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CHARACTERISTICS OF SOCIAL SCIENCE INFORMATION: A SELECTIVE REVIEW OF THE LITERATURE.* PART I

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ABSTRACT

This paper presents a review of mainly English language literature on the scope of the social sciences as understood in various countries, on the linkings between social science disciplines, on the general characteristics of social science and of social science information, on the characteristics of the primary sources and of secondary information services, on the characteristics of the flow of information, and on the characteristics of the use of social science information by social science researchers as well as by social scientists in non-research environments and non-social scientists in need of social science information, especially in decision-making processes. As far as possible comparisons are made with information in science and the humanities.

WHAT ARE THE SOCIAL SCIENCES?

As the term 'social sciences' is used in various ways in various parts of the world, it seems useful to start an article on the characteristics of social science information with a paragraph on the scope of the social sciences as understood in a number of countries and by some international organizations, with an indication of what the author has in mind when using the term.

In the introduction to the *International encyclopedia of the social sciences* the following comment is given:

> It is apparent that the question 'What are the social sciences?' is one to which no final answer can be given, since—like other groupings of scientific and academic fields—the social sciences differ in their scope

* This article is an abridged and up-dated version of a paper prepared for the International Federation for Documentation's Social Science Documentation (FID/SD) Committee, published by FID as FID Studies in Social Science Information and Documentation Nr 1 (FID Publ. 606).

** Drs. Huiberta P. Hogeweg-de Haart graduated in 1940 at the University of Amsterdam as a social geographer. After some part-time occupations combined with raising a family, she was invited in 1963 by the Social Science Council of the Royal Netherlands Academy of Arts and Sciences to set up a registration of ongoing social science research in the Netherlands, which developed into an integrated Social Science Information and Documentation Centre (SWIDOC), including also a documentation of social science reports, a reports library and a data archive. She retired in 1981 as director of SWIDOC, but remains active in some national and international committees, e.g., as chairperson of ECSSID (European Cooperation in Social Science Information and Documentation).

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Table 1. Diversity of the social sciences

	Yugoslavia*	USSR*	USA‡	UK†	Sweden*	Spain*	Rumania*	Poland*	Norway†	Netherlands†	Italy*	Hungary*	GDR*	France**	Finland*	FRG†	Denmark†	Czechoslovakia*	Bulgaria*	Inform. Services OECD	Dewey Dec. Cl.	Intern. Enc. of S.S.	UDC	Unesco
Anthropology (social, cultural)	×		×	×	×				×	×				×		×	×			×		×		×
Ethnography, ethnology	×				×									×				×				×	×	×
Archaeology, prehistory	×		×				×							×				×						
Art		×														×		×	×					
Communication science	×		×	×					×	×								×	×					
Criminology, penology	×		×	×						×										×				
Culture		×																						
Customs, folklore	×		×	×																	×		×	×
Demography	×		×	×		×	×		×	×		×	×	×		×	×	×	×	×	×	×	×	×
Economics	×	×	×	×	×	×	×		×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
Education, pedagogy	×		×	×					×	×					×	×	×	×	×	×	×		×	×
Environmental/urban/regional planning									×					×			×			×				
Ergonomics																				×				
Futurology																				×				
Geography (human, economic, sociological)	×		×	×	×				×	×				×			×			×		×		×
History	×		×	×	×				×	×	×	×	×	×		×	×	×	×	×		×		×
Information/library science, computing																×	×	×	×					
Labour, occupational sciences																×	×							
Languages, literature, philology														×										
Law	×		×	×	×	×	×		×	×	×	×	×	×		×	×	×	×	×	×	×	×	×
Linguistics	×		×	×										×						×				
Management	×		×	×										×						×				
Military science																								
Musicology														×										
Philosophy														×										
Political science	×		×	×	×	×	×		×	×	×	×	×	×	×	×	×			×	×	×	×	×

Table 1 (*Cont.*)

	Unesco	UDC	Intern. Enc. of S.S.	Dewey Dec. Cl.	Inform. Services OECD	Bulgaria*	Czechoslovakia*	Denmark†	FRG†	Finland*	France**	GDR*	Hungary*	Italy*	Netherlands†	Norway†	Poland*	Rumania*	Spain*	Sweden*	UK†	USA‡	USSR*	Yugoslavia*
Public administration		×		×				×			×		×		×		×							
Psychiatry			×																			×		
Psychology	×		×		×	×		×	×		×		×	×	×	×				×	×	×		
Social policy, social administration		×		×	×	×		×	×	×			×			×					×			
Sociology	×	×	×	×	×	×	×	×	×	×		×	×	×	×	×	×	×	×	×	×	×	×	×
Statistics		×	×	×	×	×		×					×	×	×									
Science of religion, atheism						×					×		×											
Science of science						×			×		×		×				×						×	
Scientific communism						×						×											×	×
Study of developing countries						×								×										
Trade, traffic	×			×									×					×						

