

FOUNDATIONS OF A THEORY OF BIBLIOGRAPHY

MARGARET E. EGAN AND JESSE H. SHERA

THE PROBLEM

THE fundamental problem underlying any consideration of a program of bibliographic research or development arises in the conflict between two opposing points of view. On the one side are those who would use the "macrocosmic" method, who would view bibliography as one of the instrumentalities of communication and communication itself as an instrumentality of social organization and action. On the opposing side are those who look upon each bibliography as a separate tool, fashioned to meet the specific needs of a limited number of persons with more or less common interests, each separate bibliography having little or no acknowledged relationship to any other. This is the "microcosmic" point of view, bringing under observation only a small segment of the total flow of communication.

The hodgepodge of bibliographic services available today to scholars and research workers in various fields is the result of "microcosmic" thinking. It is as though each of our railroads had been established by a small separate group, each running around and around its own little circuit, exchanging the produce of the local inhabitants within its own area, but with no junction point to connect it with other similar circuits and with no over-all plan to facilitate general exchange at national or international levels. Bibliography is, or should be, a carrier system for ideas and information analogous to a well-articulated

railroad system for the transportation of physical commodities.

Many learned and professional groups have recently voiced dissatisfaction with the services that they themselves have developed, while other groups have been clamoring for new services. Though there is no denying the urgency or the legitimacy of such demands, the continuation of such fragmentation will focus attention at the wrong places and will impede progress in developing a unified and completely articulated bibliographic system. At this time it is imperative to attack the problem as a whole rather than to limit attention to the separate requirements of single groups. Continuing separatism in bibliography is economically wasteful and intellectually frustrating, for such proliferation results only in a Rube-Goldbergian mechanism so intricate and so cumbersome that it is in danger of falling of its own weight. More important, it is possibly disintegrative to society as a whole, in that it may contribute to excessive cultural or developmental maladjustments.

Bibliography must be looked upon as being, in effect, the roadbed over which the units of graphic communication move among the various parts of society as they make their contribution to the shaping of societal structure, policy, and action. As Crane Brinton has said:

The answers to the great problems will be given by the kind of people we call geniuses; but the geniuses will be able to get their answers only because of the full, patient work of thousands of workers in research and in prac-

tical life. Still more important, the answers can be translated into effective social action in a democratic society only if the citizens of that society have some basic understanding of what is going on. . . . Indeed, for both cumulative and non-cumulative knowledge the problem of *dissemination*, the problem of correcting common errors in public thinking, is at least as important as, and in a democratic society perhaps more important than, the problem of getting the experts to agree.¹

For us, this means that there must be appropriate bibliographic communication (1) *within* each group, (2) *among* the several groups of scholar-specialists, and (3) *between* groups at the scholarly level and the various groups of practitioners, operators, educators, and lay public. Only thus can the results of scholarship be made socially useful, and only to the extent that social utility can be established can we justify the increasing social and economic costs of scholarly investigation and research.

There was a time when the mere listing of important contributions to the various fields of knowledge was considered bibliographically sufficient. More recently, new functions have been added to the role of bibliography, and new types of bibliography have developed. Today, several fields of scholarship have quite extensive bibliographic "pyramids," with a broad base of fairly comprehensive listing or indexing, a superstructure of more selective abstracting and systematic publication of planned bibliographic essays, and an apex consisting of an annual report of progress, or yearbook, which synthesizes as well as summarizes the most important publications of the year. Each type of bibliography has its own distinctive function, and one cannot easily be substituted for another. Impressive as such a pyramid may appear,

¹ *Ideas and Men* (New York: Prentice-Hall, 1950), pp. 19 and 15.

it is designed primarily for the benefit of workers in the field or in closely related fields. That some of these services may be incidentally useful to other groups is accidental, for the summarizing of either specific findings or of resulting generalizations is not planned to be easily accessible to those whose activities are not in research but are concerned with formulating or implementing social policy and action. The inter-communicatory functions of each part of the pyramid must be fully explored and made explicit in terms of the underlying principle that knowledge is both unitary and instrumental.

