

# Comments and Communications

## A Punch Card for Abstracts of Bacteriological Papers

THE use of punch cards (Fig. 1) has provided a satisfactory solution to the problem of filing and cross-indexing abstracts of bacteriological papers. The card reproduced in Fig. 1 contains subject headings

concerning antibiotics and enzymes simultaneously may be extracted by running a stylus through the hole opposite the heading *enzymes*. The selection of abstracts could be made even more specific by extracting only those abstracts which deal with the *Streptococceae*.

The headings in the classification section are not

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FIG. 1. Punch card for abstracts of bacteriological papers. A hypothetical example is illustrated.

selected to cover all phases of bacteriology and has been successfully used by four bacteriologists of widely divergent interests. The card measures 5 x 8 in. The citation appears on the front of the card while the back is reserved for the actual abstract. The hole opposite each subject heading that applies to the particular paper is punched out to the margin of the card. Thus, in the fictitious example shown, *D* is punched for the senior author, J. A. Doe; antibiotics, enzymes, and *Streptococceae* are punched as the paper deals with the antibiotic aureomycin, the enzyme hyaluronidase, and a genus in the tribe *Streptococceae*, respectively.

To select abstracts dealing with any desired subject one need only insert a stylus through the hole opposite that subject heading in the stack of abstracts and lift the cards. Those cards dealing with the desired subject will drop out of the stack. Thus all abstracts that deal with the general subject of antibiotics can be rapidly selected. From this collection those references

all of coordinate taxonomic position but are divided into units according to their relative frequency of use. In some instances an entire order was assigned to one hole, e.g., *Myxobacteriales*. In most cases in the *Eubacteriineae* the family names were used, e.g., *Neisseriaceae*. Large families were listed according to tribes, e.g., *Salmonelleae*, while the commonly encountered genera *Bacillus* and *Clostridium* were assigned individual holes. In actual use the order *Virales* can be readily divided into plant or animal viruses by simultaneously punching the hole opposite the heading plants or animals, respectively. The bacteriophages were allotted a separate hole. The type of bacteriophage can be readily designated by punching the classification heading of the host bacterium.

Each card has 16 holes without assigned subjects. These holes can be used for the special subject interests of an individual; the subject heading can be written on a master card. The card shown in Fig. 1 has a space on the face of the card for *Subject*. This

space is used if the paper abstracted includes a subject, of particular interest to the abstractor, that is not clearly designated in the title of the paper. Space is also provided for *Reprint No.* The authors number each of their reprints as received and file them in numerical sequence. This number is recorded on the abstract card for that paper. Since the abstract of any paper can be found in less than one minute, the exact location of the reprint can be determined very quickly.

The large number of combinations of subject headings possible on these punch cards provides for a much finer subdivision of subject matter than is practicable by the usual method of cross-indexing abstract cards. In addition, the time required to cross-index and file abstract cards is eliminated, as the cards need not be filed in any particular order. Space requirements are reduced since no cross-indexing cards are needed. Although the cards described here were designed for use by bacteriologists, similar cards could be readily adapted for use by scientists in other fields.

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## "Data"

DR. BACHARACH (SCIENCE, 117, 537 [1953]) surely wishes to restrict unduly the meaning of the useful word "data." The primary products of an experiment are the numerical or other abstractions known as its results. When these are transferred from a recording instrument on a bench to a sheet of paper on a desk they become the data which the experiment has *given* towards the construction of a theory or course of action. Experimental results are raw materials; experimental data are about to be put to use.

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## The Research Committee in the Organization of the International Biological and Medical Associations and their Congresses

THE Research Committee established by the International Association of Gerontology in 1951 might suggest a similar organization in other international biological and medical congresses.

At present the usual organization of these congresses does not completely satisfy all the active research workers. There is no doubt that the present congresses do important work. Such congresses, however, contribute comparatively little to the *rapid* progress of research work, since the reports, irrespective of whether they are reported at the con-

gresses or not, are published in various scientific journals, in which they can be studied more carefully than is possible at the congresses themselves. Their basic deficiency, however, is in the fact that at the usual congresses only the results of research already performed are reported, while for the solution of every problem a carefully devised research scheme and methods are of primary importance. To devise a perfect research scheme is very difficult indeed.

The point is that usually every research worker likes to approach any problem from his particular angle and to use his particular methods and tests for its solution. Such a "one-track approach" limits his research scheme, in some cases, to such an extent that it becomes impossible for him to arrive at definite conclusions; while some additional line or method in his research would allow him not only to obtain wider and more numerous results, but also to use his energy, time, and money in a more economical and productive way.

Therefore, at first during the last war, special Research Committees, consisting of the best specialists in various countries, were established (for example, for splitting the atom). At meetings of these Committees the research schemes and methods necessary for the solution of the proposed problems are considered at round-table discussions by a number of specialists. Each one considers the research project from a different angle and proposes different research methods. In this way the best possible and the most comprehensive research schemes and methods for any project can be worked out.

Of course, the author of the project is at complete liberty to accept the suggestions made at the round-table discussions or to reject them.

*Permanency in the work of Research Committees.* It is desirable that, during the whole duration of the Congress, the Sessions of the Research Committee be held separately from, but simultaneously with, the usual Sessions, so as not to interfere with the activity of the latter. The Research Sessions will be of great importance and interest only to a comparatively small group of active research specialists. However, on this small number of specialists the solution of all the biological and medical research problems depends completely; and also of all the socio-economic and other practical problems related to them (as for example in the case of gerontological socio-economic problems).

The sessions of these committees have to be arranged not only during the congresses, but also between the congresses. The financial difficulties indicate that these "between sessions" should be local, for example, conferences of the American and European Divisions of the Committee. These major local conferences can be further subdivided into meetings of small groups of specialists in each country who, at the general conferences, have found that in their current research work they are interested in the same limited line of research.