* From paper for ECSSID I, Moscow 1977. *Information Processing and Management 14* (1978) 3/4.
† From paper for Workshop ECSSID Working Group 2, Amsterdam 1978.
** From *Annuaire Sciences de l'Homme*, CNRS, Paris 1978.
‡ From *User's guide to online searching of Scisearch and Social Scisearch; Subject Coverage.* Institute for Scientific Information, Philadelphia, 1978.

> from one generation to another. There are also within-generation differences: witness the continuing controversies over whether history should be considered as one of the social sciences or as a humanistic discipline; whether geography is an independent social science or the synthetic discipline that draws upon both the social sciences and the earth sciences; whether law is a social science or a body of professional knowledge; whether psychology belongs with the social or the natural sciences; and whether psychiatry is a social science or a branch of medicine (*International encyclopedia of the social sciences*, 1972: XXI).

Therefore, it may serve better to turn from theory to what international classifications and national bodies include in the term 'social sciences' for practical purposes. For the survey given below, Unesco's list of the social sciences was compared with the subdivisions of the UDC, the contents of the *International encyclopedia of the social sciences*, the *Dewey decimal classification*, and the classification of the *Inventory of information resources in the social sciences*, compiled by Brittain and Roberts (1975). These international classifications were also compared with what national bodies considered as social sciences.

For each country the papers for the first European Conference on Social Science Information and Documentation (ECSSID I), Moscow 1977, were scanned, as well as the data collected for the Workshop of ECSSID Working Group II on ongoing research, Amsterdam 1978. For the USA the table of contents of the *Social science citation index* was used.

The data in these sources are not quite comparable, as they are not given as answers to specific questions. Moreover, the terminology for the disciplines included is not always the same; for instance Unesco lists ethnography and ethnology next to social and cultural anthropology, but in quite a few countries both will be included in the latter. In spite of these incongruities and incomparabilities, however, the listing below gives some insight in the diversity of the term 'social sciences'.

It is notable in this survey that there is complete unanimity that economics and sociology belong to the social sciences and almost total unanimity for law. Political science and education score for a great majority; history scores well in the national context but poorly in international classifications, and opinions on the position of psychology are very much divided. The major difference, however, is whether or not the humanities should be included in the social sciences. Eastern European countries, France and Italy do include the humanities, the other countries do not.

Speaking in very general terms the social sciences deal with society and the humanities deal with the products of the human mind. If the social sciences proper and the humanities are considered as one category it is difficult to speak of the characteristics of social science information, as it makes a crucial difference whether it is information on the functioning of human society or information on art, languages, literature, music or philology. For the purpose of this article the terms 'social science' 'social science information' are confined, therefore, to the more restricted definition.

Another reason to distinguish between social science information and information for the humanities is that interdisciplinary contacts between both fields are rare, even rarer than between social sciences and technology or between social sciences and life sciences.

LINKS BETWEEN SOCIAL SCIENCE DISCIPLINES

As to the integration and differentiation processes between social science disciplines it could be argued that, whereas in science, biology, for example, started as one subject and has branched into many disciplines and subdisciplines, those disciplines linked together under the term 'social sciences', such as anthropology, economics, geography, law, political science, psychology and sociology, each started on its own and links among them developed later. These links not only developed in the way of subdisciplines such as economic sociology or social psychology, but, even more importantly, through interdisciplinary subjects as criminology, education, finance, management, labour sciences, environmental planning and social policy. Of the constituent social sciences mentioned above, some, such as economics, psychology and sociology have a larger input in interdisciplinary subjects than others, such as anthropology and geography.

Links between subjects can be traced by citation patterns. In the DISISS (Design of Information Services in Social Sciences) studies such an analysis was performed. In the conclusion it was stated:

> Subject relationships are shown both by references made (indicating dependence of a subject on other subjects) and by citations received (indicating the extent to which the subject is drawn on by other subjects). These references indicate that there is a heavy general dependence on psychology and to a lesser degree on economics . . . These two subjects are quite self dependent themselves, making and receiving a very high percentage of their references to and from themselves (Bath University, 1979: xiv).