We are pleading here expressly for the "macroscopic" approach to bibliographic research and future planning—an approach that is soundly rooted in generally accepted social-science theory and that justifies itself in that it not only depends upon but also contributes to theories of communication, librarianship, and bibliography which are firmly articulated among themselves and with general social theory. Such an approach should lead directly and naturally to maximum co-ordination and social utility of bibliographic services. The problem as we see it, then, is to explore thoroughly and systematically

1. The present and potential role of bibliography in the total social process of communication
2. The specific functions of the emerging types of bibliography and the co-ordination of such types
3. The bibliographic needs of each group for different types of bibliographies and methods of co-ordinating groups as well as services

THE RELATION OF BIBLIOGRAPHY TO COMMUNICATION

Communication is so basic to the process of societal development that it

is impossible to imagine any form of social order without some mechanism or technique for the transfer of thought from one individual to another. The organization of men into even primitive societies would have been impossible without the invention of language; but the potentialities of such groups were always severely limited by complete dependence upon oral communication through the "personal carrier." Admittedly, the personal carrier—he who accumulates knowledge and transmits it orally—has always been, and is today, the most important single disseminator of knowledge. However, the personal carrier of today, especially the "expert" in any field, himself relies upon graphic records far more than upon his memory or upon direct observation of his own limited environment. The mechanical instruments of communication—the pen, the printing press, the typewriter, the film, the phonograph record, the radio—not only have vastly extended the social potential of the personal carrier but also have enormously increased the capacities of the communication system itself and thereby have expanded the possible spatial and temporal boundaries of the integrated social group to the emerging "one world" of tomorrow.

This system of social communication, in all its parts, is *instrumental* to the achievement of human social goals. Yet, perhaps because communication is instrumental rather than terminal, it has been studied only in relation to the particular situation in which it functions, and little attempt has been made to isolate it as a *process* amenable to independent study or to view this process in relation to the total pattern of social dynamics.

Research in communication has been

focused almost exclusively upon "mass" communication—a process largely limited to communication from "manipulator" to "captive audience." There are two important characteristics of mass communication which differentiate it from other types of communication in ways which are too little understood. In the first place, because the *content* of mass communication is necessarily determined by the communicator, the desired goal—and, indeed, the only possible goal—is to win the adherence of as large a part of the audience as possible to the aims of the communicator, whether the aim is to sell a certain brand of food or to induce agreement with the communicator's views as to social goals or policies. The second important characteristic is that the dynamics of this kind of communication require volition and action to a high degree upon the part of the *communicator* but demand little more than acceptance or momentary attention on the part of the *receptor*.

Obviously, mass communication has little or no use for bibliography, which is a means for locating a graphic record of the *content desired by the prospective receptor*. The dynamics of this act of communication are the reverse of the dynamics of mass communication, for the act must arise from the volition of the receptor. The goal of this process is to acquire the specific information or idea needed in a particular *situation*, and it may be enough that only one person acquires it. This is the kind of communication to which libraries and bibliographic services most readily lend themselves and for which, indeed, all their machinery has been planned. Yet, because of the overemphasis upon "mass" communication, there not only has been no adequate analysis of re-

ceptor-initiated communication, but, even worse, there has been actual distortion in the interpretation of library and bibliographic functions.

We need objective examination and precise definition of the many kinds of communication, particularly of graphic communication, and of the relation of bibliography to those functions of graphic communication to which it is appropriate.

THE NEED FOR A "THEORY" OF GRAPHIC COMMUNICATION

Before an adequate analysis of communication as a social process can be made, we must adopt a theoretical structure which will comprise *all* types of communication, which will recognize the differences among them, and which will relate each to its appropriate place in the social process. Within this structure, graphic communication will be recognized as having distinctive properties and functions. Librarians and bibliographers are concerned primarily with *graphic* communication, not with communication as characterized by the groups addressed.

At this point it is important to make a clear distinction between a theoretical structure and a statement of goals. Previous attempts to study either library or bibliographic services have been oriented about statements of goals or purposes, in some cases formulated by those who render the service and in others expressed by those who are the consumers of the service. An example of the first type is the framework within which the library has generally been studied; according to an official summary, "the major objectives of the American public library are usually stated as education, information, aesthetic appreciation, research, and recre-

ation."² It was within this time-honored frame that the Public Library Inquiry staff conducted its investigation. It failed, however, to analyze the constituent processes leading to each of these objectives, the role of graphic communication in relation to each, and the role of the library in relation to the relevant graphic communication.

