own abstracts, and since this procedure helps to retard the publication of abstracts, any programme that reduces the abstract's reliance on authors would help to solve the currency problem.

Quality

Social science abstracting services face peculiar problems in insuring the completeness, accuracy, and general quality of their abstract entries. For one thing, it is generally recognized that a relatively high proportion of social science writings have serious defects: data are questionable, samples are limited, methods are inadequate, findings are trite, and conclusions are not well supported.

Such literature may not be worth abstracting; furthermore, to treat it seriously is likely to be a disservice to the future development of a scientific discipline. In short, the quality problem refers in large part to the general quality of social science work, and the eventual solution to this problem will depend in large part on the greater selectivity of journals and publishers, as well as on the general maturing of the social sciences.

The quality problem is one reason evaluative reviews and state-of-the-art summaries are so valuable to some scholars. However, abstracting services. have to consider the variety of needs scholars have, and therefore they cannot afford to be too selective. Some users may value "browsability" more than depth and critical judgement, exhaustiveness more than selectivity, hard facts more than syntheses, and methods more than concepts. These contradictory demands on information services have contributed to a growth in research concerning the kinds of information needs scientists have. (It is generally recognised that the needs of science as a system may not coincide with the felt needs of individual scientists; the individual may limit his concern to his own narrow specialization, whereas the development of science may depend on the blending of developments from two or more specialties.)

Quite aside from the quality of research publications and the kinds of abstracts needed, there is the separate issue of

the quality and accuracy of the abstract itself. Since a high proportion of the abstracts are prepared by the authors of the abstracted article, the problem of quality is related to the general problem of the quality of social science work. It is very likely that experiments will be conducted to compare the usefulness of abstracts prepared by authors with that of abstracts prepared by professional abstractors and, eventually, by computers.

Organisation of the Files

A major purpose of abstracts is to help scholars locate materials they might want to investigate in greater detail. To serve this purpose, the abstract must briefly and accurately cover the relevant portions of the larger manuscript. Furthermore, the abstract journal must be indexed so that the user can locate all the relevant materials quickly, with the assurance that he is not missing anything because of the searching procedure forced on him by the abstract's index or filing system.

Also, the abstract's filing system must avoid providing the user with too much information: that is, it should ideally provide him only with materials directly pertinent to his initiating question. (If he is only browsing, this may be an irrelevant consideration.) The organisation of an abstract's filing or cataloguing system is an important determinant of how much the abstract can contribute to the advancement of a science.

Implied in the last statement is an assumption that abstracts are used only for research related to the advancement of science; but, of course, they are used for teaching and other purposes as well. Even researchers will differ in the demands they make of an abstract, so a catalogue system suitable to one group of scholars may be useless and annoying to another.

Some abstract users are interested primarily in very general topics, such as legislative systems; others are seeking information about research methods; others wish to see how a single concept has been used in various contexts; still others will be primarily interested in specific variables or in empirical

relationships between specified kinds of variables. Not only are the initiating concerns different, but so are the complexities of the request. For example, a cataloguing system will be organised one way if most of its requests are for general topics and another way if most of its requests refer to information on multivariate relations between such items as liquidity preference, religiousness, and political involvement.

Social science abstracting journals tend to be organised around traditional subject-matter topics rather than around variables, concepts, and findings. Even the topics tend to be gross in content. For example, in 1964 *Sociological Abstracts* organised its materials into approximately fifty categories, including "public opinion," "political sociology," and "sociology of the family." On the other hand, *Psychological Abstracts* has more than three times this number of categories, and it publishes a very detailed and extensive supplementary subject index.

The maturing of the social sciences, the recognition of new methods of organising materials, and the pressure from an accumulating mass of literature, a new view of abstracting problems and services is slowly appearing. Studies of information needs will help determine the most appropriate organisation of a catalogue; the development of natural language systems for storing, organising, and retrieving information may change the perspective on cataloguing systems; and the success of computerised information services, such as the Defence Documentation Center, may alter the concept of what services an information center can provide.