In a more recent article on the same subject Line adds:

> High self-sufficiency can indicate 'inbreeding'—an unwillingness to seek enrichment from other subjects—or maturity and coherence. There would be little disagreement that psychology and economics are the social sciences with the clearest identities. Sociology and political science are of their nature less clear cut, while the dependence of geography, criminology, and of education on other subjects is understandable (Line, 1981: 81).

James D. Neeley (1981: 222) confirmed the usefulness of the method of cross-citation analysis in a recent article on the interdisciplinary position of the management literature.

Linkages among sciences have been distinguished as:

1. Intradependent, when its research is observed to feed more on the research produced by itself than on the research produced by the other science.
2. Interdependent, when the research on one is observed to feed on the research of another in equal proportions.
3. Homodependent, when its research is observed to feed on the research of its assumed parent-science.
4. Heterodependent, when it feeds more on exterior sciences than on itself and related sciences (Espirito Santo, 1978: iii).

These linkages among subjects may be expected to have an important impact on the use of the literature for these subjects.

GENERAL CHARACTERISTICS OF SOCIAL SCIENCE AND OF SOCIAL SCIENCE INFORMATION

In 1974 Unesco sponsored a meeting of social science experts to investigate the feasibility of a world information system for the social sciences in the framework of the UNISIST programme. Adam has summarized the characteristics of social science information as brought forward in the report of this Valescure meeting. In an abridged form they are:

1. Materials in the social sciences are needed by a much wider range of users. User groups include not only scientists but also administrators, policy makers, businessmen, social workers, lawyers, etc.
2. Conversely, in most of the social sciences, the range of potential subject matter is extremely wide.
3. Certain types of information and data that are important in the social sciences are not found in other fields, or are of much less consequence there, as for instance: conceptual information, statistical and other numerical data, data which are initiated in non-Roman characters.
4. Much information is of restricted value in terms of time and/or place.
5. Social science knowledge can be packaged in a wide variety of ways, e.g., by subject matter, problem, geographical area, professional need.
6. Special forms of output are often necessary to satisfy the needs.
7. Social science materials are recorded in a wide range of media and formats. The organization and description of such varied formats present problems when related to users' needs.
8. Social scientists place a heavy reliance on informal means of communication and are often reluctant to use formal channels.
9. There is a great deal of reluctance to use data at a secondary level or to replicate earlier research.
10. The boundaries between disciplines are neither static nor clearly defined and the scope of social sciences as a whole is subject to varying definitions.
11. Social scientists' work is more significantly affected by their own world views which are influenced by social, national, religious, linguistic, cultural and ethnic differences (Adam, 1975: 287).

Some years later Brittain set the characteristics of science information systems and the structure of communications and knowledge against those in the social sciences. Some of his conclusions are:

1. In the social sciences there is less agreement about the way in which progress is made, the relative importance of communications channels, and information requirements.
2. Progress in the social sciences does not seem to proceed by building upon the achievements of previous generations.
3. There is no general consensus about subject matter, procedures, methods, and interpretation of data.
4. The social sciences suffer from a wealth of theories that either cannot be verified by empirical evidence, or are not verified because social scientists do not persist when there is conflicting evidence, which leads to rival schools and to a mass of literature with a lack of consensus.
5. The lack of consensus and problems of verification mean that many

> theories amount to no more than individual points of view (Brittain, 1979: 713).

In Brittain's opinion, to adjust information services to the requirements of the social sciences, it is necessary to study more deeply the differences in information flow and in communication and the structure of knowledge. In particular he suggests that studies by means of citation analysis should be made of publications in some ten areas of the social sciences which are generally recognized to deal with important issues.

One of the points Brittain stresses strongly is that for the most part the social sciences are non-cumulative.

> This contradicts the expressed views and hopes of many social scientists over the past 100 years; and also information specialists, who often assume that social science information accumulates to form a structured body of knowledge (Brittain, 1979: 723).

CHARACTERISTICS OF THE SOURCES OF SOCIAL SCIENCE INFORMATION

Characteristics of the primary literature

In this section data will be given on the size and composition and of the growth rates of social science literature. Wherever possible these data will be compared with data on literature in science and the humanities.

