

TOWARDS ESTABLISHING AN
EPISTEMOLOGICAL POSITION FOR
LIBRARY AND INFORMATION SCIENCE

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ABSTRACT

Towards establishing an epistemological position for library and information science.

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This study examines the need for and value of a theory of knowledge for library and information science that would account for the ways in which given philosophical assumptions lead to certain modes of professional practice and styles of academic research. Since given theoretical standpoints influence the nature of library practice and tend to structure the way in which library and information science research is conducted, this investigation focuses on an analysis of the fundamental conceptions of knowledge, information, truth and reality in the context of the unique complex of functions of this profession.

The main method applied in this study is a representative consultation and review of the literatures of library and information science, and of a few cognate or classical fields of study. A special focus is the examination and analysis of the writings of more than 40 selected library and information science theorists, as well as those of non-librarians. The inductively-derived results of this examination are reflected in analytical typologies. The holistic intellectual tradition that underlies the presumed continuities and commonalities in the typologies is developed as a framework for developing suitable criteria to establish and evaluate an appropriate epistemological position for library and information science.

An epistemological position called holistic perspectivism is proposed as one which satisfies the postulated criteria. A graphic model of this position is explained as a means of demonstrating the application of holistic perspectivism in given areas of the knowledge-transfer role of library and information science.

Table of contents

1.	Introduction	1
1.1	Purpose	1
1.2	Statement of the problem	3
1.3	Points of departure	5
1.4	Method of enquiry	5
1.5	Demarcation of the focus of the study	7
1.6	Qualifications	8
1.7	Associated areas for research	10
2.	Explanations of epistemology and the major epistemological positions, rationalism and empiricism	12
2.1	Conceptions of epistemology	12
2.2	Epistemology and logic	14
2.3	Epistemology and ontology	14
2.4	Epistemology, psychology and cognition	16
2.4.1	Attempts at naturalizing epistemology	18
2.5	The rationalism/empiricism debate	20
2.6	Summary	26
3.	Epistemological positions within selected disciplines and professions	30
3.1	The value of epistemological studies	30
3.2	Rationale for the selection of disciplines and professions cognate to library and information science	31
3.3	Epistemological positions in medicine	36
3.3.1	The mechanistic epistemological position	40
3.3.2	The holistic epistemological position	44
3.3.3	Conclusion	50
3.4	Epistemological positions in education	51
3.4.1	The positivist epistemological position	56
3.4.2	The interpretivist epistemological position	59
3.4.3	The reproductive epistemological position	63

3.4.4	The holistic epistemological position	68
3.4.5	Conclusion	72
3.5	Epistemological positions in communication theory (including mass communication)	72
3.5.1	The mechanistic/objectivist epistemological position	77
3.5.2	The process/intersubjectivist epistemological position	79
3.5.3	Conclusion	81
3.6	Summary	82
4.	Definitions of information, knowledge and library and information science	91
4.1	Knowledge transfer as a theoretical focus for library and information science	91
4.2	Information	101
4.2.1	Difficulties of defining information	102
4.2.1.1	The historical designation "Information Age"	102
4.2.1.2	The prevalence of vague definitions	103
4.2.1.3	Standard dictionary definitions	104
4.2.1.4	Terminological difficulties	105
4.2.1.4.1	Conceptions of information in different disciplines	105
4.2.1.4.2	Relation of information with cognate terms	106
4.2.2	Classification of definitions of information	107
4.2.2.1	Hierarchical structure of levels	107
4.2.2.2	Information as content and/or process	108
4.2.2.2.1	As content	109
4.2.2.2.2	As process	113
4.2.2.2.3	As content and/or process	115
4.2.2.2.4	General evaluation of the Meijer <u>et al</u> review	118
4.2.3	Conclusion	119
4.3	Knowledge	121

4.3.1	The value of a definition of knowledge in the context of library and information science	122
4.3.2	Definition of knowledge in epistemology	123
4.3.3.	Definition of knowledge in the social sciences	125
4.3.4	Broad conceptions and classifications of knowledge	126
4.3.5	Approaches to knowledge in library and information science	128
4.3.5.1	The information - knowledge relationship	129
4.3.5.1.1	Equivalent	129
4.3.5.1.2	Hierarchical	129
4.3.5.1.3	Dichotomous	131
4.3.5.1.4	Continuum	132
4.3.6	Conclusion	134
4.4	Library and information science	136
4.4.1	Difficulties of achieving a "consensually" valid definition	137
4.4.1.1	Historical	137
4.4.1.2	Conceptual	138
4.4.1.3	Logical	140
4.4.2	The library science - information science relationship	142
4.4.2.1	Information science as part of library science	143
4.4.2.2	Information science as identical with library science	143
4.4.2.3	Library science as part of information science	144
4.4.2.4	Library science and information science as separate entities	145
4.4.3	Towards a tenable definition	146
4.4.4	Conclusion	149
4.4	Summary	150
5.	Contributions to the discussion of epistemological aspects of library and information science	158
5.1	Butler, P. (1886-1953)	162

5.2	Ranganathan, S.R. (1892-1972)	167
5.3	De Vleeschauwer, H.J. (1899-1986)	174
5.4	Machlup, F. (1902-1983)	185
5.5	Shera, J.H. (1903-1982)	189
5.6.	Fairthorne, R.A. (1904-)	196
5.7	Coetzee, P.C. (1905-1987)	199
5.8	Mikhailov, A.I. (1905-1988)	212
5.9	Farradane, J. (1906-)	215
5.10	Brookes, B.C. (1910-)	221
5.11	Debons, A. (1916-)	234
5.12	Foskett, D.J. (1918-)	237
5.13	Royce, J.R. (1921-)	240
5.14	Nitecki, J.Z. (1922-)	246
5.15	Zaaiman, R.B. (1922-)	250
5.16	Swanson, D.R. (1924-)	253
5.17	Wilson, P. (1927-)	255
5.18	Kochen, M. (1928-1989)	257
5.19	Wright, H.C. (1928-)	262
5.20	Saracevic, T. (1930-)	269
5.21	Meijer, J.G. (1931-)	271
5.22	Harmon, G. (1932-)	277
5.23	McGarry, K.J. (1934-)	280
5.24	Bekker, J. (1939-)	282
5.25	De Mey, M. (1940-)	288
5.26	Harris, M.H. (1941-)	291
5.27	Schrader, A.M. (1944-)	295
5.28	Miscellaneous seminal positions	300
5.28.1	Stäber, P. & Schmidt, K.	301
5.28.2	Kemp, D.A.	301
5.28.3	Von Foerster, H.	302

5.28.4	Belkin, N.J.	302
5.28.5	Williams, P. & Pearce, J.	302
5.28.6	Mukhopadhyay, A. & Taranto, R.E.	303
5.28.7	Engle, M.O.	303
5.28.8	Bergen, D.	304
5.28.9	Olaisen, J.L.	305
5.28.10	Kesting, J.G.	305
5.28.11	Links between unrecorded knowledge and recorded knowledge	310
5.28.11.1	The invisible college	311
5.28.11.2	The dynamics of oral communication in preliterate or semi-literate cultures	313
5.28.11.2.1	Coomaraswamy, A.K.	313
5.28.11.2.2	Benge, R.C.	314
5.29	Summary	316
6.	Critique of the contributions	320
6.1	The issue of conjunction/disjunction of library science and information science	324
6.1.1	Information science as part of library science	325
6.1.2	Library science as part of information science	326
6.1.3	Library science and information science are identical	327
6.1.4	Library science and information science as separate entities	328
6.1.5	Information science and library science as parts of a larger whole	331
6.1.6	No well-defined view	332
6.1.7	Conclusion	333
6.2	The issue of divergent conceptions of knowledge/recorded knowledge	334
6.2.1	Knowledge as an integrated, dynamic unity/whole	335
6.2.2	Knowledge as differentiated into distinct types	338
6.2.3	Knowledge as exosomatic and publicly accessible	340

6.2.4	Conceptions of unrecorded knowledge	344
6.2.5	Miscellaneous conceptions of knowledge	347
6.2.5.1	Knowledge in its relationship with information	348
6.2.5.2	Knowledge as personal/subjective constructions	349
6.2.5.3	Knowledge as a dialectical process	350
6.2.5.4	No well-defined conception of knowledge	352
6.2.6	Conclusion	352
6.3	The issue of the status of truth/ultimate reality for library and information science	354
6.3.1	The objective/external view of truth/reality	356
6.3.2	The subjective/internal view of truth/reality	357
6.3.3	No well-defined view of truth/reality	363
6.3.4	Conclusion	363
6.4	Summary	364
7.	Conceptual requirements for a general framework within which to develop an epistemological position for library and information science, and the criteria for evaluating such a position	371
7.1	Wholeness and fragmentation in Western thought	376
7.1.1	The holism of Jan Christiaan Smuts (1870-1950)	384
7.2	Wholeness and fragmentation in early Eastern thought	389
7.3	Wholeness and fragmentation in the natural sciences	391
7.3.1	Contemporary Physics	392
7.3.2	Biology	397
7.4	Wholeness and fragmentation in the social sciences and the humanities	401
7.5	Wholeness and fragmentation in conceptions of human knowledge	412
7.6	Wholeness and fragmentation in library and information science	418
7.7	Holism defined	433
7.8	Criteria for the evaluation of an epistemological position for library and information science	434

7.9	Summary	437
8.	Proposed theoretical model of an epistemological position for library and information science	445
8.1	Perspectivism	447
8.2	Holism and perspectivism	449
8.3	Holistic perspectivism	451
8.4	The application of holistic perspectivism	456
8.4.1	The individual user	457
8.4.2	The librarian	462
8.4.2.1	As an intermediary in the knowledge-transmission process	462
8.4.2.2	As a researcher	466
8.4.3	Recorded and unrecorded knowledge	471
8.4.3.1	Recorded knowledge	471
8.4.3.1.1	Fiction	471
8.4.3.1.2	Non-fiction	474
8.4.3.2	Unrecorded knowledge	475
8.4.4	Approaches to truth/ultimate reality in library and information science	477
8.5	Graphic presentation of the model of the proposed position	483
8.5.1	Explanation of the model	483
8.6	Summary	487
9	Conclusions and recommendations	492
10	Bibliography	497

List of figures

Figure 1: Royce's basic paths to knowledge	127
Figure 2: Brookes' model of communication	227
Figure 3: Royce's adapted model of the paths to knowledge	244
Figure 4: Rouse's illustration of Plato's divided line	298
Figure 5: Kesting's model of the structure of human knowledge	308a
Figure 6: The conjunction/disjunction of library science and information science	325a
Figure 7a: Conceptions of knowledge	335a
Figure 7b: Miscellaneous conceptions of knowledge	347a
Figure 8: The issue of truth or ultimate reality	356a
Figure 9: Typology of the views of selected theorists in library and information science regarding inclusiveness (wholeness) and disjunction (fragmentation)	419a
Figure 10: Interrelation of the user and recorded knowledge	461
Figure 11: The librarian's intermediary role	466
Figure 12: Research methods available to the librarian and approaches to truth	470
Figure 13: Modes of thought as reflected in recorded knowledge	477a
Figure 14: Nitecki's conception of knowledge	481
Figure 15: Theoretical model of holistic perspectivism as an epistemological position for library and information science	483a

1 Introduction

1.1 Purpose

It is unclear from the professional literature, and from general discussions concerning the theoretical development and professional practice of library and information science, whether there is sufficient consensus on the major philosophical issues to enhance and facilitate an understanding of the intermediary roles that librarians play in the rendering of library and information service.

Such service, insofar as it encompasses every function and subfunction within the generally acknowledged complex of library and information science functions, emanates from and is a reflection of philosophical assumptions that typify the modes (levels and dimensions) of knowing of practising librarians and information workers. Moreover, underlying philosophical standpoints do influence the ways in which research is conducted and the variety of modes of professional practice, and hence impinges upon the nature and quality of library and information service to users. An investigation into the relationship between the epistemological views and the practices of teachers, for example, has suggested that an understanding of their theories of knowledge provides significant insight into their professional roles as educators (Young, 1985).

Although a similar investigation has not yet been undertaken in the field of library and information science to the knowledge of the researcher, there have been a number of speculative,

theoretical and on the whole fragmented explorations that have attempted an exposition of the predominant intellectual traditions underpinning library and information science theory. Such explorations have contributed to creating a critical awareness of the relation between thought and action in this profession.

The value of this study to the theoretical foundations of library and information science and consequently of its ultimate practical utility are viewed as a major motivating factor in considering the investigation. It is envisaged that a clearly articulated epistemological position will contribute - with firmer conviction and consensus support - to the resolution of numerous perennial debates on professional issues of both major and minor import. An epistemological framework would contribute to establishing more coherently the identity of this professional discipline (Christ, 1972: 22). It would provide a context for a more informed understanding of such matters as the individual user's acquisition of knowledge from the content of material in both fiction and non-fiction categories held in libraries; an exposition of the role of the librarian as an intermediary and as a researcher in this process; and the provision of incisive analyses of profession-specific key concepts such as information, knowledge, truth or ultimate reality in the context of library and information science. It would also propose a sensible theoretical basis for discussions concerning a code of professional ethics, mission statements and curriculum-development proposals - matters which are often left unresolved

because of inner discords resulting from an inadequate understanding as to the true or most appropriate epistemological position for library and information science.

1.2 Statement of the problem

Such absence of agreement regarding fundamental aspects of library and information work manifests itself, for example, in the following difficulties, viz:

(a) the lack of a logically tenable definition of the field:

Having analyzed over 1 500 definitions of library and information science, Schrader concluded in a doctoral dissertation that the extant definitions in the professional literature reveal "... confusion, disagreement, contradiction, and inconsistency" (1984: 59). In an earlier doctoral study by Meijer that culminates in a well-substantiated proposed definition of librarianship, the logical inadequacies of existing definitions are exposed equally convincingly (1978). The work of these two scholars and that of others are analyzed in greater detail in this study.

(b) the diversity of opinion prevailing in the professional literature concerning the relationship between "library science" and "information science": Library science and information science have been referred to inter alia as "intellectual competitors" and "rival traditions" (Schrader, 1984: 59-60), and the literature reveals several propositions as to the conjunction or disjunction of these two presumed interdependent or full-fledged disciplines and professions. The ambivalence surrounding the relationship between library science and

information science has sharpened the focus on the problem of the identity of this field of study. According to Wilson, the equivocal situation has contributed to the drastic closure of a number of library schools in the USA (1988: 82); and

(c) the divergence of perception of the meanings of key terms such as information and knowledge which are of primary importance to the conceptual status of library and information science: It would appear, for example, that the feature most common to attempts at defining information as a key concept and term in the professional activity and disciplinary basis of library and information science is that of lack of agreement (cf for example Wellisch, 1972; Machlup & Mansfield, 1983; Meijer et al, 1988; Yuexiao, 1988). The prevalence of confusion in the many attempts at definitions of information has led to doubt as to whether consensual agreement is possible or likely to be reached at all until there is complete epistemological accord (Kesting, 1977: 164). Similar difficulties have complicated the definition and an adequate understanding of the nature of knowledge in library and information science.

The problem that presents itself is not that no views have been expressed on the above-mentioned issues, but that these views represent, at a more fundamental level, an intellectual impasse emanating from conflicting philosophical assumptions. An explication of these philosophical assumptions may not only facilitate theoretical development but produce a more critical awareness of the ways that professional practices are influenced by these presuppositions.

1.3 Points of departure

After due consideration of the problem, as outlined above, the following informal assumptions suggest themselves for further examination:

(a) it is desirable for a profession with a well-developed institutional infrastructure of practice, education, training and research to explore its dominant epistemological positions, and to identify an appropriate one;

(b) provisional reading suggests that there are, as yet, no commonly available statements in this field that clearly articulate an appropriate epistemological position for library and information science;

(c) it is hoped that a set of criteria for establishing and evaluating such a position may be generated from an analysis of the epistemology-related views of selected library and information science theorists;

(d) it seems important that a search be made for an appropriate epistemological position for library and information science which satisfies the proposed criteria; and

(e) a compelling epistemological position may contribute significantly to the resolution of the debates and difficulties referred to above, and hence benefit library and information science both theoretically and practically.

1.4 Method

In view of its essentially exploratory research goal (Mouton, 1990: 43), this thesis is viewed as a preliminary investigation which may lend support to a more structured study, and in a more directly applicable sense as an attempt to gain new insights into epistemological positions in the professional discipline of library and information science which would beneficially inform the central concepts and constructs.

For these reasons, the main method applied in this study is a representative consultation and review of the literatures of library and information science and those of other fields of study cognate to this field. In pursuit of the goal to maximize validity and to maintain the highest level of objectivity, there will be a concerted effort to allow the examined literature as far as possible to speak for itself. This will apply to the examination of conceptions of epistemology, the epistemological positions in selected fields of study cognate to library and information science, perceptions on information, knowledge and library and information science, as well as of the several contributions to the development of an epistemological position for library and information science.

A special focus of this study will be to examine and to analyze the views of selected library and information science theorists (the perceptions of a few non-librarians will also be included in view of the manifest value of their original and relevant insights). Inferences will be drawn from these writings in an inductive manner and displayed in typologies to highlight major aspects of underlying theoretical notions. It is envisaged that the results of these inductively-derived inferences will be reflected in a proposed theoretical model. A number of perceived applications of this model will be identified and examined as associated areas for further more incisive research.

1.5 Demarcation of the focus of the study

1.5.1 Universal principles

This study concentrates on the search for global/universal theoretical principles that are applicable to this professional discipline as a whole rather than on the self-imposed limitations of: (a) individual library prototypes (such as public, national, academic, specialized and school libraries) and (b) specific regions/national boundaries, etc. The availability of such "linking" mechanisms as inter-library lending, computer-based networks and resource-sharing imply that no individual library is isolated, and that libraries/information centres collectively constitute a "global village" of recorded knowledge sources, and users in quest of their content. The consideration of a general framework of thought is hence expected to be profitable to the broadest area of application.

1.5.2 Geographical delimitation

In respect of the professional literature of library and information science, journals and monographs in the English language reflecting the Anglo-American tradition were scanned thoroughly. Relevant material from the USA, Canada, South Africa, Great Britain and Western Europe received the most comprehensive and representative treatment. To a lesser extent, journals and monographs emanating from the old Eastern Bloc and South America were scanned and selected for potential contribution to this study.

Several sources in the Afrikaans language were also consulted, and where crucial quotations are cited a free rendering in English is added.

1.5.3 Chronological delimitation and arrangement

The literature which has been consulted reflect ideas and opinions expressed in the twentieth century, and as far as possible in the case of contributions by library and information science theorists (and those of non-librarians) a chronological method of arrangement is applied as a means of ensuring that the possibility of influence of the ideas of one proponent upon another will be detected, and of establishing whether clearly-discernible patterns of cumulative thought on the subject will emerge.

1.6 Qualifications

1.6.1 Usage of the phrase "library and information science"

Although the focus of this investigation is on professional practice and research, ie the entire complex of activities encompassed within the domain of what may be traditionally referred to as "librarianship", the preferred term applied consistently here is that of "library and information science". Certain individual library theorists maintain clear views of the identity of this professional discipline, of its disciplinary domain, and of the nature of its relation with information science (cf inter alia Meijer, 1978: 52; Shera, 1983: 387; Wright, 1983: 17). However, the issue may rightly be claimed to remain inconclusive at this stage. Moreover, this study has as

one of its aims the enhancement of an understanding of this dilemma (cf 1.1 & 1.2). The appellation "library and information science" is selected on the grounds that it appears to be: (a) the most representative in the current professional literature, and (b) neutral in respect of the avoidance of a one-sided emphasis on either "library science" or "information science".

The term "librarian" is also used instead of the more rigid and cumbersome compound "librarian and information worker", except in contexts where the latter phrase is warranted.

1.6.2 Repetition

Certain concepts, phrases and arguments are repeated throughout the study in order to highlight its central ideas and to reinforce the key propositions that are postulated for critical consideration. However, an attempt is made to balance repetition as a strategic technique on the one hand with repetition as a "nuisance factor" on the other with the aid of a network of cross-references. In this manner it becomes more effective to integrate arguments, to identify key concepts and issues, and to link brief statements with those more fully elaborated elsewhere in the study.

1.6.3 Applied nature of the study

This study has an applied focus and is different from the classical philosophical search for an understanding of the nature of human knowledge in general, although knowledge of

epistemological positions in various disciplines must be warranted in the light of research methods whose validity rests on generally acceptable epistemological assumptions.

1.7 Associated areas for research

One way of studying the prevailing epistemologies in the field of library and information science would be to focus on "epistemologies-in-action", ie the epistemic practices of librarians, in making their own validity judgements in, for example, collection development, management, etc. This would entail an empirical study involving the identification of dominant epistemologies through a data-gathering method such as, eg the Ross Epistemology Inventory (Ross, 1970). However, this study focuses on exploratory conceptual research as a necessary prerequisite for the design of a sounder empirical investigation in a future study.

1.7.1 Special applications

The model of an appropriate epistemological position for library and information science may be tested more rigorously in specific contexts such as, for example, in an individual type of library or in a given professional function such as collection development. A number of possible areas of application will be discussed towards the end of the study.

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2 Explanations of epistemology and the major epistemological positions, rationalism and empiricism

2.1 Conceptions of epistemology

Definitions of epistemology reflect little significant variation in essence. For example, the Shorter Oxford Dictionary defines epistemology succinctly as:

"The theory or science of the method or grounds of knowledge" (1965: 624).

In the context of formal philosophy, Hamlyn denotes epistemology as:

"... that branch of philosophy which is concerned with the nature and scope of knowledge, its presuppositions and basis, and the general reliability of claims to knowledge" (1967: 9).

Coffey, a philosophy scholar of repute, in turn, affirmed several decades earlier that epistemology, or the theory of knowledge, constitutes:

"... the philosophical investigation of human knowledge itself, from the standpoint of the certitude, validity, or truth-value of this knowledge" (1917: 1).

Hence, in definitions emanating from the subdivisions of "formal" philosophy, epistemology is viewed as a branch of philosophy which focuses on human knowledge, that assesses the validity thereof and investigates the methods by which it is acquired (cf 2.5). Epistemology is concerned with a general treatment of the nature of human knowledge as distinct from that of particular cognitive categories of knowledge, such as, for example, scientific knowledge or religious knowledge. (It should

be noted, however, that epistemology does connote the "philosophy of science" in continental-European philosophy (Aaron, 1979: 601)).

In addition to the wider focus of epistemology on the treatment of human knowledge in general, a narrower "applied" focus within professional and disciplinary contexts is emerging as researchers and practitioners in different fields of study are beginning to investigate the epistemological assumptions underlying their research methodologies and professional practices. This feature is discussed in greater detail in Chapter 3. Moreover, whereas traditional approaches to epistemology have tended to focus predominantly on the human knowledge of the individual, recent studies suggest a growing interest in epistemological issues surrounding "social systems of science, learning and culture". These studies have culminated in a division of epistemology into individual epistemology and social epistemology (Goldman, 1986: 1; cf Shera's notion of social epistemology-5.5). While the differences (as well as the similarities and relations) between individual epistemology and social epistemology remain unclear, what is certainly manifest is the attempt to broaden the traditional scope of epistemological studies to include an awareness of its social aspects and its application in social contexts, such as, for example, those of academic research and professional practice (cf 3.3-3.5).

2.2 Epistemology and logic

A comparison with logic evinces a clearer understanding of what is meant by the term epistemology. The association of epistemology with logic underlines the normative character of the former, as Vonéche affirms:

"... the goal of epistemology has traditionally been conceived as a matter of logic... of abstract norms... as a normative discipline..." (1985: 1997).

How does epistemology serve the interest of logic? Coffey proposed authoritatively some 74 years ago that:

"Logic as a practical science brings to light from an analysis of our thought processes certain normative principles which guide these processes towards the discovery of truth. In doing so it makes a number of assumptions, as, for instance, that by thinking correctly, ie, by judging and reasoning according to logical canons, the attainment of truth and certitude is possible. All such assumptions it devolves on epistemology to justify" (1917: 2).

This claim by Coffey is still valid today, namely, that epistemology ought to validate those assumptions that make possible the attainment of truth through logical reasoning. Coffey infers from this that the aim of epistemology, unlike that of other departments of philosophy, is not to extend our knowledge but rather to perfect our acquired knowledge by teaching us what it is to know (1917: 2; cf 2.4).

2.3 Epistemology and ontology

The relation between epistemology and ontology appears to be one of mutual interdependence, that is, the one depends upon and is incomplete without, the other. This relation should be viewed

in the light of the erstwhile traditional inclusion of both within the broader framework of general metaphysics (Coffey, 1914: 23).

All metaphysics, as the study of the nature of being, aims at arriving at a rational and systematic comprehension and exposition of reality (Aaron, 1986: 601). This is an ideal which the finite mind of man can only approximate - as is evident from all recorded human knowledge. Hence a distinction between human knowledge and divine or infinite knowledge is subsumed. This capacity for legitimate but approximate understanding by mankind will remain unduly limited and unsubstantiated if it were unaccompanied by an investigation into the nature of "knowing" itself (Coffey, 1917: 4). For this reason, the theory of being (ontology) has for its necessary counterpart and condition the theory of knowing (epistemology).

The same position obtains with respect to epistemology. Since all knowing involves a knowing "subject", or, mind (subjectum cognoscens) and a known "object", or, reality (objectum cognitum), the two lines of investigation deal with two aspects of the same domain, "this domain being the sum-total of human experience, or reality as revealed in and through this experience of cognitive interchange" (Coffey, 1917: 4). This interrelationship between ontology and epistemology emerges more clearly in the affirmation that epistemological positions such as rationalism and empiricism are conjoined with given metaphysical

conceptions of reality, ie, conceptions as to whether reality is One (monistic) or Many (pluralistic) (cf William James' view in 2.5, & 7.1).

In the field of library and information science, Harris (cf 5.26) and Bekker (cf 5.24) have made exploratory attempts to demonstrate the interrelationships between ontological and epistemological aspects of library and information work. The claims of a necessary interrelatedness of conceptions of knowledge and conceptions of reality are pursued in the context of library and information science in Chapter 7 (cf 7.6).

2.4 Epistemology, psychology and cognition

When epistemology is juxtaposed with psychology, distinctive standpoints are discernible. Coffey contends that the cognitive activities of the mind, when considered as mental processes or events, belong to the domain of psychology; but when viewed as approaches to the apprehension of truth (or reality) they belong to epistemology. He asserts that:

"... while as mental events they (cognitive activities) arise and develop according to laws of mental association and conjunction which it is the duty of psychology to elucidate, they have another and distinct aspect in that they claim to apprehend truth. It is precisely this claim which epistemology has to investigate" (1917: 3).