Emergent Trends

Reference has already been made to several developments that have the possibility of profoundly improving the information services that to this time abstracts have provided. The extent and speed of these improvements will depend on financial considerations, the development of a national information policy, the future course of the social sciences, and the progress other scientific fields make in solving their information problems. Many of these developments cannot be

clearly seen, because information specialists are only now discovering the potentialities provided by modern computer technology. Computer-produced translations can expand the amount of materials that can be considered for abstracting; computer-produced abstracts can increase the number of abstracts that can be prepared, and they can also reduce the lag between publication and abstract; by means of "interest profiles"—a list of words indicating a person's interests—computers can facilitate a more aggressive dissemination of information; and by means of computer-based systems for information storage and retrieval, abstracts can be more than document-switching services; they can become invaluable research tools.

The last point deserves special mention, since it may involve a radical departure in traditional conceptions of abstracting services. At the present time abstracts are considered devices to alert scholars to materials they might wish to explore more fully.

However, exploratory work in developing systems for information storage and retrieval in social science data archives indicates that such systems can be used to retrieve and organise specific kinds of information, such as "findings" on the relationship between family structure and educational achievement. Therefore, rather than merely providing references to existing information, abstracting services could develop into facilities that actually create new information. That is, they can serve as sources of data.

Information banks will be of primary interest to those who are seeking results of studies rather than to those who are concerned more with the methods by which the information was collected and analysed. In the physical sciences and in engineering, specialized "mission-oriented" groups have been created to service requests for data, results, methods, and analytical procedures.

In the United States, groups such as the Defence Metals Information Center and the Thermophysical Properties Research Center are prepared to winnow out irrelevant and poorly performed research; they provide state-of-the-art

summaries, information on the latest findings and techniques, and references to who is doing what in the field. These and other similar groups provide specific, evaluated answers to questions, not just information on whom to see or what to read in order to answer the question.

There are indications that these same kinds of information centers will develop within the social sciences. For example, in 1964 Michigan State University began to create a diffusion documents center, a facility designed to provide bibliographic references, existing data, and other information related to the adoption of various new farming and other techniques and practices. Also, the Special Operations Research Office of the American University has created CINFAC, a service that responds to requests for information, materials, and analyses of the human factors involved in insurgency and counterinsurgency situations in specific geographical areas. There are also a variety of local and national centers that have a heavy applied or policy orientation, being concerned with intergroup relations, community planning, and various economic matters.

Data Archives

Whereas abstracting services report on published literature and research in progress, social science data archives acquire, store, process, and distribute basic social science data produced by various research and administrative groups. These data, primarily materials that are in a form for machine processing, together with their accompanying study designs, code books, research reports, etc., are used by researchers for purposes of secondary analysis and by teachers for purposes of training. ("Secondary analysis" refers to the use of materials for purposes unrelated to those for which they were originally collected.)

Such secondary materials have played a key role in the development of the social sciences, although the contribution differs in accordance with the attention different disciplines give to quantitative social research and with the standards of evidence and inference upheld in the various fields. At one

extreme, economics and demography have been heavily quantitative in orientation. While there are certainly major exceptions, in large part the materials used in these fields result from the normal bookkeeping operations of various government and private administrative operations. At the other extreme, anthropology has been largely a descriptive discipline, concerned primarily with "qualitative" materials, or, more properly, information collected by observation of one sort or another.

Sociology and, more recently, political science fall between these two poles. In the past, pathbreakers such as Quetelet, Durkheim, and Sorokin based some of their most significant research on existing published statistical data, whereas more recently, beginning in large part with the *American Soldier* volumes, there has been an increasing research interest in working with the punched cards produced by research projects that have terminated their activities.

