms are often called parameters. Now one may find on both sides (in the enquiry and in the entry) parameters on two levels: on the problem level, where the central components are the parameters, and on the aspect level, where the peripheral factors are the parameters. If the parameters are not matched at the problem level there is no possibility of a simultaneous match at the aspect level. A match at the aspect level can be achieved only if the parameters of the problem level are similar. In other words: when matching at the problem level one asks the system: do you have entries relating to a document about tomato diseases? At the aspect level, however, one can ask the system: do you have entries on a tomato disease document giving particulars about the influence of such and such factors? It is obvious that the match is more successful in the latter case than in the former.

Case A. This case is given in the first row of diagram 1. Here we have the situation in a large general agricultural library. The enquirer asks for a document on tomato diseases giving particulars about all kinds of factors possibly influencing the occurrence and control of these diseases. In a general library of this kind the pattern of enquiries is highly unstable and therefore unpredictable. They range over too wide a field to give the maker of the analysis of the documents special indications. This means that these analyses, and with them the entries, remain at a general and vague level. Our enquirer can match only with parameters of the central components level. Moreover he will find that in the tool available in this case (probably a subject-catalogue) there may be a heading "Tomato Diseases". But only publications dealing with tomato diseases and nothing else are listed here. The bulk of the relevant literature may well be either in publications with a wider scope (horticulture, greenhouse crops) or as a sideline in other more special publications (on tomato processing, tomato marketing, mosaic diseases caused by fungi) The success of the match will be only moderate under these circumstances.

Case B. In a catalogue of a general library of the type referred to in case A, there is frequently a certain aspect for which there is a constant stream of enquiries and that this stream is known to the cataloguer. He then says to the enquirer: if such and such a topic is discussed in a publication I always put an additional card under such and such a heading especially as we regularly have to deal with enquiries on this special topic. What does he do? He does what the cataloguer in a library of a specialised institute, e.g. on tomato growing always does (row 2 of diagram 1).

In the tool of such an institute the analysis of the document can be more specialised. This is shown in diagram 1 by the difference between the analysis made in the general library of the document Horticulture in the Netherlands (row 1) and the analysis of the same document made in the special

library on tomato growing (row 2). The enquiries in this special library are all about tomato growing, and this being so the cataloguer can analyse more according to the enquiry-pattern. Matching is still done at the level of the central components. But the success of the match may be greater than in Case A by virtue of the possibility of a better adapted analysis as indicated. The part of the catalogue mentioning the publications on tomato diseases might even be already further sub-divided into sub-headings, so that matching at the aspect level becomes possible in this part. This leads us to the next step, Case C.

Case C. Let us suppose that our enquirer is still unsatisfied. What will be his next move? He will make his own literature documentation, a card index which can concentrate on the specific problem, in this case tomato diseases. He can select from every publication items relevant to his subject and analyse different aspects. In some cases he will need only one phrase or only one full page of the publication in question. The entries in the system are adapted to one special group of enquiries, which is the only kind that have to be answered by this system. As the central components of both enquiry and document-analysis are similar, matching at the aspect level is possible.

Case D. Suppose now that there are still far fewer data in the literature than our enquirer needs. At this tactical moment he asks for money for research, as a result of which he finds documents with the required data. The documents themselves (in Case C only the entries) are made especially for answering the original enquiry. In most cases the document containing the data is at the same time the document analysis. In this case success in matching is assured: the documents were made to give the answers to the enquiry.

Similar situations are familiar in various fields of science. One has only to re-call the registers of patients in hospitals, the cards of the census bureau for demographic statistics, the indexes of chemical compounds with their properties as produced by firms in the field of chemical technology and so on. In our own field we have described already the (statistical) data compiled by agricultural research workers. Other good examples of Case D are the records relating to experimental plots in agriculture at Wageningen, the measurement records of the laboratory of animal husbandry at Beltsville where a kind of "Zoötron" is operated, the measurement records in the Phytotron of Professor Went at Pasadena. All these examples are records of data, made for the special purpose of answering a highly specific group of enquiries about the same problem or same central component (the experimental plot, the patient, the chemical compound etc.).

At this point let us examine a more elaborate example of Case C, which will give an idea of the relations between central components and peripheral factors.

Example of the Development of an Enquiry Pattern
(See diagram 2)

Let us suppose that in a certain region with an important tomato growing industry the head of the horticultural advisory service appoints a special officer to deal with tomato growing. This officer will start a system (presumably a card index) of literature references on tomato growing. Tomato growing is his central component. All factors influencing the growing of this crop are his peripheral factors. He will soon introduce the headings "fertilizers" and "diseases", later on perhaps "climate" and "varieties" also. Gradually the aspect "diseases" turns out to be the most important in this region, and a sub-heading for "mosaic diseases" appears.

At this point the officer becomes overworked and gets the assistant he has been asking for years. The assistant will take charge of the diseases section. He starts a file on it in the same way, perhaps basing it on parts of the original file. The assistant introduces the heading "greenhouse".

Now comes a climax. A disastrous year is experienced: mosaic disease ruins all the tomatoes and this calamity (as calamities always do) leads to the appointment of a research phytopathologist. His problem is "mosaic diseases of tomatoes" and especially its control. He soon finds out that seed treatment may be an important and promising control method, and so on. There are two different trends here: the first is the development of an increasingly scientific approach, by taking into account an increasing number of factors till finally we arrive at a complete study of all environmental factors affecting the occurrence of this disease. The second trend is that of narrowing-down the central problem, of specialisation, thus enabling the worker to go into finer details. The first trend develops during the work of a research worker: the second, during research as such.

In the diagram we have followed the double lines only, as an example, but development along the single lines is possible as well. Now, the diagram contains a dividing line between parameters 3 and 4. What is the idea of this line? With this question we come to the next point - the choice of the tool.

The Choice of Tool

For this choice the number of parameters to be matched is important, especially in the first choice, which is between conventional indices on one hand and co-ordinate indexing systems on the other. To illustrate this, let us return a moment to our familiar old-fashioned card index: if a document is about tomato diseases it must be traceable under T:D and D:T. If the document is about tomato diseases in relation to soil structure, it must be traceable under T:D:S and all the permutations. In this case 3 parameters have 6 permutations. With 4 parameters (now including e.g. climate also) we get 24 possible permutations; with 5 it is 120.

In no card index are all these permutations written out. Perhaps as many as 6, but never 24. This means that in a normal card index one cannot ask for a document with more than 3 parameters without a chance of missing the answer through using an absent permutation. We now assume that complete and free permutation is necessary (see below).

However, what is impossible in a conventional index is quite possible in a co-ordinate index system. There we bring the parameters into the system without any pre-co-ordination, and we co-ordinate (bring them together) only at the moment of searching. Which permutation is used to search the system is of no importance: the required combination always comes out. This leads to an important conclusion: with more than three parameters co-ordinate indexing systems are preferable; with three or fewer parameters conventional card indices are more satisfactory.

Let us return to our diagram 2. We saw there that the number of parameters at the aspect level increases much more readily and quickly than at the problem level. Thus at the aspect level the passing of the three-parameter border-line is easier and more frequent than at the problem level. This is extremely important. Returning to diagram 1 we can conclude that generally speaking in Cases A and B, where the matching has to be done at the problem level, we rarely pass this three-parameter limit, and that therefore co-ordinate indexing systems are not likely to be used in these cases. In Cases C and D, however, where the matching can be done at the aspect level, the three-parameter-limit will usually be passed, and therefore in these cases co-ordinate indexing systems are often to be preferred.

What is the situation in practice? Co-ordinate indexing systems are used with success all over the world in D type cases, but far less in C type cases. In our view, research workers should be made more aware of the value of co-ordinate indexing. The size of their systems undoubtedly will be modest; only hand-operated systems seem indicated. But the systems-salesmen, pointing to the success in D type cases, try to push the co-ordinate-indexing systems in the A and B cases where they are usually out of place.

Type of Tools (See diagram 3)

Choice A. This choice has already been discussed at length. The outcome of the discussion was: three or fewer parameters - conventional indexing; more than three parameters - co-ordinate indexing systems. Here one may point out a disadvantage of the co-ordinate indexing systems, which is that they give, under certain circumstances, so-called "false sorts" or extras. For instance, if one asks for "steel elements in timber house building" one gets material on timber elements in steel house building as well. Or another example: if one asks for "influence of deforestation on climate" one also gets material on the influence of climate on deforestation.

Choice B. The surface of the card (or other carrier of the information) is the limiting factor. This means that for item-entry systems (document-concept) the number of concepts is limited, and that for the entry-item systems (concept-document) the number of documents is limited. Unit cards have no limits for either, but here the number of cards increases so quickly with the growth of the system that scanning is only possible with machines. The great advantage of item-entry systems is that they are able to give direct text. The great advantage of entry-item systems, on the other hand, is that they can dispense with the work of the programming.

Choices C and F. When the field is de-restricted one can raise the capacities of all kinds of carriers of information, but the searching mechanism has to scan the whole surface, or (with superimposed coding) much longer codes also, necessary in the latter case to keep the number of extras within an acceptable limit.

Choices D and E. These are mainly between hand-operated and machine-operated systems, and depend on the size of the system.

Choice G. This is in practice no longer a choice, as uniterm cards with number matching have been superseded nearly everywhere by some kind of customary identification of pattern coincidence.

Evaluation of Types of Tools (See diagram 4)

In this evaluation the situation for hand-operated systems (H) have been separated from those for machine operated systems (M). The choice between these two depends on the size of the system. The importance of the criteria shifts from one situation to another. The list of criteria, and also the distinction between the first group (more important ones) and the second group (less important ones), is purely subjective and is given only as an example of how evaluation of criteria is possible at all. One should add that finer discriminations of some kind are better than plus or minus. In this example the best choice for hand operation is 4 or 6, and for mechanical operation 8. But again, this example is purely hypothetical and is only given to show a method for comparison.

General Considerations

While realising that machine-sorted punched-cards and even electronic computers offer great possibilities in documentation, we should bear in mind that the correct approach is to start with the problems and seek suitable methods for their solution, not to start with the machines and look for problems for them to solve.

The use of machine-sorted punched-cards or electronic devices will only be fully justified if documentation is centralised to the fullest extent. This is, as we know, a much

discussed problem. The term "centralisation", does not, however, necessarily mean physical centralisation. What is important is to work according to the same organisational principles, the same classification system and the same punched-card code. This is possible in spite of decentralisation of documentation centres, in which case only the machine-sorting of the punched-cards needs to be done at a central office.

The real problem of documentation lies less on the technical side than in classification. This is particularly true as regards punched-card systems. It is suggested, therefore, that all associated scientific discipline should be included in a uniform classification area. It has become necessary to leave behind the historical division of the sciences in favour of a classification on the basis of present day realities. We are accustomed, for organisation and scientific reasons, to think in terms of individual disciplines and their scientific terminology. The number of these disciplines has, side by side with increasing specialisation, become increasingly large. There are three disadvantages of classification by disciplines: firstly, they are not always clearly defined; secondly, they often overlap considerably; and thirdly, they simulate a variety which in reality does not exist, or which could be presented in another way.

Another basic need is to differentiate clearly between concepts and aspects. We thus arrive at a system of concepts including (in biology, for example) the organism, and a system of aspects which contains the circumstances under which these organisms may be considered. Maximum economy demands that the basic concepts occur once only in this system. By combination of this quite small number of basic terms all the other subsidiary concepts can be classified.

It is in the nature of such classification system, particularly suited to the use of punched-cards, that the number of parameters arising is larger than in other classification schemes, for example, the decimal classification. It requires, at the same time, a much more precise description of the contents of a publication.

A classification system of this type is independent of the language used since, unlike the Uniterm system, it is based on the significance of words, i.e. on the concept. Furthermore, all concepts similar in function are combined in one term.

It should be remembered that the use of punched-card systems can be very economical. A single punched card can store a considerable quantity and variety of information; and the selection of the information when filed requires only simple sorting machines such as are already widely used in institutes devoted to the natural sciences. Punched-cards can be reproduced as often as required and can be marked mechanically if a reader wishes to establish his own file. Finally, we must avoid the error of expecting miracles of punched-card systems; they cannot think for themselves, but can yield only what mental effort has already stored in them. Their effective use demands a new technique, though quite a simple one.

A co-ordinate indexing system involves the selection of relevant parameters, just as cross-references have to be selected for an alphabetical subject catalogue; and it was naturally conceded, in discussion, that not all queries can be anticipated, although predictability increases with the degree of specialisation of a library. The provision of a documentation service in a special field may demand a considerably number of parameters - more than the average reader would use; but full and detailed dissection of periodicals on punched cards is very valuable in documentation work, especially for the rapid production and cumulation of indexes.

Closer international co-operation - easily arranged at any rate within the main language groups - could obviate duplication of effort in covering the same material. A simple and generally acceptable classification scheme (Bibliotheca Lactis) has been evolved at Kiel, in co-operation with publishers and authors of articles, whereby articles are classified (usually by their authors) before publication. This reduces delay in producing abstracts and enables more indexing to be undertaken. Highly specialised systems fail when (as often happens) highly trained staff is not available to operate them.

Mechanised punched-card systems are costly to instal, and uneconomic unless continuously used; but they can be hired when any large scale analysis is required, and a number of firms undertake work at hourly rates. Hand-operated systems are more suitable for the individual user.