For Coffey, then, it is the notion of truth or valid apprehension of reality that becomes the criterion for establishing a proper demarcation between epistemology and psychology. Other writers seek to avoid the application of this very distinguishing procedure. Kornblith, for instance, distinguishes epistemology from cognition by confining the former

to the question of how we ought to arrive at our beliefs, and the latter to the question of how we actually arrive at such beliefs (1985: 3). Belief, for her, implies an assumption of having attained a state of apprehending truth and/or reality (cf 4.3.2 for knowledge as justified true belief).

At this point an exposition of the concept and term "cognition" is called for. The Encyclopaedia Britannica defines cognition as:

"... the process involved in knowing, or the act of knowing, which in its completeness includes awareness and judgment" (1979: 1042).

The Encyclopedia of psychology offers a more comprehensive definition, viz:

"Cognition is a general term or a generic term used to designate all processes involved in knowing... It comprises all mental activity or states involved in knowing and the mind's functioning, and includes perception, attention, memory, imagery, language functions, developmental processes, problem solving, and the area of artificial intelligence..." (1984: 228).

The two definitions display a common focus on the act or process of knowing and its analysis into separate components and manifests no significant concern with the validation process surrounding the knowledge act or process. In contrast to epistemology, psychology (and cognitive science in particular) emphasizes a non-normative, truth-neutral description of the act or process of knowing. Hence, the traditional distinction between epistemology and psychology has collapsed in recent attempts to "naturalize" epistemology.

2.4.1 Attempts at naturalizing epistemology

Quine has argued that epistemology should be naturalized and would in that event become a branch of psychology (1969: 68). In an attempt to explain the meaning of this proposition, Annis contends that the adoption of a naturalistic approach involves a description of "a group's inference habits, patterns of reasoning, the conditions under which beliefs of a certain sort are acquired, and their epistemic goals" (1982: 204). Kornblith, in turn, asserts that the traditional dichotomy between epistemology and psychology presupposed, fallaciously, a division between the epistemological concern with the normative issue of how we ought to arrive at our beliefs on the one hand and the cognitive concern with the descriptive issue of how we actually arrive at our beliefs on the other (1985: 3). The aim of naturalistic epistemology is to merge these two artificially demarcated issues (ibid.).

Scientific explanation and the scientific method (associated more narrowly with the natural sciences and technology) are among the central features of naturalism. (Naturalism, which incorporates materialism, maintains the philosophical view that the natural world is the whole of reality attainable by man and bases explanations for man's existence and behaviour on the physical world as distinct from cosmological, religious or supernatural views of the world (Danto, 1967: 448; Wilshire, 1979: 16; cf 7.1-7.5)). This means that naturalistic epistemology seeks to apply the procedures of the scientific method to cognitive functions (cf last definition in 2.4). Moreover, one of the tenets of naturalism is that "the only mode

of experience which is cognitive is scientific, and no cognitive claims are to be accepted if they are based on other experiential modes" (Danto, 1967: 450).

The suitability of the scientific method for the comprehensive exploration and resolution of all or even some epistemological issues remains an unresolved issue. Annis submits that one criticism of naturalism is that it "ignores the critical-normative aspect of epistemology", and that this leaves us with "simply describing epistemic practices instead of evaluating them" (1982: 205). Kornblith also notes that naturalistic epistemologists differ among themselves as to the level of directness of the bearing that psychology (and hence, the empirical sciences in general) should have on epistemology (1985: 4).

Debates and differences regarding the naturalization of epistemology do not however provide a suitable background for distinguishing genuine knowledge claims from invalid ones, since cognition, as it is approached in psychology, appears to be inadequate in its treatment of issues of an epistemological nature, such as, for example, conceptions of truth and reality (cf 6.3 & 7.1-7.5). The criteria for such a distinction are suggested, though not categorically, in the methods by which we come to know, and how this knowledge may be verified. The several modes of knowing that exist are all related, to a lesser or greater degree, to two major theories regarding respectively the source of and the test of the validity of knowledge, viz, those of rationalism and empiricism.

2.5 The rationalism/empiricism debate

Historically, and especially since the European Enlightenment, two dominant approaches to the acquisition of knowledge have been those inherent in the methodologies and assumptions of rationalism and empiricism (Williams, 1967: 71; cf also McGarry's observation-5.23). In its simplest essence, Cartesian rationalism (cf René Descartes, 1596-1650) holds that reason is the sole source of all knowledge while Lockean empiricism (cf John Locke, 1632-1704), in refuting this claim, asserts that all such authority is contingent upon the condition of experience giving rise to the empirical method of acquiring knowledge through observation and experiment (Williams, 1967: 73).

In a further attempt to emphasize the differences between rationalism and empiricism, and to provide evidence of the interrelationship of epistemology and metaphysics (cf 2.3), William James (1842-1910) makes the telling point that rationalism is monistic while empiricism is pluralistic (1911: 9). By this, James implies that the rationalist begins with the "whole" and the universal and unites things, whereas the empiricist begins with the part and converts the "whole" into a collection of separate things (cf Monism, pluralism and holism-7.1-7.7). James claims further that human temperament plays a stronger role than any objective premises in the choice by professional philosophers between rationalism and empiricism (1911: 6-7). James' own pragmatist philosophical position has been characterized as pluralistic (and hence empirically oriented) rather than monistic (Wahl, 1925: 134-5; cf 7.1).

A classical debate between rationalism and empiricism revolves around the question of whether the mind possesses innate ideas, or whether it is a tabula rasa with no pre-existing cognitive material. There is agreement, from a logical point of view, that many general theoretical concepts of mathematics and the natural sciences cannot be totally reduced to empirical concepts. However, this does not mean that the rationalist view of these concepts is unconditionally acceptable. A concept such as "mass", for example, is more than its observable value and is part of a model of reality used to impose structure on it (Williams, 1967: 75). Rationalism holds a realistic view of such concepts and their relation to reality which offer a representation of the world. Williams considers:

"... that there is a unique set of concepts and a unique set of propositions employing these concepts that adequately express the nature of the world, and that these propositions form a system and could ideally be recognized as a set of necessary truths" (1967: 73).

This rationalist view leads to the general question as to how anyone can come to know this "uniquely correct representation of the world", and to two more specific questions, namely, "what, in general, is the guarantee that knowledge of the world is possible?" and, "how can any individual tell in a particular case whether he has hit on some genuine piece of knowledge?" (ibid.). Different rationalist philosophers approach these questions in different ways, influenced in one way or another by the Cartesian tradition of "clear and distinct perception" of the intellect as a test of genuine knowledge (Williams, 1967: 75).

Empiricist philosophers are similarly divided on the central tenets of empiricism. This has resulted in:

"... a general empiricist position that all knowledge is derived from experience on the grounds either that: (a) all that we know is directly concerned with sense experience or derived from it by strictly experiential means, that is, learning, association, or inductive inference; or (b) all that we know is dependent on sense experience in that all the materials for knowledge are directly derived from sense experience; or (c) all that we know is dependent on sense perception in that even though we can know some things a priori, this is only in a relative sense, since the having of experience is a general pre-condition for being said to have such knowledge" (Acton, 1967: 499).

The major empiricist philosophers hold one or more of these positions, or variations thereof.

Whether rationalism alone, or empiricism alone, can guarantee knowledge is a matter of conjecture and dispute. In this regard, Acton contends that:

"It is futile to argue whether experience or reason alone can provide proof of what we ordinarily claim to know. No one could have knowledge of the world unless he had experiences and could reason, but this does not mean that either experience or reason by themselves could provide the kind of absolute certainty which would constitute proof. Nor is it required that they should provide proof in order that knowledge may be possible" (1967: 505).

The general view is, then, that human knowledge is dependent on both experience and reason: experience provides the material of knowledge and reason provides the principles for ordering this material (Aaron, 1979: 622-3). One thing is certain, however, viz, that rationalism and empiricism constitute the two pillars for any discussion of the possibility, validity and limitations of knowledge.

Immanuel Kant (1724-1804), in an attempt to reconcile the epistemological divergences, denies any priority to rationalism over empiricism, and vice versa, in the attainment of knowledge. Both are of equal importance. He argues that knowledge of an objective world is only possible if our sense perceptions are organized within what he calls the pure a priori intuitions of space and time in terms of rational principles. The world of sensory experience would be a confusing "manifold of fluctuating sensations without the a priori intuitions of space and time" (Kant, 1781: 143). These intuitions and the categories of the understanding enable us to synthesize our sensations. This synthesis is carried out not by the empirical self but by a transcendental self, of which we know nothing but through which a knowledge of the world is possible (1781: 144; cf Coetzee's contribution-5.7).

For all the apparent differences that distinguish rationalism from empiricism, both views endorse a fundamental separation of the knower (subject) and the known (object), ie, an underlying dualism that maintains a radical disjunction of mankind and the environment, and of the mind and the body (Versfeld, 1991: 5). The dualistic approach has served as the significant part of the philosophical basis of a mechanistic conception of the world. This mechanistic conception dominated Western scientific thought from the second half of the seventeenth century to the end of the nineteenth century (Capra, 1981: 21). Roszak corroborates this when he avers that: "Before the seventeenth century was finished, these two

philosophical currents - the Rationalism of Descartes, the Empiricism of Bacon - had formed a working alliance to produce the intellectual enterprise we call science" (1986: 212).

The rationalist aspect of this mechanistic outlook derives from the separation by René Descartes (1596-1650) of mind (res cogitans) from matter (res extensa) and holds that the world is constituted of entities which exist independently of each other (cf 7.3.1). Capra argues that, as a consequence of this division, "... it was believed that the world could be described objectively, ie, without ever mentioning the human observer, and such an objective description of nature became an ideal of all science" (1981: 58).

The empirical aspect of the mechanistic outlook, developed to a large degree by Francis Bacon (1561-1626) and Galileo Galilei (1564-1642), among others, bases the testing of theories firmly on experimentation and the evidence of experience. This involves the "... rigorous, well-targeted interrogation of nature by close observation and experimentation", which is undertaken in a spirit of "... total objectivity, avoiding all assumptions and presuppositions. It should simply try to see things as they really are" (Roszak, 1986: 102).

The dualistic approach (which separates the knower from the object of knowledge) and the mechanistic conception of the world that it espouses, has been confronted with a formidable challenge, originating remarkably enough, from recent research findings in several natural sciences, most notably, those in

contemporary physics (cf, for example Capra, 1981; Bohm, 1981) although the challenge to dualism emanated from several sources (Lovejoy, 1955; Capra, 1988; cf 7.1-7.4 for a discussion of this issue in several disciplines). A central concern of this challenge is the elimination of the dualism of mind and matter (or of knower from object of knowledge). Early in the twentieth century, findings emerging from investigations into aspects of electromagnetism and subatomic physics suggested that there appeared to be a significant interrelatedness of mind and matter, ie, that human consciousness seemed to play a crucial role in the interpretation and understanding of physical reality. These findings held significant implications for the long-held distinctions between the subject and the object, as maintained in dualist approaches to reality (and supported by rationalism and empiricism). The traditional perception of a fundamental separation between subject and object was gradually being replaced with a view that the subject and the object, as components of the knowing process, are dynamically linked with each other within a greater whole, and that this holistic approach offered deeper insights into an understanding of a multidimensional reality (cf Contemporary physics-7.3.1).

These newer, holistic approaches in physics and other natural sciences had already been anticipated, and are echoed, in the speculative ideas of several schools of thought in the West and in a number of early Eastern religious philosophies (cf 7.1 & 7.2).

The challenge to epistemological dualism has not led to its demise, nor has the mechanistic conception of the world been totally discarded. What appears to characterize the intellectual scene in the late twentieth century is the recognition of the validity of many modes of knowing, each with the potential of enriching a fuller understanding and appreciation for the fullness of human experience and total human culture (cf for example, Kesting's position-5.28.10 & Jung's schema of cognitive functions-7.4).

As theories of knowledge, rationalism and empiricism represent alternative epistemological positions that appear to offer greater insight into the variety of approaches to human knowledge when taken as essential components that are dynamically linked within a greater whole than if taken separately. The emphasis of one at the expense of the other would seem, as a necessary requirement, to include certain modes of knowing and to exclude others, whereas a recognition of both holds out the opportunity for a broader, encompassing view of the rich variety of all the forms of manifestation of human knowledge (cf Wholeness and fragmentation in conceptions of human knowledge-7.4).

2.6 Summary

In this chapter we noted the key features of the meaning of the term epistemology by:

- (a) analyzing a few definitions;
- (b) comparing it with a few closely-allied fields of inquiry; and

(c) describing the principal themes surrounding the methods for acquiring and justifying knowledge (cf 4.3).

This chapter has revealed a perception of epistemology as existing in a state of tension between its traditional philosophical context where it plays a normative, regulative role, and its modern psychological context where empirical issues have led to its assuming a descriptive role (cf 2.4.1). The importance of cognitive processes can no longer be ignored in a comprehensive discussion of knowledge acquisition. This does not however imply that the traditional view of epistemology is no longer valid. What needs to be emphasized is that there is no single method for acquiring and justifying knowledge that may serve as a fault-free basis for all kinds of knowledge claims in all fields of inquiry (cf 2.5).

In the context of library and information science, there would seem to be a need to establish the framework for a basis for an epistemological position that will recognize all manifest modes of knowing which encompass the whole of human knowledge as expressed in recorded form (ie, the generic record).

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3 Epistemological positions within selected disciplines and professions

3.1 The value of epistemological studies

Attempts at naturalizing epistemology and dislodging it from its traditional place in philosophy (cf 2.4.1) have led to an increasing interest by specialized disciplines and professions in epistemological issues. Nutter, for example, considers that "... the first step in theory building is the resolution of basic epistemological issues" (1984: 167). This observation of the value of epistemology in the contribution towards a sound development of theoretical orientations is complemented by the perception of the equally significant role that epistemology plays in the practical application of theoretical concepts. Harding points out, for example, that epistemological choices (whether these choices are explicit or implicit) do result in differences in the manner in which we practise our professions or conduct scientific research. By this he means that the espousal of a particular conception of the world tends to incline one to a selected mode of practice to the exclusion of other possibilities of action (cf 7.3 & 7.4; 1988: 155).

In the context of disciplinary research, epistemological assumptions often determine methodological principles and are philosophically more fundamental (Levison, 1974: ix). This means that the mode and manner of investigating phenomena is preceded, either deliberately or unconsciously, by what we

consider worth looking for, ie, what we consider to be of value in a given subject field and will qualify as legitimate knowledge in that disciplinary context.

The perceived significance of these issues is evident from a cursory examination of the literatures of a number of specialized disciplines and professions that have attempted to elucidate the dominant epistemological positions in their respective fields of study. For example, Dean and Fenby have explored the epistemological positions that they believe are found in the profession of social work (1989: 46-54). They contend that social work action (clinical action) reflects the philosophical assumptions that underlie "methods of knowing" and that, if social workers examine the "... intellectual traditions of social science theory" and the "... nature of knowledge in social work", they will develop an informed perspective and a critical awareness of the relation between thought and action in social work (1989: 46, 54).

In a similar development in the legal profession, Teubner has proposed a "constructivist epistemology of law" that attempts to delineate the content of the nature of thought processes that are dominant in the study and practice of law (1989: 13-27).

3.2 Rationale for the selection of disciplines and professions cognate to library and information science

Not all of the disciplines and professions that have made attempts to identify or develop epistemological positions in their fields of study, or that manifest an interest in

epistemology-related issues, share sufficient common ground for comparison with library and information science to warrant inclusion and discussion in this study. The most important criterion selected as a means for separating suitable from non-suitable examples for more detailed analysis, requires as a central concern the professional role of an intermediary in the transfer of knowledge. (The term "knowledge" is preferred to that of "information" in this study since formal epistemology is essentially concerned with the former. Furthermore, the term "information" has not yet been demarcated in the context of library and information science in a satisfactory manner - cf 4.2 for an examination of several perceptions of the meaning of this term, and 4.3.6 for the conception of knowledge adopted in this study). This results in a selection of disciplines and professions that are cognate to library and information science. This selection will itself be further limited to those cognate disciplines and professions whose literatures reveal a satisfactory degree of depth of discussion of epistemological aspects.

The disciplines of (a) education, and (b) communication theory (encompassing the field of mass communication - cf 3.3 for a justification of its inclusion), appear to meet these requirements, thereby making them eminently comparable to library and information science. While there are distinctive differences between these disciplines, the prospect of their commonalities offer an opportunity for discovering insights into the common epistemological issues that occupy their theoretical concerns.

The most significant of these commonalities is the intermediary role of the professional in the transfer or distribution of knowledge. McQuail affirms this role as a central one in education and communication when he claims that "We usually speak of knowledge as the outcome of a communication or learning process" (emphasis added; 1983: 51). This role has been acknowledged for a long time as one that also characterizes the disseminating function of libraries (cf Meijer's complex of functions-5.21). This acknowledgement has come both from:

(a) librarians, (for example McGarry (cf 5.23)), who recognizes at the same time the benefit for librarians of examining the area of mass communication, in the claim that it will enrich their insights into the social context of their function of knowledge transmission (McGarry, 1972: 11, 127); and

(b) researchers into mass communication who describe the library as an "alternative mass communication institution" which deals with "... organization and distribution of knowledge - a function commonly linked with the ... mass media" (emphasis added; Budd, 1987: 133).

One should add here the observation that this close relationship in regard of the knowledge transmission role of libraries and mass communication media may produce, in the short term, a competitive relationship between them (Orr, 1977: 212). Nevertheless, it is clear that the three disciplines share an intermediary role in the transfer of knowledge, ie, they appear to have in common the task of performing a professional function of mediation between senders and receivers in the communication process, or between seekers of knowledge and records containing the desired knowledge.

It is possible to extrapolate further similarities and differences between these disciplines. For example, in respect of education and communication (more especially mass communication) there appears to be contact between one sender and many receivers simultaneously. This may allow extensive influence upon and immediate response from receivers, although uniformity of impact cannot be readily assumed. On the other hand, library and information work usually involves a one-to-one relationship that prompts a much wider variability of response. Moreover, the emphasis on the individual user in library and information service is a distinctively traditional professional feature (cf De Vleeschauwer's individualistic approach-5.3).

Furthermore, the aim to serve the individual implies voluntary participation as distinct from compulsory participation in the services that are provided. Libraries and mass communication agencies, as institutions created to facilitate the distribution of knowledge, differ from education in the sense that the individual is more free in the former context to decide whether to use libraries or mass media than in the case of formal educational activities. Related to this voluntary character is the association of library (more specifically, the public library) and media use with leisure and free time, and its dissociation from work and duty. Moreover, the voluntary nature of participation implies that the transfer of knowledge in the case of libraries and communication (inclusive of mass communication) precludes a planned or systematic effort to select certain themes or doctrines for transmission, thereby excluding others. On the other hand, educational activity compels the

teacher, as a pedagogue, to "... select and synthesise the selected" (Kesting, 1985: 170). In its aim to be inclusive in respect of all legitimate doctrines, librarians strive to become "supradoctrinal" or "transdogmatic" - a professional ethos that transcends the legitimate constraints of an educational programme (ibid.).

Whatever other differences and similarities may feature in these disciplines, the focus of this study is specifically an investigation into the existence of the predominant epistemological positions within library and information science as a knowledge-transmitting profession. For this purpose, there appears to be sufficient common grounds for the comparison of the normative and functional foundations of library and information science with those of education and communication (the latter encompassing also mass communication), and hence for further identification and analysis of the major epistemological positions in these respective fields.

In addition to education and communication, it seems evident that reference to a classical model, though non-cognate, may well benefit this discussion. The classical model selected for this purpose is that of the medical profession. The appropriateness of this selection is based on a number of considerations, among which the following are paramount:

(a) the professional status of medicine is secure internationally, and this has been so since antiquity in different cultures;

(b) together with other classical professions such as law and theology, it has served and continues to serve as a general role model for other professions in Western culture.

Faculties of medicine (along with those of theology and law) were found at the earliest established universities, eg at Salerno c 1084 (Wieruszowski, 1966: 76); and

(c) like library and information science it has a marked interdisciplinary basis.

It should be noted that it is neither possible to comment fully on all the epistemological issues raised in the literatures of these disciplines, nor is it within the scope of this study to attempt a definitive probe. It will be regarded as being sufficient for the task at hand to consider the major evolutionary trends of epistemological thought in these disciplines and professions.

The classical model of medicine receives priority in the order of discussion that follows below. Of the cognate disciplines, education is given precedence over communication/mass communication for no specific reason since both are perceived to be concerned essentially with the transmission of knowledge.

3.3 Epistemological positions in medicine

A philosopher of medicine has noted that the "... biomedical revolution of the past two decades has raised fundamental questions concerning the conceptual foundations of medicine" (Lamb, 1986: ix). He argues that, as medicine advances into new areas, greater conceptual uncertainty has become evident. What is required, he claims, is "... more discussion of the metaphysical and epistemological aspects of medicine" (*ibid.*). The emphasis on epistemological aspects of medicine, in particular, derives from the perception that the theory of

knowledge lies at the heart of medical research and treatment, and that differences between underlying philosophical standpoints actually lead to different forms of treatment. Ledermann, for example, contends that although doctors are generally unaware that they carry on their practice employing a general theory or philosophy, "... there is indeed a philosophy underlying every medical practice, [and] moreover that there are a variety of philosophies, concurrently held in the medical profession, and that differences between them lead to different forms of treatment" (1986: xix).

The "variety of philosophies" referred to above has developed historically in medical theory and practice, and the historical development of Western medical science shares many of the characteristics of the history of natural science in the West (cf 7.3). Briskman underscores this parallel development when he explains that - from the point of view of truth - the demarcation of Western medical science from the claims of witchcraft, faith healing, Christian science and other informal modes of healing such as those practised, for example, by Paracelsus (1493-1541) was initially that the former was preferred to the latter because of the generally accepted philosophical tradition of inductivism (1988: 3).

It was the application of the inductive method, based inter alia on the ideas of Francis Bacon (1561-1626; cf 2.5), that distinguished genuine empirical science from the traditions of pseudo-empirical superstition in Western culture. The inductive method requires that the "neutral" scientist approaches the world

in an unprejudiced manner, making only empirical observations. Only after he/she has collected a sufficient body of unprejudiced observations does he/she begin to try, using these observations, to discover their underlying causes by inferring them from the observational evidence itself (Briskman, 1988: 5). On the other hand, the method of superstition, which includes witchcraft, scientology and so on, begins with ideas (conjectures about the causes) and then proceeds to find empirical or observational evidence to support or "confirm" preconceived ideas (*ibid.*). The argument is that genuine empirical science is based on the application of the inductive method and is genuinely supported by observations and experiments, and thus the validity of its results is unequivocal and beyond dispute.

The much later critique of the inductive method and the subsequent recognition of its shortcomings led eventually to the modified view advocated by Popper. Popper proposed a non-inductivist solution to the demarcation of genuine empirical science from pseudo-empirical superstition, viz that it is not the verification of theories that distinguish them as true rather than false, but that, since these theories are open to observational and empirical criticism and hence to possible refutation (ie, being falsifiable), they deserve to uphold a claim to truth in approximate terms (Briskman, 1988: 15; cf Brookes' position for the application of Popper's ideas to information science theory-5.10).

Briskman's leading argument is that, by and large, Western medical science has followed the development of the natural sciences in the Western world. For this reason, the approach described above is also characterized in medical science research theory as a mechanistic or mechanistic-materialist one (cf 2.5, 3.3.1 & 7.3.1 for fuller elaborations of this approach) that maintains the fundamental separation or Cartesian dualism of knower from known (Ledermann, 1986: xix).

The Western-based epistemological dualities such as theory/practice, subjective/objective, basic/applied and so forth, are not encountered in traditional Chinese medical theory for example. As Farquhar points out, the reason for this is that Chinese scientific and philosophical discourses have been "... characterized by forms of holistic participation in which no isolated observer standpoint has been fostered" (1987: 1013). The holistic aspect of traditional Chinese medical knowledge is affirmed in the claim that:

"Insofar as we can legitimately speak of knowledge in Chinese medicine... it must be seen as a complex achievement incorporating at least relationships to others (patients, teachers, students) and to the past" (1987: 1015).

The interrelatedness of knowledge in this conception is also echoed in the approach in Western medical science that is described as holistic, following the use of Smuts' term (Ledermann, 1986: xxi; cf 7.1.1 for Smuts' original conception of holism). In medical science, the holistic approach starts from the whole person (cf 3.3.2) as distinct from the mechanistic approach which starts from the isolated individual part. The holistic approach in contemporary Western medical science also

received impetus from developments in the natural sciences, specifically in the areas of physics and biology. Research in these fields of study have sought to overcome the rigid separation of the knower and the known, as espoused in the mechanistic approach, and has acknowledged the crucial role that human consciousness plays in scientific research and experiment (cf Contemporary physics and biology-7.3.1 & 7.3.2).

As tools for gaining knowledge, these polar opposites in the philosophy of medicine (viz mechanism and holism) provide a conceptual framework which facilitates an exploration of the major epistemological positions that have affected and are still affecting medical theory and practice (Ledermann, 1986: xi).

3.3.1 The mechanistic epistemological position

The emergence of the mechanistic position should be viewed against the background of the early attempts to assimilate into medicine the spiritualist element of religious consciousness (Laura, 1985: 30). For example, the so-called vitalist school of thought held that there was a teleological principle present in living organisms, a "life-force" (an Aristotelian "entelechy" - after the Greek en-telei-ekhe, meaning "to be in perfection") that played a role in the workings of the human body independent of the material components which constituted it (Driesch, 1914: 19-26; cf also this theme in the context of holistic ideas in Biology-7.3.2). In contrast to the exponents of this school of thought, the mechanists affirm the machine-like nature of the

human organism, thereby "... fostering the working hypothesis that all illness was a result simply of a malfunction in the machine's parts" (Laura, 1985: 30).

The original influence of the supernatural on the cause of illness diminished considerably with the articulation of the Hippocratic philosophy of medicine as set forth in the Hippocratic collection of writings, known as the Hippocratic Corpus (Lloyd, 1978). This collection, which is broadly independent of Hippocrates the man, includes the contributions of a large number of medical writers, belonging to different schools and representing in many cases quite opposed viewpoints, and advocates a natural (ie, empirical) rather than a supernatural understanding of the human organism. It should be added that Hippocrates' (c 460-357 BC) own writings revealed the role played by the environment and the interdependence of the mind and the body in the preservation of health and the elimination of disease, and that it was the successors of Hippocrates who focused upon the mechanistic aspects of the Hippocratic tradition (Laura, 1985: 31). It was specifically Galen (c AD 129-99), as Hippocrates' "epistemological" successor, who in the second century advanced certain of Hippocrates' theories to support a characteristically mechanistic outlook (Venzmer, 1972: 93).