The data for this section, except where indicated, are drawn from the publications on the DISISS project (Bath University, 1974, 1975, 1979, 1980). For the purpose of this project the scope of the social sciences was not limited to the definition given above but included also geography, linguistics, social and economic history and statistics, and excluded law.

Size and composition of social science literature

According to the DISISS team there is a good deal of literature discussing and reporting size and growth data, at the global, national and subject level, but the comparability among the studies is low. Estimates on the world number of social science serials vary from 2662 serials in the 1973 World List of Social Science Periodicals (scientific primary periodicals only) to 27 000 serials in the Unesco Statistical Yearbook 1972. This last number is thought to contain much non-academic material, and a better estimate might be in the order of 7000.

Line and Roberts (1976: 126) suppose that approximately 20 per cent of all 'serious' current serials might be social science serials. They estimate a production of 140 000 social science articles in 1970 against 130 000 monographs, which makes for a rate of 1.08:1, whereas this rate is 8:1 in science and technology.

For the bibliometric studies of the DISISS project a machine-readable database of information on social science serial titles, named CLOSSS (Check List of Social Science Serials), was constructed, containing 3909 current titles, 728 previous titles and 1595 discontinued titles. The CLOSSS file is not comprehensive. Non-English language titles are certainly under-represented

and an under-recording of serials prior to 1950 is suspected by the DISISS team. However, it seems to be the most serious study available.

The subject distribution of the 2760 current social science serials gives 8.55 per cent social sciences general, 2.53 per cent anthropology, 0.83 per cent archaeology, 0.50 per cent architecture, 1.12 per cent criminology, 25.76 per cent economics, 10.36 per cent education, 2.39 per cent environmental planning, 0.28 per cent ergonomics, 0.18 per cent futurology, 4.87 per cent geography, 2.10 per cent history, 4.89 per cent law, 2.17 per cent librarianship, 5.14 per cent linguistics, 2.60 per cent management, 0.50 per cent philosophy, 9.97 per cent political science, 6.41 per cent psychology, 4.74 per cent social work, 3.76 per cent sociology and 1.05 per cent statistics. These figures make clear how prominent economic literature stands among the social science literature on the whole, followed by the literature on education and on political science.

In contrast with the data for social science serials which could be drawn from the CLOSSS file, the data for social science monographs had to be produced by analyses from other statistical data. The DISISS team makes an estimation of 750 000 items of all types of monographs together, produced annually. They conclude that:

> The monograph literature of the social sciences appears on a crude estimate to be slightly smaller than the humanities literature (including modern literature and fiction) and the combined pure and applied science literature (Bath University, 1974: 76).

However, the social sciences (classes 3 and 9 *Dewey decimal classification*) produced some 9000 titles (10.1 per cent) more than the pure and applied sciences together in 1970, which implies that:

> Social science literature has increased to a level at least comparable with other broad areas, and at a rate which suggests it will soon represent the largest area (Bath University, 1974: 77).

As to the subject distribution of monograph literature, 28.6 per cent were classed (according to Unesco's book production statistics) as politics and economics, 15.6 per cent as education, 14.5 per cent as biography and history and 9 per cent as commerce. Twice as many titles were produced in education and four times as many in politics and economics, compared with sociology.

Growth rates of the literature

The growth rate of social science serials in the period 1950–1970, as analysed from the CLOSSS file, is 3.35 per cent p.a. for the world, with a rather large variance between countries. Growth in single subject areas of the social sciences varied widely. In the period 1960–1970 economics and education were the faster growing disciplines, while sociology, political science and psychology had a slower growth rate.

Citation analyses indicate that references in serials show a much faster decay than references in monographs in nearly all subjects and for all forms of material cited. Among subjects economics and political science show the fastest decay rates.

Also for monographs the growth rate differs considerably between social science disciplines, being the lowest in sociology and statistics, followed by

philosophy, psychology, trade and commerce, education, geography and history, the highest being politics and economics.

Contrary to the growth rates in the social science monographs, the number of monographs in science and technology show a very low level of growth and the growth of the number of monographs in the humanities is even lower (Line and Roberts, 1976: 33).

As to the future: owing to the economic crisis on the one hand and technological change on the other, a prediction of future growth rates would be very hazardous:

> In the short term, a decline in growth rate may ease the problems of bibliographic control, but any benefits here will be more than offset by the likely increase in semipublished material (report literature and working papers); in non-conventional publications such as microforms and synopsis journals, and in on-demand publishing (Bath University, 1980: 22).