DIAGRAM 1

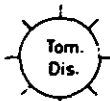








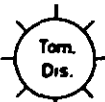


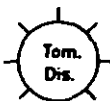
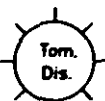
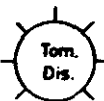

	Enquiry	Matchable part of enquiry	Analysis of the document in the tool (entry)	Document
A General agricultural library				
B Special library of institute for Tomato-research				
C Literature - documentation of research-worker				
D Research (results of experiments)				

DIAGRAM 2

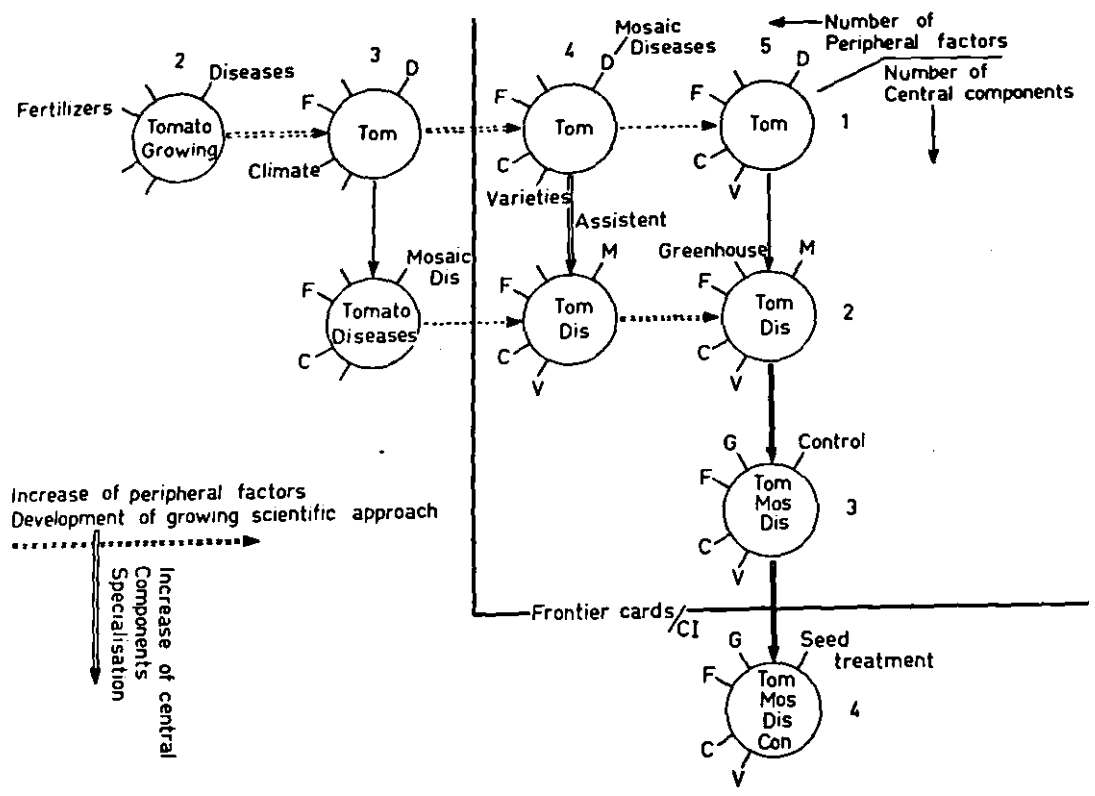


DIAGRAM 3

- Ⓐ Choices
- Ⓛ Type
- Ⓜ Hand
- Ⓜ Machine

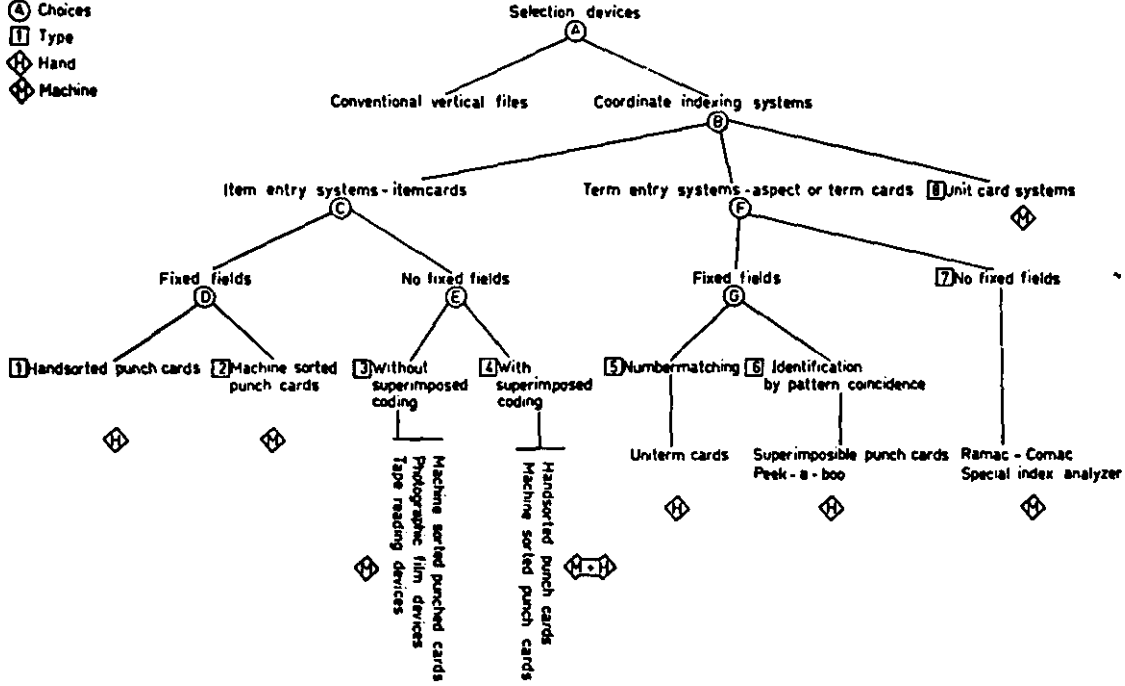


DIAGRAM 4

CI Syst. Crit	④				⑤				
	①	②	③	④	②	③	④	⑦	⑧
1 Costs	+	+	+	+	-	-	-	-	-
2 Capac. items	+	+	-	-	+	+	+	+	+
3 Capac. terms	-	+	+	+	-	+	+	+	+
4 Searching time	-	-	-	+	-	-	-	+	+
5 Necessity programming	-	-	+	+	-	-	-	-	-
6 Direct text	+	+	-	-	+	+	+	-	+
7 Possib. duplic	+	+	-	-	+	+	+	+	+
8 Necessity refiling (fixed order)	+	+	-	-	+	+	+	-	-
9 Thinning	+	+	-	-	+	-	+	-	+
10 Time posting	+	+	-	-	+	+	+	+	+
11 Possib. simult. enq.	-	-	-	-	+	+	+	+	+

DOCUMENTATION REQUIREMENTS OF AGRICULTURAL ADVISORY WORKERS

Under present day circumstances agricultural advisory offices can only carry out their wide responsibilities by considerable efforts, an elaborate organisation and carefully planned utilisation of the teaching and advisory staff. In West Germany, in most official advisory services (run by Ministries of Agriculture and Chambers of Agriculture) hardly any of the advisers devote their full time to advisory tasks. There are four types of responsibility in advisory work; advisory work as such (office and field work), experimental work (office and field work), administration work (office and field work) and teaching (preparation and class work). According to Asdonk (Berichte über Landwirtschaft, 33 (1954), no. 3) half of the working time of the teaching staff of the agricultural advisory offices is devoted to advisory work. Beuermann (Investigations into Agricultural Advisory Work in Baden-Württemberg, Doctoral thesis, Hohenheim, 1958) found that the teaching and advisory staff devoted only 34 per cent of its time to advisory work. Every year new advisory tasks are added (improvement of agricultural organisation; rural sociology; applied farm management; labour management; rationalisation in the farmhouse, the farmyard and in the fields; marketing; in-service-training in teaching, advisory work and administration.)

The number of advisers in industry and trade in West Germany carrying out private advisory work in the field of agriculture steadily increases. It is well known that these advisers have excellent specialised knowledge, that they are regularly trained in subject matter and psychology, and that first class documentation material from Germany and abroad is at their disposal. The official agricultural advisory service should take note of these facts and analyse their implications.

Farmers, and their men and women workers, as well as agricultural organisations and administrations, increase the work of the advisory worker day by day. The farmer who reads a number of technical periodicals and listens to the farm radio has today become fully competent to be a partner in discussions. In 1957 the Ministry of Food, Agriculture and Forestry of Baden-Württemberg organised a representative survey showing the following results: firstly, 76 per cent of all farmers in Baden Württemberg consider agricultural advisory work necessary and useful for agriculture; secondly, 82 per cent of all farmers demand individual advice (which requires a sufficient number of well instructed advisory workers); and thirdly, the agricultural advisory service should establish model farms to serve as a guide to other farmers.

The effectiveness of the farm advisory staff should 'be maintained and promoted mainly by relieving farm advisers of too heavy a work load. Suitable documentation services could play an important part in meeting this need.

Farm advisers should be regularly and fully informed on all aspects of agriculture, in order to be able to carry out their difficult task as all-round and specialist advisers. They should be informed about technical literature, particularly scientific studies of interest to practical agriculture, since it is the adviser who is the link between research and practical farming and who is to ensure that the results of research, laboratory tests and field trials are put into practice. The pace of development in the sciences and technology, and the rate of economic change, are much greater today than hitherto. This is reflected in the periodical press. Faced with a plethora of periodicals, advisory workers are no longer able to make use of them. Moreover, apart from lack of time, farm advisers and the advisory offices cannot afford to obtain the literature.

Documentation services, then, are needed to collate, summarise and evaluate the literature relevant to the agricultural adviser's work. The products of these services cannot replace the original literature; they should however give the farm adviser a clear idea of the contents of a book, periodical or paper. The adviser does not require instruction in doing his job, but valuable references (without criticism or comment) to studies, practical research results and information on new developments covering the various institutes and all fields of agriculture of interest to the practical farmer and the advisory worker.

One or two generations ago the literature of his own country was sufficient for the farm adviser. This is no longer so. But few advisory workers know more than one foreign language, so that the supporting documentation service must scan overseas literature on their behalf, beginning if necessary on a small scale and gradually widening its scope. It must keep in constant touch with the changing needs of its clients and so avoid waste of time and effort, for economic administration will always be important. Advisory work is an essential link between research work and practical agriculture, and requires effective support from documentation services if its functions are to be properly fulfilled.

The supply of information to the advisory worker should be considered in four stages; the selection of suitable material; appropriate editing, both analytical and synthetic; form of presentation; and methods of distribution.

The advisory worker (it was emphasized in discussion) in a practical man, who cannot keep pace with the vast output of technical literature; abstracts and summaries must be provided for him. He must keep ahead, or abreast, of the farmers, growers, etc. when he is advising; this calls for the rapid supply of digested information in a form which he can readily assimilate. More than basic bibliographical details

are needed in the present state of the education of advisory workers, and legibility and attractive presentation are very important. If interest is not stimulated for immediate consumption, the likelihood of literature being laid aside indefinitely is very great. A regular service of printed bulletins covering current literature in digest form is a good method of keeping him informed. When his interest has been stimulated, a central library service should supply him with original and additional material on demand; this library should be aware of additional sources of specialised information to supplement its own resources. The services of the Dutch Agricultural Documentation Centre is a practical, working example which comprises yearbooks (general and special); a monthly journal for advisers and teachers: a weekly, with informative and evaluative abstracts, annotations and bibliographical details. Investigations show that a considerable demand for originals and related articles was stimulated by these publications, and represented about 50 per cent of the loans from the library. A card system was also offered, but was not as popular nor as successful.

THE ABSTRACT JOURNAL AS A BRIDGE BETWEEN
SCIENTIFIC RESEARCH AND PRACTICAL AGRICULTURE

The purpose of abstract journals is to condense and collect the enormous mass of printed matter that is continually appearing on every aspect of every science, so that the research worker can keep up to date with progress, wherever made, in the subject which he is studying. Agricultural science, however, is essentially an applied science in which bits of several of the purer sciences of biology, physics and chemistry are involved. There is no agricultural science apart from agricultural practice. Many of those to whom abstract journals of the agricultural sciences appeal are practical people whose task is to convince the farmer that he will benefit by applying the latest discoveries of science to his farm. The overcoming of resistance to change in the most conservative of all industries is an ever-recurring problem. Here the abstract journal can assist by bringing the latest discoveries in the agricultural sciences to the notice of educators and administrators; its primary business is to inform the many thousands of experts in the field and the laboratory about what work is being done throughout the world in every problem which is being investigated.

Some branches of what is generally accepted as agricultural science are more practical and some are more scientific than others. For example, research work on the application of fertilizers to the land has immediate practical value, whereas work on the genetics of plant or animals is likely to have to pass through many further stages before it can be applied in practice. The activities of the Commonwealth Agricultural Bureaux, which between them aim to abstract the entire world literature of agricultural and forest sciences, afford a good illustration of how far a comprehensive abstracting service does actually help to bridge the gap between science and practice.

The Commonwealth Agricultural Bureaux (C.A.B.) are financed by the Governments of the British Commonwealth and of the Republic of Ireland and the Sudan. There are ten separate bureaux located at research stations in Great Britain, namely, the Commonwealth Bureaux of Animal Breeding and Genetics, Animal Health, Animal Nutrition, Dairy Science and Technology, Forestry, Helminthology, Horticulture and Plantation Crops, Pastures and Field Crops, Plant Breeding and Genetics, and Soils. There are also the two Institutes of Entomology and of Mycology which themselves carry out some research (which the Bureaux do not) besides producing comprehensive abstract journals. In all, the C.A.B. publish 13 such journals covering between them every branch of agricultural and forest science. Being located at research institutes each

bureau has access to a specialist library and is in close contact with research workers in its particular branch of science.

The bureaux operate independently of each other, and there are differences of detail in the way in which they perform their function of collecting, storing and retrieving information, but the basis of each bureau's work is the production of its abstract journal. There is considerable overlap in the scientific fields covered by each bureau - for example, there is much in common between animal health and animal nutrition and between the cultivation of agricultural or horticultural crops and soil science. As a consequence there is some duplication of abstracting, but the same paper may be abstracted by different bureaux from different points of view, according to the requirements of each bureau's specialist clientele.