This mechanistic development of medical science was continued in the ninth century by such Arab physicians as al-Tabari and Rhazes, and in the tenth century by Haly Abbas and Avicenna (Ali ibn-Sina, 980-1037). Venzmer contends that Avicenna's famous book, the Canon of Medicine, was an explicit

attempt to synthesize the writings of Aristotle (384-322 BC) and Galen in the service of a coherent mechanist philosophy of medicine (1972: 109).

During the Renaissance the mechanistic approach in medical science re-emerged in the work of renowned artists and scientists, such as Michelangelo (Michelagnolo Buonarroti, 1475-1564) and Leonardo da Vinci (1452-1519), who pursued dissection to achieve a knowledge adequate for depicting the human body in its finest detail, thereby contributing inadvertently to the development of new methods of medical research by their new methods of art (Laura, 1985: 32).

The work of Galileo (1564-1642) gave the mechanistic disposition an even stronger orientation. He held that mathematical laws governed the functions of all nature, including the human body (cf 2.5). Nature was to be "... understood and in turn controlled by effecting its reduction to the basic mathematical, or more precisely, the geometrical relations of which it was constituted. Medical mastery of the human body was simply one aspect of this reduction" (*ibid.*). This reductionist element, according to Laura, was eloquently articulated in the philosophy of Galileo's contemporary, René Descartes (1596-1650). Descartes' epistemic reductionism is coupled with his doctrine of dualism. Laura contends that the Cartesian separation of the res cogitans (mind) from res extensa (matter) made it possible for the first time to describe the world of matter as a machine whose workings could be reduced to mechanical laws. It was only by

eliminating the mind or spirit from matter that matter could be characterized in purely mechanical terms without reference to spirit (1985: 33).

Laura maintains further that Descartes' mechanistic and reductionist view of nature was given systematic mathematical formulation by Isaac Newton (1642-1727), and not only held far-reaching implications for natural science in general (cf 7.3), but set the stage for the future development of medical science for the next three centuries. According to this view, the body is seen as a machine whose workings could be reduced to mechanical laws. Laura explains:

"Incorporating the Galilean and Cartesian stress upon a reductionist mathematics, Newtonian mechanics transferred the Hippocratic reliance upon an empiricism of qualitative impression to an empiricism of quantitative analysis. Insofar as quantitative analysis favoured a science of mensuration, the reductionist programme claimed for itself an objectivity that could itself be measured" (1985: 33).

This empirical approach sought the explanation for the cause of disease in an increasingly narrower focus upon the human body, that is, from the body as a whole to its parts, from its parts to its internal organs and glands, from its internal organs and glands to cells, and eventually to microscopic bacteria.

Evidence of the further elaboration of the mechanistic approach in medicine include the gradual shift in analysis from organs to cells and their structure in the work of several prominent physicians in the seventeenth, eighteenth and nineteenth centuries. The main point to be observed, however, is

that mechanism and its reductionist epistemological principle had become firmly established in the theory and practice of medicine by the twentieth century.

The mechanistic approach has led to advances in medical science such as, for example, the treatment of infectious diseases, the ability to remove diseased parts such as inflamed gall bladders and appendices and the prevention of illness through immunization (Ledermann, 1986: 26). However, the approach does not appear to have been equally effective in the case of degenerative diseases and cancer. The view exists that the principle of wholeness has much to offer to medicine and that the holistic approach should be considered as being complementary to the mechanistic one. Ledermann, for example, submits that the prevention of disease (a more significant aspect of medicine than the cure of illness) depends on the proper functioning of the whole body (and mind) and on the conditions under which health is possible (ibid.). Views such as these have led to the systematic development of an approach that focuses on the whole rather than the part in medical treatment, and which involves a fresh construal of medical knowledge in the context of medical theory and practice. This position is discussed below.

3.3.2 The holistic epistemological position

Although the machine can serve as a model for living organisms, as the mechanist approach has demonstrated, there is a fundamental difference between living matter and non-living machine matter, viz, purposiveness, ie, a special form of unified action towards an end. It is this purposiveness (creativity)

that distinguishes living organisms from non-living organisms, and such behavioural forms cannot be effectively explained in mechanistic terms (this argument is also discussed in 7.3.2). According to certain medical theorists an approach that is consonant with this recognition is a holistic one. Holistic medicine denies that disease can be explained satisfactorily via its reduction to the particular biological causes traditionally associated with it. It stresses the multidimensional character of the human being and the essential interdependence between the state of a being and the biological, psychological, social and cultural factors which impinge upon it (Laura, 1985: 36).

Like mechanism, holism also constitutes a view of the nature of the universe (cf Smuts-7.1.1); within the context of medicine it is likewise recognized as a way of gaining knowledge of the phenomena with which physicians are concerned (Ledermann, 1986: xi). Holistic medical practice does not treat parts in isolation but considers the different aspects of the whole person, ie body and mind in relation as parts to the greater whole of the surrounding environment. In the case of the body, for example, the food which is introduced into the body affects the whole body and a change of diet can profoundly affect vital functions. In the case of the mind, the individual mind is affected by other minds with which it comes into contact (Ledermann, 1986: 36).

Laura calls for the articulation of an epistemological framework that will support holism in medicine. He believes that the radical shift in medicine which seeks to treat illness and disease as a consequence of a complex interplay among social,

environmental, psychological and physical factors cannot be supported by most of the traditionally formal epistemologies underlying medicine explicitly or implicitly (1985: 35).

Laura's so-called "epistemic holism" derives its predominant support from the recent developments in physics (cf 7.1.3). This epistemological position accords a crucial role to the subjective knower's conceptual organization in the growth of knowledge.

Although it is Laura who attempts to delineate the content of an epistemological position that will support a holistic approach to medicine, there were several prominent early medical theorists who foreshadowed this attempt. For example, among several others, the French medical philosopher, Carrel, noted the trend toward specialization without the accompanying need to synthesize. He claimed in the late 1940's that:

"Nowadays the data accumulated by specialists are largely unusable because there is no one to coordinate this knowledge and look at the human being as a whole..." (emphasis added; 1948: 54).

Proceeding along similar lines, Spicker ascribes a "medical epistemology" to a noted philosopher of medicine, Canguilhem. This position emphasizes the view that the patient should be seen as a totality and as a unique individual. Spicker quotes Canguilhem in support of this position:

"In the final analysis, would it not be appropriate to say that the pathological can be distinguished as such, that is, as an alteration of the normal state, only at the level of organic totality, and when it concerns man, at the level of conscious individual totality..." (emphasis added; Canguilhem, 1978: 44 as cited in Spicker, 1987: 403-4).

Canguilhem continued the debate begun by the famous nineteenth-century French physiologist, Claude Bernard (1813-78), who posed the question as to whether the acknowledgement of the uniqueness of each organism is not tantamount to a denial of the possibility of a medical science in general (Bernard, 1865: 129). Pointing out the limitations of statistical knowledge, namely, that the law of large numbers never teaches us anything about any particular case, whereas the individual patient is an organic whole (ie a particular case), Canguilhem suggested that the disease complex of each patient therefore cannot be a mere biological category. Disease should be viewed and treated within a broader context of imponderable influencing factors. It is clear that holistic notions were prominent in the theoretical views of noted physicians of the past, albeit in different guises.

To return to Laura's "epistemic holism", the discoveries of quantum physics and Einstein's theory of relativity (cf 7.3.1) constitute the basis of this epistemological view. Laura perceives the universe to be a "web of interconnections" and knowledge of such a universe as dependent upon both unity and diversity. He explains the meaning of this proposition as follows:

"Epistemic holism... seeks to preserve diversity at the expense of conformity. The unity of knowledge at which it aims comes not from the comparison of frames of semantic descriptions with some Archimedean world independent of description, for there is no world undescribed in virtue of which descriptions can be validated... The growth of knowledge depends not so much upon some independent reality underpinning our descriptions, as upon the conceptual organization embracing them, and it is this which is the referent of epistemic holism" (1985: 38; cf 6.3).

Laura's notion of epistemic holism aims at countering fragmentation by synthesizing diversity or "frames of reference" and projecting them into "... new constellations of meaning and understanding" (ibid.). He contends, furthermore, that since knowledge and truth are not completely co-extensive, truth is not the only, or even the prime, consideration in the growth of knowledge (ibid.; cf 6.3 & 8.5.4 for more detailed treatment of the notion of truth). The implication of this claim for epistemic holism is that it not only seeks truth, but that it seeks also cognitive insight through intuition, imagination, and creativity. In this way, human knowledge is conceived as being multi-dimensional (ibid.; cf Kesting's view that human knowledge is organically indivisible-5.28.10).

The debate between mechanistic approaches and holistic approaches is also evident in the search for epistemological foundations carried on in a field closely related to medicine, viz psychoanalysis. For example, Carveth offers a critique of Barratt's view that psychoanalytic knowing is based, not upon logical empiricism (which is associated with logical positivism-cf 3.4.1), but upon dialectical deconstruction. Barratt emphasizes strongly the social and historical determination of thought and contends that the scientific character of psychoanalysis is assured not by its use of the correspondence theory of truth, but rather by its readiness to systematically call itself and all of its assumptions in question (1987: 106). The correspondence theory, used largely in the natural sciences, holds that truth is guaranteed as a

correspondence between an observation and the external object of observation, that is, that things can be accurately known as they exist "out there".

Carveth maintains that a blanket rejection of logical empiricism and its correspondence theory is not consistent with a truly dialectical deconstructive method. Barratt, according to Carveth, has gone from the one extreme position where reality is entirely independent of the knowing subject to the other extreme position where all knowledge is constituted entirely socially and historically. Carveth cautions that:

"... to counter the claim that logical empiricism possesses literal validity by the opposite claim that it is literally invalid is to remain within the framework of a literalism which fails to grasp the metaphorical foundation of every approach to the ultimately incompletely knowable Real beyond its various representations in the registers of the Imaginary and the Symbolic" (1987: 107; cf 2.5).

The necessity of using metaphors should be viewed in the light of the principle that some metaphors may be judged with validity as being more appropriate than others "in that they are in various ways more congruent (or less congruent) with the reality they attempt (inevitably incompletely) to symbolize" (Carveth, 1987: 107).

Carveth proposes, as an attempt to resolve this dilemma, a rejection of both a pure objectivism and a one-sided subjectivism, that is, it is possible to "deconstruct" the privileging of either term of the binary opposition of subject versus object. What he really seeks is an accommodation of both

subject and object as opposed to the adoption of a one-sided perspective, a perspective which lends support to a parochially derived epistemological position for psychoanalysis.

The attempt by Carveth to encompass different approaches within a greater whole suggests an appreciation for broader, integrating frameworks that allow a more comprehensive understanding of the nature of the psychoanalytic process.

3.3.3 Conclusion

The epistemological debates in medicine (physical health/illness) and psychoanalysis (mental health/illness and its prevention or cure) surround the dichotomies of analysis versus synthesis, subject versus object, and other presumed polarities, thus reflecting essentially the tension between mechanism and holism in medicine and psychoanalysis. A too strict adherence to one extreme position results in the deleterious neglect of the other position. The resolution of these debates invariably lies in a position that would grant equal validity to the whole continuum in which each position would seek to establish its validity within well-defined contextual criteria. Both mechanism and holism, as ways of regarding phenomena "... are complementary and are both necessary to a balanced understanding" of the nature of medical theory and practice (Ledermann, 1986: 43).

The dominant epistemology-related issues that have been identified in these positions in medicine and psychoanalysis have included:

(a) the nature of the subject-object relationship that influences conceptions of knowledge as they are applied in the context of medical theory and practice (cf 2.5); and

(b) different conceptions of the notions of knowledge, truth and reality as they appear in the literature of medical science (cf 6.1-6.3).

3.4 Epistemological positions in Education

The literature on epistemological issues in the field of education is particularly instructive for library and information science because of their mission-directed commonalities. Both fields are regarded as knowledge-transmitting professions. Each field is committed to the (educational/psychic/ethical, etc) development of individual and society and the acquisition of practical skills and techniques required for his/her vocation in life in so far as this mission can be accomplished through the instrumentality of knowledge-dissemination. However, each adopts different sets of approaches to achieve these goals. This implies also, therefore, the presence of given characteristics that set them apart.

Education involves a deliberate attempt to regulate the learning and teaching of individuals or groups of individuals, and to this end, tends to employ a curriculum structured to endorse or promote particular viewpoints. Library and information science ideally involves an actively neutral diffusion of knowledge sources to individual users upon demand. Whereas library and information science strives to maintain a transdogmatic stance in respect of individual users, it is debatable whether the process of education by its nature can be essentially value-free or neutral in respect of matters sensitive

to human bias and disposition such as political, religious, philosophical, scientific and artistic states of mind (cf the challenge to Wartofsky's claim below).

It should be acknowledged at this juncture that education, in the context of this study, is viewed as:

- (a) predominantly formal, as distinct from informal or non-formal;
- (b) designed to serve primary, secondary and tertiary levels of teaching;
- (c) encompassing both teaching and research; and
- (d) unavoidably normative, and hence ideological (see discussion below)

Because teachers are involved in the process of producing, transmitting and justifying public knowledge, as Matthews points out, it is important to recognize and to explicate the theories of knowledge encountered in the field of education (1980: 1). While not entirely relevant to this study, it should be noted in passing that studies have been made of individual teachers' epistemologies, that is, attempts to understand teachers' theories of knowledge and the implications of these for practice (Young, 1985). A theory of knowledge makes explicit the underlying assumptions and tacit understandings that inform the educational process. Such a theory of knowledge may be codified into a model, or an epistemological position, that sets forth the distinctive descriptive features of that theory of knowledge.

Wartofsky also highlights the relevance of epistemology for education when he notes that epistemological considerations are germane to education insofar as educational theory and practice are involved in the normative questions of the quest for truth, the elimination of error, and the development of critical and analytic modes of thinking, and in so far as education also deals with the concepts of knowledge, learning, understanding, and their relation to the acquisition of skills (1971: 424).

Wartofsky's claim may be challenged today on two main counts, namely:

(a) some researchers challenge the assumption if there can be any single epistemological basis for education since even the classical scientific epistemology with its rigid notion of objective truth is presently being called in question on several disciplinary fronts (cf for example, the case of contemporary physics-7.1.3). Hence O'Neill, for example, prefers to speak of educational ideologies instead of "educational philosophies" (1981).. The implied difference between the two is that, whereas educational ideology seeks to promote a particular conception of reality (social, economic, political and so on), educational philosophy connotes a more open-ended and ongoing inquiry into the values and limitations of the nature of different conceptions of reality and the impartial identification, description and analysis of different educational theories (Carr, 1985: 19).

As far as the former is concerned, Ashley contends that they constitute "systems of belief and values about the purpose of education held by particular groups of educators and publics and which result in educational action" (1989: 2). He argues that educational ideologies:

"... express and transmit beliefs about the nature of social, economic, political and religious reality by formal and non-formal processes. This is done particularly through the agency of formal schooling..." (1989: 3).

In spite of (and perhaps because of) the realization of the dominantly ideological nature of the educational process, the need to examine the underlying philosophical tenets, specifically the epistemological assumptions regarding the conceptions of knowledge, truth and reality, is maintained as a necessary requirement to keep intellectual debate in education in a healthy condition; and

(b) the attempts to naturalize epistemology, that is, to make it a branch of psychology, will deprive educational theory of its traditionally normative features. However, there are well-documented critiques of the limitations of applying the principles of the scientific method (as advocated in attempts to naturalize epistemology) to epistemological issues (cf 2.4.1)

Regardless of these challenges to the relevance of epistemology to education, a few well-defined epistemological positions are discernible in educational research and practice which offer valuable insights for library and information science.

By 1971, radical students were accusing many analytical philosophers of education of using philosophy "to attack value systems and at the same time to support present, socially dominant values, and they were asserting that this conservative function of analytical philosophy was starkly ideological" (ibid.). This led to the emergence of positions based on fresh approaches to education such as the new sociology of education and the reproduction of culture perspective (cf 3.4.3).

Finally, an approach that seeks to integrate the former positions as parts of a greater, unified whole is currently emerging, although its intellectual origins are rooted in antiquity (cf 7.1). This approach is characterized as a holistic position (cf 3.4.4). It applies research from other fields of inquiry that are relevant to education and is based upon assumptions concerning the nature of the basic structure of the universe that are consonant with recent research findings in contemporary physics and other natural sciences (cf 7.3).

It would appear, then, that the historical development of more or less well-defined positions provides a satisfactory basis for defining their order of presentation for discussion.

3.4.1 The positivist epistemological position

This stance is also referred to as a logically positivist position, and it is implicit in educational research where research is defined as the application of the scientific (method to the study of a problem either unexplored or insufficiently tested at the time when research is embarked upon (Logical

positivism, which emerged in the twentieth century, bears distinctive relationships with the positivism as developed by its chief exponent, August Comte (1798-1857), in its anti-metaphysical stance and its emphasis on sense-experience as the basis for all knowledge. Furthermore, it shares a conviction that the principles of the natural sciences may be applied to epistemological problems (cf attempts to naturalize epistemology-2.4.1; empiricism-2.5; Passmore, 1967: 52-6)). The principal issue is not so much the scientific method itself as it is the notion of "objectivity" which is widely claimed to be the fundamental and essential component of the activity of the researcher (Freeman, 1980: 3). Giroux points out that, in this position, the foundation for knowledge is drawn from the empirically-derived bases, such as in the natural sciences, and from the formal rationalist disciplines, such as logic and mathematics (1981: 43). Knowledge is thus associated with "objective facts" gathered by the educational researcher and stands in opposition to his/her subjective experience. This position assumes a clear separation and distinction between the researcher and that which is being researched so that the explanations of a subject matter reveal the actual nature of that subject matter regardless of the researcher's own thoughts or desires regarding them. Eisner characterizes this feature of the positivist position as a bifurcation of the knower and the known in which only the "externalized" environment (as the known) attains the status of reality or truth "as it really is" (1988: 18; cf 7.3 & 7.4).

It is clear that as a result of its strong support of the methodological procedures associated with the natural and physical sciences, this position upholds an epistemology in which knowledge starts from the concrete and is raised to general propositions through a process of abstraction or generalization. This epistemology is characterized as a realist epistemology, which postulates that external objects exist independently of our awareness of them, and that true knowledge is knowledge that corresponds to the world as it is (Kneller, 1971: 24).

The qualities of research that assure validity in this position are labelled as "objective" and "quantitative". Truth is guaranteed as a correspondence between an observation and the external object of observation.

This position is also characterized as underscoring a so-called "technocratic rationality", which emphasizes a value-free and ethically neutral approach to educational research. Problems are viewed as being isolated from their historical, social, political and economic contexts, and, in fact, this position is best suited to and has been predominantly useful for technical progress and control (Giroux, 1981: 46; cf also Harris' view-5.26).

The positivist epistemological position thus professes to offer to educational researchers an "apolitical" method for investigating what are seen to be essentially issues of technique. It emphasizes quantitative measurement and numeration which are intrinsic to the scientific method, and it subscribes

to an "objectivist illusion" that the social world may be viewed as a realm of facts independent of the knower, that is, it supports an essential division between the subject and object in educational research.

3.4.2 The interpretivist epistemological position

This position is often characterized as "constructive" and "interpretative" because it emphasizes the role of the subjective observer in the construction of knowledge of external objects. Central to this position is the concern with the communicative and symbolic patterns of interaction that shape individual and inter-subjective meaning. According to the view maintained by this position, knowledge transmitted in educational activities is not seen as objective and value-free (cf 3.4.1), but as a social construction tied to the interests, perceptions and experience of those who "produced and negotiated its meaning" (Giroux, 1981: 12). This epistemological position calls in question the "neutrality" of scientific research, and it is based on a more social or sociological interpretation of scientific activity, following the research of Kuhn. The role of the mind of the subjective researcher in shaping his reality, and the rejection of any uniform way of separating facts from values are emphasized in this approach (Miller, 1986: 24). The object of knowledge and the instrument of knowledge cannot be separated but must be taken together as a whole (Bridgman, 1958: 40).

Whitty claims that the interpretivist epistemology is one in which "... truth and objectivity are seen as nothing but human products and man rather than nature is seen as the ultimate

author of 'knowledge' and 'reality'" (1974: 120). This position thus rests on an idealist philosophical perspective, namely, that external objects depend for their existence on the subjective mind (Acton, 1967: 110).

In education this position serves as a point of departure for many movements that stand in opposition to the positivist epistemological position (cf 3.4.1). Some of these schools of thought are the free-school movement of the 1960's in the USA, the ethnomethodology and symbolic interactionist movements of the 1970's and the recent new sociology of education movement (Giroux, 1981: 12).

Several eminent educational philosophers of the past subscribe to variant forms of this position. The view of Pestalozzi (1746-1827) that knowledge derives from sense perception underscores the central tenet of the interpretivist position, namely, that the subjective knower cannot be divorced from the object of knowing. He submits, however, that sense perceptions should be developed into "clear and distinct ideas", a phrase that suggests the influence of Cartesian rationalism (Connell, 1985: 5140; cf 2.5).

Herbart (1776-1841), the German philosopher and educator, was strongly influenced by Pestalozzi's educational theories. He affirms the fundamental role of cognition in the learning process (cf 2.4). "Vorstellungen", or "presentations", which are closely associated with sense perceptions, are welcomed or repelled by other "presentations" already existing in the mind, whether

consciously or subconsciously. Herbart refers in this regard to dynamic consciousness and static consciousness (Bluhm, 1971: 350). Following this line of reasoning, he is led to the epistemological position that new experiences are always modified by what has been experienced previously.

These ideas influenced Bruner's (1915-) work on the nature of perception, which lent impetus to the growth of the so-called "cognitive revolution" (cf 2.4). The cognitive revolution primarily implies that the human mind plays a crucial role in the knowing process, that is, the mind is actively engaged in selecting and sorting the stimuli of the external world according to inner dictates or models of that world. Bruner's The process of education embodies his (and his colleagues') ideas on cognitive theory applied to education. He proclaims that the focus of this work is on the knower and the process of knowing and that its ideas spring from epistemology and the sciences of knowing (1960: 186).

John Dewey's (1859-1952) instrumentalist position, which is a form of pragmatism, may arguably be viewed as a variant of interpretivist epistemology. Instrumentalism holds that scientific thought is instrumental in problem-solving. For Dewey, ordinary experience is the fundamental and enduring reality which is the basis for all our learning in which knowledge is gained through problem-solving and discovery. He defines the educational process as "a continual reorganization, reconstruction and transformation of experience" (1916: 50). In this regard, psychological factors are of great importance, and

educational growth occurs as a result of the integration and combination of new experiences with existing experiences. This subjectivist element underscores the association of his ideas with the interpretivist position.

The interpretivist position has been criticized for being subjective, and its research results described as being "relativistic". Freeman and Jones contend that to establish an interpretivist epistemology that is not relative or subjective, there is a need for a fresh interpretation of the notion of objectivity itself. Objectivity, in this new interpretation, would involve self-reflection and self-criticism, and objective researchers would seek to understand and attempt to make known the way in which their ideas are influenced by their metaphysical or moral assumptions (1980: 13). Smith and Heshuis, in their turn, maintain that, instead of facing up to the relativist implications of the interpretivist position and attempting to seek a fresh perspective of the notion of objectivity as Freeman and Jones suggest, interpretative inquiry has tended rather,

"... to abandon its philosophical heritage and, as a result, it has come to look very much like a version of quantitative [positivist] inquiry within the same framework of assumptions" (1986: 25).

Smith and Heshuis conclude, despairingly, that instead of subscribing either to the fundamentally flawed "positivist" and/or seriously problematic relativist "interpretivist" epistemological positions, it is now necessary to elaborate "new forms of rationality" (1986: 25). They do not explain any further how these forms of rationality would manifest themselves,

but their insights do hold serious implications for the continued applicability or validity of only two dominant traditions of epistemology in contemporary education in the West.

The interpretivist epistemological position shifts the emphasis from the known object to the knowing subject, and emphasizes the several categories of influencing factors that impinge upon the mind of the knower. The object of knowledge is not "seen" for what it is, but "interpreted" by the knower in accordance with personal or subjective biases; and the charge of relativism has not yet been answered satisfactorily.

3.4.3 The reproductive epistemological position

As distinct from an emphasis upon the knowing individual (cf 3.4.2) or upon the known object (cf 3.4.1), this position focuses on "macro-structural relationships and how these relations in the form of structural determinations shape, as well as limit, the actions of human beings" (Giroux, 1981: 13). The central interest of this position is to discover the ways in which schools function to reproduce a class-stratified society, that is, the ways in which dominant classes are able "to reproduce existing power relations in an unjust and unequal society" (1981: 13).

A protagonist of this view, Freire (1921-), insists that schooling is not neutral. He maintains, moreover, that the proclaimed "neutrality" is a convenient ideology that masks the

political functioning of schooling. However, he avoids a mechanistic explanation of the school as a "wooden agent" in the transformation of students. He seeks, rather, to develop:

"... a dialectical understanding of the connections between school and the larger universe of socio-political meanings and beliefs that legitimate the dominant society" (Giroux, 1981: 129).

Illich (1926-) holds a stronger, quite negatory view, of the role of schools in society. He rejects the belief that education constitutes the "great equalizer" and he even calls for the very elimination of schools (as they exist today) (1971). Illich's view of schools and the educational process stems from a more fundamental critique of the associations between economic relations that affect the lives of individuals in society and the values that these relations institutionalize (Gintis, 1972: 95). These values, according to Illich, are those of progressive liberalism, and schools merely serve to legitimize them. Chief among these values is an undue emphasis on mechanistic approaches and its consequent underemphasis of subjective, non-mechanistic approaches. In an explanatory statement that holds significant implications for both the professions of education and library and information science, Illich underscores the crucial role of the subjective knower:

"The world does not contain any information. It is as it is. Information about it is created in the organism through its interaction with the world. To speak about storage of information through its interaction with the world is to fall into a semantic trap. Books or computers are part of the world. They can yield information when they are looked upon. We move the problem of learning and of cognition nicely into the blind spot of our intellectual vision if we confuse vehicles for potential information with information itself" (1975: 101)

By this, Illich means that the institutionalization of knowledge makes people dependent on having their knowledge produced for them and leads to a paralysis of the moral and political imagination. It is the application of the subjective human mind to books and other "vehicles for potential information" that needs to be recognized as a significant aspect of the knowing process (cf 3.4.2).

