PHENOMENA

We began by enumerating the kinds of low-level phenomena (objects, activities, etc.) which we regard as the proper concern of information science. The table overleaf is a crudely classified array of the categories of phenomena that we would include. Fringe subjects of study include the *constraints* (eg economic) on the above.

There was disagreement as to the extent to which information science should be concerned with the ends of the dumbbell ... eg with the mental processes involved in writing and in understanding. But we agreed that, although in these areas (and in some depth studies in the central portion) information science might impinge on other disciplines (eg psychology, linguistics), it is not necessary or desirable to put up hard and fast barriers.

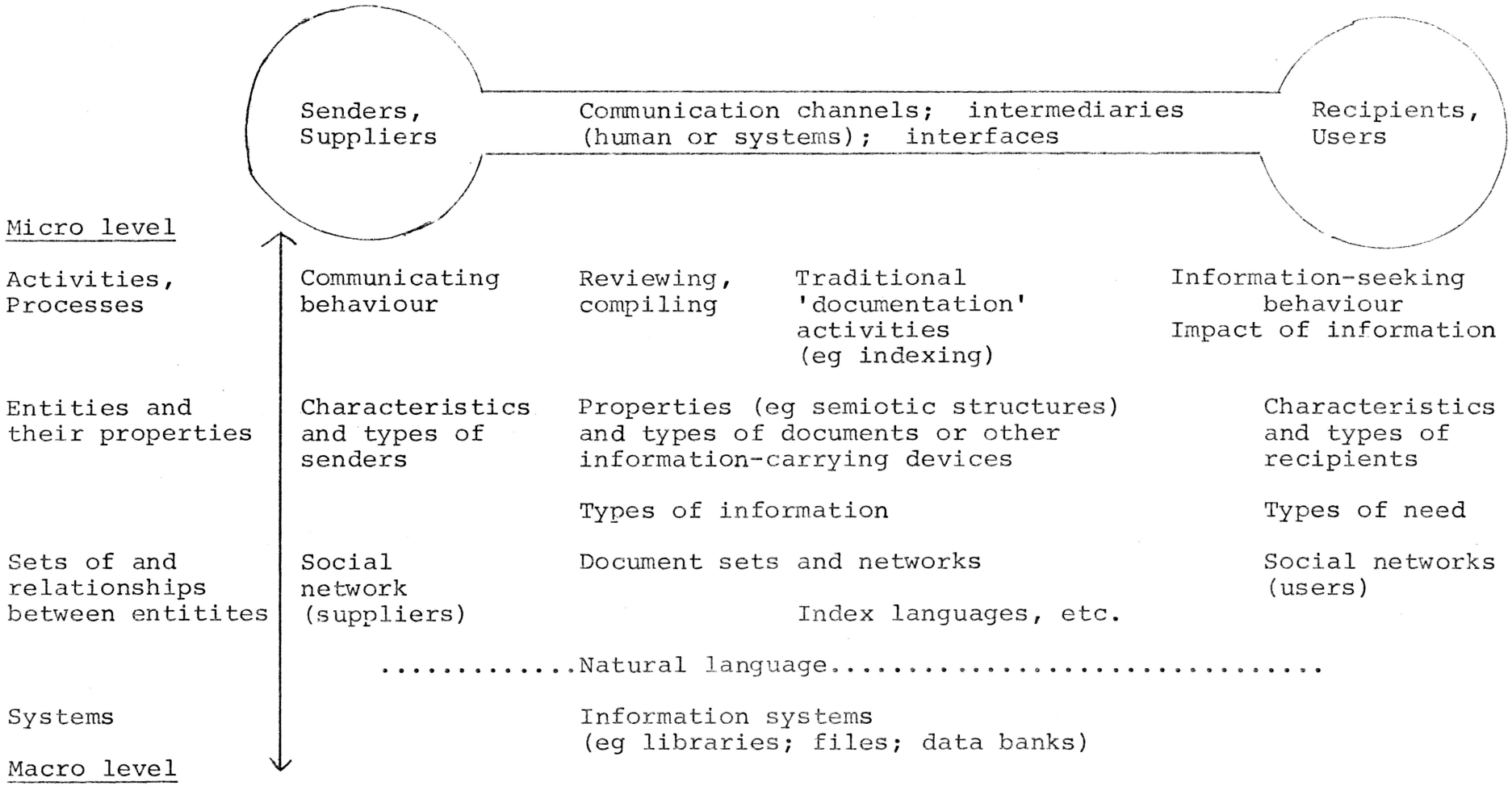
The study of all these areas does not in itself constitute a science, but would do so if all the areas were related in an explanatorily powerful way to some central concept. We consider that they *can* all be related to the concept of information (or of informing), even though we did not agree on a definition of this concept, and the necessary pulling together has clearly not yet been done.