Abstracting has now become an indispensable part of the organism of scientific research, and until it is recognised, as ultimately it will be, as a profession requiring skills at least equal to those required for research, it will not be in a position to perform adequately its rapidly expanding duties. Two skills, neither of which is usually possessed by men or women who have passed through a science course at a university, stand out pre-eminently. One is to extract, and to express clearly and concisely, the basic facts brought out in a scientific paper; the other is to classify the information contained in the paper so that it can be stored and retrieved when required.

The first of these is the lesser skill of the two; nevertheless it is skill which is not a common natural ability, and it is not taught as a part of a science training. But most scientific journals now insist that authors should produce their own summaries which usually contain what the authors regard as the most important facts and conclusions revealed by the work described in their papers. The bulk of a scientific paper is a kind of liturgy which the author must recite in order to show that he has followed the ritual of his scientific discipline, and, although absolutely essential for the maintenance of discipline, should not be the concern of the abstractor. A trained abstractor will read the author's summary, will judge what parts of it are unnecessary, or unclear to those unable to read the full paper, and will modify the summary accordingly. He will not, however, attempt, either to pass judgement on the validity of the results and conclusions described, or to indicate possible practical applications. In many cases the author's abstract is good enough for an abstract journal, but printing costs can often be saved, without loss to the abstract, by reducing its length.

The second skill - of classifying scientific information - is much more difficult to acquire, but is absolutely essential to the efficient functioning of a scientific abstracting service. Whereas the ability to write a clear summary of his own paper is a skill which the research specialist could and should acquire, the classification of the knowledge he has gained lies outside his province. To classify adequately requires a wide acquaintance with the science concerned and of the inter-relationships of its several branches,

besides an appreciation of what are, at any time, recognised as the "growing points". To many users of abstract journals the most valuable part is the subject index in which, say, ten abstracts on one subject but on different pages of one or more volumes are listed together. If the matter has been efficiently classified and indexed the user of the abstract journal can thus quickly obtain a comprehensive summary of the literature of any indexed subject.

The abstract journal has thus achieved first, in its abstracts, a concentration of the diffuse knowledge contained in research papers, and secondly, in its index, a synthesis of the severally insignificant portions of new knowledge into something which may be significant. At the Commonwealth Bureau of Soils abstracts are printed not only in the journal Soils and Fertilizers which contains an annual subject index, but also on index cards which are meticulously classified according to the matter of the abstracts and put into a card index from which a summary, in the form of abstracts, of all available information on any subject connected with the soil can be extracted.

By providing such summaries, in the form of "annotated bibliographies", we think that we have, at least partially, solved the problem of synthesising the minute amounts of information contained in widely scattered scientific papers into something more serviceable to the scientist. The most important and the most difficult process in preparing these summaries is the classification of the abstracts. It requires a high degree of scientific perception on the part of the classifier. In an ideal world all abstracting of scientific papers would be done once, and once only, by the authors, and those who now abstract - that is, do what the research worker should be able to do much better - would occupy themselves with the highly technical task of classifying and storing new information in a way in which it can be immediately and infallibly retrieved. Such a division of labour would enormously reduce the deplorable waste of effort that at present characterises scientific research in all its branches.

One of the chief uses of abstracts, or of abstract journals, is that they enable the first, perhaps rather crude, steps to be taken in the synthesis of the tenuous material contained in research papers into something more substantial. Moreover, this crude synthesis represents a plank that abstracts can provide in the bridge connecting science with agricultural practice, because a collection of abstracts does indicate trends in scientific thought and achievement. An abstract of a single scientific paper tells the practical man nothing, but abstracts of 30 scientific papers on a single subject may add up to quite a lot of useful information on what scientists are thinking about. To the scientist, also, 30 informative abstracts give much more than 30 times the information contained in one abstract.

Our annotated bibliographies are widely used by advisory officers in agriculture. For example, we recently prepared for an advisory officer a bibliography of 30 abstracts on the effect of subsoiling on crop yields. This constituted

a summary of the results contained in papers published during the last six years and in all parts of the world. It showed that under some rather ill-defined conditions subsoiling was effective, and under others ineffective, in increasing yields. That is what the enquirer wanted to know. He could also have obtained the information by consulting the indexes of six volumes of our abstract journal, opening the volumes at about 20 different places, and memorising or writing out the abstracts. But the preparation of the bibliography took us much less time than that alternative would have taken him.

To make the most efficient use of the present tremendous output of research in the agricultural sciences the greatest need is for the continual synthesis of the results of research into the body of existing knowledge. The abstract journal now plays an indispensable part in this synthesis.

In recent years scientists have increasingly demanded briefer information - annotations rather than abstracts - but a more complete coverage of available literature, from which they could themselves select. An example of the attempt by documentalists to meet this demand is Veterinary annotations and reviews, issued twice yearly by the Commonwealth Bureau of Animal Health.

Agricultural engineering and economics are not covered by C.A.B., but the National Institute of Agricultural Engineering at Silsoe has been producing Agricultural Engineering abstracts for some years, and World Agricultural Economics and Rural Sociology Abstracts (a co-operative undertaking by the International Association of Agricultural Librarians and Documentalists (IAALD) and the International Conference of Agricultural Economists) began regular publication in 1959.

The language barrier to the wider international utilisation of abstracts was discussed by the meeting, which considered that a determined effort should be made to improve translation facilities. Mechanical translation is still in its infancy; further developments along this line may eventually help to solve the problem, but other solutions must be attempted meanwhile. The Commonwealth Bureau of Horticulture and Plantation Crops, East Malling, is now offering a translation service based on Horticulture Abstracts.

CLASSIFICATION SYSTEMS AND INFORMATION RETRIEVAL

The librarian, when establishing a subject catalogue, has the choice of two main groups of methods. The first consists of characterising the subject-matter content by the term which identifies the subject-matter briefly, relevantly and clearly, and which by its nature allows the entries (terms) to be arranged in alphabetical order. The alternative to this is systematic arrangement which, however, requires the development of a classification system or the adoption of a system already in existence. The decision between an alphabetical and a systematic subject catalogue will depend on the particular circumstances. A better solution would be to have both an alphabetic and a classified subject-catalogue. These statements are however only applicable to an ordinary book catalogue of a library.

For documentation in the strict sense - that is to say, where specialised scientific texts with multiple subject contents have to be classified - preference will be given to a systematic classification system since it includes a notation which permits each subject to be symbolised by a kind of shorthand sign, thus avoiding difficulties which arise from long chains of words and the danger caused by language similarities (synonyms) etc. The systematic catalogue demands more effort from the user, thus contravening the axiom of maximum simplicity and convenience. This is why the user is rather sceptical of it - particularly of the most carefully developed classification systems such as U.D.C. and the Colon Classification (Ranganathan). The basic principle of both these classification systems is that an integral subject analysis of a scientific text can only very seldom be achieved by employing one subject term as is done in the traditional classification systems, but that side-systems and auxiliary systems need to be added. The supporters of the modern classification systems have exercised much ingenuity in classifying the frequent auxiliary and side references by categories, to cover all possible aspects. The champions, as well as the opponents, of the U.D.C. system have tried again and again to demonstrate with typical examples the extent to which classification symbols can identify publications, though there is the disadvantage that these accumulated classification-symbols become very long and complicated.

There is also the question to what point of sub-division the classifying analysis of a title should be carried - on the supposition that the title really expresses the principal facts contained in a scientific paper. If this is not so, systematic classification requires careful reading of the scientific paper in question. The more detailed the analysis of a paper is to be, the larger obviously is the number of aspects or symbols the classifier is confronted with. In highly

specialised research institutes one is even forced to apply the methods which will lead to a kind of "complete analysis" of the scientific paper. Here the application of newly developed selection and coding procedures is fully justified. Where, however, the field of work is wider, for example, in a medium-sized library of an agricultural university which often lacks sufficiently trained classifiers, and where nevertheless some kind of documentation is needed, such intensive subject analyses will rarely be achieved. Here we have to find a compromise between the requirements of multiple subject analysis and the resources of a documentation centre working on a limited budget but trying to cover a wide field; in our own case the whole of the agricultural sciences often include forestry, veterinary science, fisheries etc.

Existing classification systems which have been developed with a view to a systematic card index have been much criticised by the supporters of mechanical selection systems. Their arguments are partly justified, particularly when making demands of older classification systems which they were never designed to meet. If these systems, however, are set up in such a way that they permit the combined classification of several subjects contained in a paper, they are capable of meeting demands for quick and complete identification of agricultural literature. Both the U.D.C. and Colon Classification offer a number of possibilities for classifying subject elements. The latter system is based on the principle of "facetting", i.e. the principle of parallel circuits and the combination of a number of classification principles. However, as far as technical libraries or documentation services are concerned, a special classification is probably to be preferred to a general one - on the supposition, of course, that a well organised subject classification is available. Each field of science will have its particular associations and accordingly its particular system for a systematic classification of its subject areas. A zoologist, for example, will consider or classify a zoological problem differently from a livestock breeder, a geologist differently from a soil scientist with regard to types of soils. An additional advantage of a special agricultural scheme against a general scheme is that it allows a considerable simplification and the shortening of notations.

The Classification scheme for agricultural sciences, first published in 1934 by the International Institute of Agriculture in Rome, reflects these considerations and follows the principle of an optimal simplification. For its notation this system uses capital letters to mark the main groups, each of which is further sub-divided into sub-headings provided with decimal numbers (which are of course completely independent of the D.C. system). In most cases the classification problem can be solved by using notation aggregates of 2 to 5 parameters. Since this scheme was originally set up not for general bibliographical purposes but for a large bibliographical card index, the possibility of further "facetting", i.e. subdivision by different points of view or a combination of individual notions, was envisaged from the beginning. A simplified method involving two auxiliary classifications was chosen. One of these auxiliary tools is a systematic geographical table applying decimal

numbers in brackets, as in the U.D.C. The second scheme is called an "analytical auxiliary scheme" which classifies all possible kinds of interdependencies between subject-matter, whether of a more formal kind showing the form of presentation (e.g. lexicon, periodical) or indicating some kind of parallel circuit, co-ordination, dependency, superiority, causality, comparison, influencing factors etc. This kind of integration of different categories of interdependencies could be called an offence against logic, and in the case of a very subtle and detailed technical documentation, even more subtle sub-divisions (facets) will be needed. For documentation problems normally arising in practice, however, the simplified method will be adequate.

The significant aspect of this analytical auxiliary scheme is that by converting the capital letters and decimal numbers which designate the subject matter in the main scheme into the corresponding small letters, one effects the analytical classification of a second subject, to which one may, of course, add in brackets the country symbol. A simple example will make this clear: if G 1 indicates grain and F 2 soil science the combination G 1 f 2 will be the symbol for grain soils: R 7 (dairy) combined with A 32 (lexicon) would give R 7 a 32 indicating a dairy glossary. We may, of course, turn these subject combinations round or may even quote them twice if necessary. Thus we are approaching a higher stage of documentary analysis which can also make use of the above system to its fullest advantage. It might, without further development, be suitable as a key for punched-card systems and, if we co-ordinate the subject-matter notations in a simple way, its brief notation will permit 3 to 4 parameters per document even in primitive selection systems. The need for a more detailed classification than that given by 3 to 4 aspects plus a geographical symbol will be unusual in agricultural documentation.

A difficulty could arise, however, where a specialised systematic scheme is used and where the subject in question does not permit clear distinctions from related or so-called basic sciences, as in the agricultural sciences which are a complex, diversified field more or less closely related to a number of other technical disciplines. The question arises, how to classify all the numerous studies dealing with general, chemical, botanical, genetical or sociological problems which have no immediate relation to agriculture and for which there is no place in a specialised agricultural classification scheme. There are two possibilities for overcoming these difficulties. In the scheme outlined above there is a group Z under which all those subjects may be listed which are likely to be represented in an agricultural library in addition to the normal technical literature and which have been classified on the same principle as the other main groups of the scheme. More detailed subdivisions do not, however, exist. Where we need more sub-division - for example, to indicate complicated subjects in the natural sciences - it might be possible to sub-divide the group Z further according to a general system (the best would be U.D.C.). Such an indirect approach may be applied without particular difficulty in the case of traditional index systems as well as for punched-cards systems etc. The

establishment of classification systems is by no means out-of-date, but rather is gaining renewed importance particularly in view of modern mechanical selection procedures. Bibliographical classification, however, needs further extension so that classification of a number of aspects, parameters and categories, becomes possible. Under normal conditions, i.e. in an ordinary library or documentation office, any superfluous complication and sub-division should be avoided, so that the ordinary user may still understand the classification system applied. The skill of a documentalist lies in developing an optimum simplicity of classification as regards sub-division and notation while at the same time providing for all the essential information required.

A discovery may have been made and fully reported in the technical literature and may yet not be known to those whom it concerns. Lord Rayleigh(1), at the end of the last century, used to say that to find a piece of information in a library could be a more difficult and hazardous operation than the original discovery in the laboratory. Again, during recent discussions in the American Senate on the co-ordination of scientific and technical information(2) it was pointed out several times that, when a research project costing less than \$100,000 is contemplated, it is cheaper to execute it than to search the literature to see whether or not it has already been done. These and other equally pessimistic views show how little confidence many people feel in present methods for the dissemination of documents.

There are many different ways of making documentation available to users: descriptive or analytical bibliographies (retrospective or contemporary), periodic surveys of the "annual review" type, library catalogues and consultation of specialists as regards the supply of the information proper, book-lending (regional or international), photographic reproduction (photostats, micro-films, micro-cards), and transmission by teleprinter or television etc. - as regards the communication of the document. But one factor is common to, and forms so to speak the backbone of, all techniques for the dissemination of information, i.e. classification.