The role of the electronic journal in social science information seems to be quite uncertain.

Other primary sources

Whereas the library is sometimes called the social scientist's laboratory, his ingredients are not only the library's holdings of serials and monographs, but also other primary materials that are more often than not insufficiently available in libraries.

The range of materials that is potentially of use to social science research was enumerated by J. Madge in *The tools of social science* (London, 1953), cited by Brittain. They include:

1. Personal documents, including letters, folklore, life histories, autobiographies, diaries and letters.
2. Records, including records of professional societies, committee records, government records.
3. Reports that are made after an event, e.g., newspaper reports.
4. Observations, including mass observation where the investigator may penetrate into the environment he is observing.
5. Data from 'action research' where the investigator resides in the target area for a period to observe the group life, morale and productivity of a single community with the aim of developing effective ways of resolving social stress and tension and facilitating agreed and desired social change.
6. 'Overheard' data from passive observation.
7. Data from interviews such as Gallup polls, opinion polls, scalogram analyses, and measures of attitudes.
8. Data from experiments, usually conducted in controlled environments in laboratories (Brittain, 1970: 36, 37).

P. L. Garvin in *Problems of processing information in the behavioral sciences*, an unpublished paper (1967), also cited in Brittain, adds to this enumeration the non-textual data, especially used in social psychology and psychiatry, such as gestural movements, facial expressions and psychiatric interviews (Brittain, 1970: 37).

Line (1971: 203), in his conclusions on the Aslib Social Sciences Group's Conference on primary materials in 1971, mentioned some uncertainty as to

the clear division between primary and secondary material. As examples of primary materials he gave: unpublished survey reports, raw statistics, personal reminiscences, records and minutes of meetings, local political manifests, parish records, etc., and also non-book material, including sound recordings, videotapes, pictorial media such as air photographs and machine-readable files.

During the Aslib Social Sciences Group's Conference, papers were given on primary materials in economics, in politics and political science, and in urban and regional planning.

Swan (1971: 167) mentioned as the main forms of primary materials for economists in the UK those which emanate from the UK government, the international bodies, such as the UN, OECD, EEG, EFTA, IMF and foreign governments.

As primary materials used in politics and political science Rush (1971: 178–181) lists:

1. Original documents, including personal documents, formal records and reports (unauthorized accounts and comments).
2. Digests, annuals, yearbooks.
3. Opinion polls and other surveys.

White (1971: 191–196) lists as primary sources most needed by urban and regional planners:

1. Topographical and thematic maps and plans.
2. Data collected from national and local surveys.

The principal gaps in which planners require more and better data she considered to be: income, population migration, and interregional movement generally. The main problem in using data is the compatibility among data drawn from different sources.

These examples of the need for primary materials in three social science disciplines make it clear that although these primary materials are a very characteristic feature of social science information they are a hardly explored area. Therefore, details will be given in only three of the better studied categories of primary materials: ephemera, statistics, and machine-readable data.

Ephemera

According to Pemberton ephemera may be defined as:

> documents which have been produced in connection with a particular event or item of current interest and which are not intended to survive the topicality of their message (Pemberton, 1971: 6).

They are the raw material for much of the research undertaken by social scientists and social historians. Pemberton (1971: 53–54) lists 39 types within this definition, including advertising circulars, company reports, computer programs, conference papers, manifestos, newsletters, newspaper cuttings, obituaries, photographs, press releases, questionnaires, survey reports, transcripts of broadcasts, annual reports, broadsheets, constitutions and rules, leaflets, membership lists, pamphlets and posters.

Pemberton carried out an investigation of collections of printed ephemera in national libraries, university libraries, libraries of research institutes, government libraries, specialist libraries and public libraries in the UK. He studied acquisition policies and views on a central collection of printed ephemera. He found rich collections in every category of library. For instance:

1. Public libraries often had rich collections in local history.
2. Newspaper, radio and television services were rich in all forms of topical ephemera.
3. Political party libraries had much historical and topical material.

But the collections were scattered and there was no guide to them. Demand was high, in many cases even too high to handle adequately. Problems were considered to be:

1. Difficulties with identifying, obtaining and processing material of this kind.
2. The impossibility of bibliographic control because of a lack of bibliographies.
3. The difficulty of forecasting which trends or movements of today are going to be the stuff of research tomorrow (Pemberton, 1971: 45).