A recent example of the second type of study was the survey of the need of social scientists for improved bibliographic services, conducted under the auspices of the Graduate Library School and the Social Sciences Division of the University of Chicago, which obtained its data by questioning social scientists as to what they desired in the way of a bibliographic service. The weakness of this study arises from its exclusive emphasis upon the subjective opinion, at a given moment, of the individual social scientist and from the attempt to formulate policy on the basis of nothing more than majority opinion concerning a limited number of bibliographic possibilities. The results might have been very different, and ultimately more satisfactory to the social scientists themselves, had the investigation begun with an objective analysis of the several types of communication used by the social scientist in the prosecution of his work, proceeded then to an examination of the bibliographic devices best suited to expedite the flow of each type of communication, and concluded with a study of the means by which the results of his work are made known not only to his colleagues but to other individuals or groups who might be interested.

² American Library Association, Committee on Post-war Planning, *A National Plan for Public Library Service* (Chicago: American Library Association, 1948), p. 107, summarizing from the committee's *Post-war Standards for Public Libraries* (1943), pp. 19-24.

Each of these studies, like many others of recent years, used currently accepted empirical techniques of the social scientist but failed to achieve significant results because each proceeded from an a priori assumption of a fixed relationship between a given end and a given instrumentality. The last statement is so crucial to any program of research that further amplification seems necessary. The teleological approach accepts as its one fixed axis the stated goal or purpose of the process to be studied. Given this fixed point, the logical and fundamental question is: What are the characteristics of the instrument or process best fitted to achieve this goal? When the answer to this question has been sufficiently spelled out, it becomes possible to plan the instrumentality or process with complete freedom to the extent that material resources permit. The uncritical acceptance of an existing instrument or process without reference to its fitness for the particular task can result only in the miscarriage of effort and in the distorted evaluation of results. If one must begin with a given instrument or process, the logical and fundamental questions then are: What is the nature, or structure, of this object of study? What are its characteristics? For what functions is it best fitted? When the answers to these questions have been fully worked out, it becomes possible to apply the given instrument or process in the situation where it will be most effective. In other words, freedom of judgment and freedom of action are lost when a given frame of investigation contains more than one fixed and unalterable point.

If an accepted goal of a certain community is to level a great forest, one would scarcely adopt as an instrument

to achieve that end the surgeon's scalpel simply because the scalpel is recognized as a cutting instrument and a supply of scalpels happens to be available in the community. In this instance the logical first question (What *kind* of cutting instrument do we need?) is so simple and the answer so obvious that it would hardly become a matter for conscious questioning. Similarly, the purposes for which a surgeon's scalpel are appropriate are well recognized. However, in many social situations the goals to be attained and the agencies to be employed are so imperfectly defined and comprehended that exactly this kind of misapplication of means to ends frequently results.

From the earlier discussion of communication it should be abundantly clear that communication itself, as well as the various agencies concerned with the communication process, is an *instrumentality*, not an *end*. The questions to be asked, then, are the questions appropriate to the study of an instrumentality: What is its nature? What is its structure? What are its characteristics? How does it work? What can it do? What are its limitations? What are the conditions necessary to its successful functioning in those situations to which it is appropriate?

This approach might be called genuinely empirical, for it has eliminated the base of teleological definition and assumed relationships described above. It advocates exact observation, description, and functional analysis of the object of study. Does this imply complete disregard of social goals? Not at all. It recognizes social goals as socially determined, but it rejects the unalterable association of particular goals with particular instrumentalities. Social goals

are relatively stable; instrumentalities are subject to constant change, adaptation, improvement, or even rejection. The point is not that the study of instrumentalities and goals must be completely dissociated but rather that there must be no a priori unexamined assumptions as to relationships between the two. Although an investigation may begin with either goal or instrumentality, once that fixed factor has been accepted there must be complete freedom at the other pole to make choices or adjustments according to the findings.

An explicit theoretical framework for the study of communication or any of its parts would go far to prevent the warping of results of investigation through the unconscious acceptance of (1) teleological or traditional definitions, (2) assumed relationships, or (3) arbitrarily limited fields of choice.

THE LARGER FRAMEWORK FOR A THEORY OF GRAPHIC COMMUNICATION

There is nothing new or radical in the suggestion that the teleological and the empirical approaches give rise to different questions, to different procedures of investigation, and to different conclusions. This is widely understood and accepted today in the investigation of all social phenomena, and the empirical approach is so generally considered the more fruitful that its use is almost axiomatic. In the particular field with which we are concerned, however, the failure to observe and to define accurately has led to the unnoticed introduction of the teleological element even when empirical methods are used. To correct this, it is not necessary to erect *ad hoc* an entirely new theoretical structure but only to re-examine the theoretical and the methodological foundations of currently accepted gen-

eral social research and to articulate with this a logically compatible theory for the study of graphic communication.