A survey carried out a few years before the last war by the International Institute of Agriculture at Rome(3) showed that almost two-thirds of the agricultural libraries which answered the questionnaire sent to them had subject catalogues arranged alphabetically - mostly in the form of dictionary catalogues in the United States and of separate author and subject catalogues in Europe. Among the bodies with systematic catalogues, some 60 or so used decimal classification (Dewey in America, but usually U.D.C. (Universal Decimal Classification) in Europe), five the system of the International Institute of Agriculture, four that of the Library of Congress, one Cutter's classification used, which suggests that most were individual systems. Some libraries (about 25) kept both an alphabetical catalogue and a systematic subject catalogue, others kept only a catalogue of authors. The Royal Agricultural Society of England(4) showed in 1957 that, out of 47 specifically agricultural libraries, or libraries with a substantial agricultural section, in Great Britain, 17 used the U.D.C., most of the others having devised special types of

classification suited to their needs. Nine libraries had alphabetical subject catalogues; 22 had systematic catalogues and six both types.

Analysis of the questionnaires sent out in 1958 for the preparation of the World Directory of Agricultural Libraries and Documentation Centres(5) published in 1960, revealed that the 645 bodies (out of the 2,600 recorded) which specified their system of classification could be broken down as follows:

U.D.C.	180
Dewey	150
Oxford (and I. Flury)	30
Library of Congress	64
International Institute of Agriculture	13
Barnard	10
United States Department of Agriculture	8
Nippon decimal classification	7
Ranganathan	4
Bliss	3
Hungarian standard classification	2
Asten	2
Yale	2
Bibliotheca Lactis	1
Glidden and Marchus	1
Special classification systems	169

As the Oxford Forestry Classification has now been incorporated in the U.D.C., from which it is in any event derived, and the Nippon decimal classification is closely related to it, the number of decimal classifications of the Dewey type can be placed at 367, i.e. over half the systems reported. It is, however, true that about three quarters of the libraries covered by the survey did not specify whether or not they used a classification system, and most of them are no doubt content with subject catalogues arranged alphabetically.

Bibliographical periodicals, whether descriptive or analytic, are less heterogeneous than catalogues, in that apart from a small number with a systematic classification of reference (usually the U.D.C.), they normally adopt an alphabetical breakdown by names of authors within broad systematic categories. These categories, which are designed mainly to avoid the reader's having to go through too many titles relating to subjects which do not interest him, unfortunately vary considerably from one bibliography to another. The same is true of the alphabetical subject indexes published at the end of the year, which are the usual guide in the search for references. The main headings and references vary not only from one language to another, but also, in a given language, from

one bibliography to another, and even, in some cases, in a given bibliography, from one year to another.

This diversity is easily explained. Agricultural science is an extremely wide field, agricultural techniques being based on a large number of fundamental sciences and related to many other applied sciences. Within this field special branches differing widely from each other may develop. Moreover, classification is applied at different "levels" - arrangement of books on shelves, grouping of references in bibliographies, arranging of catalogue cards - and by different bodies - rural libraries (a special form of the public library), university libraries and research libraries, and documentation services specialised in varying degrees. The purpose and characteristics of the classification system will not invariably be the same.

The diversity of the systems used has, however, serious disadvantages. In the first place it greatly increases the cost of documentary tools (catalogues and bibliographies) in libraries. The most delicate, or "intellectual", part of the work is the classifying of the references, for which specialists on the subjects sometimes have to be consulted. As this operation has to be carried out several times for the same references, it wastes much time and lowers productivity (at world, or even national level), which would not happen if the class numbers of a general universally accepted classification could simply be recopies. Furthermore, and worse still, it requires considerable extra effort from the reader, which may cause him to view documentation with pronounced disfavour. A reader who frequents several libraries has to acquaint himself with the classification systems of each in turn, calling on the librarians for assistance to a greater or less extent. Not only does this take up a lot of his time, but it may also result in his missing the information he requires if certain points of the classification system have escaped him. Even if he confines himself to one library, the reader finds himself faced with a number of printed bibliographies of various kinds. They are particularly numerous in the field of agricultural science, where in addition to specialised agricultural bibliographies such as the abstracts of the Commonwealth Agricultural Bureaux, it is often necessary to consult those concerned with related sciences, either fundamental or applied, such as Chemical Abstracts, Biological Abstracts, etc., particularly as no bibliographical periodical can be said to cover its chosen field exhaustively.

The indexes of bibliographies are not only planned in different ways but usually leave much to be desired as guides to information. Dyson(6) once said, in chemistry, the best indexes enabled the reader to find 70 per cent of the existing references, and the worst only 18 per cent. While this assertion, relating to one of the most complex scientific sectors, cannot be universally applicable, it is still true that to consult only an alphabetical subject index usually gives incomplete results.

Standardization of Classification

The standardization of classification systems would improve the situation both for librarians and for readers. But is such standardization possible, or even conceivable, given the different requirements which classification has to satisfy in different cases?

For instance, the arrangement of books - concrete objects which can only be arranged on shelves in one dimension - calls for a system of linear classification with a notation which can be expressed succinctly and inscribed without difficulty on the backs of the books. On the other hand, a linear system is a serious defect in the classification of catalogue cards, where it is important to take into account all the aspects - and there are often a great many - of a given publication. As it is easy to increase the number of cards, the classification must here be multi-dimensional so that subjects can be approached from different points of view. The importance of this multi-dimensional character will, however, vary from case to case. It will, for instance, be of secondary importance in university libraries designed for students pursuing higher studies, but of vital importance in libraries which normally serve readers with different backgrounds who may be interested in a subject, method or technique from very different angles.

The extent of subdivision and the specificity of the classification will also vary from place to place. A general library need not be too detailed as this would only complicate its card index system and lead non-specialised readers astray. The same applies to bibliographies, where very detailed classification leads to excessively large variations in the information supplied by different services. Even the best systems of classification contain ambiguities and may be over-repetitive, particularly when there is a high degree of subdivision. Moreover, on a given subject, where they will normally use the same classification, one classifier may give a general class number and the other a specific one very strictly limited to the subject of the publication.

On the other hand, in specialised libraries and documentation centres, the best research instrument will be a very detailed, systematic classification, which should not only contain more detailed subdivisions, but should also group concepts in the light of the user's special approach and problems.

In view of the difficulties of reconciling these different requirements, many librarians and documentalists have concluded that general classifications are no use and have fallen back on specialised classifications, or more frequently on the alphabetical arrangement of subjects. But apart from their deplorable consequences for co-operation, these solutions have serious faults of their own.

The advantages of specialised classifications (better grouping, from the specialist's point of view, of subjects which are often dispersed in a general classification; more subdivisions and hence a more detailed breakdown; shorter class numbers) are more or less offset by the disadvantages (interpenetration of sciences and techniques, which makes it

impossible to isolate any given field; difficulty of leaving sufficient room for marginal subjects likely to become very important in the future; difficulty of planning and keeping the classification system up-to-date; individual nature of the system, which makes it impossible for specialists in other, sometimes very closely related fields, to use it).

As regards alphabetical subject arrangement, the simplicity of this system is more apparent than real. The selection of the main headings, from amongst many synonyms and near-synonyms, is a delicate matter in which there is a subjective element which cannot be eliminated even by using all the lists, general or specialised, which have been published. The principles adopted by the cataloguer for selecting and subdividing the main headings and the system of cross-references in fact correspond, as Bradford(7) has emphasized, to an occult classification system, which the reader has to discover gradually by dint of searching through the whole card index. Moreover, at the end of his laborious search, he will often wonder whether some important document on the subject with which he is concerned is not hidden under some synonym or near-synonym, generic or specific term, which the cataloguer forgot, for some reason, to link up by a cross-reference to the main headings. The same applies to subject indexes in bibliographies, where the risk of missing the information wanted is, in fact, greater because the references which enable marginal fields to be explored are reduced to a minimum.

Systematic classification is much safer. As related subjects are grouped in a sequence descending from the general to the particular, it is easy to find more general or more specific documents than those in the class considered, and to explore marginal fields not originally contemplated. Moreover, as the system of reference numbers is not tied to any given language, it offers possibilities of international standardization and co-operation not found in alphabetical arrangements of subject headings.

We must therefore now consider whether, contrary to a common view, it is really impossible to find a compromise between the various types of classification - bibliothetic, bibliographical and cataloguing (general or specialised).

The first point to be noted is that no major difficulties are raised by passing from the hierarchical, multi-dimensional, catalogue type to the bibliothetic type used for arranging books along shelves. It is, in fact, sufficient here to find the hierarchical level best suited to the state of the collection and, in fixing the class number, to consider only the essence of the document, ignoring secondary aspects. The two types of classification have in fact already been harmonized in many libraries, by using the U.D.C. for cataloguing, and the abridged U.D.C. or Dewey system (which usually concurs with the former, at least to the third decimal point) for arranging the books. (It should, incidentally, be noted that the value of systematic classification for books is far from generally recognised, especially in Europe and where readers more rarely have direct access to the shelves.) The use of a very detailed classification for arranging bibliographies raises no special difficulties. It is sufficient to decide

at what level or degree of specification to stop, and for all publishers to observe the rules laid down.

On the other hand, it seems much more difficult to harmonize general encyclopaedic classifications with specialised and, even more, individual systems. Here the only solution seems to be to combine systematic and alphabetical classifications in what Ranganathan called "chain indexing". The full index number, which gives the subject of the document, with all details, in a systematic classification, is broken down into its component sections. Opposite each section, the appropriate verbal term is entered and these terms are finally grouped in alphabetical order, followed by the corresponding classification index number. This leads, in cataloguing, to a double catalogue of subjects, alphabetical and systematic, and in bibliographies, to a far more complex index. The extra work entailed is, however, amply compensated for by the advantages: quicker research work, reduction or even removal of the danger of missing the information desired, standardization of catalogues and bibliographies within each linguistic group and, at international level, substantial simplification of the preparation of multi-lingual scientific and technical glossaries. The combination of the alphabetical and systematic systems makes it much easier to solve certain delicate problems such as the subdivision of the main headings and the establishment of cross-references in alphabetical catalogues, and the introduction of very specific terms in the systematic classification.

But even once the principle of a standardized classification has been adopted, the problem has still not been solved. A librarian will generally maintain that his own system is the best. It matters little whether this is due to a deep-seated conviction of its intrinsic value, or to the influence of secondary reasons and motives, such as inadequate knowledge of other systems, fear of the considerable work entailed by re-classifying, should the system be changed, or author's pride (if the classification is an individual one). The fact remains that much opposition will have to be overcome, and this can only be done by persuading those concerned that the advantages of retaining the classifications in use are asily outweighed by those of adopting a universal, standard system.

As this standard classification must be encyclopaedic (to cover the whole field of agricultural science), very detailed (so that all the various subjects can be entered), sufficiently flexible (to reflect the whole range of opinions and enable new concepts to be introduced, where necessary, by a kind of synthesis) and sufficiently widespread not to disconcert the users unduly, there is undoubtedly only one possible system: the Universal Decimal Classification. The many other systems in use, superior though they may be in some respects, are either adapted to too limited a field (as is the case for the many specialised classifications) or far too rigid (Dewey classification), or finally, inadequately developed (Ranganathan). An exception must, however be made for the system of the International Institute of Agriculture, which can be very useful in certain cases, in particular for

the arrangement of books in general agricultural libraries and the classification of references in bibliographies. The two systems can, in any event, easily be used together, as they are very similar in structure.

The U.D.C. no doubt has its faults; but the best course would seem to be to revise it where necessary by means of close co-operation between librarians and specialists in the various subjects. This has been done satisfactorily in several sectors and there is no reason why it should not be done in others. Some specialists complain, rather illogically, about the shortcomings of bibliographical classification, when they themselves have done nothing to bring it into line with their concepts, or have even been unable to agree amongst themselves as to how to systematise the concepts in their own field*.

Finally, for a standardized classification to be used to good purpose, the users must have some notion of bibliographical methods. This subject is not at present taught in any secondary or higher education establishment, except special schools of librarianship. The result is that specialists, whether scientists or technicians, rarely make the effort to acquaint themselves with the different classification systems, the multitude of which they attribute to the vagaries of librarians. It therefore seems desirable to introduce the subject of bibliographical methods into scientific and technical study courses. This has already been done in Poland and by a few professors at Universities or State Colleges in various other countries.

Discussion of the international standardization of classification indicated that it would be very difficult to achieve, although its advantages would be many; meanwhile an up-to-date expansion of the agricultural sections of U.D.C., developed from the point of view of the specialist librarian, would be very valuable.

Libraries would be more fully and profitably utilised if readers were shown how to use them; the best method would be to include in university curricula at least some minimum instruction in the use of catalogues and classification schemes.

The production of a small manual on agricultural librarianship including the basic principles of classification and comparative studies of various schemes has been undertaken by the International Association for Agricultural Librarians and Documentalists.

* The following are examples of agricultural subjects on which the specialists have not yet been able to agree: the description of types of vegetation, approached differently by the European and Anglo-Saxon schools, and the classification of soils, on which there are three main schools (Russian, American and French) each of which has many sub-schools.

- (1) Vickery, B.C. 1958. Classification and Indexing in science. London, Butterworth.
- (2) United States. Science and Technology Act 1858. Hearings before a Sub-Committee on Government Operation. U.S. Senate 85th Congress, Pt. I, Washington, Government Printing Office.
- (3) International Institute of Agriculture, Rome. 1939. Les Bibliothèques Agricoles dans le Monde. Rome, I.I.A.
- (4) Royal Agricultural Society of England. 1957. Survey of Agricultural Libraries in England and Scotland. London, R.A.S.E.
- (5) Data supplied in litteris by D.H. Boalch, Rothamsted Experimental Station.
- (6) Dyson, G.M. 1949. Abstracts, indexes and ideals. Chem. & Ind. 822-825.
- (7) Bradford, S.C. 1948. Documentation. London, Crosby Lockwood.