With the advent of modern data-processing equipment, social scientists are able to utilize new techniques on new bodies of data. This in turn has contributed to new concepts, theories, and methodologies and to demands for still more data. The change in research orientation can be seen in the history of the concern with existing materials, especially with public-opinion data. Recognising the significance of these materials very early, *Public Opinion Quarterly* began in July 1938 to publish the poll results released by the American Institute of Public Opinion; the American and overseas coverage of releases was increased until 1951, when this regular feature was discontinued.

However, it was reinstituted some ten years later. In the meantime, the *International Journal of Opinion and Attitude Research,* published from 1947 to 1951, ran a major feature called "World Opinion." Between 1943 and 1948 the National Opinion Research Center published eleven issues of *Opinion News,* which included releases from polling groups in the United States, as well as other countries.

In 1951 Cantril and Strunk compiled their book *Public Opinion 1935-1946,* which included opinion-poll materials from

sixteen countries. In 1960 Cole and Nakanishi edited *Japanese Polls With Sociopolitical Significance, 1947-1957,* and comparable volumes of German, Swedish, and Italian materials have been published.

In 1965 the Steinmetz Institute of Amsterdam assumed the editorial responsibilities for *Polls,* an international journal reporting the research results obtained by about seventy organisations from more than twenty countries.

With the further development of survey methodology, research interests, and data-processing equipment, scholars became increasingly aware of the limitations of these published volumes of research findings. Only a small portion of all the findings and materials was reported; and the materials that did appear in print were at most simple marginal distributions, although two-variable tabulations were sometimes given. In no sense were these materials being adequately exploited. Since large quantities of the basic materials were being destroyed, it appeared that these invaluable research resources would be lost forever.

Although public-minded commercial research agencies, both in America and in Germany, had expressed an early interest in having their materials preserved and made available to scholars, it was not until 1955 that steps were taken to provide an over-all solution to the problem of archiving these data. In 1957 York Lucci and Stein Rokkan reported on their two-year investigation of archive prospects in the United States and Europe.

Among other suggestions, the authors proposed the creation in the United States of a central national archive containing survey materials collected from around the world. It was felt that the level of research practices and sophistication among Europeans required that the creation of European archives be accompanied by training programmes in the use of survey materials, as well as methodological studies of problems involved in the use of such data. Prior to 1957 individual university research centers maintained archive operations for their own materials, making them available primarily to graduate students for their dissertations.

After 1957 a number of specialized archives were created. Although a study in the United States in 1963 discovered that there were, on the average, three or four archives per state, most of these were repositories of materials that were not made readily available to the academic community. But by 1965 approximately fifteen university archives were in existence or in the process of being created in the United States. Other archives were being created in Norway, Finland, the Netherlands, France, England, Germany, and Argentina. This proliferation in turn led to the creation in 1964 of the Council of Social Science Data Archives, an American group, and to the beginnings of an international coordinating network.

Most of these archives were created in response to the research needs of local faculties. Because of this, the archives differ considerably in their scope of concerns, the services they offer, and the data they collect. Some archives have focused primarily on one kind of data—survey materials or aggregative statistics.

(The Yale Political Data Programme is concerned with national aggregative statistics; an archive at Indiana University is concerned with the more qualitative aspects of nation-states.) Some are concerned with particular regions of the world. (The International Data Library and Reference Service of the Survey Research Center of the University of California at Berkeley specializes in materials from the developing nations; Steinmetz Stichting, a University of Amsterdam archive, focuses on materials from the Netherlands; and the Zentralarchive fur Empirische Sozialforschung at the University of Cologne is devoted primarily to German materials.) Others are concerned with materials pertaining to limited substantive research interests.

(The Inter-university Consortium for Political Research, an American group with offices at the University of Michigan, focuses primarily on politically relevant American materials.) Still others are primarily concerned with materials provided by particular kinds of data suppliers. (The Roper Public Opinion Research Center has relied primarily on commercial polling agencies for the materials it distributes.)