Pemberton made a strong case for a central collection of printed ephemera for which he listed a considerable number of advantages. But the first thing needed would be a directory to the existing collections. Moreover:

> Any systematic approach to the provision and preservation of ephemera on a national scale must begin with a survey in depth of the needs of the users, and continue by modifying policies in response to changing needs revealed by constant surveillance (Pemberton, 1971: 45).

Statistics

Statistics are also a primary source characteristic for social science research. They are used and produced in great quantities, especially in economic research, and even more in all levels of national, regional and local administration. However, many statistics are collected in different categories and time scales, which makes it difficult to compare them, not only on an international scale, but even on a national, regional or local scale. This difficulty is well illustrated by the library statistics as given earlier in this article.

Piatier suggests that:

> A world statistical centre should be able to deal with all the statistical material available, make series homogeneous, explain divergencies, and indicate the degree of reliability (Piatier, 1976: 440).

On the other hand, as statistics are collected not only by governmental, but also by professional and private organizations, on multinational, national and local scales, there would seem to be a useful place for a general directory of possible sources of information. To parallel other types of scientific information the following characteristics should be included:

> periodicity or field covered, time required to obtain information, length of the series, number of countries for which data are comparable (Piatier, 1976: 441).

So far as to published statistics. A matter of concern should also be the 'concealed statistics', i.e., those statistics calculated by research workers on the basis of official and other published statistics, but not included in organized information systems and networks (Földi, personal observation).

Machine-readable data files

Machine-readable data files are another primary source for social science research. Robbin (1981: 97–109) draws attention to the problems in the utilization of numerical databases. She argues that the large databases which are developed to respond to administrative reporting requirements and used for research and policy questions must be organized in tractable ways, and she mentions a number of strategies to improve the unsatisfactory situation.

Machine-readable files of concluded research projects are collected by specialized social science data archives for the benefit of social science research, as the raw data of one researcher's project may, by secondary analysis, enter as a primary source into a second researcher's new project. These data archives make the data more easily accessible through documentation and the production of, for instance, SPSS files. Nevertheless, the data are not used as much as they could be in longitudinal or comparative research.

One of the reasons for non-use, suggested by White, is that the data files are, just like ephemera, not entered into the secondary information systems. The reason for this is that the unit for bibliographic description of these files differs from that of printed material. White argues that data files have two parts: the codebook and the machine-readable part. In file description the codebook should be a primary source of the abstract, it should be subject-indexed and it can serve for library cataloguing. According to White, another way of improving the accessibility of machine-readable data files is to put abstracts of data files, and instructions for ordering their codebooks, into an existing national online bibliographic service, as NTIS does for data files made public by government agencies (White, 1977: 313–322).

Dodd (1979: 77–82) proposes that a proper bibliographic reference for these files should include: authorship, title, subtitle, general material designator, statement of authorship (including the sponsor or funding source), edition, imprint (producer statement and distributor statement), notes and series. A bibliographic citation, incorporating all the required and optional fields of a main entry, is recommended in the *Anglo-American cataloguing rules* (American Library Association, 1979). One of the optional elements is the medium designator MRDF, which stands for Machine Readable Data File (Robbin, 1981: 102, 105).

CHARACTERISTICS OF SECONDARY INFORMATION

Indexing and abstracting services

In the overview of research carried out for the DISISS project, it is stated:

> One major difference between science and technology on the one hand and the social sciences on the other is the nature of the potential market for secondary services. The social science market is smaller in total, more diverse and less easy to identify, and above all much less wealthy (Bath University, 1980: 85).

This corresponds with Clayton's statement:

> In science there is a small number of very large services, well financed with smaller overlapping services alongside. In the social sciences and the humanities there is a very large number of small secondary services (Clayton, 1976b: 14).

Brittain and Roberts (1975) listed 295 organizations in Western Europe which provided social science information services: 7 for anthropology, 9 for criminology, 3 for demography, 52 for economics, 46 for education, 17 for environmental planning, 1 for ergonomics, 1 for futurology, 3 for geography, 4 for history, 1 for linguistics, 15 for management, 30 for political science, 6 for psychology, 26 for social policy and social administration, 11 for sociology, 8 for statistics, and 54 for social and behavioural sciences in general. Nevertheless:

> As yet bibliographical control in the social sciences is, both relatively and absolutely underdeveloped, a situation which should not long be allowed to continue (Line and Roberts, 1976: 77).