Admittedly, there is not *complete* agreement among social scientists as to the necessity or utility of theory, or as to the details of a generally acceptable theory if the desirability of one be granted. Nevertheless, there is sufficiently wide agreement to permit the statement of a fairly broad and general outline of theory upon which a sub-theory of graphic communication might be based without encountering more than the normal amount of academic disagreement.

The type of systematic theory which seems most immediately useful at the present stage of social research is the "structural-functional," using the "action" frame of reference and employing concepts which are "operationally" defined. Such a formulation directs attention, on the one hand, to the *actor* and, on the other, to the structure of the *situation* within which he acts, in so far as the elements of the situation are significant to the actor. Talcott Parsons has said:

This means that the analysis of the situation must be fully integrated with the analysis of action itself. Action, in turn, it seems convenient to analyze in terms of three fundamental modes of orientation, which may be called cognitive, goal-directed, and affective, respectively. We can, that is, have an adequate analysis of the action of the individual only so far as we understand his action and his situation in terms of his attempts to know it cognitively, in terms of the goals he is trying to achieve, and in terms of his affective attitudes toward these components and toward the situation.³

³ *Essays in Sociological Theory Pure and Applied* (Glencoe, Ill.: Free Press, 1949), p. 6. (The greater part of this summary of general theoretical considerations is paraphrased from Parsons.)

An adequate framework for the study of graphic communication can be directly articulated with this general formulation through the interjection of the simple question: What is the role of graphic communication in each of the three fundamental modes of orientation—the cognitive, the goal-directed, and the affective?

THE NEED FOR A "PARENT"-DISCIPLINE AS FOUNDATION

An important aspect of the structuring of any social system is that of "institutionalization," or the organization of action around relatively stable patterns within which each individual has his accepted "role." Whether a situation occurs within an institutional framework, where the actor's role is habitual or traditional, or whether it occurs within an uninstitutionalized segment of a given structure, each action will exhibit to some degree each of the three fundamental aspects mentioned above, i.e., the cognitive, the goal-directed, and the affective. Of these three aspects, the goal-directed and the affective have been rather extensively and successfully studied by both psychologists and sociologists, at the level of both the individual and the social system as a whole. They have been studied as phenomena in themselves, abstracted from the variety of situations in which each plays a part.

The cognitive aspect, on the other hand, has never been systematically studied as a separate element within the social system as a whole. Yet it is easily observable that the cognitive element is perhaps most influential in determining the institutional patterning of a complex and highly specialized society. It is also obvious that graphic communication plays a much more im-

portant role in the cognitive than in any other aspect. The study of the individual in relation to any kind of communication has meaning only in so far as it can be related to his "role" as an "actor" in the many "situations" confronting him within the institutional pattern of his society. The focus of a socially relevant study of communication is not the individual as a unique personality but, rather, the production, flow, and consumption of communication through all parts of the social pattern.

By way of analogy, one might look at economics. There was no recognized need for any systematic study of economic processes so long as the means of acquiring food, clothing, and shelter remained a simple and local process. But, as human wants and the possibilities for satisfying them became more complex, as the economic pattern increased in intricacy, and as economic forces became more divergent and conflicting, it became mandatory for scholars to initiate systematic study in the hope of achieving some measure of control. Although the ultimate aim of the study of economics is to improve the economic condition of the individual and although economics began with certain assumptions concerning the motivations and behavior of the individual—the "economic man" of classical theory—there has never been a serious attempt to develop economic knowledge through quantitative studies of individual behavior. Rather, such indexes as production, exchange, and consumption of various kinds of economic goods have been used to measure relative status, progress, and stability in the economic sphere. Today, after less than two centuries of such investigation, there has been developed a respectable body of tested generalizations regarding the so-

cial effects of varying economic forces and forms of organization.

The implications of this analogy for the understanding of the intellectual processes of society are clear. Philosophers have long speculated about knowledge itself—the sources and methods of knowledge, its limits and its validity—but the study of epistemology has always revolved about the intellectual processes of the *individual*. Psychologists carried the philosophers' speculations into the laboratory and have made some progress in studying certain aspects of the mental abilities and behavior of the individual. Neither epistemologists nor psychologists have attempted to develop an orderly and comprehensive body of knowledge concerning intellectual differentiation and integration within a complex social structure. Yet it is no more necessary for such an attempt to wait until final answers at the individual level have been attained than for social psychology or economics to await complete knowledge of individual behavior within their spheres. The "macrocosmic" and the "microcosmic" methods have each something to contribute to the other.