STEPHEN ROBERTSON

WHAT KIND OF SCIENCE IS INFORMATION SCIENCE?

The question, 'What kind of science should information science be?' was split up into several component questions.

1. What kinds of problems, issues, ideas should concern information scientists? For example, if a student submits a proposal for doctoral research or a dissertation to a committee in an information science program or


Senders,
Suppliers
Communication channels; intermediaries
(human or systems); interfaces
Recipients,
Users
Micro level
Activities,
Processes
Communicating
behaviour
Reviewing,
compiling
Traditional
'documentation'
activities
(eg indexing)
Information-seeking
behaviour
Impact of information
Entities and
their properties
Characteristics
and types of
senders
Properties (eg semiotic structures)
and types of documents or other
information-carrying devices
Characteristics
and types of
recipients
Types of information
Types of need
Sets of and
relationships
between entitites
Social
network
(suppliers)
Document sets and networks
Index languages, etc.
Social networks
(users)
.....Natural language.....
Systems
Information systems
(eg libraries; files; data banks)
Macro level

department, what considerations apply to decide whether the project is information science or not?

2. What criteria should the methods of arriving at valid knowledge and explanations in IS observe? Can we set standards?

3. Can political and social aspects of the question be separated, even if we agree that they should be?

4. Can we establish priorities in respect of the directions of research in IS?

5. Can we make judgments on the interdisciplinary specialties that exist within IS? Should there be more, and have we achieved the right level of specificity, a sufficient range of specialization?

The question was raised (but not settled) about the taxonomy of "kinds of science" to use for our answer: pure, applied, programmatic, free, according to a Piaget-type model, a star-model, etc. The question of the aims of IS was raised and it was suggested that it is to provide a foundation for taking care of the information needs of man, just as medical science is to take care of the health needs of man. With regard to questions (1) and (4) above, it was suggested that key problems were:

a) Development of 'empirical' epistemology

b) Developing a rationale for classifying documents as well as users and to retrieve documents for user classes.

c) The problem of how to represent knowledge in a field and organise it so as to make it possible for an algorithm to recognize problems and cope with them or to help people to do so.

It was suggested that there is a need for the study of

users before files can be designed. The most important files may be non-bibliographic - eg medical records, census-type data. Perhaps the most important problem is how to help users ask better questions, questions that would make better use of stored data as well as critically examine the existing data for quality as well as gaps. Needed most may be aids to help certain willing users to improve their problem-representations and mechanisms for self-assessment and self-improvement in the dynamics of query negotiations.

It was agreed that IS includes studies of the structure and properties of information and communication, as well as theory and methods for the transfer, storage, retrieval, classification/organization, evaluation and distribution of information. It also includes the processes and activities that mediate knowledge from source to user. It deals primarily with complex information in large files and their human users.

With regard to question (2), different people perceive standards differently. For example, some researchers stress the number of relevant items retrieved as a primary criterion for evaluating IR systems while others stress the judgment of quality of retrieved items. We should, however, distinguish between standards adopted for evaluating IS products and criteria for evaluating the quality of research in IS, such as how to validate claims, to assess significance of findings. We did not discuss this further.

With regard to (5), IS was seen to be a point of view that draws on many disciplines. It overlaps the viewpoint of what is now called "Cognitive Science". Yet, IS may generate its own problems, an increasingly clear definition may eventually emerge as these problems evolve and are recognized as solvable by IS concepts and methods. At this time, we should not be too concerned with formulating very precise and consistent definitions of IS. A loose, nominal definition may be just right for now.

A convergence and co-ordination of methodologies may be

desirable at this time. Several strands that have been created need to be woven together, though a definitive 'closure' of how this is to be done would be premature. Two of these strands are the cognitive and the empirical. Two more are:

1. That core part of IS concerned with human information-seeking or response to information supply. Associated with this is a need for methodologies to study such behaviour and for a philosophy or a calculus to describe the activities.

2. The formal, scientific study of files of stored messages (eg sequence of signs) and the technology and economics of file-handling. This requires study of languages employed by users and authors as well as users in interacting with files and one another.

In sum, this group appreciated the work of the organizers for raising the questions and the chance for grappling with them. It agreed that no closure on the question about the kind of science IS should be could be reached at this time.

M. KOCHEN

FORMALISMS

We tried to work within the framework drawn up by the Reporting Group on Phenomena. We found that most of the existing formalisms in Information Science lay within the micro-level activities occurring along the transmission channel (traditional documentation activities). In trying to diverge from this area to the outer edges of the matrix we felt we were entering a "fuzzy region" which exists because of the very weak nature of the laws of Information Science. There was a general consensus of opinion that there is no necessity to construct new formalisms to cover this region because there are many formalisms in other disciplines (computer science, operational research, management science, statistics, "fuzzy mathematics", etc.) which