INTERNATIONAL AND INTER-REGIONAL CO-OPERATION
IN AGRICULTURAL DOCUMENTATION

The first and most obvious barrier to international co-operation is that of language. This may be surmounted or circumvented in various ways. Librarians born into one of the widely spoken languages start with a great advantage; their less fortunate colleagues will inevitably, in the course of handling literature in languages other than their own, acquire at least a superficial knowledge of one of the major world languages, and it is but one step further to learn enough of one of these languages to engage in correspondence with librarians in other countries.

Another difficulty, to which almost every librarian is subject, is shortage of time or (which often amounts to the same thing) of assistant staff. For most of us it requires constant effort to carry out the essentials of administering our own libraries, and there are many tasks we should like to undertake and improvements we should like to make in them if we had the time. Under these circumstances how can we bestow much attention on co-operating with other libraries, particularly with those in other countries? There is of course a solid and reasonable basis to this attitude; but we should sometimes approach the problem from another angle and ask ourselves the question: Could I improve the service provided to the users of my library if I made more use of the opportunities offered by closer practical contact with colleagues abroad? The answer would frequently be Yes, and then, somehow, the necessary time would be made, and more often than not the new approach would be found to justify itself amply in practical results.

That international co-operation has benefits to confer, and indeed is in the last analysis essential to the satisfactory transaction of our work in any but the narrowest sense, is amply shown by the existence of our own Association as well as by others in many other fields. A glance at the past and a more detailed survey of the present scene will make this abundantly clear.

Co-operation in Earlier Years

International learned societies specialising in one or other of the subjects related to agriculture have from time to time produced documentation in their fields, based to a greater or lesser extent on contributions from their members in various countries. To take two examples from many: the Comité International de Pédologie appointed a commission in 1910 to study soil nomenclature and classification, which

published its Mémoires sur la Nomenclature et la Classification des Sols des Pays Suivants ... (sixteen countries) in 1924. In another field, the year 1931 saw the publication of the International Address Book of Botanists, being a Directory of Individuals and Scientific Institutions ... in all parts of the world interested in the study of botany.

The outbreak of war in 1939 put a premature stop to the activities of the Comité International des Bibliothécaires Agricoles, from which one could have expected considerable achievements in agricultural documentation. Their final revision made a substantial contribution to Bibliothèques Agricoles dans le Monde, the directory issued by the International Institute of Agriculture at Rome in 1939.

Of the publications issued by the International Institute of Agriculture between the two world wars a substantial proportion was devoted to bibliography and documentation. We may recall its Notes Bibliographiques sur le Café (1929), Bibliography of tropical agriculture (1932-37), its two directories of agricultural experiment stations - one for temperate and one for tropical countries - (1933-34); in 1937 it issued a Survey of Current Bibliographies in Agriculture and Allied Subjects. The directory mentioned above, Bibliothèques Agricoles dans le Monde, was succeeded after the war by the Catalogue of Periodicals Owned by the Library which was Institute's last contribution to agricultural bibliography before it was absorbed into the Food and Agriculture Organisation of the United Nations (F.A.O.).

Co-operation Today

A great deal of international co-operation between librarians in the agricultural sphere as in many others is, of course, going on, informal and unpublicised, all the time. But a moderate degree of organisation can ensure a much higher return for the labour expended, and this is one of the chief causes underlying the formation of such organisations as IAALD and the International American Association of Agricultural Librarians (with its secretariat at the Instituto Interamericano de Ciencias Agrícolas at Turrialba, Costa Rica).

The division of labour in library work is well illustrated by the arrangement, organised along the lines of the Farmington plan, made by Scandinavian agricultural libraries in 1956 with the purpose of avoiding the overlapping of periodical holdings in libraries in Denmark, Finland, Norway and Sweden. The origin and development of the plan are described in two articles in the Quarterly bulletin of the International Association of Agricultural Librarians and Documentalists (IAALD) - Nos. 1 and 2, and a more detailed account of it is given below. Co-operation has also been organised between agricultural libraries in Albania, Bulgaria, Czechoslovakia, China, Korea, Hungary, East Germany, Poland, Rumania and the U.S.S.R. in the field of the exchange of literature. This was also described in the Quarterly bulletin of IAALD(3).

Everyone concerned with the study of agriculture and food finds valuable material among the publications of the Organisation for European Economic Co-operation (O.E.E.C.). Of especial interest to librarians in our field are such FATIS publications as the Catalogue of Agricultural Films in Europe, U.S.A. and Canada, the References on Grassland, and also the Lexicon of Terminology in the Fruit and Vegetable Trade in the O.E.E.C. Documentation series. Again, the Food and Agriculture Organisation of the United Nations (F.A.O.) draws on a world-wide network of sources for the preparation of its reference publications. The Yearbook of Food and Agricultural Statistics is based on a wide international circulation of questionnaires; the F.A.O. Plant Protection Bulletin is a "medium for the dissemination of information received by the World Reporting Service on Plant Diseases and Pests". Among the bibliographical and reference periodicals of F.A.O. are numbered the World Fisheries Abstracts, the Yearbook of Fisheries statistics, the Bibliography of Forestry and Forest Products (now ceased); while soil scientists in all countries are familiar with its Bibliography on Rice Soils and its Multilingual Vocabulary of Soil Science (of which a revised and expanded edition is due to appear this year).

But the outstanding - indeed so far unique - example of large-scale organised documentation in our field is furnished by the Commonwealth Agricultural Bureaux, whose work is described in Chapter V above. Among the results of the Bureaux' activities are the invaluable publications familiar to all of us: the abstract journals and Technical Communications, covering the subjects enumerated above, issued by individual Bureaux, and the Joint publications produced by two or more of them in collaboration.

Co-operation with IAALD

It is certainly relevant and probably helpful to consider in detail one or two examples of international co-operation in agricultural documentation which lie close to hand.

The Quarterly Bulletin of IAALD is essentially a co-operative undertaking, in which items of information contributed by members are made available - through the medium of the Bulletin, acting as a sort of clearing-house - to all the other members. This was recognised at the Foundation Meeting of IAALD in 1955, when a group of about ten "regional correspondents" (later increased to 18) was organised whose task was to send to the Editor every three months a note of new journals, bibliographies, dictionaries, congress or symposium publications and other reference works in the sphere of agriculture published in their respective countries. Each of these correspondents is in the best possible position for keeping a look-out for such publications in his own country, so that information channelled by this means through the Bulletin is more likely to be accurate, up-to-date and comprehensive than could be hoped for by any other method. In particular, the problem of recording new publications either highly specialised or of obscure provenance can be tackled sensibly only by some such system as this. Naturally the human element enters into this arrangement as into any other, so that the con-

tributions from correspondents vary in their regularity and completeness; but on the whole the arrangement has worked remarkably well.

In 1957 the World Bibliography of Agricultural Bibliographies by R. Lauche, one of our members, was published, and shortly afterwards the arrangement was made that the sub-section on "New Agricultural Bibliographies" in the "Bibliographical News" section of the Bulletin should be re-moulded so as to form quarterly supplements to the World Bibliography. Information concerning new bibliographies was thenceforward sent not to the Editor of the Bulletin but to Dr. Lauche, who now assembles and edits it and then sends the copy in to the Bulletin. This sub-section has become, in the view of many readers, one of the most important in the Bulletin.

Another facet of international co-operation exemplified in the Bulletin is presented by the sub-section "Exchange: offers and requests". This offers to members, on the one hand, a hopeful possibility of obtaining books or issues of journals which are out of print and unavailable, and on the other, a means of disposing of potentially valuable duplicates less wastefully than by putting them in the waste-paper basket. This section of the Bulletin has not been used as much as one would hope and expect; perhaps one small result of these discussions will be that it will be used more in the future.

In most issues of the Bulletin there appears an article about an agricultural library or documentation centre, contributed by one of our members. These are drawn from various parts of the world - in the last four-and-a-half years about fifteen different countries have been represented. One of the benefits which may be derived by members from these articles is the chance of learning of other libraries faced by similar problems to their own and so of taking the further step of collaborating in an attempt to solve them.

Another vehicle for the co-operation of members of the various countries represented in IAALD is the "Letter to the Editor", drawing the attention of other members to a particular problem and asking for suggestions about its solution. Examples of these may be found in various issues of the Bulletin, but here again less advantage has been taken of this facility than would be expected.

The World Directory of Agricultural Libraries and Documentation Centres, just published, illustrates both the effective working of internationally co-operative methods and at the same time their failure to rise to an occasion presenting openings for the supplying of information unobtainable in any other way.

For the collection of information (date of foundation, stock of books and periodicals, staff etc.) for the Directory the traditional method of sending out questionnaires was followed. In the preparation of the world-wide address-list for the despatch of questionnaires, the editor was greatly helped by IAALD members in many countries, who were sent a draft list prepared by the editor from mailing-lists, published directories and other generally available sources and were asked to correct, amplify and return it. On the basis of the

returns a list of more than 3,200 addresses was prepared. Questionnaires in five languages (English, French, German, Russian and Spanish) were then sent out to these addresses. The response to these questionnaires, although probably no lower than the average, was disappointing; about 25-30 per cent of the questionnaires were returned completed to the editor and formed the basis of the text of the Directory.

At the next stage in compiling, the assistance of IAALD members in various countries was again invaluable. The co-operating members were sent drafts of the final text for their respective countries and were asked to correct them. This was done, and their corrections then incorporated in the text. The importance of the contribution of these collaborating members towards the accuracy and usefulness of the finished Directory can hardly be overestimated.

A third excellent example of international collaboration in agricultural documentation is the recently started World Agricultural Economics and Rural Sociology Abstracts, issued quarterly by IAALD in co-operation with the International Conference of Agricultural Economists. The editor, being anxious that the requirements of prospective users should be taken into account in the planning of this journal, produced a preliminary issue which was circulated together with a questionnaire which sought enlightenment on these requirements. The response was encouraging; replies came from 33 different countries and were of considerable assistance to the editor in formulating a policy which should meet the needs of the greatest possible number of potential readers. (A detailed analysis of the returns was published(4)). The success of such a journal depends in large measure on the contributions of individual abstractors in various countries. As early as its third issue (December 1959) this journal is able to draw much basic material from as many as 24 countries; in the course of time this figure will doubtless rise, and the international scope of the coverage will be correspondingly extended.

Shortcomings and Future Development

The principle shortcomings in international co-operation in agricultural documentation have been illustrated and some of their causes touched upon. At the same time there is no doubt that international co-operation will develop. Our task is to find and exploit means for speeding up this development, so that agricultural libraries and documentalists may become increasingly aware of the benefits obtainable through maintaining and widening their contacts with colleagues in other countries.

Library Co-operation in Scandinavia: the "Scandia" Plan

Since 1933 the question of Scandinavian co-operation has continually been raised in discussions among librarians of the national and scientific libraries in Scandinavia. But it was not until the Scandinavian Library Meeting at Abo, Finland in 1956 that the plan actually came into existence.

The chief reason for the Abo resolution was the ever-increasing numbers of publications which have created an urgent need for specialisation and co-operation. Scientific libraries have to deal with increasing quantities of periodicals from all parts of the world - also from a number of countries previously less important as regards scientific research. The resources available to an individual library are not sufficient to meet these tremendously increasing demands. This need has resulted in large-scale national co-operation systems like the American Farmington Plan and the German "Sondersammelgebiete".

The Farmington Plan came into force in 1948. The aim of the plan is to ensure that one copy of each foreign publication which is judged to be of any interest to research workers can be found in at least one American library, and that this publications can be traced through the National Union Catalogue at the Library of Congress. A parallel to the Farmington Plan is the corresponding German system. It is the task of the Deutsche Forschungsgemeinschaft to supply foreign books and periodicals to about three dozen university and special libraries. The country is divided in "Sondersammelgebiete", and the aim is to provide one copy of all useful foreign periodicals and monographs to each one of these. But it is a long step from these national co-operative systems to an acquisitional co-operative system which is to include a number of countries. If each Scandinavian country acquires only a part of the special resources which it may sometimes need, there will be a much greater need for co-operation among the countries so that publications can be borrowed freely by each library, as needed.

At the Scandinavian Library Meeting in Abo, Mrs. Vibeke Ammundsen of the Royal Veterinary and Agricultural College Library in Copenhagen suggested that there was no need to maintain, in each of the Scandinavian countries, files of those periodicals which, owing to language difficulties, would be of little use to Scandinavian research workers, especially periodicals from the European Slavic-language countries, from Asia and South America. There was also small need for every agricultural library to collect periodicals in subject fields of small interest to the research workers in the Scandinavian countries. An efficient inter-library loan service could easily arrange loans between the countries, eliminating the libraries' need for a complete stock of periodicals.

Mrs. Ammundsen then discussed the problem arising in library co-operation when the task of collecting "little-used" material came to be divided among the libraries. She was not in favour of dividing the periodical holdings according to subject interests. Most of the libraries which were to co-operate were libraries of a national and educational character, and it was their duty to maintain material in every subject taught at their institutions. Instead, the "little-used" material should be divided into broad geographical and linguistic interest-areas between the libraries.

A statistical investigation, based on the periodical holdings in the libraries involved, showed that the number of periodicals from the European Slavic-language countries, Asia

and South America, was very low compared with the holdings in the United States Department of Agriculture Library, and with the number of periodicals referred to in international indexes. A co-operative system would therefore be of great importance in helping to extend the number of agricultural periodicals held in Scandinavia. It was emphasized that European periodicals in the main languages and periodicals from the United States, Canada, Australia and other English-speaking areas, should not be included in the co-operation plans for little-used material. The exchange relations of agricultural libraries was also discussed and a pooling of exchange materials suggested so that each participating library could have access to the exchange resources of other Scandinavian countries. In conclusion, Mrs. Ammundsen sketched a plan for the holding of the "little-used" periodicals in the agricultural libraries, based on the idea of a geographical and linguistic division.