The sociologists, though they have directed their attention toward the behavior of men in groups, have emphasized basic emotional drives and motivations and have paid scant heed to the intellectual forces shaping social structures. Yet that such intellectual forces are extremely important, particularly in the formal, as opposed to the informal, structures of society, is an inescapable observation. One is forced to conclude, then, that a new discipline must be created that will provide a framework for the effective investigation of the whole complex problem of the intellectual processes of society—a discipline found-

ed on sound research techniques and methods that will not only result in understanding and appreciation but also make possible future national planning and implementation.

Such a discipline is here denominated, for want of a more accurately descriptive term, "social epistemology," by which is meant the study of those processes by which society *as a whole* seeks to achieve a perceptive or understanding relation to the total environment—physical, psychological, and intellectual. The derivation of the term is readily apparent. Epistemology is the theory or science of the methods and foundations of knowledge, especially with reference to the limits and validity of knowledge; and through it the philosopher seeks an understanding of how the individual achieves a perceptual or knowing relationship to his environment. Social epistemology merely lifts the discipline from the intellectual life of the individual to that of the society, nation, or culture.

RELATION OF THE NEW DISCIPLINE TO GRAPHIC COMMUNICATION

Four basic assumptions underlie this new discipline:

1. That it is possible for the individual to enter into a relationship of "knowing" with respect to his own immediate environment or that part of the entirety of his environment with which he has personal contact.
2. That the instruments of communication which mankind has developed enable the individual to come into approximately the same kind of relationship with that part of his total environment that is beyond his immediate personal experience but which he is able to comprehend because the symbols of communication relate this vicarious experience to his own immediate experience. In short, one must assume that man can achieve an intellectual synthesis with his environment and that that environment,

through our present mediums of communication, includes remote and vicarious as well as immediate and direct experience.

3. That, by co-ordinating the differing knowledge of many individuals, the society as a whole may transcend the knowledge of the individual.
4. That social action, reflecting integrated intellectual action, transcends individual action.

Because modern man finds himself in an environment that has been extended to almost limitless dimensions in space and time, it is no longer possible for a single individual today to enter into a relationship of complete understanding with the totality of that environment. Thus specialization of function, whereby each may master a part of the whole, becomes the only practicable alternative. But such specialization can achieve unity of action only when there is a rational synthesis of the collective contributions for the solution of inter- or intradisciplinary or group problems, for the planning of courses of action, or for the determination of policy. In the scholarly world this is exemplified by the synthesis that results from a pooling of resources by anthropologists, sociologists, economists, political scientists, and psychologists for an effective attack upon such problems as conflicts among racial groups, economic interests, or political entities. Likewise, in commerce and industry it is a common practice for corporations to bring together specialists in particular technologies—in design, market analysis, law, labor relations, economics, advertising, or other areas of specialization—in order that the enterprise as a whole may improve the production or distribution of its commodity or extend and develop its services. This process of the synthesizing of technical assistance is further exemplified in the increasing use

made by many agencies of government of the special knowledge of experts in such fields as economic theory, technological processes, regional planning, utilization of natural resources, and political manipulation for the implementation of particular programs of governmental policy or action.

In all these instances the specialists employed may be quite properly regarded as "personal carriers" in the total communication process; but the substantive content thus communicated may be, and generally is, derived from a lengthy and intricate pattern of secondary, or graphic, communication—a main stream that is fed by an elaborate network of tributaries, artificially and fortuitously created with little regard for over-all efficiency. Yet it is largely upon such a devious system of communication that the individual must depend if he is to keep abreast of the progress of his specialty. Finally, it should be pointed out that the flow of communication to the situation in which it is to be used may be entirely secondary, without personal interaction, synthesized from many sources through the reading or reporting of a single person. All too frequently, then, the individual finds himself virtually a prisoner in the labyrinth of communication, without an Ariadne or a spool of thread.