The perhaps excessive view of Illich is tempered in the proposal of a more sophisticated mode of reproduction, that is, that schools and students are not the passive recipients of the ideological imperatives of the logic of capital and its institutions. Giroux employs different notions of ideology, culture and hegemony to develop a critical perspective of the manner in which power, reproduction and resistance structure the complex relations among the state, the economic system and the educational structure.

The concept of culture, in this perspective, is subsumed within the category of society where it is linked more closely to notions of class, power and ideology. In this way, the idea of a dominant culture with its accompanying minority cultures replaces the idea of one culture or a multiplicity of cultures. This dominant culture, according to Gramsci (1891-1937), is reproduced through the political and economic functions of the state (1971: 57). The state, says Gramsci, relies less upon the use of physical repression than it does upon the use of belief and value systems to organize public consent for its policies and practices.

Giroux views ideology not in its orthodox Marxist conception as a set of illusions or lies, but as a set of beliefs, values and social practices that contain oppositional assumptions about varying elements of social reality, that is, society, economics, authority, human nature, politics, and so forth (cf Ashley's conception of ideology in 3.4 above). Ideologies become hegemonic when they are institutionalized by the dominant societies. Once this happens, they are stripped of their oppositional power and serve to legitimize existing institutional arrangements and social practices (1981: 148). In this way, the state apparatus in advanced industrial countries inequitably distribute not only economic goods and services, but certain forms of cultural capital as well, that is, that system of meanings, abilities, language forms, and tastes that are directly and indirectly defined by dominant groups as socially legitimate (Apple, 1979: 156). Schools then reproduce existing power relations "more subtly through the production of a dominant culture that tacitly confirms what it means to be educated" (Giroux, 1983: 267).

Freire is concerned more with the epistemological assumptions upon which these macro-structural forces are predicated than upon the forces themselves. This is evident in his notions of "banking" education and "problem-posing" education which are antithetical concepts. He explains that the "banking" view of education holds that students are receptacles into which the teacher makes "deposits". Students receive patiently and passively these deposits of information and are adapted to the world (1972: 50). On the other hand, the "problem-posing" view

of education holds that teachers are themselves students and that students and teachers "become jointly responsible for a process in which all grow" (1972: 53). Specific concepts of "knowledge" and "reality" underlie his "problem-posing" view. Reality is not static but dynamic, and hence viewed as a process by Freire. Knowledge, in his view, is not neutral, but is ideological and political, and tied to human interests and norms. He states that it:

"... emerges only through invention and re-invention, through the restless, impatient, hopeful inquiry men pursue in the world, with the world and with each other" (1972: 46; cf 4.3).

Freire's notion of knowledge recognizes the dialectical interconnections between the doer, the receiver and the objective world itself. These interconnections provide the main support for his dialogical theory of action, which is basically an epistemological stance. He contends, in this theory, that subjects meet in cooperation in order to transform the world which exists in a dialectical relationship with them. Using the famous I-Thou relationship of Martin Buber (1878-1965), he converts the "Thou" into another "I", thus eliminating the object qua object. He explains that:

"The dialogical theory of action does not involve a Subject, who dominates by virtue of conquest, and a dominated object. Instead, there are Subjects who meet to name the world in order to transform it" (1972: 135).

The reproductive epistemological position with its dialectical method takes the interpretivist epistemological position one step further. While the interpretivist position emphasizes the subjective role of the researcher or knower, it still maintains the passive status of the object of research. In

the reproductive epistemological position both subject and object, that is, both human consciousness and objective reality, are involved in a dialectical interplay to a higher synthesis, or, new knowledge that seeks to identify (unmask) and eliminate perceived power relations in society.

3.2.4 The holistic epistemological position

Another prominent position may be discerned in the literature of education. This position is found within the context of what is described as a holistic paradigm of thought (cf 7.1-7.7). In an article in the journal, Educational theory, Zigler proposes, as an additional paradigm of thought to the three mentioned above, a holistic one. He submits that this paradigm does not possess assumptions that are necessarily opposed to those of the other paradigms, but that it regards the assumptions and research findings as parts of a more inclusive whole (1978: 318). Furthermore, from an epistemological point of view, it regards all areas of knowledge as interdependent and interconnected.

According to Zigler, the central and distinctive assumption of the holistic paradigm of thought is that features of the whole are not entirely derived from the study of the parts (ibid.). In this way, the assumptions and research findings associated with other educational paradigms are considered to be parts of a larger, more unified system or whole. Zigler derives support for his view of the holistic paradigm from work undertaken by the Gestalt psychologists, and the views of the psychologist, Abraham Maslow (1908-70). He contends further that the holistic outlook

received an important measure of credence from developments in theoretical physics (cf Wholeness and fragmentation in the natural sciences and the social sciences-7.3 & 7.4). He also acknowledges that these notions are echoed in early Eastern religious philosophies (cf Wholeness and fragmentation in early Eastern thought-7.2)

In a stronger attempt to link holistic ideas in education with a major philosopher and educational theorist, Zigler argues that such ideas appear to be evident in the writings of John Dewey (cf the perception of Dewey's relevance to the interpretivist position-3.4.2). Zigler maintains that Dewey had merely extended the thought of William James who had himself attempted to integrate the empiricist's inclination to study parts (pluralism) and the rationalist's disposition for constructing intellectual wholes and unifying principles (monism) (cf 2.5; 1978: 320). In his articulation of this holistic theme, Dewey, according to Zigler, sought to overcome the dualisms or dichotomies that pervaded philosophical and educational thought, such as science and morals, theory and practice, mind and body, and so forth.

Zigler further consolidates the argument for the holistic paradigm of thought by referring to recent research on the brain. He points out that recent writers on this issue have suggested that the two hemispheres of the brain provide distinctively different functions which reflect the way we consciously experience the world, ie, a verbal, analytic function and an intuitive, aesthetic-imaginative function (Ornstein, 1973).

Zigler admits that these findings are not new and that they were already observed by James who noted that there are two modes of consciousness or knowing, viz, knowing things immediately or intuitively and knowing things conceptually or representatively (James, 1971: 13).

Nevertheless, it was Dewey "... who understood the special bearing which a Holistic perspective holds for educational theory and practice" (Zigler, 1978: 323). For example, Dewey's work, entitled The sources of a science of education, recognizes the multi- and interdisciplinary nature of education which requires that it search for and synthesize the links with other fields of knowledge in order to construct a model of education that takes into account all findings relevant to educational practice. Hence, Dewey assumes a holistic approach that appears to be eminently suited to the purposes of education.

While Zigler only infers indirectly the holistic mode of knowing from his interpretation of Dewey's theoretical writings, Hope attempts to articulate this epistemological position more explicitly in his application of holistic views to educational possibilities. The holistic mode of knowing, Hope contends, "... integrates all forms of cognition from the innate impulse of instinct, to the rational faculty of the intellect, to the apprehensive powers of intuitive perception" (1988: 193; cf 7.5). Hope maintains that while this holistic mode of knowing allows the expression of different ways of perceiving reality, it recognizes also that all are contained within a greater whole that develops to a higher synthesis of the individual parts.

Comenius (Jan Komenský - 1592-1670), a noted educational philosopher who influenced Diderot and other French encyclopaedists of the eighteenth century, did not specify any particular epistemological view. However, it may be inferred from his writings with some authority that he was also inspired by the notions of wholeness and totality with regard to knowledge. For example, he holds that truth is indivisible and should be seen as a whole, and his pansophic program in education envisaged an encyclopaedia containing all scientific knowledge, a college with facilities for the advancement and unification of knowledge, and a new method of access to knowledge in order to achieve wisdom. That this method of access to knowledge requires an awareness of underlying laws rather than an accumulation of facts is confirmed in the following quotation:

"Do not imagine that we demand an exact or thorough knowledge of all the arts and sciences from all men... It is the principles, the causes, and the uses of all the most important things in existence that we wish all men to learn..." (Comenius, 1896: 70).

This emphasis of Comenius on the whole (for example, general principles and causes) rather than the parts (accumulation of isolated facts), is one that appears to be entirely consonant with holistic approaches as outlined by Zigler and Hope above.

The holistic epistemological position, while not widely and consistently applied in educational theory and practice in the West, appears to be gathering support from a growing number of theorists and also reveals strong associations with interpretations of views expressed in the writings of major educational philosophers of the past.

3.4.5 Conclusion

This section has elicited from the writings of several writers in education at least four discernible epistemological positions that have developed historically. The dominant epistemology-related issues that have been focused upon in these positions have included:

(a) the subject-object relationship, ie, teacher and student/pupil, in which the focus of attention is shifted from the one to the other and to both with respect to their role in the knowing process (cf 2.5); and

(b) varying conceptions of knowledge, learning, reality and truth as central epistemological notions in education (cf 6.1-6.3).

The implications of these positions have far-reaching effects on educational theory and practice, and their fundamental significance for the related field of library and information science cannot be sufficiently emphasized.

3.5 Epistemological positions in communication theory (including mass communication)

Another field of inquiry, or discipline, also closely allied to library and information science, and which has well-defined epistemological stances, is that of communication theory (encompassing mass communication).

Communication is a word with multiple meanings. Some of these meanings are concerned with making oneself understood. Some use the term "communication" to indicate bilateral or two-way information flow (Boulding, 1956: 111). The idea in this case implies a meaningful message from a sender to a

receiver, a relationship between sender and receiver, an effect, a context within which communication occurs and a range of things to which meanings refer (McQuail, 1981: 3). There are also senses of the word "communication" that do not imply meanings intended by a speaker or a writer and understanding by a recipient, such as, for example, the communication of heat, of liquids or gases between connected vessels or the communication of diseases (Machlup, 1983: 49).

The term "communication", as it is used here, is limited to human symbolic communicative usage (including other modes of interpersonal exchange, for example, mathematics, music, Braille, etc) where meaning is of cardinal importance (cf its association with knowledge-transmission, below). Engineers, who also use the term, are interested in the correct transmission of signals, or (electronic) representations of messages and not in the purposes or meanings of messages. For example, mathematical communication theory such as that of Shannon and Weaver "concerns the signals alone... abstracted from all human uses" (Cherry, 1957: 168). Moreover, Machlup and Mansfield contend that the theory of signal transmission has nothing to teach that could be extended to human communication (1983: 56).

The area of mass communication is included within this conception of communication. Mass communications perform the basic tasks of the communication process, but involves different components in this process to achieve different (modified) purposes. Janowitz defines mass communication as follows:

"Mass communications comprise the institutions and techniques by which specialized groups employ technological devices (press, radio, films, etc.) to disseminate symbolic content to large, heterogeneous and widely dispersed audiences (1968: 41).

This definition highlights some of the variations and additions that should be recognized. The 'sender' in mass communication "... is always part of an organized group". The 'receiver' is always seen as "... a group or collectivity with certain general attributes" (although it is the individual who actually receives the message). The channel "... no longer consists of the social relationship, means of expression and sensory organs, but includes large scale technologically-based distribution devices and systems". The message in mass communication is "... not a unique and transitory phenomenon, but a mass produced and infinitely repeatable symbolic structure, often of great complexity" (McQuail, 1981: 4).

The important point to be observed is that library and information science shares some of the same commitments and employs some of the same mechanisms as those of communication (viz, in a person-to-person role) and mass communication (viz, using technological means or devices such as newspapers, magazines, radio, video cassettes or films to convey messages to a larger audience). More fundamentally, libraries as distributors or transmitters of knowledge stimulates "... the creation of widely shared symbolic realities..." which is considered to be a function of communication and mass communication (Budd, 1987: 133).

The usage of communication in this study is limited to the meanings or meaningful messages conveyed in/through recorded knowledge by a sender to a receiver. In this sense, communication (including mass communication) is cognate to library and information science in that libraries may also be construed as communication channels that facilitate the transmission of ideas, as found in recorded human knowledge, from senders ("authors") to receivers ("users") mediated by librarians and/or information workers (cf 3.2 for more similarities).

Epistemological positions of this conception of communication are explicated as fully as possible with the intention of offering insights for the cognate field of library and information science.

If the process of education includes, among other things, the transmission of knowledge (cf 3.4), then it is more specifically the communication process that involves the transfer of knowledge from teacher (sender) to student (receiver) within educational activities. This interrelatedness of communication and knowledge is affirmed by Cherwitz and Hikins. They submit that:

"The very act of calling something 'knowledge' is the product of discussion and debate among scientists. This is to say that any scientific community is an audience to be persuaded and dissuaded; members interact communicatively in the pursuit of knowledge, and decisions as to what constitutes knowledge result as much from processes of communication as from direct observation of 'facts'" (1986: 10).

However, what may count and what may not count as valid knowledge in the areas of communication (and mass communication) depends upon the assumptions and views espoused in particular epistemological positions.

According to Dissanyake, early models of communication reveal the influence of Aristotelian (384-322 BC) ideas on rhetoric as the art of persuasive speaking (or writing) (1983: 36). Dissanyake claims, for example, that the Shannon and Weaver model of communication and all models that preceded it operate within the framework constructed by Aristotle. He argues that:

"According to Shannon and Weaver, the communication act consisted of source, transmitter, signal, receiver and destination; this is virtually the same as Aristotle's communicator, message, and audience" (1983: 36).

This Aristotelian framework, referred to by Dissanyake, is suggested in the following translation by Hobbes of Aristotle's treatise on rhetoric:

"Of means of persuading by speaking there are three species: some consist in the character of the speaker; others in the disposing the hearer a certain way; others in the thing itself which is said, by reason of its proving, or appearing to prove the point" (1847: 12).

Dissanyake views these models as being "mechanistic" and contrasts them with what he calls "process" models whose origins he traces to the ideas of Heraclitus, Hegel, Bergson, Whitehead and the modern physicists (cf 7.1 & 7.3.1 for an explication of the views of these philosophers).

The mechanistic/objectivist and the process/inter-subjectivist models of communication represent two distinctively different camps of epistemological thought, and are discussed below in that order.

3.5.1 The mechanistic/objectivist epistemological position

The philosophical basis of this position in communication derives from the Cartesian-Newtonian Western world epistemological outlook. It is also characterized as a causalist-mechanist-energetic view in which there is a clear subject/object or mind/body dualism (Merrell, 1984: 140; cf 2.5 & 7.1.3). This position bears a strong resemblance to the positivist epistemological position in education (cf 3.4.1). According to this view of the communication process, meaning is transferred in a linear, unidirectional manner from a sender to a passive receiver. No provision is made for feedback, or the opportunity for two-way, interactive communication. Successful communication is measured by the extent of overlap between the "mind" of the sender and that of the receiver, that is, the accuracy or "faithfulness" with which the original message is transmitted by the sender and acquired by the receiver. The receiver as a subject is neutral with respect to the meaning of message, that is, its meaning. This presupposes a realist epistemology, in which reality is wholly independent of the receiver (cf 3.4.1 & 6.3.1). However, in this view, reality is "active" and impinges upon the receiver's cognitive and affective lives (Cherwitz, 1986: 23). This means that while reality (external objects) is independent of one's mind, it can yet be known.

Cherwitz and Hikins develop this notion of reality into an epistemological position for communication. Synthesizing a conception of rhetoric from its early Greek and mediaeval formulations, they claim that language is capable of describing reality (in a rhetorical manner). They endeavour to articulate the central tenets of a "perspectivist rhetorical epistemology" for communication (1986: 166). While rhetoric encompasses both written and oral media in their view, their emphasis falls only on the written component. They conceive of rhetoric as the description of reality through language, and argue that it is central to the knowing process. However, the knowing process is construed in its objectivist stance, in which there is a clear and unambiguous distinction between knower (subject) and known (object). They clarify this stance by submitting that:

"... the objectivist position contends that observations conducted during the course of cancer research are observations of data whose existence is not dependent on the observer nor on his or her attitudes, beliefs and values. That is, the objects of scientific inquiry enjoy independent status. The task for rhetoric in the scientific method... is to insure that the scientists' descriptions and measurements accurately reflect the independent objects of reality..." (1986: 12; cf Medawar-6.3).

In this view, then, reality which is independent of the subjective knower or receiver can be communicated, and hence known, in an objective sense, that is, by imposing itself in a one-way direction on the receiver. An epistemological dualism of sender and receiver is central to this position, and it supports the view of communication in which meaning has little, if anything, to do with the "detached" receiver's role, situation or circumstances.

3.5.2 The process/intersubjectivist epistemological position

The process/intersubjectivist position is open-ended and multi-dimensional as distinct from the mechanistic objectivist position. It derives strong support from developments in the so-called "new" physics (cf 7.1.3).

In this view of the communication process, the receiver is conditioned by his subjective background and the equally subjective perception of the sender, and he/she acts as co-originator of the message. It is also characterized as a sociological view because it recognizes the influence of social factors that influence the communication process (cf the exposition of the interpretivist position in education-3.4.2).

This position is evident in the work of Krippendorff who attempts to establish "an epistemological foundation for communication" (1984: 21-36). He argues against ontological assumptions of a one-way process of communication from an unvarying and disinterested object to an intelligent and interested observer (as advocated, for example, by Cherwitz and Hikins-3.5.1), and proposes in its place an epistemological model that allows a two-way communication process where properties of the observer enter his domain of observation (1984: 23). He replaces the duality of the observer and the observed with what he calls the "epistemological unity of observation". He maintains that:

"While ontological commitments assign scientific observers the role of discoverers of facts that are unalterably outside themselves, the emerging epistemology for communication assigns such observers the role of co-creators of facts" (1984: 27).

This view subscribes to a "process" conception of reality as distinct from a commitment to a fixed, unalterable reality, and affirms the self-referential and perspectival character of knowledge (cf 7.5).

A similar epistemological view underlies the attempt by Merrell to develop an epistemology of written texts. His ideas presume a communication framework, ie, the communication of ideas through the instrumentality of written texts, thus making them especially relevant and valuable for discussion here. He claims that the dualistic problem of perception, viz the separation of knower from known may be overcome by readers who put themselves "into" texts. He proposes a holistic framework for the reading process that seeks to transcend the subject/object and mind/body split in which human beings are potentially capable of reintegrating themselves with the external world and the world of texts (1984: 142). Interpretation is a central factor in Merrell's epistemological view, and knowledge is not directed toward the ideal of some static and absolute truth (such as Victor Cousin's philosophy of eclecticism - cf 6.3.2). On the contrary, Merrell maintains that knowledge is always incomplete since:

"Nothing can be absolutely unknowable through time and nothing can be absolutely known at any given moment in time" (1984: 148).

Merrell deals with the charge of relativism levelled against his position by proclaiming that any particular system or theory can only be an approximation of truth in its absolute sense, but that

the possibility exists for "discovering-inventing newer and more broadly-based portions of truth ad infinitum" (1984: 148; cf 2.4 & 3.4.2).

In this process/intersubjectivist epistemological position the dualism of sender and receiver is replaced with an integration of sender and receiver, each contributing¹ in a mutually reciprocative manner to create the meaning of a message. This notion of mutual interrelationship is identified and applied by both Krippendorff and Merrell, and it avoids an undue emphasis on either pole of a metaphoric epistemological continuum for communication which places the sender at one extreme end and the receiver at the other. By stressing the whole rather than the part, it becomes possible to explicate a bi-directional, non-linear, interactive communication process in which the receiver is not a passive receptacle of messages, but rather a dynamic re-creator of the meaning of the messages in accordance with a constellation of factors such as motives, needs, levels of interpretation, background, and so on.

3.5.3 Conclusion

The epistemological positions in communication (and mass communication) that are identified above reflect:

(a) the continuing epistemological debate on the dualism of subject versus object, or sender and receiver in the key communication activity of the transfer of knowledge (cf 2.5 & 7.1-7.5); and

(b) different conceptions in communication studies of the central epistemological notions of reality, truth and knowledge (cf 6.1-6.3)

Each position represents a historical moment in the development of epistemological thought in communication as it adapted, respectively, the early Greek and mediaeval conceptions of rhetoric (3.5.1), and the findings of experiments undertaken in modern physics and the newer ideas in the philosophy of science (3.5.2; cf also 7.1.3). These positions are of great pertinence to library and information science and offer rich insights into the epistemological dimensions of library and information science as a communicatory discipline.

3.6 Summary

This chapter has sought to explore and elucidate the epistemological positions that are encountered in a classical discipline and profession, namely, medicine, and in two cognate disciplines, namely, education and communication (encompassing mass communication). The examination of the epistemological positions in these fields of study has revealed a number of valuable insights to the search for such positions in library and information science, among which the following are worth noting: First, we observe the considerable amount of research interest in these issues as bearing fundamental implications for understanding the ways in which given theoretical assumptions, upon which methods of knowing are based, influence modes of professional practice as well as approaches to the design of research techniques. Second, there is a manifest concern with the need to explore the nature of knowledge within the context of each discipline, and with the value of the consequences thereof for the rendering of professional service. For example, in the disciplines of education and communication, a clear understanding

of what constitutes valid knowledge offers a sounder theoretical basis for the fulfillment of such professional tasks such as a consideration as to what knowledge is most reliable and important and hence worth teaching or communicating, how the search for knowledge ought to be conducted, what the most effective ways of transmitting knowledge are, and so forth. Third, it is evident that even if a single epistemological position may be dominant at any given time, there are others in the discipline that exist in a state of tension and conflict with that position. This accounts to some extent for the differences of opinion regarding the claimed "best" techniques or approaches in practice, as being reflections of fundamentally divergent theories of knowledge.

While there may be other valuable insights from an analysis of these disciplines, the most significant has been the opportunity to observe the recognition of the relation between thought and action within the context of each.

An implicit theme in the delineation of the substantive content of these positions has been a debate surrounding the emphasis of the importance of either a dualistic separation of the subject (knower) and object (known) or a holistic integration/synthesis of both as mutually reciprocative aspects in the knowing process. The former view received its fullest expression in the mechanistic approaches to explanation that predominated in the natural sciences from the second half of the seventeenth century to the end of the nineteenth century, and the latter view is represented in the form of non-mechanistic

approaches which have more recently been applied with success in the natural sciences and the social sciences and the humanities (cf 7.3 & 7.4).

A significant feature of the holistic approach has been the recognition of the validity of other approaches and the attempt to include and unify all other approaches within a greater whole that represents a qualitatively new level of synthesis that cannot be explained in terms of the constitutive parts, ie, the whole is greater than the sum of its parts (cf 7.1.1). The same claim cannot be made by any other position however, ie, no other position manifests, as a necessary theoretical feature, the inclusion of other conflicting (dissimilar) positions in an attempt to interrelate them into a larger whole.

In this approach, human knowledge is perceived as being essentially holistic in the sense that all areas of knowledge are interrelated and interdependent as distinct from its fragmented conceptions (cf 3.3.2 & 3.4.4). Furthermore, the notion of truth in the holistic outlook is not conceived in its absolute sense (cf 3.4.2, 3.4.4 & 3.5.2) and is not considered to be the most distinctive feature of human knowledge (cf Laura's epistemic holism-3.3.2).

Although this chapter presents an insight into the growing recognition of the limitations of the application of mechanistic approaches in certain disciplines and professions (that include as a primary focus an intermediary role in the transfer of

knowledge), and indicates the direction that responses to these limitations have taken, a fuller articulation of the holistic approach (as one of these responses) is provided in Chapter 7.

As pointed out above, all the positions identified and analyzed in Chapter 3 hold salutary insights for the possible development of an epistemological position for library and information science. However, none of these insights may be applied per se, for the following reasons:

(a) First, none of the disciplines is completely co-extensive with the disciplinary domain of library and information science. Moreover, library and information science is too inter-, and multidisciplinary to consider as final, notions of validity or objectivity as they are treated in the disciplines discussed here (cf Kesting-5.28.10);

(b) Second, while education and library and information science overlap to a large extent, there are significant divergences (cf 3.4). A more thorough-going emphasis in commitment to the individual and personalized service is central to library and information science. Education concentrates on formal curriculum-assisted learning by groups of individuals. The degree of conscious and deliberate manipulation of what knowledge is considered to be of greater or lesser importance, is less covert than in the case of library and information science. Educational

curricula, both through inclusionary and exclusionary practices selectively present a specific world view to the student; and

(c) Third, a position acceptable to librarians and information scientists will have to come from within the profession itself, ie, from those who possess both a knowledge of bibliographic issues and practices and who manifest an inclination to reflect upon their bearing upon the question of how we come to know through recorded knowledge, and how it may be possible to assess the validity of knowledge acquired in this manner. Several theorists and practitioners in the field of library and information science have, at some or other time, made implicit or explicit references to these issues. These contributions have to be recognized, and evaluated for their potential value in a proposal of a position suited to library and information science. These contributions are presented and evaluated in Chapters 5 & 6.

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4 Definitions of information, knowledge, and library and information science

4.1 Knowledge transfer as a theoretical focus for library and information science

In contrast to the well-established recognition by the professional disciplines of education (cf 3.4) and communication (cf 3.5) of their intermediary roles in the transfer of knowledge, and hence of the relevance of epistemology to their practice, there are conflicting views in library and information science about a professional concern with the transfer of knowledge. The latter debate often assumes the "container" versus "content" form so that there is uncertainty as to whether librarians and information officers should focus on the physical carriers of knowledge, or the content thereof, or both, and to what extent. There is also uncertainty as to what similarities and differences, if any, there are between the terms "knowledge" and "information", as well as their meanings in the context of library and information science.

Regarding the issue relating to the concern of library and information science with either the physical record or knowledge itself, there are three views that are discernible in the literature:

(a) There is the view that the concern of librarians with the content of documents is mostly for the purposes of classification and indexing (Cilliers, 1985: 154). There is, for example, the widely-expressed perception that the

study of the organization of recorded knowledge ought to be preceded by the analysis of knowledge itself as a valuable investigation by students of library and information science (cf for example Langridge, 1969: 3; McGarry, 1969: 127; Caldwell, 1970: 139). Caldwell suggests that such a study could include, for example, the theory of knowledge, perception, concept formation, the personal acquisition of knowledge and the growth of knowledge. However, he envisages this study of knowledge itself as a necessary prerequisite for the study of the organization of recorded knowledge as equal parts of a whole, conceived as a developmental unity (ibid.).

There is the need to distinguish between, on the one hand, the conception of knowledge as that resource which manifests itself in physical records (as recorded knowledge) and which librarians and information officers organize for use, and on the other hand the conception of knowledge that manifests itself in distinctive modes of knowing and that guides the approach of the librarian and information officer to all his/her professional tasks (encompassing, inter alia, classification and indexing). McGarry characterizes this latter conception as the "... special kind of knowing ..." that distinguishes us from other related professions" (emphasis added; 1985: 97). This perception that there is a need for the clear understanding of basic concepts such as knowledge (and information) in the context of library and information science as a means to establish professional identity is shared by Pauline Wilson. She argues, moreover,

that the failure on the part of library and information science to distinguish itself from other information-related occupations by defining its instructional domain or explaining the content of education for information professionals has led to the closing of four library schools in the USA by 1988 (1988: 82). Hence, these definitional issues have more than mere academic value.