After the meeting a Working Committee of representatives from agricultural libraries in each country (Denmark, Finland, Norway and Sweden) was appointed to study the question. The Committee held its first meeting in Copenhagen on 9th September, 1957. The meeting was arranged by Mr. Overgaard Nilsen of the Royal Veterinary and Agricultural College. The following libraries were represented: the Library of the Royal Veterinary and Agricultural College of Denmark, Copenhagen; the Agricultural Library of the University of Helsingfors, Finland; the Library of the Agricultural College of Norway, Vollebekk; the Library of the Royal Swedish Academy of Agriculture and Forestry, Stockholm; and the Library of the Royal Agricultural College of Sweden, Uppsala. The Committee appointed as Chairman Miss Majlis Tulander of the Agricultural Library of the University of Helsingfors.

The Committee resolved that, for the time being, the co-operative system should only concern periodicals and serials, excluding books and other material. The Committee supported the proposal for a geographical and linguistic basis of division. It was decided to start on a small scale, including only some European countries in this first stage. The plan adopted was that Denmark would take material from Portugal and Spain; Finland from Yugoslavia, Hungary and Russia; Norway from Poland and Rumania; and Sweden from Ireland, Czechoslovakia, Bulgaria and Greece.

Each library would have the following responsibilities: (1) to follow up the periodical literature of each country, and to collect it either by buying or through exchange or gift; (2) to receive and keep in store the periodicals of the country in question which were previously in other Scandinavian libraries; and (3) to hand over to the library in charge of a certain country's publications the material from that country if it was not considered necessary to keep it in the original library. This arrangement should not, however, prevent the libraries from continuing their existing exchanges of publications, or from establishing new ones.

As a first practical measure, the co-operating libraries were to send their periodicals relative to the scheme to the depository library, and put at its disposal the catalogue

entries on cards, so that they could easily be added to the existing catalogue. If there are several agricultural libraries in any of the countries, it is up to them to divide the task between them.

The next meeting of the Committee was held in Norway at the Library of the Agricultural College of Norway, Vollebekk in August, 1958, and received the first reports on the progress of the work since the meeting in Copenhagen. To some degree all the agricultural libraries in Scandinavia had started practical work on the plan by sending literature to the depository libraries and by improving their contacts with the countries in their charge. Having considered the results, the meeting at Vollebekk went on to discuss further development of the plan. It appeared that Sweden already had a good system of exchange relations, and the Library of the Royal Agricultural College of Sweden in Uppsala offered its great collection of sample copies for general use, in order to make it easier for other libraries to get acquainted with different periodicals and to establish contact with the issuing institutes. It was decided that every country should try to make a union list of current agricultural periodicals received.

On the second day of the meeting at Vollebekk, Mr. Fløgstad, Secretary of the General Committee for Scandinavian Library Co-operation under the auspices of the Scandinavian Association of Scientific Libraries, reported on the work done. He explained that working plans of the General Committee emphasized the need for the present library work to extend beyond national limits, and the subjects of research had to be divided among the different libraries in Scandinavia. Consequently an analysis of the needs in different subjects was necessary and information on present valuable collections had to be obtained. The best basis for organising this division was undoubtedly a combined subject and language (geographical) basis. The subject basis can very well be used in those branches of research which are not pursued very much in Scandinavia, e.g. non-European linguistics, literature etc. The language (geographical) basis is advantageous in collecting literature from distant countries. Mr. Fløgstad expressed the hope that little by little the other special libraries would join in this co-operative plan. Besides the committee of agricultural libraries, there was also a committee of technical libraries working on the plan. He concluded his report with information on a statistical study to be made, by the General Committee on Library Co-operation, of the holdings of periodicals in different libraries and their subjects in order to find out the best geographical division.

The Committee of Agricultural Libraries decided to organise its work in accordance with the results of the above-mentioned statistical investigation. While awaiting the results it is continuing its work by improving present contacts and preparing the union lists mentioned above. Finally the meeting expressed its wish for closer collaboration with the other committees, so that the agricultural libraries could adjust their work to the whole plan - the general Scandia plan.

To discuss further progress a meeting was held in connection with the general Scandinavian Library Congress at Arhus, Denmark in August 1959. On this occasion the Committee was joined by representatives of forestry and veterinary libraries. The following problems were discussed: (1) regional division of subject; (2) catalogues; (3) discontinued periodicals.

Regional division of subjects. It was resolved to adopt the scheme worked out by the General Committee, which proved to be very similar to the original plan of our Committee adopted in Copenhagen in 1957. The subjects should only comprise periodicals in agriculture (including veterinary science, forestry and horticulture) except for some cases where auxiliary subjects might be of interest.

Catalogues. The exchange of catalogue cards of holdings was discussed. As to current periodicals, the meeting found that exchange of accession lists would be satisfactory. Each entry might then be cut out and mounted on a catalogue card in the libraries concerned. All libraries were interested in compiling union catalogues, making their lists of current periodicals up-to-date, or issuing accession lists. It is important for the libraries to inform each other of the different periodicals holdings by means of these or similar measures.

Discontinued periodicals. This literature, or part of it, should be forwarded to the depository library according to the wishes of the library concerned. If the holdings are not forwarded to the depository library, the latter ought to be informed of which periodicals relevant to its subject fields are held in the different libraries.

We have in the Scandinavian countries just one or two libraries in the fields of agriculture, horticulture, forestry and veterinary science. In Denmark there is one combined library for all these subjects. Thus for our countries it has been a natural development to take the next step arising from a successful national co-operation system: i.e. an inter-Scandinavian co-operative acquisition scheme in the fields just mentioned. We are working on the development and realisation of the Scandia plan, firmly believing we can successfully solve the problems which such a collaboration across borders is certain to raise. We still have a long way to go before the co-operation programme can be put into practice in every sense of the word. This is the first time such an international co-operation plan has been worked out, and we do not have the experience of other countries to build on. But we are working in the firm conviction that we are following the right course.

Agricultural Library Co-operation in Canada

Library co-operation in Canada is of major importance, especially perhaps because of the distance that may separate so many of the libraries. The establishment of the National Library ten years ago on a working basis (even though the building to house it has not yet been built!) has greatly

aided in this co-operative effort. We have not yet reached such goals as national centralised cataloguing and the mass production of printed catalogue cards, but we have achieved considerable success of a bibliographic nature through such publications as: Canadiana, by the National Library (listing all titles published in, on or about Canada or by Canadians); Canadian Index to Periodicals and Documentary Films, by the Canadian Library Association; Canadian Business & Technical Index, started in 1959 by the Toronto Public Library; and Union List of Scientific Serials in Canadian Libraries, published in 1957 by the National Research Council. There are other examples of interlibrary co-operation along these lines, particularly as expressed in publications and activities of the provincial and local library associations. In all of these efforts the agricultural libraries participate to the fullest extent - but probably the largest single co-operative activity is in the field of interlibrary loans. The past ten years have seen a great expansion in these loans owing to the photo-reproduction by the National Library of the card catalogue of most of the major Canadian libraries and to the publication by the National Research Council of its Union list of scientific serials.

How do agricultural libraries co-operate amongst themselves? As might be expected from our relatively small number, co-operation among ourselves tends to be something of a "family compact", in which the individual libraries help each other as standard procedure, rather than as a formal undertaking. Co-operation is our recognised way of life, and this is exemplified by the number of our interlibrary loans. However, owing to the Department of Agriculture Library's size and scope it lends to other agricultural libraries much more than it borrows from them. The reverse is true in its dealings with many of the larger university libraries; it leans heavily upon their resources in some of the scientific disciplines which are only indirectly related to the field of scientific agriculture.

The Canadian Almanac (1960) lists 18 agricultural libraries, of which 12 belong to the Department of Agriculture. These 12 may be considered as the fundamental family unit, and the others as "first cousins". In this closely knit family, the Department Library of the Department of Agriculture is the "parent body", and its branches (there are 16, plus numerous smaller unit collections throughout the country) compose the immediate family.

The Canada Department of Agriculture Library System. This system is responsible for maintaining the recognised national collection in the Life Sciences field and for giving efficient library services to members of the Department throughout Canada. Its services are available also to members of the Agricultural Institute of Canada, to other libraries and to members of other Federal and Provincial government departments. Organisationally the Information Division and the Library of the Department are directly responsible to the Director of Information. There is also a Departmental Library Committee, composed of very senior officials, whose role is to advise the Minister on matters of general Departmental Library policy. This Committee meets formally only

when circumstances seem to warrant, but individual members may be approached at any time for advice or assistance.

Main Library. This is located in Ottawa, the capital, in the grounds of the Central Experimental Farm in the heart of the City. It was established in 1910 and now contains approximately 200,000 volumes, with a staff of 10 professional librarians and 18 clerical assistants. This does not include the staff or the contents of the branch libraries. Approximately 3,000 Departmental staff in the scientific and technical classifications are served by the library system.

The postwar period has seen a tremendous upsurge in library activities in Canada as in the other countries, due primarily to the many advances in science and technology. In line with the acceleration of peacetime research, the Department of Agriculture expanded its research programme accordingly, and the library found it increasingly difficult to give adequate service to all its widely separated patrons. As a result, a decentralised system of library service was planned, involving a chain of branch libraries to be organised and developed at strategic research centres throughout the country. The first of these began operations in 1950 in Western Canada, and in the ensuing ten years eleven others have been established, a number of them situated on university campuses. This enables the library of the Department of Agriculture to integrate and co-ordinate its programmes with those of the universities and thus give better service to its patrons. There is evident here a very practical form of co-operation. In addition to these in-the-field branch libraries, there are four branches in Ottawa itself. These contain valuable collections in their special subject fields, i.e. plant research; entomology; animal diseases; chemistry. The Plant Research and the Entomology libraries comprise the most valuable collections of their kind in Canada.

Travelling Librarian. As the chain of libraries grew, it became obvious that there must be a "connecting link" between them and the central collection in the main library in Ottawa, otherwise the decentralisation scheme might well result in chaos. Besides the established libraries the many small unit collections in nearly every research and experimental station had to be considered - collections that did not need full-time professional librarians, but only occasional guidance and assistance. To integrate and co-ordinate all these varied collections there was established in 1954 a new position known as the "Head, Branch and Unit Libraries" (soon popularly known as the "Travelling Librarian", from the nature of the duties involved) based at Ottawa. The Travelling Librarian spends several months each year going from station to station advising and supervising the branch libraries, as well as performing standard operational library duties in the smaller units as required. Other duties of this officer are to advise the Chief Librarian on where and when new branches need to be established, in accordance with the importance and scope of the local Departmental activities, and to review purchases of new books and periodical subscriptions for all branch libraries and establishments. In the six years since the establishment of this position, the library system has developed to the extent that the "Travelling Librarian" is now also the

"Assistant Librarian, Reader and Special Services". Similarly, the "Head, Acquisitions Unit" is also "Assistant Librarian, Technical Services".

Automatic Punched-Card Circulation. A unique feature of the Department of Agriculture Library system is its method of circulating current issues of periodicals. Until 1st April, 1954, the current periodical circulations were performed manually, with strict adherence to the old system of "keeping track" of the location of each issue by having it returned to the Library in Ottawa after each reader had finished with it. Considering that its readers of some 3,000 periodicals are scattered across the 3,500 mile breadth of Canada, and even north to the Yukon, it is little wonder that so-called "current" periodicals issues were circulating to western Canada readers as long as 2½ years after the date of issue. Obviously, this system was quite inadequate.

Current library literature offered various solutions, but the most suitable seemed to be in the punched-card field. But it became clear that, if this medium were adopted, much study would be required, since there were known established procedures to follow - in spite of some claims. From 1952 to 1954 much research was done by data-processing experts, Departmental authorities and library staff, and by 1st April, 1954 it was possible to initiate the new system of "Automatic Circulation of Current Periodical Issues". The system had been explained in advance to readers, and its success or failure depended upon their co-operation. Now, six years later, it is possible to report unqualified success - not only from the librarian's point of view, but also from that of the readers. It is true that a journal issue may take up to six months to reach a distant reader, but compared with 2½ years this is a considerable improvement.

Each periodical title has a code number and each issue has a code number based on the frequency of release. Each borrower also has a code number, based on the branch of division to which he belongs and where he is located. When a new periodical issue is received, it is checked into a visible index, stamped, and the two code numbers (title code and issue code) written on the cover. It then is sent to the Automatic Circulation clerk. He had anticipated receipt of this particular journal and had arranged with the Data Processing Unit of the Department to have addressed labels and "receipt cards" ready. These labels and cards are filed in a special cabinet awaiting the arrival of the journal. The clerk now removes the appropriate "package" and places it in the journal, which then proceeds to the Mail Room. The mail clerk selects the appropriate size of special "automatic circulation" envelope. These are made of the strongest type of kraft paper, and each contains an inside pocket to hold the address labels and receipt cards. The first address label is affixed to the top right-hand corner of the front of the envelope, the journal issue is placed inside, the remaining address labels and all the receipt cards are placed in the inside pocket, the "button and string" envelope is closed and placed in the mail. The Library does not see it again until its entire circulation is completed, the last label in the envelope being always addressed to the main Departmental

Library in Ottawa. In the meantime, while it is on its circulation route, each reader as he receives it extracts his own "Receipt Card" from the inside pocket (his name and the Main Library's address are printed on it), signs it and puts it in the mail. When he has read the journal, the reader takes from the inside pocket of the envelope (by the way, he keeps the special envelope in which the journal arrived, and re-mails it using the same envelope) the next address label in numerical sequence, affixes it to the front of the envelope over the previous label, and places it in the mail for the next reader.