Yet, despite its complexity and its obvious inefficiency, it is upon this very system of secondary communication that mankind is dependent for intelligent social action in units larger than the individual, and today corporate rather than individual action is increasingly the vital determinant force in the shaping of contemporary society. *Thus the focus of attention for the new area of study here described as social epistemology is the analysis of the production,*

distribution, and utilization of intellectual products in much the same fashion as that in which the production, distribution, and utilization of material products have long been investigated. Graphic communication provides objective evidence of the process.

THE AVAILABILITY OF DATA

To such a discipline a well-developed system of bibliography is essential. A coherent, rational, and effective pattern of bibliographic organization incorporating new, more refined, and more precise techniques for the description and analysis of content would provide the basic data for such an investigation, much as statistics of population provide the basic data for the demographic study of man, or as statistics of the production and consumption of economic goods and the analyses of the flow of money have provided accurate indexes of the economic condition or development of societies. Hulme's correlation of bibliography with technological development, as indicated by the registration of patents, is a pioneer contribution to this new discipline and a foreshadowing of what could be accomplished, had we sufficiently refined bibliographic description and analysis of content and dependable and regular reporting of the production and flow of the content of communication so described and analyzed.

But until these techniques of bibliographic description and analysis have been refined and until there is a bibliographically well-charted flow of the content of the existing system of communication, attempts at quantitative investigation will be as crude, inexact, and unreliable in their results as are the concepts and techniques characteristic of the dissociated bibliographic services of today.

THE ROLE OF THE LIBRARIAN AND BIBLIOGRAPHER

In the development of the theoretical framework of this new discipline and in the improvement of methods of analysis and measurement the librarian and bibliographer should be a pioneer; the operating library, the bibliographic or documentation center, and the bibliographic service the laboratory; and the schools for advanced study in librarianship the focuses of research. Already there is considerable evidence that some librarians in the United States, and still more in England, are struggling with the problems of more exact bibliographic description and analysis through new approaches to classification and new techniques of high-speed electronic bibliographic manipulation. Immediate next steps must be directed toward the formulation of a systematic theory of graphic communication which would not only reveal significant research problems for investigation but would, at the same time, develop a rational guide for the systematic planning of bibliographic services—a pattern of bibliographic organization that not only would facilitate the flow of communication throughout all parts of the scholarly world but would permeate the entire social structure. Such a comprehensive and integrated system of bibliographic organization would, at one and the same time, meet the needs of specialized groups for specialized information, provide the layman with syntheses and generalizations that would be guides to intelligent social action, and release sources of essential data for continuing research and inquiry.

FIRST STEPS IN DEVELOPMENT

Just as economics, as a discipline, depends upon the psychological factor of man's acquisitiveness and involves a

continuing study of the forms and processes which that acquisitiveness creates and just as sociology is founded upon the evidence that man is inherently gregarious and seeks to examine the forms and processes in which such gregariousness manifests itself, so the proposed discipline is predicated on the assumption that man is naturally and continuously curious about his environment and that he seeks continually to extend his knowledge in his efforts to control and manipulate his environment. This discipline would undertake to study the kinds of social organization and social behavior occasioned by this universal human drive. Therefore, because it is a continuing study of one of the basic social processes, it cannot achieve full maturity as a discipline in the immediate future. Years, decades, perhaps a century or more, may be required for its full development as an established discipline. Nevertheless, it is possible now to initiate investigations into certain parts of the total process, so long as those parts are clearly understood in relation to the whole. Thus such original exploration can be kept within practicable limits of time and resources and yet contribute substantially to the advancement of the parent-discipline. The initial exploration should follow two main avenues—situational analysis and analysis of the information unit.

1. *Situational analysis*.—The first basic need is for a complete analysis of the kinds of information, knowledge, and insights developed by all the contributory sciences or disciplines that are brought to bear upon each of the many focal points of human activity. Such analyses would answer, for example, such questions as: What information or knowledge is required when a business enterprise or commercial undertaking proposes to open a new market? What

information or knowledge should be available when a legislative body is considering a new or revised tax law? What information or knowledge is essential to a chemical industry that is developing a new synthetic fiber? Such situations might be multiplied indefinitely; although each is unique, all probably fall into a finite number of discoverable types distinguished from one another by the possession of identifiable characteristics.