In addition to the view that librarians are only concerned with human knowledge for the purposes of classification and indexing, an even stronger view holds that it is fallacious to think that libraries are responsible for the transmission or transfer of knowledge at all. The reason for this claim is the view that the actual transfer of knowledge, which involves a process of "cognition", takes place after the user has been handed a generic document (Meijer, 1982: 24). Meijer maintains that:

"The transfer of knowledge, an extralibrary matter, is therefore not characteristic of librarianship and is wrongly included with library activities" (1982: 24).

In a later publication, however, Meijer et al do acknowledge that the library and information profession works with documents as well as their content (1988: 18-27, 95; cf 5.21). This content (which Meijer et al submit is not adequately described by the terms "knowledge" and "information"-cf 4.2 & 4.3) should be made accessible in order to make cultural progress possible. The notion of cultural progress appears to assume the transfer of

knowledge, or at least the interaction between knowledge and individuals, and knowledge and society, and suggests a partial acceptance of the view that libraries are, after all, intermediaries in the transfer of knowledge.

(b) In contrast to these uncertain views, the perception that it is the very purpose of the library to be engaged in the knowledge transfer function is best summed up in Shera's claim that the library aims "... to bring the human mind and the graphic record together in a fruitful relation" (1983: 387; cf Giuliano, 1969: 344). Shera speaks of the mastery of the substantive content of graphic records as the primary emphasis of librarians, and of librarianship being rooted in epistemology (1965: 176-7; 1970: 88). The categorical claim that library science should be seen as an integral part of the theory of knowledge is made by Stäber and Schmidt (1983: 348-52; cf 5.28.1 for a brief exposition of their views).

In this view, there is clearly the perceived need to move beyond the focus only upon the study of the physical records of knowledge towards the investigation of the processes surrounding the transfer of knowledge itself. In the context of a discussion of the foundations of academic librarianship, Buckland claims that academic library services have to do with:

"... support for learning, both the study of what others have discovered and research to discover what is apparently not yet known... Yet the librarian's role is often very indirect. Rather than knowledge itself, the librarian's concern is usually with representations of knowledge: texts

and images... [and]... text-bearing objects: books, journals, photographs and databases - millions of them. Somehow we need to maintain our underlying concern with the generation and acquisition of knowledge" (emphasis added; 1989: 394).

Buckland continues by explaining that the new information technology is enabling the direct location, access, transfer, analysis, manipulation, comparison and revision of texts (ie, direct access to knowledge itself). He envisages that, in this way, librarianship may become directly engaged in the search for beauty, truth, justice and knowledge rather than with texts and images that represent them or physical objects that are text-bearing (1989: 391).

(c) A third view seeks a dialectical interaction between:

- (i) the intellectual structure of knowledge, and
 - (ii) the librarian's technology of access to knowledge
- (Wright, 1986: 768; cf 5.19).

This view requires that the librarian concentrate his intellectual efforts both on the physical "container" and knowledge itself, with a view to providing optimal access to the holdings and to stimulating optimal use. Hannabus, in this regard, proposes that the cognitive dynamics surrounding what he describes as "the knowledge encounter" (referring traditionally to the reference interview) which encompasses as essential components, the user seeking knowledge and the librarian as an intermediary in this process, is worthy of careful investigation since it also sheds light on the issue of knowledge representation (1988: 14). These dynamics include world views, cognitive styles

and ways in which users, and librarians as intermediaries, categorize and classify knowledge as significant factors that influence the ways in which they "... come to know" (ibid.). These and other aspects surrounding the process of knowledge transfer are considered by Hannabus as being important to the librarian as an intermediary in order to enhance an understanding of the process of seeking and handling information (cf 4.2 & 4.3 below for a more careful analytical distinction between the terms "knowledge" and "information"). He argues that "If we are to understand the way in which information gets converted into knowledge, such [knowledge] encounters... are unique in their informative value to the professional information handler" (ibid.; cf 4.3.5.1.4).

While the first view, viz (a) above, essentially holds that libraries do not produce thoughts themselves, it is difficult to imagine how thoughts emerge and develop without recourse to organized knowledge in libraries. To preclude the transfer of knowledge as a study for the librarian and information officer means that less emphasis is placed on user studies, knowledge utilization, the process of reading as a means of understanding the physical world, and the value of literacy programmes. Libraries corporatively develop their collections because they assume that individuals using them do "learn" or "acquire knowledge".

Meijer's definition of librarianship orients this profession to the ideal of cultural progress, and it is difficult to interpret this notion in any context other than in one of the growth of knowledge, or of what Danton calls "epistemological progress" (1934: 551). This underscores the need by librarians and information workers, on the one hand, to come to grips with the several ways by which their users come to "know" through the use of recorded human knowledge, and to understand how their own methods of knowing influence their intermediary roles on the other. An understanding of these processes will provide the librarian with a keener insight into, and critical awareness of the epistemological dynamics surrounding, his professional role.

The close association of library and information science with education suggests an overlap of professional concerns (cf education as a cognate discipline-3.4). The difference between the two is in degree rather than in principle, and hence a concern with how knowledge is transmitted through texts or documents is also an important study for librarians. The issue involves epistemological considerations, and this study attempts to expound a framework within which an understanding of the ways in which users of recorded knowledge may arrive at valid knowledge claims, and primarily, to establish an epistemological position for librarians that will highlight the methods of knowing and philosophical assumptions that guide their approaches to the performance of professional tasks, and that influence their research strategies and techniques.

While the views noted above [(a) to (c)] express differences of opinion regarding the degree to which knowledge transfer ought to be investigated as a critical issue in the education of librarians, there is little doubt that the terms "knowledge" and "information" are widely used in the literature of library and information science (cf 4.2, & 4.3.1 for a discussion of the value of a definition of knowledge for library and information science). It may be inferred hence that these terms are of central significance in both academic and professional contexts and that the attempt to achieve clarity and consistency regarding their meanings, and precision in their application, is a worthy undertaking in the search for an appropriate epistemological position for library and information science.

On the other hand, the absence (or unawareness) of a consciously-held and consensus-supported epistemological position may be the very reason for the failure to arrive at suitable definitions of the notions of knowledge and information, as well as of library and information science (cf 4.2-4.4).

While it is beyond the scope and intended purpose of this study to explore the relationships between semantics and linguistic philosophy (specifically those between semantics and epistemology), there is considerable evidence that the creation of the meanings of words, and hence their definitions, are influenced by given philosophical stances. For example, in his work Logic, truth and language, Ayer proclaims that philosophers are concerned more directly with the definitions of words corresponding with the physical properties of things (1946: 57).

Of greater relevance here is the observation that, as a representative of the positivist view of language, Ayer contends that the meaning of a proposition is identical with its method of verification (referred to as the "principle of verifiability") (cf also the positivist epistemological position in education-3.4.1; Kretzmann, 1967: 404). The underlying empiricist epistemological position of positivism requires that validity of meaning, ie the truth or falsity, of concepts is established by the extent to which they are empirically observable, ie, tested against sense experience. For this reason, metaphysical concepts such as, for example "mass", "God" etc, are considered as being meaningless or "fictions" (Mouton, 1987: 14; Blanshard, 1962: 323).

This example highlights the ongoing concern of linguistic philosophers with the provision of definitions that they consider to be valid or true (in accordance with their epistemological positions), as distinct from conventional dictionary definitions. Furthermore, the specific view of reality maintained by a given philosopher supplies an epistemological dimension to the attempt to derive the meanings and definitions of concepts. The implication of this observation is that, without a clearly-held epistemological position, confusion and divergence of opinion appears to prevail in respect of the meanings or definitions of key concepts.

This concern is expressed in the context of library and information science by Kesting: "In the absence of a coherently conceived epistemological foundation for our profession, we tend

to display the typical symptoms of Babel" (1990: vi; cf also his quotation regarding the lack of consensus of a definition for "information" at the end of 4.2). The absence of an epistemological position is clearly the result of the lack of fundamental thinking and the paucity of writings on theoretical issues in this profession, as well as the positive disregard for its significance (cf also the Preamble to Chapter 5). Cronin, for example, states: "While others may seek to define and refine, we move beyond epistemology (what is information?)... to value analysis (how can information be exploited?)" (1988: 1). This assertion clearly links epistemology with the process of definition, in this instance the definition of information.

This association is expanded in McGarry's observation that the several definitions of information reflect gradations and varieties of epistemological standpoints (1983: 99; cf 5.23). This claim that epistemological views are fundamental in an attempt to define information is supported strongly in Bengé's claim that "... our descriptions of the meaning of information rest on our concept of reality", ie our epistemological commitments (1984: 188; cf 6.3). Hence there is a manifest acknowledgement of the relationship between epistemological views and definitional aspects.

In the remainder of this chapter the divergence of opinion regarding the definition of the concepts perceived to be relevant to a discussion of epistemological aspects of library and

information science reflects these theoretical lacunae and the concomitant importance of establishing a clearly-defined epistemological position.

The need to define "knowledge" and "information" in the context of library and information science cannot be divorced from the need to determine the identity of this professional discipline itself (cf Pauline Wilson's claim in 4.1 (a), above). It is especially the concern of several other academic disciplines with the notion of information that confirms the need for library and information science to distinguish itself in its approach to information as distinct in its essence from these disciplines (cf 4.2.1.4.1). For this reason, it is also necessary to provide an overview of the several definitions of library and information science and to examine the several categories of perceptions of the relationships between library science and information science (cf 4.4).

4.2 Information

There are so many different meanings of the word "information" that it has been referred to, inter alia, as a "God-word" and as "an all-purpose weasel-word" in extremity (Roszak, 1986: ix; Machlup, 1983: 653). The task of attaining a single definition that would be acceptable in all contexts is complicated by several difficulties. However, as "information" has been identified over a wide front as a potential central dynamic for the discipline of library and information science (cf Meijer et al, 1988: 64-84), there is a concomitant imperative to delimit this term to this disciplinary context. There have been

a few major attempts in Western countries over the last two decades to describe the delimitation of information within the context of library and information science (cf for example Wellisch, 1972; Machlup & Mansfield, 1983; Meijer et al, 1988; Yuexiao, 1988).

4.2.1 Difficulties of defining information

The difficulties of definition that have been identified are randomly listed and briefly discussed below.

4.2.1.1 The historical designation "Information Age"

The characterization of the current historical period as the "Information Age", and the modern awareness of the value of information for several occupations, industries and professions exacerbates the difficulty of definition. In his survey of the history of information, Stevens makes the salient point that, amidst the current emphasis on information as a dominant contemporary phenomenon, it has consistently been a significant element in the overall development of human society throughout the ages, having shaped the way in which we think and act cumulatively (1986: 2). He states in this regard that:

"What is now proclaimed as an Information Age is, in some sense, a term that can be applied to all stages of human development. The old concept, for example, of an Iron Age can be seen to have had its roots in the discovery and transmission of information about how iron ore could be transformed into useful objects" (1986: 2).

In general then, Stevens' contention that all ages may be described as "Information Ages" seems justified to some extent. However, the application of this specific appellation to describe the essential quality of the present historical period stems from

the need to typify the significance of a period characterized by a dramatic interrelationship between civilization's information requirements and the emergence of tools and systems (ie, information technology) to meet those requirements. The further refinement of information technology contributed to the emergence of information industries that established themselves and grew to the point where they are now dominant economic segments of society (Stevens, 1986: 38).

Hence, although the concept of information may have a long history, its perceived current social and economic significance has contributed to a concerted effort being made to define it systematically.

4.2.1.2 The prevalence of vague definitions

Many of the definitions in the literatures of library and information science as well as in those of other disciplines tend to be imprecise, ambiguous and contradictory - a difficulty which has been well-documented (cf for example Wellisch, 1972; Machlup & Mansfield, 1983; Meijer et al 1988: 69; Yuexiao, 1988). The terminological and conceptual problem has led Belkin, for example, to propose out of desperation that we ought to concern ourselves, not with definitions, but rather with concepts, of information (1978: 58). Against this, Meijer has argued that conceptualization and definition are inseparably linked in so far as there can be no concept to interpret without definition as a process of delimitation (1978: 147-8).

The prevalence of confusion in the many attempts at definitions of information has led to doubt as to whether consensual agreement is possible or likely to be reached at all (Kesting, 1977: 164; cf 4.2.3).

4.2.1.3 Standard dictionary definitions

Standard language dictionaries cannot supply an adequate definition because they tend to confine themselves to broad, general, generic descriptions. For example, the Webster's Third International Dictionary defines information as:

"the communication or reception of knowledge or intelligence; something obtained or received through informing; the process by which the form of an object of knowledge is impressed upon the apprehending mind so as to bring about the status of knowing" (1976: 1160).

In its turn, the Shorter Oxford English dictionary states that information is:

"The action of informing; training, instruction; communication of instructive knowledge... The action of telling or fact of being told of something... That of which one is apprised or told; intelligence, news..." (1972: 1003).

Stevens observes in response to the above that while non-specialists still seem to use this kind of broad definition of the term, it is obvious that such general definitions of information cannot be applied profitably to an understanding of the more specialized ways in which the word is now used in several disparate or cognate disciplines (1986: 6).

4.2.1.4 Terminological difficulties

These difficulties derive chiefly from two sources: viz, the prominence of information as a theoretical phenomenon of interest in several disciplines, and the relationship of information with cognate terms.

4.2.1.4.1 Conceptions of information in different disciplines

There are several disciplines that have an interest in information, and that define it from their own points of view. This results, not only in the emergence of a wide variety of definitions of information, but also in the perceived conceptual interrelationships of information with many other terms from these disciplines. These terms themselves often require definition before the meaning of information can be clarified in its many contexts.

In compiling their definitive survey, The study of information; interdisciplinary messages, Machlup and Mansfield invited representatives from all academic disciplines claiming to have disciplinary interests in the study of information to submit essays describing how information relates to their respective areas of study. Machlup and Mansfield's study contains 46 essays, 20 of which incorporate the designation of an academic discipline or sub-discipline in the title of the essay concerned. In the final chapter, Machlup refers to the "compendium of meanings" that emerge from these essays, noting that the very diversity of disciplines involved impose restrictions on the definition of information "for purposes of their theoretical tasks" (1983: 660). These disciplinary-related restrictions on

the definition of information suggest the need to guard against the unduly uncritical "borrowing" of definitions across disciplinary boundaries. For example, definitions of information in biology will unavoidably differ from definitions of information in library and information science because the two fields do not share a common or even remotely cognate disciplinary focus.

4.2.1.4.2 Relationship of information with cognate terms

Many definitions of information refer to cognate terms such as data, percepts, knowledge and sometimes truth, understanding and wisdom (cf for example Ehlers, 1971: 178-85; Shera, 1972; Kochen, 1975; Bekker, 1977; Wilson, 1977, 1983; Pansegrouw, 1984 etc). These cognate terms are themselves not easy to define, and their relationship with information has even been called in question by some researchers (Meijer et al, 1988: 83).

The major difficulties of defining the term information underscore the absence of a single source for an adequate definition and suggest the probable futility of seeking to achieve a single, common definition of appropriate applications for the wide range of specialized disciplines involved. A more useful approach seems to lie in the direction of an attempt to delimit the parameters within which a suitable working definition may be sought for library and information science.

4.2.2 Classification of definitions of information

4.2.2.1 Hierarchical structure of levels

One attempt to delimit the notion of information in its most general sense is typified by Yuexiao's classification of the definitions of information. The writer was motivated by the discovery that the more than 400 diverse definitions of information encountered in his survey of the literature led to unavoidable misunderstandings in scientific and cultural communications. These definitions need to be classified according to ranges with appropriate descriptive headings. Yuexiao distinguishes, in a hierarchical structure headed by the philosophical range (the broadest), at least 14 other subordinate categories or ranges of definitions of information (1988: 481). The purpose of the classification is to clarify misunderstandings by demonstrating the notion of multiple levels, ranges and categories of information definitions rather than singular ones with singular subsets (1988: 483).

Yuexiao believes that it would be more profitable for each profession or discipline to attempt reaching agreement on the range of definitions or single definition most suited to its requirements rather than to expect that all professions and disciplines will attain consensus regarding a uniform definition of information. Accordingly, therefore, library and information science, which traces its roots, as librarianship, to the origins of writing as a means of recording ideas and experience in interpersonally shareable symbols on relatively permanent media, and to the social and economic pressures that led to the

preparation, preservation and retrieval of permanent written records, should restrict itself to that range of information which is of relevance to the collection, organization and use of recorded knowledge (1988: 485). In other words, library and information science is not the only or even the primary science involved in the study of information; hence its domain ought to be demarcated clearly (cf 4.4).

In an investigation to "establish a scientific basis for curriculum development in library and information science and to determine the required learning content at the macrolevel", Meijer et al have identified and examined information as one of three proposed central dynamics of the discipline (1988: viii). The section of this investigation devoted to information as a probable central dynamic highlights the need to delimit its use to the context of library and information science. Meijer et al provide the following framework to facilitate critical analysis and delimitation of the concept of information:

4.2.2.2 Information as content and/or process

The range of definitions of information appropriate to library and information science may be further narrowed and analyzed in accordance with their primary emphases. Meijer et al identify and analyze nine definitions of information as content (cf 4.2.2.2.1) and seven definitions of information as process (cf 4.2.2.2.2). A free rendering into English is followed by the original Afrikaans text. This has been necessary because of the difficulty of achieving a meaningful literal translation. Each

The essence of each of these perceptions of information is analyzed in considerable detail and discussed critically by Meijer et al (1988: 71). It is difficult to accept without further ado Meijer et al's view that "information as commodity" [a(i)] and "information as knowledge contained in documents" [a(vi)] can be included under the wider rubric of information as "content in documents" [a] (ie, documents as a generic medium of whatever kind). While the former suggests an external "carrier of information", the latter conveys the subjective meaning attached to graphic symbols, or "marks-on-paper". The tendency on the part of Meijer et al to conflate the external (physical) and the subjective (metaphysical) conceptions of information within the same subcategory, appears to complicate the effort to provide an unambiguous definition of the phenomenon of information.

Furthermore, the reference to information as "the structure of texts" [a(iii)] is not explained further in Meijer et al and is consequently obscure in isolation. The meaning becomes clearer if one consults the original source, viz Belkin and Robertson, the cited originators of this view, who claim however that it is impossible to isolate information as "the structure of texts" from its specific role, ie, the capability of any text - as structured by a sender - to change the "image-structure" of a recipient. This use of the term "structure" refers to its semiotic connotation, ie, it refers to concept formation and inter-human communication (Belkin & Robertson, 1976: 200). The authors state specifically that:

"... we cannot study the phenomenon of the text and its associated information, except in association with the phenomena that relate the text to the sender and recipient" (1976: 201).

This statement would seem accordingly to suggest a "process" rather than a "content" approach to defining information.

Nevertheless, the overriding characteristic of this subcategory of definitions appears to be an attempt to restrict the meaning of information to that of a "physical record" or "generic document", ie, information is conceived as a physically independent and externalized entity.

(b) In contrast to the narrower conceptions of information as content, above, this subcategory interprets information as content more widely as:

(i) 'content either recorded in/on documents, or existing only in people's minds' [*"inhoude wat [of] in/op dokumente vasgeleë is... [of] net in mensekoppe bestaan"*];

(ii) 'Information/s, ie, data, facts, things and events irrespective of their being recorded or not in or on documents; and' [*"'Information(en)' [Inligtinge], dit wil sê data, feite, dinge en gebeurtenisse wat in/op dokumente vasgeleë is, al dan nie; en"*]

(iii) 'every source from which a human being may be informed, viz, divine revelation, nature (ie, the entirety of created reality), and culture (inter alia what man obtains, manufactures or accomplishes via natural phenomena)... and the content of human memory' [*"alle brongebiede waaruit 'n mens ingelig kan word, te wete God se openbaring, die natuur (die hele geskape*

werklikheid), [en] die kultuur (onder meer wat die mens met die materiaal wat hy uit die natuur verkry, vervaardig en tot stand gebring het)... en die inhoud van die menslike geheue"] (1988: 72).

In this subcategory of definitions of information as content, the content that characterizes information is extended to include all possible sources, ie, it reaches beyond a narrower association with the generic document. In this way, the content of one's mind, cultural symbols and physical artifacts, etc, are all included in the meaning of information. More accurately, some of these sources have a latent "potential for meaning". Such a meaning becomes apparent through recognition by a "knowing" individual. For this reason, some cultural "products" may be more meaningful to some than to others.

The value of unrecorded information (information "in one's mind") is enhanced when it is recorded in some permanent form in that it may be made more widely available, and it transcends the "time-bound" barrier, ie, it does not disappear at the time of death of its creator/possessor. On the other hand, as long as information does not exist in a "recorded" state, its value is diminished by restricted and transient exposure, and indeed the possibility of its total disappearance (cf also conceptions of recorded and unrecorded knowledge-5.28.11 & 6.2.4).

4.2.2.2.2 Information as process

In addition to the nine interpretations of information as content, as noted above, Meijer et al identify at least seven interpretations of information as process as encountered in the literature examined. The interpretations that view information as process are all derived from classical communication theory as applied to library and information science. These interpretations may be divided into two subcategories:

(a) In the first category (comprising three characterizations), Meijer et al state that:

'Three of the seven characterizations deal with processes that are directed at the receiver. The processes concerned are the direct informing of the receiver by the sender, the indirect informing by means of a channel, and the execution of special 'information transfer functions in the channel for the purposes of the receiver' [*"Drie van die sewe karakteriserings handel oor prosesse wat op die ontvanger gerig is. Die prosesse is die direkte inlig van die ontvanger deur die sender, die indirekte inlig deur middel van 'n kanaal en die uitvoering van spesiale 'inligtingoordragfunksies' in die kanaal ten behoeve van die ontvanger"*] (1988: 72).

In this threefold understanding of information as process the idea of "action" or "activity" is of central significance. The three definitions concentrate on processes directed at the receiver. Some of these views attempt to link the components of the communication process, viz, the sender, the channel and the receiver into a chain that supports an interaction, or transfer-"action".

(b) The remaining four interpretations of information as a process have a bearing upon what occurs within the mind of a receiver (1988: 73). The focus, in this case, is on mental or

cerebral processes that convert external stimuli into personal meaning for the benefit of an individual receiver. In this way, an individual is able to "make sense of the world" by organizing the information assimilated, using internal mechanisms. The following quotation from Minder & Whitten in Meijer et al, which represents a summation of the views of several writers, explains more fully that information, in this sense, refers to:

"the ways in which the human mind accepts external stimuli from the percept world and uses its internal functions of logic, memory and emotion to make meaning of them and to stimulate the mind to understanding and insights" (Minder & Whitten, 1975: 263 cited in Meijer et al, 1988: 73).

This view corresponds closely with Licklider's perception of information as the processing of "organized data into knowledge" (1975: 167).

The idea conveyed in this subcategory is that information is some active principle governing the human capacity to process fragments which are meaningless in isolation into a coherent and meaningful whole for the receiver.

It is important to note that Meijer et al claim that the nine interpretations of information as content and the seven interpretations of information as process do not exhaust the totality of the interpretations of information that apply to library and information science, inferring, however, that they have highlighted the most significant ones at that. The reason for this is that there are a number of authors who view information as both content and process simultaneously.

4.2.2.2.3 Information as content and process

Instead of an either/or approach to the definition of information according to Meijer et al there is also a category of interpretation that construes information as both noun and verb, and hence as both commodity and process. It may well have been more accurate to characterize this category as a "multiple view of information", since many of the authors associated with this category characterize information in three and four different ways.

Debons, for example, characterizes information not only as process and commodity, but also adds a third dimension to this multiple view:

"I would like to think of information as an environment representing the assembly of peoples, equipment, and procedure - in the latter sense as a system obeying system laws. Consequently, I visualize a science of information as an attempt to bridge these three dimensions by laws which are metascientific in character" (1974: 14).

In its turn, Furth's conception of information as a "process of knowing" and as a "coded fact" should be seen in the context of Piaget's theory of knowledge (1974: 21-27). This conception cannot be simplistically reduced to a process plus content view of information. It should be mentioned that the Meijer et al survey does not give it this qualified description. The reference to Otten also requires further elaboration. Although Otten suggests that information may be seen as a commodity in a static sense and as a process in a dynamic sense, he continues to sketch a rather complex picture of the multi-level features of

information, the interdependence of information with matter and energy and the significance of the communication process to the existence of information (1974: 105).

Meijer et al (1988: 73) do contend, however, that these combined views of information are not as concise as those expressed in chapter subdivisions 4.2.2.2.1 and 4.2.2.2.2. Their attempt to establish a scientific basis for curriculum development in library and information science subsumes a content plus process view of information.

On pp. 74-5 they summarize all the views considered in their study. Information as content is understood as:

(a) 'Potential information in senders' brains; this may be subdivided into' [*"Potensiele inligting in die brein van senders; dit kan onderskei word in*]:

(i) 'non-processed data and/or' [*nie-verwerkte gegewens en/of*]

(ii) 'processed data and/or' [*verwerkte gegewens en/of*]

(iii) 'constituted pre- and/or post-expressive knowledge in the human brain' [*gevormde pre- en/of post-ekspressiewe kennis in die menslike brein;*"]

(b) 'the content of documents (ie records, information sources) without narrower specification' [*"die inhoud van dokumente (rekord, inligtingbronne) sonder nadere presisering;*"]

(c) 'the content of processed data contained in and on documents, and' [*"die inhoud van verwerkte gegewens wat in/op dokumente vasgelê is, en"*]

(d) 'the content of non-processed data which is contained in or on documents. To this should be added in a consistent manner': [*"die inhoud van nie-verwerkte gegewens (data) wat in/op dokumente vasgelê is. Hieraan moet konsekwent toegevoeg word"*]:]

(e) 'the potential information from the source areas which are not contained in or on documents' [*"die potensiele inligting uit die brongebiede, wat nie in/op dokumente vasgelê is nie"*] (1988: 75).