This is a simple system for everyone concerned. It is based on an average of 10 to 12 borrowers per circulating copy, and there may be from one to seven copies of each issue circulating. An average of 10 readers for each recorded borrower is estimated, and each borrower readers is estimated, and each borrower readers regularly an average of six or seven periodicals. During the six-year period that has elapsed since the inauguration of this automatic system the current periodical circulation has risen from 60,782 loans under the old method in 1953 to 118,000 circulations under the punched-card system during the 1959-60 fiscal year. To do these 118,000 circulations, only 16,838 initial routings from the main library were required. Some 2,068 periodical titles are now circulating automatically to 594 recorded borrowers.

Other services offered by the library of the Department of Agriculture include photo-duplication, extensive inter-library loans, translation arrangements, bibliographic compilations and searches, other loan facilities, advisory services on technical problems, monthly accession lists, exchanges, and so on.

Canada conducts exchanges on a co-operative basis with most countries of the world and would be glad to make this exchange coverage even more complete. As the medium of exchange in these co-operative arrangements they had access not only to the publications of their own Department, as listed in its List of Publications, but also to the three journals of the Agricultural Institute of Canada: (1) Canadian Journal of Plant Science; (2) Canadian Journal of Soil Science; and (3) Canadian Journal of Animal Science. This broadened their activities greatly, and enabled them to negotiate our exchanges on a more equitable basis. In the last 10 years there has been a marked expansion in the free exchange of scientific literature between all countries.

Another form of exchange, little developed as yet but of considerable importance, is the exchange of professional librarians themselves - although not on quite so permanent a basis as that of publications! What an advantage it could be to all libraries if collected knowledge and abilities could be shared by selecting certain professional staff and "exchanging" them for a year or two. There would, of course, be administrative difficulties in formulating such an international scheme, but none that could not be surmounted; school teachers and university professors solved them years ago. Why are librarians lagging behind?

International co-operation between librarians would develop much more rapidly if librarians themselves realised the advantages to be gained from it. Some of these advantages are illustrated in the work of the International Association of Agricultural Librarians and Documentalists; in particular its Quarterly Bulletin provides a medium of information covering a wide area. The meeting emphasized the need for exchange of staff as well as of documentation within the context of international co-operation, and considered that agricultural librarians and documentalists were not adequately represented in some technical exchange schemes.

It is to be hoped that administrative restrictions hampering the international exchange and acquisition of documents will loosen their hold. A good example of what can be achieved by careful organisation is provided by the Exchange of Publications Scheme operated by FATIS through its liaison centres for the benefit of advisory and information workers in O.E.E.C. countries.

- (1) Tulander, M. 1958. Library co-operation in Scandinavia. Quart. Bull. IAALD, 3, 1-2.
- (2) Tulander, M. 1959. Library co-operation in Scandinavia. II. Quart. Bull. IAALD, 4, 141-142.
- (3) Novak, M. 1958. Our experiences of agricultural library co-operation in socialist countries. Quart. Bull. IAALD, 3, 161-164.
- (4) Frauendorfer, S.v. 1959. World Agricultural Economics and Rural Sociology Abstracts: Analysis of a questionnaire. Quart. Bull. IAALD, 4, 211-216.

RURAL PUBLIC LIBRARIES AND THE READING REQUIREMENTS AND PREFERENCES OF THE FARMING POPULATION

Before embarking upon a study of the reading of rural populations and their libraries and examining the differences in reading habits between farmers and townspeople it might not be out of place to emphasise that both belong to the same species. Most human, cultural, and social problems are common to both town and to country. People's ability, inclination and desire to keep vocational knowledge up-to-date and to utilise vocational literature vary, but the evidence is not very impressive either as regards town or country. Moreover, the extent of their reading does not immediately indicate the measure of their vocational ability, culture or humanity.

The standards of schools and education in rural areas tend to be less advanced in country districts and on the whole there will be greater distances to travel to cultural centres. However, advances in communications and technology are helping to narrow the differences between town and country and reception of radio and television is as good in the latter as in urban areas. But rural cultural centres are small, being conditioned to the limited number of people they serve and the resources available, and meet little competition. Modern developments thus afford more uniform opportunities to the rural population, whose other cultural sources are limited. These factors are particularly true of Scandinavia.

Two books in particular give valuable information about public library services in various countries: L. McColvin, The Chance to Read: Public Libraries in the World Today, 1956, and B. Berelson, The Library's Public: A report of the public library inquiry, 1949, which deals with library use.

Historically, religious schools in the late 17th and the beginning of the 18th centuries stimulated reading ability through elementary schools with the result that not only learned men but also the lay public were enabled to read the Bible as well as hymn-books and religious tracts, distributed from the printing offices of the religious centres - e.g. in Britain the Society for the Propagation of Christian knowledge. In Germany the centre at Halle, and in Denmark and Norway certain religious bodies in Copenhagen. This printed material was distributed freely or at a small charge, but in Britain, North America, and Sweden religious parochial libraries for lending of this material still exist. The rural traditions in relation to church and religious reading has preserved the Christian books longer on the shelves of country folk than in towns, although this is often perhaps more as a tribute to tradition than for actual use. New religious agencies in

France after the French revolution, in Germany (Borromäusverein, 1845), in the Anglo-Saxon world (Bible societies, from 1804, and societies for distribution of religious tracts) supplied new material, and their activities in this field are still considerable in the countryside.

The increasing ability of the populace to read opened up, and extended, the rural market for secular literature, popular books, and broadsheet ballads. Almanacs published by commercial printing houses had a rapid sale in country districts where they were read over and over again until they were worn out. These were replaced in the 19th century by historical novels, adventures and books of travel, and the newspapers which took over criminal reporting from the broadsheet ballads! Then came the advent of useful knowledge and moral enlightenment. Agriculture found itself in the centre of public debate; the immense changes in agricultural techniques and farm economy involved, as today, two sorts of literature - one to convey to the farmer motivation for changes, and a practical and technical one of how-to-do-it. Clergymen and pedagogues not only wrote the books, but founded rural lending libraries for their circulation - the forerunners of the modern parish libraries in central and northern Europe. The books were borrowed and used - no other source of agricultural information existed - but this interlude of agricultural education, through books alone, was not really successful. Better elementary schools, agricultural apprenticeships, agricultural schools and organisations, model farms and practical demonstrations were necessary for positive development. "The farmers must have examples and models", reported competent observers - who were most often clergymen - to the Royal Society of Agriculture in Denmark, a society which published the books and distributed them to the rural libraries. The realisation had emerged that books and libraries are seldom creative in themselves; they can only supplement other activities.

In the first decades of the 19th century new streams of useful knowledge - especially social, political, historical and economic knowledge - began to flow, and provided the masses with concepts of national feeling, moral and civic duties to State and society, and the new economic doctrine of liberalism. The Society for the Diffusion of Useful Knowledge and the activities of Lord Brougham had their counterpart on the Continent, for instance in northern Europe, where Anglo-Saxon influences now began to compete with the German. In Denmark this meant a sudden expansion of rural libraries in the thirties and forties to most of the parishes.

Farmers in Denmark had other views with the result that the parish libraries stocked educational literature of a somewhat neutral type, together with harmless romantic and rural fiction, mostly written by school teachers, supplemented by in-offensive and moral urban literature. It was a rural front line of defence against what was regarded as the dangerous modern and radical literature from the towns, a front which was not turned until the first decades of this century. Much of this kind of literature is still on the private bookshelves of farmers, but the opinion has gained acceptance that public libraries in town and country should acquire and lend the literature which is contemporary in the widest sense, with the

consequence that where equivalent library facilities exist both in the country and towns, there is no significant difference in the kinds of books borrowed by the reading public. But the percentage of registered borrowers today in country districts is much lower in rural districts than in towns, and moreover is decreasing. Why is this, and to what extent, do the rural districts enjoy library facilities?

The small independent unit such as the parish library, is often the basis of continental library systems. In Denmark the librarian will be the school teacher, and the library will be housed in the school. Funds are small, but a State grant of 80 per cent of the local expenditure is given. In return a State body supervises the libraries. As to book selection the local authority is helped by select lists and annual lists of new books, published by central library agencies. Libraries are individually advised and assisted by the so-called central libraries which are both town libraries and district or country libraries. As the annual accession of new books cannot be great, exchange depots are provided by the central library, from which special books which are not in stock in the parish library may also be ordered. All the rural borrowers in a library district are allowed to apply personally to the central library for their special requirements. Special literature not available at the central libraries, which differ widely in size and resources, may be ordered from the provincial state library or from the special libraries in Copenhagen.

Since the nineteen-twenties these libraries have formed a library system covering all fields of literature, a special sector of which has been assigned to each of them. Corresponding units are formed by all the libraries in the other Scandinavian countries. This system of rural library service with small independent units has its strength in local pride and interest, in the teacher's knowledge of his public, and in the opportunities provided of supplementing the modest local collections through borrowing from larger libraries. But the weak points are many. A library service based upon a collection of a few thousand books, with little accession of new books and directed by a teacher with little if any library training, cannot be very effective. Branches of a larger library could have a higher degree of professional guidance and service, with a small permanent stock of books and larger exchange depots. The trend in the library world is towards larger and fewer units, professionally staffed and with a mobile book service. But the Scandinavian system can and does function, especially in Sweden of late where the establishment of somewhat larger units has led to considerable expansion in the rural districts. In Denmark the building of central schools in the country in recent years, with new library premises and financially assisted by the State, has served to consolidate the system. Ideally these schools should be situated centrally in relation to communication lines, not in the geographic or geometric centre; but if this means that they are placed at a distance from the villages or the community and shopping centres, the school children will become the messengers of the adult population and no personal contact between the adult population and the library and librarian will be established.

In the Anglo-Saxon world (and partly in France since the nineteen forties) the rural districts are served from great county libraries, situated in a city with the sole duty of serving the country. They have branches in smaller towns and in the village centres or other service plants which are usually looked after by a local voluntary librarian. The very small stock in the centres is changed several times a year. Travelling libraries are used by a great many libraries in England, the United States and France: vans with 1,500 to 2,000 volumes bring the books directly to the borrowers, and act as centres by stopping at a given time at given places. They offer a more varied selection of books to the borrowers than the centre, can reach a much greater part of a scattered population, and can be staffed professionally. The limited room, however, in the van necessitates a quick service and the possibility of contact and of advice on more complicated problems will be less. Even if a new public can be reached, which would never have dreamt of going to a distant centre, many librarians only favour this service as a temporary solution. Perhaps the density of population will be the best guide to what service is most suitable.

The library service offered to the rural population differs much from country to country and from county to county, but as a whole the coverage is much better in towns. All research into the use of libraries has proved that the distance to the library is a decisive factor. The trouble of going for books and the desire for books are weighed one against the other. Another factor which limits the percentage of rural borrowers is the close connection between library use and the duration of education and training. The shorter educational training of the rural population, whose schools are smaller and and fewer, limits reading ability and the desire to read as compared with persons who spend a longer time at school and college. But among library users with little school education, keen readers will be found as frequently as among educated library users. Frequent library users are novel-reading housewives. There is evidence of rural children's hunger for books; children and young persons form the greatest percentage of borrowers in country areas although this may be because the use of libraries is necessary in their school work and training.

With vocational reading the position is perhaps different, although admittedly there has been little research in this field of library use. In Maryland, U.S.A., the use of agricultural college publications in one county has been examined and it was found that the greatest use occurred in the ages from 30 to 40. More than one-quarter of the white farming population had occasionally used these publications, which were sent free of charge on request. This material was not circulated through the libraries, for as a rule the extension services in neither the United States nor Europe use the public libraries as a channel of distribution for their pamphlets and bulletins to the rural population.

What sort of vocational literature is offered in the public library; what types exist and how are they used? In the first place there are in Denmark general textbooks, textbooks for agricultural schools and for agricultural colleges

and for training courses in different subjects. They amount to a great part of the national agricultural literature, and it is not least by these books that the libraries try to cover the agricultural subjects. These books are used at school, and taken home to the private libraries of the former pupils and students as reference tools. The books are frequently revised according to the development of the sciences, in so far as the authors have followed this development. We have here a series of problems: the bringing up to date of this material for the book owner, the problem of the eternal renewal for the libraries, and an eternal doubt for the librarian about the fitness of textbooks as library material. The same doubt and the same problem of continuous renewal are applied to other surveys covering extensive subject fields, as well as agricultural encyclopaedias, all-round agricultural books and systematic monographs. The general impression of librarians is that the borrowers are not very interested in the last type of books which may be well written by experts, but are seldom exciting. The borrower comes with a special question and special problems, and has not the slightest intention of taking an all-round course in a subject through the library. Much of the agricultural literature is published by the State and non-profit making agencies - in Denmark, for example, by the Royal Danish Society of Agriculture. Only in respect of textbooks and larger subscription works are commercial interests involved to a great degree, and only in special fields such as horticulture and poultry keeping do they compete with the Society.

In the early fifties the Society started an enquiry into rural libraries. Their stock of agricultural books proved to be extremely poor, often obsolete and almost unused. With the support of the State libraries and the central libraries a great many rural libraries were persuaded to buy sets of agricultural books from the Society. When later in the decade the agent of the Society returned to the libraries, these books had not been much used and several had become obsolete. A new arrangement was evolved - a subscription system, whereby the books in the set were gradually renewed for the sum of 25 Danish Kroner (£1.6.0d.) a year, and all of them kept up to date through a yearbook entitled "All the Newest in Agriculture". In spite of some reluctance on the part of the teacher-librarians who were not eager to use their limited funds in an enterprise with so many risks, the majority of parish libraries agreed to this, after pressure from the government and from most of the central librarians. However these books also are not very much used, and it is not reasonable in all cases to reproach the non-professional librarian. Perhaps other types of books and another arrangement should be tried. It should be noted that the subscription system is also used by over 2,000 private farmers. This proves the usefulness of the books, since not many farmers will continue a subscription which does not pay; but it reduces the number of potential users in the libraries. If this service is to survive, more publicity must be given to it, in the press, on the radio and in the libraries. Farmers' advisers especially should try to encourage the use of agricultural texts by their patrons, and draw attention to the books and the libraries. Much advice on special problems could, one supposes, be supported and consolidated through books, and reading could help

to show up problems and make the farmers put the relevant questions to their advisers. The whole problem which may be a basic and general one is - should not agricultural advisers think more about agricultural books and solid vocational reading material as a source of information and stimulation to their more progressive farmers?