In an International Workshop of Secondary Service Producers held in York in 1975, it became evident that the key problem is that although the number of secondary services is great (980 in 1970 of which 200 were considered to be major) (Line, 1976a: 7) and the rate of growth of the services has since about 1915 been greater than the rate of growth of the primary literature (Brittain, 1976: 19) usage is certainly less than it might be, particularly by practitioners (Clayton, 1976a: 5).

> Most secondary services are very deficient in covering non-serial literature, an important matter, since whereas in science non-journal items account for only about 10% of the literature, in the social sciences they account for about half (Line, 1976a: 7).

Freides (1976: 70) presented data on coverage of books and US government publications by the bibliographic services of psychology, political science and economics and two interdisciplinary bibliographies. Coverage of books ranged between 45 per cent and 68 per cent; coverage of government publications was about 50 per cent. In accordance with the DISISS findings coverage increases with the number of bibliographic services, but so does duplication.

The DISISS team paid much attention to the clustering of journals from a file of nearly 50 000 citations drawn from a representative sample of journal articles in most of the social sciences. Clustering of journals and a comparison of clusters with existing coverage patterns gives a good insight into the value of specific services for user groups. This could be an incentive for rationalization. Line (1976b: 53) suggests it would be beneficial to get secondary service producers to define clearly their aims and their audiences.

A possible future system is suggested by the DISISS team which in principle would consist of:

> An international database of references maintained in high density storage, accessible world-wide for both input and use. New items would be fed into the database, which would first be checked to avoid unnecessary duplication; references would not be duplicated, but additional index entries and different abstracts might be entered to reflect different perspectives (Bath University, 1980: 87).

However, as the obstacles to such an 'ideal' system seem formidable, moves towards compatibility between the already existing machine-readable social science databases might benefit the whole system in such a way that total integration would not be necessary.

Review articles and book reviews

There are few pertinent data on review articles and book reviews in the social sciences. The DISISS team reached the following conclusions:

> Altogether in 1972 the output of scientific reviews of reasonable quality (according to criteria identified by Woodward) was about 22 000, which is rather less than 2% of the world's scientific and technical literature . . . An estimate of the number of reviews per year in the social sciences has not been produced, although a rough guess is possible . . . Allowing for growth in both journals and review articles (which is now quite likely) it is possible that in 1974 about 1500 review articles were produced in social science journals . . . However rough the calculation, it is clear that the ratio of reviews to primary articles is much smaller in social science than in science: the ratio of reviews in science to reviews in social science was about 16:1 in 1972; the ratio of reviews to primary articles is approximately 1:45 in science and technology, and 1:133 in the social sciences in 1972 (Bath University, 1975: 114, 115).

Line (1976b: 52) remarks that there are also reviews 'concealed' in monographs but does not give an estimate of their number in relation to reviews in serials.

Also in the case of reviews there are considerable differences between the various social science disciplines. Of the CLOSSS file 41 per cent of the linguistic serials, and 27 per cent of education serials contained review articles, whereas in social welfare, criminology and economics the proportion of serials containing review articles was around 5 per cent.

As to the humanities the DISISS team concludes:

> Critical book reviews are important in nearly all fields, but there is no evidence to suggest that quantitatively or qualitatively they are more important in the humanities than in the social or natural sciences (Bath University, 1975: 116).

CHARACTERISTICS OF THE FLOW OF INFORMATION

The American Psychological Association's Project on Scientific Information Exchange in Psychology (APA/PSIEP) is a classic study on this subject, executed in the early sixties. The Project's first objective was to develop a natural history of scientific information exchange, i.e., to describe the scientific exchange environment of the scientific psychologist. Most of the earlier studies of the Project dealt with each of the channels of communication in psychology, such as journals, conventions, the distribution and use of reports prior to publication, and the informal face-to-face communication (APA/PSIEP I, 1963).

The research directors Garvey and Griffith consider after analysing these earlier studies on the process of dissemination and the behaviour of the active user that:

> It seems clear that while information retrieval services mainly wait for 'public' information (i.e., from or in archival sources), the scientist who wants contemporary findings to plan research or to interpret his own findings does not. During the various stages leading to journal publication of work, he is involved in trying to discover every means of obtaining information on new, ongoing, or recently completed work relevant to his own. He does not seem willing to wait to discover this in a journal or a secondary source; rather he seems to use journals to catch what he has missed in his efforts to gather information in the past couple of years (APA/PSIEP I, 1963: 10).