Information as process is understood variously as:

(a) 'The direct informing of receivers from information-source areas' [*"Die direkte inlig van ontvangers uit inligtingbrongebiede;"*]

(b) 'the direct informing of receivers by senders' [*"die direkte inlig van ontvangers deur senders;"*]

(c) 'all services, equipment and activities in libraries and information centres' [*"alle dienste, toerusting en aktiwiteite in biblioteke en inligtingsentrums;"*]

(d) 'limiting these services, equipment and activities to the transfer of potential information of the channel to the receiver - including consultation services which facilitate communication between senders and receivers, and' [*"die beperking van hierdie dienste, toerusting en aktiwiteite tot*

die oordrag van potensieële inligting van die kanaal na die ontvanger - met insluiting van konsultasiedienste wat senders en ontvangers met mekaar in aanraking bring, en"]

(e) 'one or more of the information activities operating in the receiver' [*"een of meer van die inligtingaktiwiteite in die ontvanger"*] (1988: 75).

Meijer et al conclude that the above delineation (viz (a) to (e)) reaffirms the finding that the prevalent application of the term 'information' in library and information science remains obscurely and hence inadequately demarcated (1988: 75).

4.2.2.2.4 General evaluation of the Meijer et al review of definitions of information

The task of classifying definitions of information, as they are presented in the literature by various authors, under chosen descriptive headings, is not unrelated to the purpose of such a classification. Meijer et al's review should be seen in the context of the aim of their specific project, ie, to investigate the establishment of a scientific basis for curriculum development in library and information science. Hence their classification of the definitions of information of necessity imposes certain restrictions on the definitions that they consider.

Belkin's attempt to develop a suitable definition of information for information science demonstrates similar unavoidable difficulties. Having specified a number of requirements with which a suitable definition should comply, it

is not surprising that his own definition emerged as the most appropriate of all (1978: 55-85). Of equal importance is the fact that several authors, whose definitions of information were analysed by Belkin, responded critically to the latter's interpretation of their views (1978: 242-6 & 350; 1979: 92-3). Thus, Belkin's analysis rests on assumptions which are queried by the ostensible creators of those very assumptions and claims.

While criticism may then be levelled at Meijer et al for the ways in which they have grouped together seemingly disparate views of information, their review emerges undoubtedly as a synthetic and helpful (if not at times a somewhat rigid) analysis of a complex conceptual and semantic issue of primary importance to the discussion of an epistemological position for library and information science.

4.2.3 Conclusion

The failure to delimit the term information for library and information science has led to the relative impossibility of accepting any single definition as completely adequate. Meijer et al conclude accordingly that information has not yet been delimited definitively as a potentially appropriate central dynamic for curriculum planning and design in library and information science (1988: 83).

From the point of view of this study, which, of course, is not focused on the needs of curriculum development, but concerns itself rather with an investigation into developing an epistemological position for the professional discipline of

library and information science, information is viewed within a broader epistemological framework, ie, the term information is delimited further in terms of the scope of this study by relating it more systematically to the term "knowledge" (cf 4.3).

We have noted the need to recognize the divergence of opinion as to what constitutes information in the field of library and information science. For example, in a manner akin to the content-plus-process conception of Meijer et al, (cf 4.2.2.2.3), Wright proposes a dualistic, physico-metaphysical scheme for thinking about information (1986; cf 5.19). The physical conception of information corresponds to the interpretation of information in its objective existence both in a non-physical sense (ie, in one's mind) and a physical form (ie, on record) (cf 4.2.2.1). The metaphysical view of information as idea implies "a humanistic study of information conceived as symbolic realities in the cultural environment" (1986: 739). Wright's schema is not delimited in terms of libraries and information centres, but it confirms the point nonetheless that there is very little basis for comparing definitions found in the literature without delimitation (cf Wright-5.19).

The difficulties of finding a satisfactory definition for the term information has led Barnes to compare the situation to that in physics, in which photons are neither exclusively waves nor exclusively particles, but are entities with aspects of each (1975: 111; cf conceptions of reality in modern physics-7.3.1)

In the broadest sense of the conflict, Kesting concludes that:

"...information may remain irreducible to a clearly unified concept and a neat definition, at least as long as inner epistemological discord continues to fragment the total body of knowledge into islands essentially foreign to one another, each imprisoned in its own mode of thinking, its own vernacular " (1977: 164).

In the light of the foregoing review of the difficulties of defining information in the context of library and information science, the view of information as content plus process, as set forth by Meijer et al, appears to merit serious consideration.

For the purposes of this study, however, the notion of information will be associated more closely with that of knowledge (cf 4.3).

4.3 Knowledge

The library's relationship with knowledge has not been as strongly emphasized in recent professional literature as has been its relationship with information. The issue as to whether library and information science focuses on the management of knowledge or the management of information as a central dynamic is still unresolved (cf for example Shera, 1972: 128; Meijer, et al, 1988). Moreover, it is not entirely clear whether there ought to be an emphasis on the one to the exclusion of the other. Wilson, showing partiality, makes the claim that the library, especially the academic library, serves its purpose better by facilitating the acquisition and production of knowledge. She states that knowledge, not information, is "the best game on campus" (1988: 86). Boorstin, expressing similar views, contends

that libraries, along with colleges and universities, are knowledge- rather than information-based institutions (1979: 1-2; cf 4.3.5.1.3).

This dilemma is complicated by the difficulty of defining both terms in such a way that they are clearly delimited in their meanings for library and information science (cf 4.1). Many of the difficulties of defining information may be repeated here to show that to define knowledge is equally difficult.

4.3.1 The value of a definition of knowledge in the context of library and information science

The librarian is concerned with human beings and their desire to know. What they come to know, as a result of having assimilated the content of records held in libraries, is something that may be called knowledge. But many questions may be raised in this regard, eg, "is knowledge of this sort to be equated to the philosophical idea of knowledge or not?"; "is such knowledge necessarily true or valid?"; "does the nature of this knowledge differ from that of information?", etc. The last question noted here is itself rendered as problematic in the light of the discovery that information as a concept still remains poorly defined in several contexts, including that of library and information science. Nonetheless, there is a goal-specific need to define knowledge in the context of library and information science. The following reasons support this need:

(a) there are many different conceptions of knowledge, including those underlying the social sciences generally and those consistent with an epistemological view (cf 4.3.2; 4.3.3);

(b) the need to define information should not be exercised in isolation from the need to define knowledge for librarians;

(c) the descriptions and metaphors of libraries and books as "storehouses of knowledge" or "repositories for knowledge" require a clearer conception of what is meant precisely by such application of the term knowledge; and

(d) from the point of view of this study's focus on epistemological issues, it is necessary to reach consensus on usage for the sake of clarity and consistency.

For centuries, epistemologists have had as their chief concern the study of knowledge, its grounds and limitations as well as its methods of acquisition (cf conceptions of epistemology-2.1). For this reason it is necessary to review the major conceptions of knowledge in that branch of philosophy.

4.3.2 Definition of knowledge in epistemology

For a number of decades, philosophers have debated the criteria for knowledge. It is beyond the scope of this study to engage in this debate in any comprehensive sense. It is helpful, nevertheless, to note the salient features of knowledge as considered by philosophers.

The traditional, formal epistemological view is that knowledge is justified, true belief (Ayer, 1956; Chisholm, 1977; Lehrer, 1978). The three criteria for valid knowledge are, thus: (a) truth; (b) belief and (c) justification.

The truth criterion of knowledge requires that it cannot be false, ie, to say "I know that X" is to say that "I know that X is true". To suggest that X could be both true and not true (false), at the same time and under the same conditions, would be to violate a fundamental "law of thought" (Quinton, 1967: 345). Although truth is construed differently in specific epistemological doctrines, it remains a cardinal criterion for the epistemologist.

The belief criterion of knowledge requires that, to say that one has knowledge of X, not only must X be the case, but in addition one must believe that X is the case. Butcharov notes:

"Whatever one really knows one also believes; for a statement of the form "X knows that P but does not believe that P" seems to be, if not incoherent, puzzling without any redeeming informativeness..." (1970: 15).

Belief is then a necessary component of knowledge in formal philosophy.

The justification criterion of knowledge turns on the phrase "sufficiency of evidence". Knowledge cannot rest on lucky guesses. To say that one has knowledge of X is to possess strong evidence that X is the case.

This view of knowledge as justified, true belief is not without its detractors, but it remains a plausible position to take in dealing with epistemological issues (Gettier, 1963: 121-3; Russell, 1959: 131-2).

4.3.3 Definition of knowledge in the social sciences

In the social sciences, especially the sociology of knowledge, knowledge relates to thoughts present in a person's mind (eg, opinions, assumptions, fantasies, etc). In this view, knowledge is related to thoughts and may be perceived as true by an organism, without meeting the criteria for knowledge (cf 4.3.2). Knowledge in the social scientific sense is synonymous with Boulding's "image", ie, "the view of the universe held by an organism" (1956).

The major difference between the social science view of knowledge and that of the traditional epistemologist is that the former version of the term does not "require knowledge to be true in terms of scientific or ontological criteria of objectively conceived authenticity" (Kesting, 1978: 4). In this interpretation, a person's knowledge is based on his acceptance of what is true rather than the formal criteria of knowledge.

This view of knowledge derives from the so-called "social constructivist" approaches to the theory of knowledge. (cf Mannheim, 1936; also, the interpretivist epistemological position in education-3.4.2).

4.3.4 Broad conceptions and classifications of knowledge

Apart from the narrower, definitional, approaches to knowledge, there are attempts at classifying into broad categories all the possible kinds of human knowledge. These broad classifications show the varieties of human knowledge in its totality and its unity. This sense of variety and totality is relevant for the field of library and information science which takes as its purview all human knowledge as reflected in the totality of recorded thought.

Although there are several broad typologies or classifications of the many modes of knowing, with ensuing branches of knowledge, which date back to the earliest Western philosophers, it is not within the scope of this study to analyze them. It is sufficient to delineate the major features of an exemplary model that seeks to encompass all the possible pathways to knowledge and which emphasizes alternative, but equally valid epistemic norms that support those claims to knowledge. Such a model is offered by Royce (Figure 1).

THE NATURE OF MAN (SUBJECTIVE) MAN'S APPROACH TO REALITY (SUBJECT-OBJECT) CONSEQUENT UNDERSTANDINGS OF REALITY (IMAGES) THE NATURE OF ULTIMATE REALITY

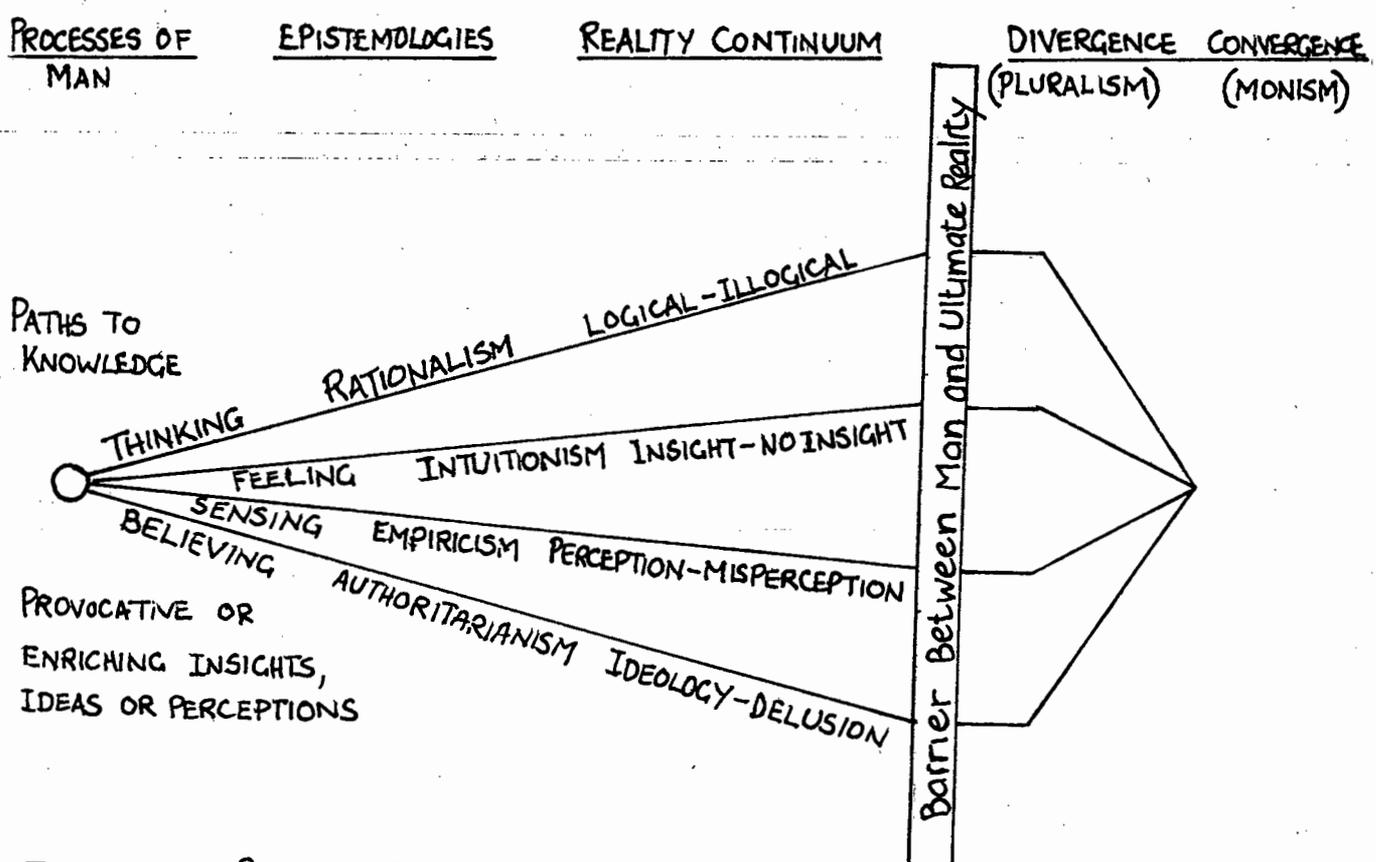


FIGURE 1: ROYCE'S PATHS TO KNOWLEDGE

Royce characterizes his approach to the classification of knowledge as insights into "different and complementary aspects of reality" (1964: 27). His approach reveals a correspondence with the Jungian scheme of major psychological functions (cf Jungian schema-7.4). The model illustrated above was presented to librarians and information scientists (albeit in a modified version) at the NATO conference of 1973 (cf Figure 3).

Royce explains that rationalism is "that epistemological position which states that nothing is true if it is illogical" (1964: 13). Empiricism is that approach to knowledge which states that we know only via sensory experience, viz,

observation, and that the verifiability of a fact or idea is dependent on the criterion of valid perception versus misperception. The intuitionist claims to know by immediate or obvious apprehension. This knowledge is not mystical because an intuitive person is "highly acute or sensitive in perceiving complex stimulus configurations" (1964: 16). By authoritarianism, Royce simply means that we know on the basis of authority. Using these "basic paths" of knowledge, Royce contends that no single individual path can claim to lead the seeker to the "Truth" (ie, ultimate reality). Each path involves:

"... a different criterion for establishing truth and therefore a different reality continuum. Thus, each of these approaches, while epistemologically valid, is limited to a particular way of looking at things" (1964: 3).

Royce holds that ultimate reality is epistemologically untestable. He believes that all humans are "encapsulated" reality seekers, and therefore lacking the adequate procedure for assessing whether ultimate reality is truly pluralistic or monistic (1964: 33; cf notions of pluralism and monism, 7.1-7.4). He conceives knowledge in its broadest sense and recognizes the relevant criteria for validating different knowledge claims.

4.3.5 Approaches to knowledge in library and information science

Most of the writings by librarians and information scientists on the concept of knowledge also deal with the concept of information and the relation between the two, because both are central concepts for this discipline. An analysis of this literature reveals at least four kinds of relationship between

knowledge and information. These relationships are discussed in a chronological order in terms of their treatment in the literature of library and information science. The four groups do not suggest a division into mutually exclusive or water-tight compartments, as it is often possible to classify a single writer in more than one group. The essential purpose of this schema is to highlight the ways in which librarians and information scientists think about these concepts and their relations.

4.3.5.1 The information-knowledge relationship

The several views of librarians and information scientists on this relationship may be classified as follows:

4.3.5.1.1 Equivalent

Equivalent relationships imply the identity or near identity of the two terms. This is reflected in the statements that "information is knowledge of facts", "knowledge is information processed with a point of view", and "... knowledge is ordered information" (cf for example Nitecki, 1985: 390; Kochen, 1975: 5; McHale, 1976: 4). Machlup contends that in some instances information and knowledge are synonymous (1980: 9). In this approach, information and knowledge are of the same kind, with no or little distinction between their precise meanings.

4.3.5.1.2 Hierarchical

A number of writers view information and knowledge as co-ordinate or as subordinate/superordinate to each other. Coordinate relationships suggest that, rather than being identical or nearly identical, the one is on the same level as

the other, but in a different form. Usually, information is seen as the externalized manifestation of knowledge, or as its materialized copy, ie, the physical surrogate of knowledge. Farradane states in this regard:

"... information is defined as a physical surrogate of knowledge..." (1980: 75).

Bekker affirms that information is communicable knowledge which cannot exist without a medium (gestures, spoken, written or printed language) (1977: 7). This observation stresses the view that information is a kind or variety of knowledge, ie, that information is an externalized representation of what exists in someone's mind.

Superordinate or subordinate relationships see one term as encompassing the other. In this way, knowledge may be a constituent of information, or, alternatively, information may be a smaller part contained within the greater whole of knowledge. For Shera, knowledge encompasses information. He claims that :

"... information is a ... part of the sum total of that which can be known... knowledge is everything an organism has learned or assimilated - values as well as facts or information..." (1972: 115-6)

McGarry also prefers knowledge as the more comprehensive of the two terms (1975: 34; cf 5.23).

For Ehlers, who adopts the formal philosophical position, information encompasses knowledge. He maintains that:

"Knowledge is... a type of information which satisfies certain conditions... Knowledge is totally contained within the general concept of information" (1971: 181).

Saracevic expresses similar views on this issue (1975: 347). He contends that:

"... it is evident... that information is a broader concept, involving in addition to knowledge, all kinds of signals and representations that affect our senses and biological processes" (1975: 348 cf 5.20).

The idea of hierarchical relationships between information and knowledge does not emphasize the importance of one at the expense of the other; however, this notion does complicate the attempt at achieving a single, acceptable definition of either term.

4.3.5.1.3 Dichotomous

There are views by some who hold that information and knowledge are two basically different, even mutually exclusive terms. In Nitecki's opinion, for example, information is data about matter determined empirically, while knowledge is the philosophically inferred essence of that matter (1986: 391; cf 5.14). A similar distinction is drawn by Neill who contends that information may be described as "naked fact" and knowledge as "a systematic body of interrelating concepts" (1985: 57). The following definition of Boorstin also expresses a sharp divergence:

"Information ... is something someone else provides us... We must all acquire knowledge for ourselves." (1979: 6).

The bifurcation noted in Boorstin's quotation is that information is externally motivated (ie, we are informed from outside), whereas knowledge is inner-directed or self-motivated (ie, knowledge results from internal, subjective processes).

Pauline Wilson endorses the view that there are certain clear-cut differences between the two terms (1988: 84-5). She states:

"Information is acquired by being told. Knowledge can be acquired by thinking. Information is a process. Knowledge is a state. Information is a flow of messages. Knowledge is a stock. Information is bits and pieces of discrete information, fragmented and particular. Knowledge is coherent and structured, it often has enduring value. Knowledge may be restructured by the addition of new information, but new information is not necessary for new knowledge to be acquired." (1988: 84-5).

This interpretation of the information-knowledge relationship holds contrasting views of these terms, and the proponents assume, in some cases, an either/or stance in the sense that they hold clear convictions on which term should be preferred in library and information science.

4.3.5.1.4 Continuum

The information-knowledge continuum emphasizes the notion of:

"... information-knowledge as a continuous process of integrating newly received perceptions into the previously established systems of relations. It is a transition from a passive state of knowledge (acquired in the past) to an active, newly formed state of relations (newly perceived ideas)" (Nitecki, 1986: 395).

Similar approaches, though different in some ways, are suggested by Otten and by Kochen. Otten sees the two terms as separate entities rather than aspects of one process (Otten, 1974: 103). Kochen views the information-knowledge process as part of his "epistemo-dynamics" which is a discipline that expresses regularities governing the transformation of

information into knowledge, an assimilation of knowledge into a more general understanding and a fusion of understanding into wisdom (Kochen, 1975: 42; cf 5.18).

According to Vinken, the information-knowledge continuity is dynamic in the sense that after knowledge has been generated by information, knowledge in turn generates information on a higher level (1982: 334). This means that new information supersedes old knowledge and leads to the generation of new knowledge, and so on. Brookes contends that one's knowledge structure is modified by information input. This locates the information-knowledge process within an individual's "cognitive world", so that knowledge is structured, integrated information and information is fragmented knowledge (1981: 4; cf 5.10).

It would appear that there may be either an epistemological demarcation principle or a practical demarcation principle to separate the two terms on the continuum. As an example of the former, Shera claims that it is at the point of validation that information passes the barrier to become knowledge (1968: 21; cf 4.2). As an example of the latter, Stratton holds that "knowledge becomes information because ... of accessibility", ie, information in recorded form is the objective, physical pole which is accessible to users, and is the concrete expression of the subjective, metaphysical pole which exists only as a mental event/process (knowledge) (1985: 35).

The several approaches encompassed within the information-knowledge continuum share the view that the fluidity of the relationship between the two terms is a distinctive feature. Information is transmuted into knowledge, which may lead to the generation of new information (cf for example Hannabus, 1984: 81; 1988: 12, 14; Farradane, 1976: 100). Rather than being seen as separate entities, information and knowledge are seen as being dynamically linked with each other (cf Pratt, 1982: 38). The nature of this link, in Swan's view, is that of the provision of a vital human context so that knowledge differs from information "... in the degree of connectedness, perspective, [and] human value..." (1988: 28). Swan maintains that it is this human context that distinguishes librarianship from other information-based disciplines (ibid.).

4.3.6 Conclusion

When taken together, the different categories of relationship reveal the several ways in which librarians and information scientists view the interrelationships between these central concepts. While it is not within the scope of this study to arrive at a final solution to this dilemma, it is necessary to describe the conception of knowledge that will serve its purposes.

While information is the "physical surrogate" and the process by which the content of records/documents as externalized ideas are transferred to the individual human mind through a medium (cf 4.2.3), knowledge is a personal mental state as well as the expression (in the form of information) of what is known.

Knowledge may be both private or public, and assumes a systematically organized structure that may be modified by information and that may be used by the human mind to generate new knowledge (Wilson, 1977; Ziman, 1968). When this knowledge is communicated, it requires a medium (such as gestures, spoken, written or printed language) and becomes information.

Knowledge, as it is understood in this study, is not confined to truth in its narrow epistemological sense as it is held in formal philosophy (cf 4.3.2). Rather, the broader view of knowledge is adopted. There are several modes of knowing, and the knowledge that ensues from these modes subscribe to different sets of truth conditions. This means that while knowledge is true for the individual knower, it may not necessarily be held to be universally true.

Libraries and recorded materials are consulted as part of a search by individuals to know something, and the knowledge gained through the use of libraries and recorded materials is personal and private to that individual. Patrick Wilson characterizes this view of knowledge as contrary to opinion, but concedes that what may be knowledge may become a matter of opinion (1983: 17; cf 5.17). This distinction between knowledge and opinion derives from the classical Platonic dichotomy (Ryle, 1967: 325-6; cf Schrader-5.27).

In a profession such as library and information science which seeks the systematic collection of all forms of recorded culture, an individual user is exposed to a multiplicity of

approaches to ultimate reality (cf the views of several theorists noted in Chapter 5). For librarians to emphasize one approach at the expense of the other would involve this profession in a debate regarding the superiority of one approach over the other, which may result in a consequent bias in one or all of its primary functions, viz systematic collection development, heuristics and promotion of use in the corporate or collective sense.

From an epistemological point of view, this means that there is no room for a one-sided commitment to a single approach to human knowledge, but rather, there is the need to recognize the value of the several modes of knowing (with their respective sets of truth criteria) as equally valid manifestations within a broad and comprehensive conception of human knowledge (cf Royce's view-4.3.4; cf 5.13). Boorstin affirms this conception of knowledge when he states that:

"Truth is a stray camel; tie it wherever you may find it."

"Knowledge comes from the free mind foraging in the rich pastures of the whole everywhere-past" (1979: 6).

This holistic metaphor of knowledge appears to be suited to a perception of the "inclusive" nature of library and information science (cf 7.6).

4.4 Library and information science

There are several views of the relationship between library science and information science, ie, whether they are distinctive and separate disciplines, whether they together constitute a single discipline, or, whether they are identical. (cf 4.4.2.1). Moreover, there is a view that it is difficult to deal with

relationships between the two until the status of each presumed area of activity has been established as a true discipline (Shera, 1983: 379; cf 5.5).

It is questionable whether scholarly agreement beyond doubt on a definition of the field is possible before an understanding as to what constitutes its proper domain is achieved. On the other hand, a logically tenable definition of the field may assist in mapping out its domain. Attempts at definition face many problems, as may be seen below.

4.4.1 Difficulties of achieving a "consensually" valid definition

The difficulties of achieving a consensible definition of library and information science may be grouped into three categories. The term "consensible" is Ziman's neologism for signifying that body of rational opinion on which collective scholarly agreement exists (1968: 9).

4.4.1.1 Historical

Shera traces, through the establishment of institutions, associations and societies, a historically-based divergence, as well as convergence, between the two disciplines. He notes that the Brussels Institute which subsequently became the International Federation for Documentation (FID) was started by librarians (1983: 380). The goal of this group was to employ technology to provide access to the "total record of the human adventure" (ibid.). In other words, documentalists were mainly librarians who had used new technology. When, however, the American Documentation Institute (ADI) was established in the

United States of America, the distinction was drawn more sharply between librarians and information scientists. The latter group began to concentrate on the "application of electronic and mechanical systems for improving the accessibility of graphic records" (ibid.). This became known as information retrieval. The division received impetus from the work by Shannon and Weaver on the communication of information. The ADI described information as their major concern, although this term was misleading (cf 4.2.1.4). By the late 1960's the ADI changed its name to the American Society for Information Science (ASIS), thereby accelerating the process of an incipient split in some circles.

The insight offered by this brief historical perspective is the demonstration that ambivalence and divergent development has complicated the search for a "consensible" definition.

4.4.1.2 Conceptual

Conceptual difficulties in defining library and information science surround the absence of widely accepted definitions of information and information science (Serjean, 1976: 4).

Meijer et al point out that the variety of opinions on the content of the concept information leads to the variation of points of view of the relationship between library science and information science (1988: 77; cf 4.2 & 5.21).

scientific and technical information and in the application of well-tested research methods to the study of information systems and services (1983: 18; cf 5.4).