Rural libraries can play an important part in the cultural and technical education of the rural population, and they should be able to provide a wide range of up-to-date books such as fiction, and general and technical publications, as well as literature relevant to advisory work issued by official bodies, professional organisations and commercial agricultural firms.

Investigations have shown that those who read widely are, in general, those who are most active in communal affairs, are progressive in their ideas and aware of the factors underlying the drift from the country to the town.

In order to encourage more reading among the rural population, the schools, as well as the press, radio, television and agricultural advisory workers, should pay more attention to technical literature in the sphere of agricultural and rural life generally.

APPENDIX

SUMMARY REPORT OF THE SEMINAR

INTRODUCTORY

Dr. F. Herren, Director for Agricultural Production of the Federal Ministry of Food, Agricultural and Forestry and Mr. Schad of the Ministry of Education of Baden-Württemberg welcomed members of the Conference. Dr. Herren expressed the hope that the Conference would be successful in every way, that the deliberations would benefit from being held at Stuttgart-Hohenheim which was a long-established educational centre for agriculture, and that the work done would lead to valuable and practical results for all who are working in library, documentation and information fields and ultimately for the agricultural industry as a whole. New developments in agricultural science and economics, Dr. Herren continued, will become normal practice on farms more rapidly if the information services to advisers and farmers are well-based and efficiently organised. The Conference agreed that the objective of their meeting should be to serve the interests of agriculture to the full, by promoting co-operation between agricultural advisory and research workers and agricultural librarians and documentalists.

Agricultural Research and Reference Libraries and their Role as Agencies of Information

The Conference heard with great interest the papers presented by Mr. F. Mohrhardt and Professor G. Franz on "Agricultural Research and Reference Libraries and their Role as Agencies of Information". The difficulty of obtaining all the necessary material, especially in marginal subject fields, was stressed, and attention was drawn to the importance of adequate finance and staff in making possible the rapid dissemination of information. There was also the problem of translation which presents difficulties especially in relation to the eastern European languages. The Conference agreed that in view of the fact that few agricultural scientists or advisory workers have sufficient time to keep pace with the output of literature in their own special fields, abstracts and bibliographies are indispensable to them. Delays in publication are common to all fields, and prompt abstracting and indexing are therefore essential to speed up the spread of vital information once it is published. The Conference considered that the choice of material for indexing ought to be selective, particularly in view of the wide range and complexity of the subject-matter content of many periodicals. It was also considered that more attention should be given to ascertaining more precisely the needs of the various classes of

readers who are served by agricultural libraries and documentation services (for example, teachers; students; advisory workers; and research workers etc.) so that each category can be provided for with the maximum efficiency and economy. In view of the rapid developments in agricultural science and economics there was a special need to instruct students of agricultural colleges and universities in the full use of library and documentation services.

The Conference noted with satisfaction that the tremendous increase in agricultural publications (estimated to amount to a 100 per cent increase within the past twenty years) which had long been a problem to librarians and documentalists, was now engaging the attention of the scientists themselves who were interested in the devising of new techniques for classification and dissemination. In expressing appreciation of the value and present coverage of the U.S.D.A. Bibliography of Agriculture, the Conference also hoped that this coverage could be further extended, if possible, to take in the continually increasing output of publications. Mr. Mohrhardt stated that while he shared the wish to extend the coverage, the possibilities of doing this, especially in the light of rapidly increasing output of publications, were limited by staffing considerations.

Types of Inquiry from various kinds of Readers in Agricultural Libraries and the Tools for Answering Them

From the papers presented by Mr. Th. P. Loosjes and Dr. M. Scheele on "Types of Inquiry from various Kinds of Readers in Agricultural Libraries and the Tools for Answering Them" the Conference noted with great interest recent developments in the techniques of analysis and evaluation of agricultural literature. The Conference agreed that these techniques had great potential importance especially for documentation and that they deserve serious consideration as contributions to more effective analysis, retrieval and dissemination. At the same time, the Conference considered that the terminology at present associated with the techniques made their general comprehension somewhat difficult and that this fact might limit the rate at which they were more widely adopted; it was also noted that they were primarily applicable to the exact and the biological sciences. It was acknowledged that the complexity of scientific literature made multiple parameters unavoidable, and that although three or four should normally suffice, as many as eight or ten are in fact used in practical work. While it was recognised that this number was more than the average user would call for, it was also agreed that complete analysis by punched cards would facilitate documentation work in tracing a variety of sources of material, wherever the application of the technique was practicable. Members of the Conference were of the opinion that the new systems of mechanical selection should principally be used in situations where highly specific groups of enquiries follow a pattern with similar central components.

Documentation Requirements of Agricultural Advisory Workers

The needs of agricultural advisory workers for documentation was the subject of an interesting paper presented to the Conference by Mr. B. Waibel who stressed the urgent need for advisers to be kept well-up-to-date on recent developments in the science and economics of agriculture, and thereby to help them to give farmers the fullest possible service of advice and information. Unlike many other scientists, advisory workers are, by the very nature of their calling, often stationed away from good library facilities and an adequate service of documentation is therefore a professional lifeline for them. The Conference agreed that agricultural librarians, documentalists and information services should consider the problem in four clear stages, (a) the selection of suitable material, (b) appropriate editing procedures, of a synthetic as well as an analytical type, (c) form of publication, and (d) methods of distribution. A distinction should be recognised between material to serve research workers, advisory workers and farmers respectively. The form of presentation should be appropriate to each class of recipient, taking full account, in the case of farmers, of the physical and economic conditions in which they worked.

In this connection the Conference noted with interest accounts of documentation services provided in certain countries; including critically evaluated weekly and monthly abstracts for advisers and teachers, and summaries in the form of yearbooks of specialised and general appeal in the Netherlands; also looseleaf systems of abstracts for advisers and teachers operated by Denmark and Norway and soon to be adopted by Sweden. It was noted that in the Netherlands it had been estimated that 50 per cent of the loans from the library had been stimulated by the issue of abstracts and documentation. The Conference agreed that the need of all advisory workers for a prompt service of information could be met by close collaboration between them and librarians, documentalists and information personnel, all of whom wish to achieve the maximum dissemination of information to advisers, and ultimately to the farming community.

With regard to encouraging the demand for, and proper use, of library and documentation services, some delegates reported upon the conduct of successful courses of instruction for agricultural students in universities and colleges on the use of libraries, abstracts and bibliographies. The Conference considered that this type of activity was likely to prove of the greatest value to students, not only during their training but also in carrying out their subsequent responsibilities in the field in a more effective way, as well as making it easier for the librarian and documentalist to give a quick and efficient service.

The Abstract Journal as a Bridge between Scientific Research and Practical Agriculture

Following a much appreciated paper by Mr. G. V. Jacks which contained an account of the organisation and methods of work of the Commonwealth Agricultural Bureaux, the Conference

discussed the role of the abstract-journal in aiding the work of agricultural scientists and advisers. It was agreed that abstracting has now become an indispensable part of the organization of scientific research and until abstracting is recognised as a profession requiring skills comparable with those required for research itself, it will not be in a position adequately to perform its rapidly expanding duties. Also, shortages of staff and finance in many countries made the development of adequate abstracting services very difficult. It was noted that a demand was arising for a more comprehensive coverage of available literature consisting of short abstracts (annotations) rather than full ones. The Conference was of the opinion that some wider form of international co-operation in the exchange of abstracts should be sought, and that a positive effort should be made to overcome the existing difficulties with regard to adequate translation facilities. If more extensive international co-operation is to be achieved, effective national abstracting centres might be needed to co-operate with an international agency by which subsequent translation and wide dissemination of material could be undertaken. In this connection, interest was expressed in an account given to the Conference concerning experimental work in the United States and the U.S.S.R. to develop mechanical translation, although the process was as yet narrowly limited to certain subjects and certain languages. For the present, it was noted that copying and translation services were offered by many abstracting organisations by means of photostats and microfilms. The Conference noted with satisfaction that the advisory workers as well as research workers were making good use of abstracting services in their work, and attention was drawn to the need for abstracts in fields which were closely associated with adviser's work but not yet covered, or inadequately covered, by existing services. Accordingly the Conference learned with great interest of the recent publication of World Agricultural Economics and Rural Sociology Abstracts by IAALD in conjunction with the International Conference of Agricultural Economists. Attention was drawn to a recommendation made by an ad hoc group of Agricultural and Horticultural Work Study Specialists in March 1960 held under E.P.A. Project 5/17 that IAALD should include a section on "Work Study" in the World Agricultural Economics and Rural Sociology Abstracts. The Conference strongly endorsed this recommendation and hoped that it would be considered at the IAALD meeting to be held during subsequent days at Stuttgart-Hohenheim.

Classification Systems as a Tool for Retrieving Information

The importance of classification systems in agricultural library and documentation work, and in making material readily available to readers, was the subject of two stimulating papers presented to the Conference by Professor S. von Frauendorfer and M. Kervégant. The Conference considered that the international standardization of classification systems was extremely difficult to achieve, but different systems could be made available in a number of languages. The Conference were of the opinion that it is desirable to retain the U.D.C. as a normal classification reference after revision of certain sections. However, this does not mean a renunciation of the specialised classifications, notably the "system of classifica-

tion of agricultural sciences" which might be usefully related to the classification reference. The importance of giving readers some minimum instruction in the use of catalogues and classification systems and also including this subject in university curricula was stressed. The Conference asked the IALD to consider the preparation of a booklet on the basic principles of classification with comparative studies of various classification schemes and examples of use.

International, Inter-regional and National co-operation in Agricultural Documentation

The Conference listened with great interest to a report by Miss Borghild Bjørlikke on the "Scandia Plan" of co-operation between libraries which is in a steady process of full realisation. It commended the work being done as a model of practical co-operation which should serve as a stimulus to other countries and regional groups. The progress of International and Inter-regional co-operation in Agricultural Documentation over a wider field was the subject of a survey by Mr. D.H. Boalch and presented to the Conference, in his absence by Mr. F.C. Hirst. It was generally agreed that progress would be more rapid as agricultural librarians and documentalists became increasingly aware of the mutual benefits to be gained. In this connection the Conference particularly welcomed the contribution being made by the publication of the IALD Quarterly Bulletin as a medium of information over a wide area. The Conference emphasized the need for exchange of personnel as well as documentation within the context of international co-operation, and considered that agricultural librarians and documentalists were not adequately represented in some exchange-schemes for technical personnel.

The Conference drew attention to the difficulties arising in the international exchange and acquisition of documents by administrative restrictions, and expressed strongly the hope that this situation would progressively improve. The well-established Exchange of Publications Scheme operated by FATIS through its Liaison Centres for the benefit of advisory and information workers in O.E.E.C. countries was noted as an example of what a "sample" scheme of exchange could achieve by international co-operation. The Conference expressed the hope that appropriate international organisations would do everything possible to assist the development of co-operation between agricultural libraries and documentation services. In this connection interest was expressed in the selective catalogue of holdings in the F.A.O. library, to be published shortly, and a mimeographed list of current journals issued in 1959. One of the factors affecting the development of international co-operation was considered by the Conference to be a lack, in some countries, of adequate support for documentation centres, and there was a need in this connection for a form of agreement on the status, qualifications, and training of agricultural librarians and documentalists. Turning to co-operation on a national scale the Conference heard with great interest a description of co-operation between the agricultural libraries of Canada by Mrs. Margaret Reynolds. It was agreed that the automatic periodical circulation scheme operated in Canada,

which overcame many of the disadvantages of the manual methods of circulation, was an innovation of great importance.

Rural Public Libraries and Reading Requirements and Preferences of the Rural Population

The paper by Mr. Helge Nielsen gave rise to considerable discussion of the particular needs and preferences of rural readers. The Conference agreed that rural libraries can play an important role in the cultural and technical education of the rural population and that they should be able to put at the disposal of their readers a wide range of recent books, general and technical publications, as well as fiction; they should also carry literature relating to advisory work published by official bodies, professional organisations and commercial agricultural firms. Liaison between libraries would provide a more comprehensive choice for readers, and the Conference considered that attention should be drawn to the fact that rural libraries can be of great value in supporting agricultural advisory work especially for groups of progressive farmers. To encourage reading among the rural population, the Conference considered that the schools, the agricultural press, radio and television and the agricultural advisers themselves should pay closer attention to technical literature in the agricultural and rural fields generally.

Summary Recommendations

As a result of its deliberations, the Conference also wished to recommend that:

- (1) Competent organisations should be requested to give close attention to co-operation between advisory workers and documentalists. There is a need for fuller and more precise information on the kind and form of documentation material which the advisory worker finds most valuable in his work; such information would make it possible to derive the maximum value from documentation services.
- (2) International co-operation between agricultural librarians and documentalists should be strengthened in a number of ways. One important task is the compilation of a world list of agricultural periodicals. Attention should be given to the exchange of material between agricultural libraries, possibly by creating international centres for this purpose.
- (3) Interest in documentation work ought to be further encouraged by international and national organisations through (a) sponsoring the training and exchange of staff and (b) creating or improving educational facilities in the use of agricultural libraries and documentation services.
- (4) Research on modern methods of automatic selection should be carried out because this subject deserves the fullest attention, particularly in relation to specialised research institutions, although its more general use also needs careful consideration.

(5) The Conference, noting the growing demands for bibliographical information and documentation from agricultural research and advisory workers, wished to draw attention to the increase in finance and equipment which these demands necessitated.

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