Later findings of the Project have hinted that scientific communication and information exchange cannot simply be regarded as a single system serving the same needs and transmitting the same type of information to all users. More research was required on the information need of applied psychologists, on the ways in which these needs are met, and on the operation and use by applied psychologists of media outside the information system. More research was also required on the informal communication and social organization among active researchers, and on national environments as a factor in the development and functioning of psychology (APA/PSIEP III, 1969).

Garvey, Lin and Nelson of the Johns Hopkins University's Centre for Research in Scientific Communication compared the processes of disseminating and assimilating information in science and in social science. In this study differences were ascertained between time-lags in the scientific social scientific information flows. For instance:

1. The delay between the last prepublication report and the time of journal publication is nine months for scientists and 15 months for social scientists.
2. Prepublication dissemination of information appeared less effective in the social sciences than in the sciences.
3. More physical scientists reported their work prior to a national meeting than social scientists.
4. Social scientists show greater activity in and resulting from meetings than physical scientists.

The authors conclude that, although as a whole the scientific communication process shows gross similarities, there are considerable differences between disciplines, and communication innovations designed for one discipline may prove inappropriate and even damaging for another (Garvey *et al.*, 1970: 1166–1173).

Brittain (1979) makes a comparison between the structure of communication and knowledge in science and the social sciences. He argues that because of the differences found in these structures the information services for the social sciences, which have hitherto largely been based upon the model of science information services, should be adapted to the requirements of the social sciences. He indicates the studies necessary to establish these adaptations and he stresses the growing role of librarians and information specialists in the process.

Another approach to analyse the flow of information in social science is citation analysis. According to the DISISS team:

> The chief interest of citation studies lies not in practical library applications, but in potential application to information system design and

interpretation for studies of the communication and transmission of knowledge (Bath University, 1979: 3).

CONCLUSIONS

1. There is no unanimity on what is meant by the term 'social sciences'. The most striking difference is that some countries include the humanities in the social sciences and others do not. As the object of social science in its proper meaning is crudely 'man in relation to society' and as arts and letters are crudely spoken 'the spiritual products of man', interdisciplinary contacts are rare.
2. Some social science disciplines show more linkings to each other than others. One can speak of self sufficient and dependent disciplines, distinguishing between various types of dependency. Psychology, economics and to a lesser degree sociology are more self dependent and are cited extensively by other disciplines and interdisciplinary subjects. Therefore, their literature will be used far beyond the scope of their own field.
3. The characteristics of the social sciences are reflected in the characteristics of social science information, i.e., the often unclear and ever changing language of the social sciences, the different meanings of terms as used in various subjects, and the considerable overlap between disciplines are reflected respectively in the incompatibilities of information over time sequences, the terminological problems of social science information retrieval, and the overlap between information services.
4. The sources used for this review are almost exclusively taken from the English language literature and research carried out in the UK and USA. Little or none could be found in the French or German or Dutch literature, and it does not seem likely that the characteristics of social science information as such constitute an important subject of research in other Western European countries or in Eastern Europe.
5. The production of social science journal articles is hardly higher than the production of monographs, whereas in science the number of articles is eight times as large as the number of monographs. The monograph literature in social science is estimated to be only slightly smaller than for either the literature of the sciences or the humanities. Growth rates of the social science literature are greater than those of the literature of the sciences or the humanities. Therefore, the amount of primary literature social science information will have to deal with in the near future will be comparable with or larger than the quantity of information which has to be processed in science or the humanities.
6. Apart from serial and monograph literature other primary materials are very important for social science research. These primary materials are insufficiently available in libraries, and information on this kind of material is for several reasons quite unsatisfactory, especially for ephemera. Handling statistical material and machine-readable data in a way comparable to other bibliographic rules would make them more easily accessible for the user.
7. Secondary information services in the social sciences are small and numerous. Bibliographic control is unsatisfactory; there are gaps and overlaps in coverage. Provision should be made for different categories of users.

8. The flow of information between social scientists is slower and more laborious than between scientists. Possibly as a result of the difficulties in formal communication, social scientists seem to show in some respects a greater activity in informal communication, though research results are somewhat contradictory.

The implications of these conclusions for information services in the social sciences would appear to be the need for more cooperation in order:

1. To enhance the coverage of all primary literature, including primary materials other than books and serials.
2. To enhance compatibility among databases.
3. To avoid unnecessary overlap.
4. To make a common effort towards a greater compatibility among retrieval languages.

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