Even when information science is delimited to its relation with library science, there is little consensus in definition (Schrader, 1984). Whether information science should be defined in isolation from library science or as part of library science depends on whether one accepts that the two are distinctive and separate disciplines or that they are fused in a single discipline (cf 4.4.2).

4.4.1.3 Logical

In a thorough analysis of more than 1 500 definitions of the terms "library science", "information science", of their conjunctions, their disjunctions and their respective conceptual antecedents, Schrader finds confusion, disagreement, contradiction and inconsistency. He contends that:

"... conceptualizations of library science are inadequate because of their institutional binding, while the conceptualizations of information science are inadequate because of their object binding. Neither a focusing on libraries nor a focusing on information is sufficient." (1983: 379).

Schrader's analysis reveals the absence of conceptual evolution in the search for a definition of library and information science. Changes in labels or terms have outpaced advances in its conceptualization. In support of this claim, he notes that at least 340 synonymous, quasi-synonymous and pseudo-synonymous terms are proposed in the definitions analysed which purport to describe the principal function (ibid.: 380).

Although these can be reduced to 29 generic terms representing 29 divergent notions of how this field ought to be described, they are applied variously to objects, both physical and immaterial, to persons, and to objects and persons together.

Schrader also notes that it is rare to find a paper which presents definitions of both library science and information science. The more usual course is for the author to define the favoured term, to assert its separate and generally superior identity, and then to shift to some other subject matter (*ibid.*: 381).

The specific difficulties affecting logical adequacy of the analysed definitions, as formulated by Schrader are:

- (a) There is no clear indication as to the role of the user, when interacting with the librarian or information consultant;
- (b) The definitional literature does not focus on interacting relations between librarian/information consultant and user;
- (c) There is no focusing on all of this domain behaviour as a social system; and
- (d) There is no clear notion of what the user obtains when interacting with the librarian/information consultant - information, knowledge, recorded information, recorded knowledge, etc, (1984: 65).

In an earlier doctoral dissertation on a definition of librarianship, Meijer identifies the following inadequacies in definitions of librarianship (a field which he incidentally equates with that of information science):

- (a) The pars pro toto group, which mistakes the part for the whole, is too narrow in its scope;
- (b) The genus group is too broad in its scope; and
- (c) The heterogeneously composed group lacks a central subject (1978; 1982).

In their attempts at developing a logically tenable definition, both Schrader and Meijer seek ways of overcoming these logical inadequacies (cf 4.4.3).

The variety of difficulties in defining library and information science emanates, to a considerable extent, from the ambivalence surrounding the relationship between the two disciplines. Conceptual progress is inhibited by conflicting views of this relationship.

4.4.2 The library science-information science relationship

An issue that further compounds the question of definition is the variety of opinions regarding the relationship between library science and information science. They have been referred to inter alia as "intellectual competitors" and as "rival traditions" (Schrader, 1984: 59-60). Schrader claims that every

conceivable proposition as to the dichotomy or conjunction of the two disciplines has been presented and promoted in the literature (1983: 381).

Four major categories of relationship are identified by Meijer et al. They are outlined briefly below (cf 6.1.5 for a fifth category, viz library science and information science as parts of a larger whole).

4.4.2.1 Information science as part of library science

This view expresses the historical "seniority" of library science. Information science is seen as being grafted on to library science and able to benefit certain areas of library science, e.g., the organization of library materials for "maximum convenience and efficiency of use" (Shera, 1983: 385). Meijer et al maintain that this view received impetus when the word "documentation" was replaced by "information" (1988: 77; cf 4.4.1.1). Accordingly, information became restricted in its meaning to written and/or printed documents being limited to the "ontsluiting en beskikbaarstelling van die rekord" (ie, the intermediate heuristic function) (Viljoen, 1973: 88, 109, 409). Library science assumes responsibility for the information function in society, and information is regarded as being equivalent to library materials (cf also 6.1.1).

4.4.2.2 Information science and library science are identical

The central argument for this view is that library science and information science share the same goals and carry out the same functions (Meijer et al, 1988: 78). While O'Neill contends

that the professed differences between library science and information science are overshadowed by their commonalities (1982: 373), Borko makes the categorical claim that "library science and information science is a single, unified discipline" (1984: 185).

A cogent argument for the similarity between the two disciplines is offered in Meijer's doctoral thesis. He contends that both libraries and information centres aim to provide users with access to the content of recorded matter irrespective of whether the content is in printed, audio-visual, electronic or any other form (1978: 45). He concedes that the depth of analysis and retrieval in information science is greater than in library science. Despite their identity, Meijer prefers the term librarianship ("bibliotheekwezen") to information science for historical reasons (1978: 52).

Although Schrader concurs with Meijer's view that library and information science share the same conceptual domain, he prefers to reflect explicitly this unity in the title "library and information science" rather than in a single title such as "librarianship" (1984: 59; cf also 6.1.3).

4.4.2.3 Library science as part of information science

This view derives from the more fundamental belief that libraries are not the only institutions that deal with information and that library science is not the only science relating to the study of information (Yuexiao, 1988: 485). Library science is seen as a branch of information science, and

information science is itself viewed more broadly as a meta-science, and as an interdiscipline (Otten & Debons, 1970: 94; Yuexiao, 1988: 488). As a metascience it is a science based on other sciences, and as an interdiscipline it is at an intermediate stage of an emerging new discipline in which researchers from other sciences share common interests. Once again, lack of agreement as to exactly what information science is or should be, complicates the issue of identity (cf 4.4.1.2 & 6.1.2).

4.4.2.4 Library science and information science as separate entities

There are two interpretations of this view. The one is that separation is, in fact, substitution, ie, that information science is replacing library science. The second interpretation merely upholds a strict separation of the two.

Saracevic supports the first interpretation, citing adaptation to modern requirements as justification for his view (1982: 32; cf 5.20). This argument is extended to serve as a means of ensuring growth, or merely the survival of traditional library schools. This is reflected not only in the eagerness to incorporate the word "information" in the designation of library schools and the degrees they confer, but also in the intention to drop the word "library" altogether (Harter, 1982: 32). Bohnert points out that the disappearance of library science from the compound title "library and information science" would suggest that a single field (information science) could handle all the

diverse communication activities that exist (1982: 44). This, once again, alludes to the "identity" problem of information science (cf 4.4.1.2).

The second interpretation of this view finds support in the writings of Holley (1985: 63), Caldwell (1970: 138), and Van Brakel and Boon (1986: 17) who emphasize a sharp delineation between the two disciplines. Holley and Caldwell call for separate degrees in information science and library science and for the setting up of two distinct programmes within the same school. On the other hand, New observes that the overlap between the two would make it a waste of time to teach "... two kinds of information worker separately" (1978: 44; cf also 6.1.4).

4.4.3 Towards a tenable definition

The several difficulties surrounding a definition of library and information science do not lead to a situation of total despair. Two scholarly analyses, both in the form of doctoral theses, seek to address some of these problems and to derive a logically tenable definition.

Meijer's definition is as follows:

"Librarianship is a form of cultural enterprise whose main characteristic is the stimulation of the optimum use of mankind's cultural heritage insofar as it consists of coded thoughts recorded in documents that are and must be held in readiness for use with the ultimate objective of making possible cultural progress (also in the fields of religion and science) in its particular spheres" (1982: 26).

Schrader's definition, in its turn, proposes that:

"Library and information science is the study of the symbolic culture accessing system, a system of social practice in which access to reproduced symbolic culture is provided for users seeking that culture" (1984: 74).

Both definitions represent the culmination of intensive scholarly analysis. As such, they also reveal certain difficulties. The term "culture" is used in both definitions, but connotes different meanings. In Meijer's definition it is adjoined with other words to yield the phrases "cultural enterprise", "cultural heritage", and "cultural progress". As a "cultural enterprise", librarianship (Meijer's preferred term) is subordinated to its genus proximum, the cultural sphere (ibid.: 26). In the phrase "cultural heritage" the extremely divergent content that libraries deal with is described, although it is confined to "coded thoughts in documents" to distinguish it from archaeological and museum artefacts and, significantly, from unrecorded knowledge/uncoded thoughts etc, (ibid.: 25). The idea of the role of librarianship in the progression of society (whether in positive or negative senses) is posited as "cultural progress" (cf 4.1).

In the Schrader definition, the phrase "symbolic culture" is akin to Meijer's "cultural heritage" in that it refers to the content of recorded culture that librarians and information officers deal with. "Symbolic culture", a phrase that Schrader contends is more useful than the terms "information" and "knowledge", refers to ideas and values expressed and recorded in symbols and encompassing both positive and negative thought (1984: 75; 1983: 357; cf 5.27).

This variety of uses of the term "culture" contributes to linguistic inexactness and ambiguity. In the social sciences there is no consensus on the use of this term. For example, Spradley identifies six kinds of definition, one of which is an "omnibus" definition. This omnibus concept of culture is the broadest, ie, culture is everything made by man, viz:

"It is emotions and works of art; it is behavior, beliefs and institutions; it includes what people know, feel, think, make, and do" (1972: 6).

It is not wholly clear whether or not this comprehensive concept of culture is subsumed by either or both Meijer and Schrader.

Meijer's "... is a form of ... enterprise..." and Schrader's "... is the study of..." suggest that each definition has a different focus. Meijer focuses on professional activity and service while Schrader emphasizes the academic study of that activity. As a form of cultural enterprise, Meijer's definition successfully demarcates librarianship from similar activities in the cultural sphere, eg, museology. On the other hand, Schrader's objective of formulating an adequate notion of "definitional discourse" is to provide "... a logical beginning for future researchers" (1984: 76).

When taken together, the two definitions appear to encompass the most important features that a logically tenable definition requires. Library and information science may be seen as a human social practice in the cultural sphere. It also involves the study of that practice. This study focuses upon the stimulation

for optimum use and the guidance of access to mankind's heritage of coded thoughts, as well as upon the user seeking access to that heritage.

This conception views library and information science as a single discipline with service and academic components. The content of libraries and information centres is restricted to artifactual carriers of human thoughts encoded in symbolic form (although the theoretical interest of the librarian extends to include manifestations of oral or preliterate traditions - cf 5.28.11). This content is mediated by the librarian or information officer for optimum use through the execution of professional activities surrounding stimulation and the provision of access.

The inclusion of the user in the definition is significant for this study, since the recognition of the acquisition of knowledge by the individual user is a salient feature of a proposed epistemological position for library and information science (cf 8.5.1).

4.4.4 Conclusion

The definition of library and information science has received wide attention, but little consensus has emerged. A few researchers have attempted to overcome the more significant difficulties and to formulate a consensible definition. The components for a logically tenable definition may be derived from the writings of Meijer and Schrader (cf 4.4.3).

For the purposes of this study, additional emphases are placed on: (a) the task of the librarian (as intermediary) to discover the ways in which users may acquire knowledge through access and use of the content of generic documents, and (b) the recognition of the ways in which librarians are themselves influenced in their practices by certain philosophical assumptions that underlie their methods of knowing. This study seeks to offer a framework that may accommodate all these ways of acquiring knowledge (and their related truth criteria), ie, a suitable epistemological position, as a necessary part of the librarians' fundamental academic training, since such a position also influences professional practice.

4.5 Summary

This chapter has attempted to demonstrate the several perceptions of the key concepts of information and knowledge and of library and information science, as well as the difficulties of attaining consensus-supported definitions. In the absence of exhaustively comprehensive definitions it has been useful, nonetheless, to observe the several approaches to dealing with complex theoretical concepts that are considered to be of primary significance to the investigation of epistemological aspects of library and information science.

One of the major difficulties regarding the definition of the terms noted in this chapter has been the lack of demarcation and the absence of a coherent theoretical context to illuminate precise meanings. In an attempt to overcome this dilemma, the more fully developed theoretical writings of several librarians

and information scientists (as well as a few non-librarians) are examined to provide an opportunity to analyse their specific views of these key concepts and other relevant epistemological issues. The ideas of these exponents are provided in Chapter 5.

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5 Contributions to the discussion of epistemological aspects
of library and information science

Preamble

As a requirement of the inductive approach adopted in this central part of the study, the writings of several relevant authors are examined and explicated here. The inductive process provides the desired feature of inferential validity to strengthen the quality of the argument presented and sustained in this study. The merit of the inductive argument is that genuine supporting evidence (as expressed in the statements of the exponents considered in this chapter) lends gradual support to highly probable conclusions (Mouton & Marais, 1990: 112).

The majority of these contributions reveal the fundamental ideas of selected, philosophically-inclined librarians and information scientists. These fundamental ideas are of significant relevance to the subject of this study. Relatively few librarians and information scientists have expressed in their professional writings any major interest in epistemological aspects of library and information science. Butler noted this characteristic almost six decades ago when he said that the "... librarian is strangely uninterested in the theoretical aspects of his profession... the librarian apparently stands alone in the simplicity of his pragmatism" (1933: xi-xii). This does not mean that there has not been any theoretical research undertaken since Butler's declaration in 1933, as Buckland points out (1983: 35). What remains a concern, however, is the paucity of monographs and articles addressing fundamental theoretical issues

in library and information science (Meijer, 1978: 8-13; Schrader, 1984: 59-77), and a general agreement on the "... sorts of theory which could be expected with respect to library services" (Buckland, 1983: loc. cit.; cf Maguire, 1989: 4).

There are, however, a small number of professional librarians and information scientists who have, in a major or a minor but always logically pertinent way, made speculative or seminal contributions to this subject. In addition to these librarians and information scientists, the contributions of three non-librarians have been included. Of the latter, Machlup is an economist who has contributed extensively to an understanding of the phenomenon of knowledge in the post-industrial, knowledge-based society (cf 5.4). Royce is a psychologist who has elaborated an interesting model of the different modes of knowing (cf 5.13). De Mey is a philosopher who is concerned with the applications of research findings in cognitive psychology to information work (cf 5.25).

In an attempt to offer a faithful reflection of the ideas of the selected authors it is impossible to maintain uniform treatment of the contributions of each individual author. In cases where references are plentiful, treatment is substantial. Conversely, in cases where references are sparse, the treatment aims to elaborate only to the extent that the author's main proposition is presented in essential outline. In this regard, it stands to reason that the treatment of individual contributions is bound to be of variable length.

Unevenness in treatment is inevitable in a study such as this where the writings of each selected author is examined from a specific standpoint, viz, his epistemological position in library and information science. Only those writings of a given author which have provided pertinent source material for this study have been selected. These select bibliographies appear at the end of each contribution; while they are of course not intended to be definitive bibliographies of all the writings by or about each particular author, an attempt has been made to list all apposite references.

References to epistemological issues in library and information science vary in scope from tentative remarks to more comprehensive statements. Such statements have been made by both theorists and practitioners in the field. The individual contributions to this subject, as they are listed here, have been selected on one or more of the following grounds:

(a) The contributors are either associated with the field of library and information science, or have expressed an interest in epistemological issues surrounding the transfer of knowledge, or information;

(b) Their writings, when considered collectively, reveal a common interest in the explication of fundamental concepts cognate to epistemological issues such as truth, culture, information, knowledge, library and information science and knowledge transfer; and

(c) Their seminal ideas on epistemological issues in library and information science provide a suitable context within which the critical development of an epistemological position for library and information science may be developed.

The purpose of this chapter is to present the central ideas of the selected authors (as they bear upon the subject of this study) as faithfully as possible. For this reason, a classified presentation has been avoided in order to prevent the posture of an "artificial" ("taxonomical") re-arrangement of the ideas of these authors in accordance with the purpose(s) of such a classification. However, a critique as opposed to an exposition, it is felt, does require some classified framework (cf Chapter 6 - Critique of the contributions).

The arrangement that seems to present itself as the most suitable for the purpose of this study is one that offers a basis for observing some measure of evolution of thought on the subject. That goal has not always proved attainable, from a practical point of view, since the 30-odd selected authors only span the last hundred years or so. For this reason, it has not always been possible to infer from the writings of a particular author the degree of influence of an earlier writer, except in cases where direct references are made. Nevertheless, whatever development of ideas there may have been, a chronological arrangement (by date of birth) of these authors is suited to this more modest purpose. It has been assumed that chronological arrangement by date of birth would be more suitable than chronological arrangement by date of publication. A primary reason for this is that some major authors have published articles and monographs consistently - and in other instances sporadically - over a period of many years, thereby confounding the attempt to determine the significance of a single location in the list of a given author in a constant manner throughout.

The chronological arrangement by date of birth applies only to the major exponents, ie from 5.1-5.27. The minor contributions in 5.28 are arranged primarily according to their predominant conceptual outlook in an attempt to link related perceptions that would clarify key issues in a self-evident manner with a minimal need for interpretation by the researcher.

Moreover, it is the purpose of this chapter to present each author's contribution, as far as possible, as a self-contained coherent unit of a theoretical thought system in order to provide a complete and faithful record of that system of thought. These individual contributions are summarized below, from 5.1 to 5.27, followed by the minor contributions in 5.28.

5.1 BUTLER, PIERCE (1886-1953)

It may seem odd that Butler, who had academic qualifications in medieval history and theology, advocated the application of the scientific method in the investigation of library problems (Karetzky, 1982: 62; Harris, 1986: 516). However, a critical reading of the writings of Butler resolves this apparent difficulty. Butler's call for the application of the scientific method should be viewed within the broader context of his emphasis on the need for the librarian to broaden his vision in his approach to the library as a social and a cultural phenomenon.

Butler's view of the library provides a clearer understanding of his more philosophical ideas. He maintains that libraries reflect the social and intellectual state of their times, and that the history of libraries is thus a part of the history of scholarship (1961: 84). In his view, it is impossible to divorce the study of libraries from that of civilization. He believes that, for example, "The library has been created by actual necessities in modern civilization. It is now a necessary unit in the social fabric" (1933: xi).

As an important part of modern civilization, libraries fulfill a specific role. In this regard, he argues that:

"The library may therefore be regarded as an integrating machine in which all the diverse intellectual factors of civilization are reduced to a single index value and library history as a running record of its fluctuations" (1945: 10).

Because the library is contained within a larger whole, it is necessary for the librarian, especially the library researcher, to adopt a broad outlook of its function in society. This requires that the library researcher should search for explanatory principles outside of the library itself. He states in this regard:

"But the library has no integrity in itself; it is only an incidental mechanism in the larger machine of civilization. The forces that impel its activities, the conditions that prescribe them, and the work they accomplish are all externally determined. Hence every cause and effect in librarianship must be looked for outside, in the culture of which it is a subordinate element" (1953: v).

Butler's insistence upon the "externally determined" nature of libraries and hence of library research thus provides a background to understanding his conception of the role of

scientific method in investigating library problems (Coetzee, 1962: 41). In his preface to the Phoenix edition reprint of Butler's classic monograph, Introduction to library science, Asheim makes the observation that Butler expresses the need "to shape a professional philosophy responsive to the needs and interests of the coeval society" (1961: vii). Butler saw in the so-called scientific method a partial but necessary component of a professional philosophy of librarianship. Karetzky contends that:

"The library philosophy Butler wanted would co-exist with, and to some extent be based on, a library science and the library philosophy would be more effective if a library science existed because with an 'accurate sense of social reality', librarians could formulate their ideals and standards according to it instead of making them a priori" (1982: 63).

Butler was acutely aware of both the possibilities and the limitations of a library science. He recognized that science cannot deal with "the problems concerning the ultimate nature of things and final reality" (Karetzky, 1982: 64), and that, to this end, the scientific and humanistic aspects of librarianship should co-exist (Butler, 1961: xii; 26-9). He believed nonetheless that the consequent sacrifice of some spirituality was far outweighed by the benefit promised by science (1961: xi-xiii).

The need to balance the different approaches in library philosophy is emphasized in subsequent writings by Butler. Here, for example, he observes that, despite their quest for a philosophy of librarianship, librarians have tended to remain pragmatically empirical (1951: 236). He notes the emergence

amongst librarians of a "scientistic delusion" described as the "mistaken assumption that librarianship is a profession only insofar as it is a science" (1951: 239).

Emphasizing the many-sidedness of librarianship, he considers that:

"The intellectual content of librarianship undoubtedly consists of three distinct branches. It deals with things and principles that must be scientifically handled, with processes and apparatus that require special understanding and skills for their operations, and with cultural motivations that can be apprehended only humanistically" (1951: 246).

Against this background, the librarian can never simply be a subject specialist, but should rather be equally concerned with "every ramification of every science and of every humanistic discipline, not for their own sake, but for the sake of scholarship as a whole" (1945: 10). Scholarship in this sense is defined by Butler as "the total intellectual content of a culture" (Wilson, 1945: 150). According to Coetzee, Butler's notion of the "history of scholarship" has strong associations with Shera's idea of social epistemology (1966: 156; cf 5.7). The notion of scholarship is central to Butler's view of the chief function of librarianship. He claims that this is "... to communicate, so far as possible, the whole scholarship to the whole community..." (1951: 246).

Here Butler stressed the instrumentality of librarians in realizing the function of the library in society. His professional view was idealistic, optimistic and even ambitious

in the sense that he held librarianship to be a prime promoter of wisdom in the individual and the community and the subsequent advancement of civilization (1951: 246-7).

Butler clearly recognized the shortcomings of empiricism in its formal epistemological sense (cf 2.5). He maintained the need to see the validity of other approaches to library and information science. He also confirmed the necessity for librarians to concern themselves with such approaches in declaring that: "it will make a great difference... whether... [the librarian] thinks of truth as an objective standard, or as a limit to which the approximations of science are gradually approaching" (1961: 90).

Butler's contribution should be viewed in the light of his attempt to convince the library profession of the theoretical necessity and practical benefits of applying a scientific approach to aspects of librarianship. Science becomes a useful adjunct for librarianship in his view. However, his own academic training in the humanities and his conviction that librarianship is also humanistic suggest that librarianship should accommodate more than one epistemological approach.

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5.2 RANGANATHAN, S.R. (1892-1972)

Ranganathan held advanced academic qualifications in mathematics, English literature and library science (Kumar, 1977: 53). He has been considered, moreover, as "the father of Indian librarianship" and one of the "immortals" of the profession of library and information science (Sharma, 1979: 58; Palmer, 1969: 285). Striking parallels have even been drawn between Ranganathan and Gandhi in the context of Indian culture. Kumar claims, for example, that "Like Gandhiji, Ranganathan would have preferred to have opted for truth rather than logical consistency", and that "Like Gandhian thought, Ranganathan's philosophy was a open-ended system welcoming new ideas... His ideas were cyclical in the dialectical sense of the term..." (Kumar, 1986: v).

Ranganathan has made significant contributions to many areas of library and information science, most notably those of library classification and reference work. He sought the basic principles that unify library practices and services as a whole while studying librarianship at the University College of London in the 1920's. After extensive travel and library practice in Great Britain, he formulated five laws of library science, which constitute, for him, a unified theory for library service as a whole (Atherton, 1973: 141). These laws have been codified as follows:

- (i) "Books are for use";
- (ii) "Every reader his book";
- (iii) "Every book its reader";
- (iv) "Save the time of the reader"; and
- (v) "The library is a growing mechanism".

In Mangla's view the five laws as articulated above provide Ranganathan with a definitive conceptual framework for developing various normative principles, canons, techniques, practices, etc, essential for organizing libraries and their services along scientific lines (1984: 277). Satija argues that Ranganathan's laws conform to the logical requirements for scientific laws: "From a philosophical and epistemological standpoint, they fully hold the status of a law" (1986: 89). He proposes that the rest of Ranganathan's writings flow seminally out of the five laws and that the "Development of Ranganathan's work is only a history of interpreting and tapping the laws" (1986: 91).

There are, however, ambivalent claims among critics and admirers concerning the alleged scientific nature of Ranganathan's work in librarianship. Chappell, for example, challenges the generally held assumption that scientific methodology characterizes Ranganathan's approach to librarianship, suggesting that the impact of his own value system and of the Hindu tradition is in fact dominant in many of his writings:

"While the conventional characteristics of a scientific methodology often appear to be imposed on his conceptions after the fact, the influence of the cosmic and moral world view of Hinduism seems integral to his thought, shaping it from within and forming the perspective from which he observes library practice and formulates his five laws. Ranganathan's approach to librarianship is fundamentally not scientific but religious in the broadest sense of the term" (1985: 381).

The two conceptions basic to all forms of Hinduism are a belief in cosmic unity in the essential interrelationship of all things, and a conviction that knowledge is a powerful agent of this unity (Edgerton, 1964: 21). Chappell argues that this twin philosophy pervades Ranganathan's writings. She contends that "Ranganathan's belief in the importance of librarianship and his understanding of its primary function are rooted in a faith in the pragmatic and ultimately cosmic value of knowledge" (1985: 382). Librarianship is instrumental in facilitating a progress of librarians and library patrons from a "vital plane" to a "mental plane", and finally to a "spiritual plane" (1985: 383). Chappell submits that, according to Ranganathan, the purpose of librarianship is to participate in the unfolding of this

universal destiny by educating individuals towards the adoption of a sense of intellectual and social cooperation and unity, into a realization of interrelatedness (1985: 384).

Chappell's view is not without support from Indian librarians. Kumar characterizes Ranganathan primarily as a religious person, while Satija contends that he taught attitude and spirit more than "facts, methods, theory or philosophy" (1977: 57; 1987: 307). Despite this characterization, Ranganathan's religious views are not interpreted as being antithetical to his so-called "spiral of scientific method". Ranganathan believed that mystical intuition was a fundamental basis of the "scientific method", but Kumar points out that it is not unusual for scientists to discover laws through intuition and that this does not make such laws any less objective than laws derived inductively. He considers, in fact, that "Ranganathan at heart was a positivist, despite the halo of a mystic attributed to him" (Kumar, 1977: 57).

Ranganathan affirms of his own account the influence of both religious and scientific influences in his thinking in the statement:

"I have had split moments of experience of intuition. My five laws of library science were 'seen' in this way. My own other postulates, forming the foundation of my theory of library classification were seen like that. I had to slave a great deal to understand the Why and Why For of certain facts of experience. But when the intellect had done its best, and it appears for a split second and gives the postulates etc. [sic] Once they are handed over by intuition, my intellect had to work out their implications for days and days with hardly any sleep for example, continuously for a few days. My theory of library classification, published as Prolegomena to library classification, has been worked in this way" (Quoted by Kumar, 1977: 59).