Valid analyses, therefore, might be obtained by associating or grouping these situations in broad classes derived from relatively crude empirical observation. Exploration of the characteristics of these broad classes would be a preliminary step toward a more refined definition, analysis, and grouping of the situations in terms of their informational needs and requirements. That exploration of this kind cannot be done once and for all is obvious, for the situations themselves will change as the factors that condition them change. An illustration will make this clear. Let it be assumed, for example, that someone should suddenly establish beyond all doubt that the cause of poliomyelitis is not bacteriological but systemic and chemical. Such a development would be immediately reflected in a drastic alteration of the informational needs and requirements of those working to improve the diagnosis, treatment, cure, and prevention of this dread disease. In the series of investigations here proposed, it is the purpose of "situational analysis" not to supply final answers concerning the informational requirements of specific groups engaged in specific types of activities but to develop a *sound methodology* by means of which situational analysis can be applied with ease, efficiency, and accuracy to a variety of differing situations or to the same

situation as it changes through time. Such a methodology would be equally useful as an operational, administrative, or research tool. Many librarians today are being forced to develop for their own use the crude and pragmatic beginnings of just such a method of analysis; tomorrow the mastery of the method may be an essential part of the education of every professional librarian.

2. *Analysis of information unit.*—

The second main avenue of exploration here proposed leads to the development of techniques for the accurate description of the many "thought units" that comprise the flow of information and to the creation of a method for identifying classes of these units briefly, through the use of symbols. The need upon which this avenue of approach is founded, is, in effect, the basis for the current revival of interest in classification and the contribution that it can make to the improvement of bibliographic operations. Though classification is the end-product of the approach here suggested, the result need not be a universal or permanent schematism. Again, the important contribution of the proposed investigation is the development of an appropriate methodology, not the fabrication of a utopian schedule of classes or an ideal notation system. The importance of a sound methodology, however, is apparent when one reflects that only after valid techniques and systems of classification have been devised can bibliographic materials be so manipulated that it will be possible (a) to analyze, describe, and hence locate the separate units of information, whether they be micro-units or macro-units, and (b) to compile the continuing statistics which will provide the necessary indexes of the production, flow, and consumption of the content of graphic

communication. F. H. Giddings has stated:

Science, as was said, "is nothing more nor less than getting at facts, and trying to understand them," the discovery of facts *which prove to be facts* is initial scientific activity. . . . We make acquaintance with a fact as an individual instance of something or other which arrests attention. A hundred other things, quite as obvious, quite as important, and probably more significant, we may not see at all. If we reflect for a moment on this circumstance we discover that the assortment of facts which we carry in our heads and build into the structure of knowledge must be smaller than the assortment which makes up the world of actuality, and differently arranged. . . . The particular instance of something or other which has arrested our attention looks like a unit or item, detached or detachable, and so we think of it for the moment. Then we make further discoveries. Our instance is a unit as far as its relations with other instances like itself or different happen to go, but if we leave them out of our field of vision and forget them, and look intently at our particular instance we see it resolve into a multitude of lesser items, arranged perhaps in clusters or patterns, and, like enough, moving about. Each of these items in turn, we presently ascertain, is composite, and so on, without end. . . . Here it is important to understand that in so viewing the particular instance, and in so choosing a unit of investigation, we are not acting arbitrarily. . . . Speaking strictly, our choice is determined by a logical necessity. We take the particular instance as a unit if we are investigating what it does. We do not take it as a unit, but resolve it into units of the next lower order, if we are investigating what it is.⁴

SUMMARY

Systematic investigation of human behavior, in order to be brought within manageable limits, must always segregate certain aspects of behavior even while recognizing that behavior is always composed of many elements. Economics attempts to isolate and study

⁴ *The Scientific Study of Human Society* (Chapel Hill: University of North Carolina Press, 1924), pp. 42-46.

the economic aspects of behavior, sociology studies behavior in relation to the group, and psychology (during the last half-century, at least) has emphasized inherent "drives" or motivations derived from such drives. It is empirically observable that there are many situations in which rational observation; analysis, and decision determine the course of action of both individuals and groups. These situations are the ones which, in the long run, are probably most effective in the attempt to understand and control the environment, societal as well as physical, and the ones in which graphic communication is most frequently and effectively used. Yet there has been little systematic investigation of this kind of behavior

as a form of social action. There are many agencies which share responsibility for implementing the flow of knowledge and information through society, many of them dealing directly with the production and flow of secondary, or graphic, communication. We are concerned here only with bibliographic agencies, but it must not be forgotten that they are only one link in the chain and that the entire process must eventually be studied. Bibliographic services must be adequately planned with reference to the types of situations in which they will be used; and they must be internally organized according to the descriptive devices developed by following the second avenue of investigation suggested above.