Ranganathan made a plea for the scientific study of the fundamental characteristics of human thought that could be applied to the study of library classification. However, Chappell points out that there is little evidence that he ever undertook the kind of systematic and rigorous investigation that he advocated or that he attempted to make use of available research (1985: 393). In spite of this, his classification scheme has drawn praise from many librarians. Shera, for example, proclaims that:

"Of all librarians, only S.R. Ranganathan has attempted to build a bibliographic classification upon epistemological principles. By demonstrating the ways in which knowledge grows -- by 'denudation, dissection, lamination, and loose assemblage', he has clearly shown the relation between bibliographic classification and the patterns of man's cognitive growth" (1973: 333).

Shera and Perry contended earlier that:

"... for the first time, librarianship as the science of the management of knowledge merges with epistemology" (1965: 45).

It is perhaps to be regretted that Ranganathan does not make any pronounced references to epistemology, but it is clear that he did not conceive of it only in its narrow scientific sense. He was inspired instead by broader notions of the unity of human knowledge and by the need to make this knowledge readily accessible to the library user. Chappell has asserted, for example, that his classification scheme is valuable for its immediate helpfulness rather than for any direct correspondence it might have with some fundamental reality (1985: 393). It is however significant to note that Ranganathan's work on the theoretical foundations of library science was inspired by the

notion of unity, or - as it is expressed in Sanskrit - Ekavakyata. This profound Vedic principle of unity implies that all knowledge is one, was a guiding principle in his life:

"I often realize that even apparently trivial occurrences are organically fused into a single life - experience... The five laws of library science is a verbal record of the Ekavakyata of library practice and science, as it revealed itself to me" (1963: B17).

Chappell rates Ranganathan's contribution to librarianship as an equivocal one, however:

"The value of his work is by no means negligible, but neither is it fundamental. He does not, as he tries to do, find a way of firmly anchoring the jerry-built structure of librarianship to the bedrock of metaphysical reality, of keeping it constantly attuned to the cosmic plan... Ranganathan's justification of his vision is finally no more than a statement of faith in intuition. Since intuition is uncontrollable and incommunicable, we have no way of systematically exploiting it or of judging its claims" (1985: 394).

However, Chappell's assessment does not negate the consensus that Ranganathan remains a fundamental thinker in library philosophy who, through his writings, reflects the tension in library and information science of the presence and equal validity of more than one epistemological approach, tending to favour a personal preference for the mystical mode of consciousness as a dominant gateway to an appreciation of librarianship's key role in preserving and unfolding the spiritual heritage of mankind.

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5.3 DE VLEESCHAUWER, H.J. (1899-1986)

During the many years that he explored the historical dimensions of philosophy, the Belgium-born De Vleeschauwer became intimately acquainted with the learned libraries of Western Europe. In this process he was induced to study the library as a phenomenon. He explains in this respect:

"What took me along this path was not professional necessity but sympathy based upon the splendid feeling of solidarity I experienced in the great study libraries of Western Europe" (1961: 245).

De Vleeschauwer was primarily a philosopher and a cultural historian, who at one time headed both the Department of Philosophy and the Department of Library science at the University of South Africa (Van Jaarsveld, n.d.: 9). Among his numerous writings, about three hundred books and articles have been published, while about seventy-five books and articles remain unpublished (Van Jaarsveld, n.d.: 9). In one of the issues of Mousaion, a periodical started by De Vleeschauwer, his student, Rauche, provides a succinct account of his career and a systematic listing of his extensive writings in philosophy and library science (1957: 1-61).

His writings in library science cover a wide spectrum to encompass its history (which he felt gives a proper perspective and depth to theoretical library science), its philosophy, its scientific status, its professional deontology (including censorship and intellectual freedom), user studies, comparative literature for librarians and the academic preparation for a

professional career. This patent versatility has led one writer to compare him favourably to Ranganathan in an international perspective (Montgomery, 1963: 366).

De Vleeschauwer holds well-defined views of the library. His perception of the library as a cultural and humanistic social institution as distinct from a utilitarian and mechanical agency permeates all his writings. This view is illustrated in the contention that "A library is not an abstraction but a unit within the intellectual framework of a particular nation" (1966: 7; cf Butler-5.1). The library's increasingly important role in the intellectual world attracted him as a philosopher and educationist to study library science (Iben, 1962: 308).

De Vleeschauwer's philosophical views provide a context for understanding more fully his writings on library science. The epistemological position he develops in his philosophical work permeates his perception of the purpose of the library.

His formally epistemic views and his specific epistemological position are discussed to clarify this perception. His three longest works on Kant comprise 1 700 pages and constitute one of the most valuable contributions ever made to Kantian literature (Van Jaarsveld, n.d.: 9). In his The development of Kantian thought, he offers a peer-acknowledged historical account of Kant's intellectual life (1962a: viii).

One of De Vleeschauwer's other major works is a multi -
volumed history of philosophy in the West. He claims that
Western philosophy had its basis in the concern for the physical
world rather than in the concern for God or for man (n.d.: 6).
He also claims that epistemology originated in Spanish
scholasticism when reality and thought were divided into two
separate worlds and their necessary correspondence subjected to
formal proof (n.d.: 55).

He poses the fundamental problem of epistemology as follows:
How can we show, by analytical/demonstrable or rational/
scientific means, that our objective representations correspond
to such an extent with transcendental reality that these
representations may be regarded as adequate? (1952: 243).

In De Vleeschauwer's own attempt to resolve this problem it
is suggested that knowledge results from a relationship between
subject (the person's mind) and object, and that it becomes
manifest as judgements that are objective, universal and
necessary (cf 4.3.2 for other conceptions of "knowledge").
Importantly, he believes that epistemology, which recognizes the
limitations of human knowledge, is always aware that the logical
order is contained within, and by, an anthropological order
(1952: 247). In this respect he states:

"... die hele problematiek van die waar- en valsheid
leë in daardie intieme kontak van die logiese met die
antropologiese opgesluit" (1952: 247).

De Vleeschauwer's own epistemological position is a
perspectivistic one which serves as a foundation and explanatory
principle for the multiplicity of truth perspectives (cf 4.3.4).

None of these perspectives is superior to the other, and they stand in harmonious relation to each other (1952: 267). Perspectivism affirms a pluralistic world-view as distinct from a monistic one. It is characterized as a principle of tolerance for differentiation in viewpoints. It is also a principle of mutual understanding and mutual respect which recognizes that our mental lives reflect a persistent state of tension between rationality and irrationality and excludes a perfectly complete knowledge of all that is (1952: 269; cf also 8.1 for a fuller discussion of perspectivism).

Rauche, who studied under De Vleeschauwer, clarifies further the notion of perspectivism. He maintains that our knowledge of the truth is perspectival and that in our search for knowledge we are confronted with more than one kind of knowledge, for example, moral knowledge, aesthetic knowledge and religious knowledge (1983: 26). These types of knowledge are methodologically constituted and reconstituted in the form of varying theories and in terms of man's changing experience of reality. No single method may be absolutized, although it is in point of fact the method which is the truth-function of knowledge (1983: 29). In this view, the scientific method is simply another man-made method that recognizes the human mind as the critical denominator in all human truth. Truth-perspectives change in accordance with man's historically changing world consciousness (1983: 31). This insight is antithetical to that underlying dogmatism and encourages modesty, tolerance, open-mindedness, respect and goodwill among people in their exchange of ideas. Rauche maintains that it is upon this ground of contingent experience of

reality that the dialogue about truth continues in the natural sciences, in history, in philosophy, in theology and other types of knowledge (1983: 32).

In his studies of library science as a science, De Vleeschauer sets forth a general philosophical investigation of the library as part of a larger phenomenon, namely, the means by which all human thought can be communicated in writing (1960: 3). He asserts that, with a true library theory, library science cannot be denied a fixed and assured place in the globus intellectualis of contemporary thought. This, it is contended, can only be achieved if researchers concentrate on library science as a whole rather than on library practices and techniques (1960: 132).

De Vleeschauer contends that library science is 'scientific' (that is, in the broad Germanic sense of Wissenschaft) in essence. It cannot be categorized as an exact natural science in accordance with a positivistic conceptual framework, as Butler sought to do (1960: 97; cf 5.1). De Vleeschauer presents a clear description of his conception of the criteria for a science. When he applies these criteria to library theory, he proposes that we should be able to:

- (i) describe the elements of which librarianship as a multifarious phenomenon is composed;
- (ii) determine the universal and formal nature of the phenomenon as a whole;
- (iii) explain its complex causal nexus;
- (iv) show that the present-day library is the dynamic culmination of an evolutionary process; and

(v) show that the professional aspect of the library conforms to an ethical and professional deontology (1960: 24).

He proceeds to demonstrate that library science fulfills these criteria, thereby qualifying as a "mental" science rather than a "natural" science in the globus intellectualis. He states:

"In its particular objective content the library remains a mental phenomenon. The library is materialized mind both in essence and in practice; both in its aim and in its utility" (1960: 239).

He conceives of "mental" science as a genus, and assigns library science to some species thereof, namely, the cultural sciences (1960: 240).

Criterion (ii) above is formulated in terms of the possibility of generalization of library theory in respect of time, place and observer. In this regard, De Vleeschauwer seeks to discover the central object or dynamic of the library as a whole around which all the others may be grouped. This central object, he submits, will of necessity be both general and indefinite: general, since it is the unique, central theme with which every aspect of the library is connected; indefinite, since an additional characteristic should be assigned to it in order to transform the general object into a library object (1960: 41).

Having thus characterized the central object, De Vleeschauwer identifies it as the transmission of ideas through the instrumentality of books. This is:

"... the universal idea underlying each concrete aspect of the library... it may be an object of scientific reflection since its universal nature is based on a function which is general, and independent of time, place and human observers" (1960: 44).

This central object satisfies the criterion of universality required by science. His conviction that this central object supplies library science with unity and internal coherence leads him to reject a library science based on precepts which govern individual processes, such as the injunction of giving the reader the book that he requires as quickly as possible. Such professional pragmatism, he contends, fails to account for library thought as a whole (1960: 99).

In his discussion of the ethico-deontological aspect of library science, De Vleeschauer identifies and discusses four purposes of the library, namely:

- (i) the individualistic;
- (ii) the sociological;
- (iii) the pedagogical; and
- (iv) the objectivistic.

The individualistic approach views the library as a place that allows the thinking individual an opportunity for freedom of thought (1960: 65). This approach is similar to that of Broadfield, as expressed in the latter's Philosophy of librarianship (1949). It sees the library as serving individuals rather than communities.

The sociological, or socialistic approach, restricts the library to a reflection of the views of the authorities in control of the community. This approach aims at establishing certain norms and ideals as the homogeneous basis of a unified body of communal thought through careful selection, and even censorship of literature (1960: 66). In this conception, the library promotes and protects a "way of life", such as, for example, "the American way of life".

The pedagogical concept of the library is closely connected with the previous one and aims at the provision to adults of opportunities for acquiring culture and professional training. In this approach the library considers itself as part of the educational structure of a particular community and believes that it has the social duty of educating the masses, and moulding people into "useful and innocuous members of their respective communities" (1960: 67).

None of these three approaches resolves the individual versus community problem and they are inadequate in accounting for the pluralistic character of present-day society which the library serves. De Vleeschauwer sets forth his own approach, which he calls "objectivistic". This approach claims that the library should take no stand on the problem of the individual versus community, nor should it hold any representative opinion. The library should aim at being a complete record of intellectual life. It can only rise above the controversies raging in the world and embody the regard for the freedom of human personality if it remains neutral and, instead of assuming a doctrinal

attitude in the world, "gives proof of a noble eclecticism and of a high degree of intellectual many-sided and wide interests" (1960: 216).

As an individual, the librarian should hold his own opinion, but in a professional capacity, he should build up his library as an actively neutral institution supplying all the contending parties with intellectual weapons. The library should be allied to neither the East nor the West in any single-minded sense. As an instrument of civilization it should recognize only the authority and purpose of serving the intellect and the free personality. This is an objective authority and not the subjective conviction of an individual, a community or some other social force. This forms the basis for his objectivistic concept of the library, in which it reflects the pluralistic intellectual life of its community and pursues a policy of ideological neutrality.

By pluralism, on which democracy is based; De Vleeschauer means the recognition of diversity and individuality which are entitled to certain inalienable rights and liberties (1959: 63). He maintains that the whole of creation up to and including the human mind is built on the heterogeneity of genera and species, that is, on pluralism (1959: 66; cf 5.26 for Harris' view of a pluralist ontology in library and information science).

In this objectivistic view, the library is the handmaiden of the objective mind and the human personality, of responsible citizenship and intellectual freedom, and of the fundamental principle of tolerance (1962b: 42).

The objectivistic approach reflects De Vleeschauer's epistemological position as it is developed in his philosophical writings, that is, perspectivism. It is quite possible that if he had concentrated his mental energies on the epistemological foundations of library and information science, he would have developed his perspectivistic epistemological position within this objectivistic framework. He affirms that the library's primary duty is to be an institution of veracity, which in its written content objectively reflects intellectual life by displaying a many-sided interest in it, and by admitting all ideological trends without taking an active part in the ideological feuds of the country (1960: 69; 1961: 206). He speaks of an adequatio bibliothecae et idearum, declaring that the greater this adequatio is and the more fully the library can achieve it, the more true it will be to its own nature and aims, and the better it will fulfill its modern function (1960: 70).

De Vleeschauer's conception of culture emerges in a historical analysis of a fundamental duality in librarianship. He traces this duality to a schism in intellectual life, namely, the liberal principle of individual freedom and the socialistic principle of equality which led to a duality in culture, that is, between active creation and general culture (for other views of culture, cf 4.4.3). Active creation implies scientific culture or participation in research. General culture has a more passive meaning, namely, the contemplation, evaluation and enjoyment of someone else's creative work, whether literary or scientific (1964: 33).

This duality led to the emergence of the learned library on the one hand and the public or "reading" library on the other. Culture lies at the heart of the policy which should be adopted by the public library since the library emanates from, and reacts upon culture (1960: 240; 1961: 238). All the other library objectives serve merely to stimulate in the public an interest in culture, on the assumption that all books are instruments for the betterment of the mind (cf 4.4.3). De Vleeschauwer claims that culture cannot be organized and he objects strongly to a "cultural policy" which can be used by the state to its own political ends (1959: 73).

As an integral part of the social reality, the library embodies the principles of tolerance and freedom. It does not stand in isolation from the world, and yet it stands aloof from any sectional outlook or specific dogma. For De Vleeschauwer the library is a place of "... tolerance and of pure, unalloyed intellectual culture and superior humanity" (1959: 162).

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5.4 MACHLUP, F. (1902-1983)

As an economist, Machlup was interested in the production and distribution of knowledge in modern society. His work has been and still is of considerable importance and of provoking interest to librarians and information scientists. His comprehensive study of information (co-authored with Mansfield) offers valuable insights to librarians and information scientists

of the nature of information and the relationship between library science and information science (1983). Harmon considers him an iconoclast who sought to "rid the study of knowledge of its mystic baggage, folklore, and semantic confusion..." (1982: 235).

Machlup's analysis of the notions of knowledge, information and information science should be seen in the context of his encyclopaedic effort at developing an economics of knowledge. Following upon his earlier work, The production and distribution of knowledge in the U.S.A., published in 1962, Machlup initiated a research project on several aspects of the economics of knowledge. The initial project envisaged eight volumes, but was later expanded to ten. He died while working on volume four, which is an interdisciplinary study of information (Machlup & Mansfield: 1983).

Machlup rejects certain distinctions in meaning between information and knowledge (cf 4.3.5.1). He proposes that we should avoid the "redundant phrase 'knowledge and information' when both are meant to signify contents" (1980: 9), posing the question:

"Is there any tradition or any philosophically sound reason for such discrimination between knowledge and information where their contents are the same or both refer to the same contents? All information, in the sense of the contents conveyed, is knowledge..." (1980: 58).

Machlup's concern with the concept of knowledge and the need to re-fashion it in the modern knowledge-based economy reflects his underlying conviction that certain "kinds of knowledge are instrumental in increasing the efficiency of the economy" (1980: 6).

He identifies five types of knowledge, viz, practical, intellectual, ephemeral, spiritual and unwanted (1980). Miksa suggests that these categories of knowledge present a "useful framework for thinking about and tracing the development of the modern library" (1985: 170). Miksa does not, however, carry any further the implicit suggestion that the different categories of knowledge result from different ways of knowing which, according to Machlup, is precisely what epistemology studies (1980: 27).

For Machlup, library science is a sub-field of information science (cf 4.4.2). Furthermore, library science is viewed as being empirical in all its aspects (1983: 16). Machlup does not, however, restrict information science in this way. Harmon contends that Machlup was "intensely dedicated to the task of broadly defining information science and its relation not just to economics but to the sum of human knowledge" (1987: 227). For this reason, he proposes, together with Mansfield, four views of information science (1983: 18; cf 4.4.1.2). First, it may be considered as the systematic study of information which involves all or any combination of a number of academic disciplines. Second, in its association with computer science, it may denote the study of the phenomena of interest to those who are concerned with computers as processors of information. Third, in library

and information science, it indicates the application of new technologies to traditional practices of librarianship. Fourth, it may be perceived as the intersection of newer technologies with a special interest in improved communication of scientific and technological information (ibid.). In its association with library science, it is seen as concentrating on improving its technical aspects only. Rayward points out that the fourth view which holds that information science is the intersection of newer technologies, and which is also a combination of the other three views, is one that is currently emerging strongly (1985: 120).

Machlup views library and information science in a narrow sense in which the incorporation of information science into library science consists "...merely of teaching the students to use a new tool, the computer (1983: 21).

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5.5 SHERA, J.H. (1903-1982)

Shera has been described as a fundamental thinker - one who tried to trace the foundations of his foundations (Bekker, 1984: 15). The word "foundations" was a favourite one in his vocabulary (Rawski, 1973: 353).

He was inspired by the notion of reconciling library science with information science under "a unifying theoretical cover" (Brookes, 1973: 234). According to Shera, library science and information science have been concerned, mistakenly, with individual systems and both lacked any general theory. His ideas on the articulation of such a general theory do not always appear to develop in a logically consistent manner. Brookes has suggested an explanation for this: that Shera's several essays were written "at various times for a variety of purposes and occasions" (1973: 234), which seems a fair and perceptive comment.

Shera locates the central problem for libraries and information workers, namely, the "maximization of the social utility of graphic records", in a larger social context. (The ostensibly confined term "graphic", incidentally, seems unfortunate since it excludes in the literal sense other possible

sources such as, for example, audio-visual material, while this was clearly not Shera's intention). In this larger social context the assistance of scholars from other academic disciplines is valuable, but it is left to librarians and information scientists themselves to synthesize the results of interdisciplinary scholarship (Shera, 1966: 75).

The notions of unity and synthesis feature strongly in Shera's writings. For example, he observes that "fragmentation" and "centrifugation" are tendencies resulting from the increase in volume and complexity of man's knowledge (1965: 15), and that what is needed to counteract these tendencies is "a powerful cohesive force" (ibid.). He contends that this force can be exerted by the communication system operating in civilized society.

To this end, Shera, together with Margaret Egan, developed what they called a "theory of graphic communication" in which communication is conceived as an instrumentality as distinct from an end (1952: 129). In this conception, the dynamics of bibliographical control is considered one such instrumentality of communication. Bibliography is seen in its macrocosmic view as distinct from its microcosmic view which emphasizes "each bibliography as a separate tool fashioned to meet the specific needs of a limited number of persons with more or less common interests" (1952: 125).

In this way, bibliography (conceived in its widest sense) and communication merge to provide the essential elements for a possible line of study that investigates human intellectual development as recorded in documents (ie, "the generic document"). Shera and Egan named this discipline social epistemology which, they envisaged, would become an academic discipline in its own right and a core subject in the education of librarians (1956: 8). This discipline would have its own "corpus of theoretical knowledge" as well as one of "practical aspects" (1970: 87-8). Brookes views his own bibliometric studies as the development of the quantitative aspects of what he refers to as Shera's "theory of bibliography" (1973: 240). He states that the initial work in developing the practical aspects of social epistemology was undertaken by information scientists because they "were more familiar with general theories, with the construction of theoretical models and with the required techniques than are most librarians" (1973: 241). However, he does add that the development of social epistemology offers common ground for librarians and information scientists to cultivate, together, a unifying concern which holds out the promise of an ultimate reconciliation between the two disciplines (1973: 245).

What exactly is meant by social epistemology is uncertain. The several descriptions of this phrase in Shera's writings reflect ambivalences and a lack of clarity. For example, it is variously and disparately described as:

1. "... 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" (1952: 134).

2. "... 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" (1952: 135).

3. "... social epistemology... should lift the intellectual life from that of a scrutiny of the individual to an enquiry into the means by which a society, nation, or culture achieves an understanding of the totality of stimuli which act upon it. The focus of this discipline should be upon the production, flow, integration, and consumption of all forms of communicated thought throughout the entire social fabric. From such a discipline should emerge then, a new study of knowledge about knowledge, giving rise to a new synthesis of the interaction between knowledge and social activity, or, if you prefer, social dynamics" (1970: 86).

4. "The emphasis of social epistemology falls on the whole man and the whole society, and all their ways of thinking, knowing, feeling, acting and communicating" (1968: 24).

These several descriptions fail to delineate in an unambiguous way the precise scope and meaning of social epistemology. Shera did contrast it with the sociology of knowledge by stating that the sociology of knowledge concerns the conditioning of knowledge by social ideas, while social epistemology is conversely concerned with the impact of knowledge upon society (1970: 107). (It is interesting to note in passing Fuller's observation that in formal philosophy, social epistemology is currently viewed as the result of a reconciliation of normative philosophy of science and empirical sociology of knowledge (1988; cf 2.1 for the traditional conception of epistemology)).

Despite the lack of clarity in his definition of social epistemology, there is little doubt regarding Shera's conviction that librarianship is truly based on epistemological foundations, "because it deals with the nature of knowledge and the utilization of that knowledge by men both individually and in groups, that is, collectively" (1970: 88). Here, as elsewhere, it is to be noted that he generally prefers the term "knowledge" to that of "information" since knowledge encompasses information (1983: 382; cf 4.3.5.1.2). This allows him to stress that librarians deal primarily with ideas, concepts and thoughts, and only incidentally with "things", that is, "things that can be measured, weighed, poured fastened, or mixed together" (1983: 384). The juxtaposition of a primary emphasis on ideas and a secondary emphasis on "things" should be viewed in the light of Shera's sustained argument for a holistic view of librarianship so that it encompasses, according to Wright, the "... immaterial realities (ideas) and physical instruments (data)..." which interact as two great halves "... to create the unity of one great whole" (1988: 38). For Shera, knowledge is conceived in its broadest possible sense. In a statement on the unified, cohesive, holistic nature of knowledge, he declares unequivocally:

"I submit that knowledge is unitary; that the world of knowledge is a unity..." (1970: 100).

Shera also views culture in this broad sense. For him, culture is a duality of action and thought, and should be understood in its several manifestations throughout history and throughout the world (1970: 89; cf 4.4.3 for other notions of culture).

It is perhaps curious that in one of his last essays, which reflects the mature culmination of his life-long ideas about librarianship and information science, no mention is made of social epistemology at all. He suggests in this essay, instead, that librarians should look to "symbolic interactionism" for the proper foundation of a theory of librarianship instead of expecting it to come from information science (as he had once mistakenly thought it would) (1983: 386). Whether Shera abandoned social epistemology in favour of symbolic interactionism, and whether there are any fundamental connections between the two fields, is not sufficiently clear. Wright suggests that Shera's injunction that librarians should look to symbolic interactionism for a proper foundation of a theory of librarianship affirms his consistent reminder that librarianship's primary area of concern is that of social phenomena rather than natural phenomena (1988: 48).

What clearly does pervade Shera's writings in the ultimate sense, however, is the thought that the librarian's bibliographic and information systems should conform as closely as possible to man's use of recorded knowledge (in the generic document). For him, the unique purpose of the library is to bring the human mind

and the "graphic" record together "so that people may understand the totality of the environment in which they find themselves and their own place in it" (1983: 387).

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5.6 FAIRTHORNE, R.A. (1904-)

Fairthorne, a trained mathematician, began applying his technical knowledge to the study of the theoretical foundations of the classification and communication of information while he worked for the Royal Aircraft Establishment (Coblans, 1974: 129). Perhaps predictably, one of his early articles dealt with the mathematics of classification (1947). In this article he outlines, amongst other things, the limitations of Aristotelian classification for libraries, ie, the restricted utility of genus-species relationships for effective arrangement of library materials (1947: 35). Some of his essays relating to library and information science culminated in a monograph entitled Towards information retrieval (Fairthorne: 1961).

In his theory of communication, Fairthorne reserves for information a strict, technical meaning, that is, its narrower sense as interpreted in Shannon's mathematical theory of information (1954: 255; cf 4.2.2.2.1). Much later, in a more skeptical vein, he submits that the word "information" is no more than "a linguistic convenience that saves you the trouble of thinking what you are talking about. Fortunately one does not have to use the word. Always, if we put our minds to it, we can say what we mean" (Quoted in Cawkell, 1987: 1).

While it appears that he is vague - and perhaps even ambivalent - about the meaning of information, there is no such ambivalence in his view of the purpose of information retrieval. Bohnert contends that, from the beginning, Fairthorne maintained

the proposition that retrieval is a social process and that, consequently, he targets the user as the emphasis of all retrieval systems design (1961: xiii). Whether the user should receive the actual knowledge or information contained in the document or merely the document itself is another issue that is unclear from Fairthorne's writings. For example, he challenges Nitecki's view that knowledge is the subject of study of library science, taking "discourse" to be that subject (1968b: 363; cf 5.14). He proposes that the difference between the two can be explained as "being informed about a document" (Fairthorne's conception) and "being informed by a document" (Nitecki's conception). However, in the same essay on the limits of information retrieval he demonstrates the need for the information retrieval system to select those documents with true statements rather than those with false statements (according to the precepts of formal logic). He submits that the factors that govern this situation are ignorance and chance (1968b: 366).

Regarding the intellectual foundations of information science, he contends that physical analogues, that is, references to mass, time, space and electrical charge are necessary but not sufficient to explain the informational situation. Despite his wide knowledge of technical applications to library operations, and perhaps because of it, he advocates careful and limited application of "automata" to library problems, warning against the expectation of "sensational advances, suggested by diluted analogies between control mechanisms and multi-purposed institutions" (1961: 21). Fairthorne's cautious approach to the application of the methods of the natural sciences to library

problems and his emphasis of the user in retrieval system design reveal a necessary professional tolerance of more than one epistemological approach to library and information science. He states that basic theory should determine the nature of practice, otherwise librarians:

"... will be unable to supply a formal key to the lock, but will continue as before to tamper with the lock to fit their favourite keys" (1975: 13).

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5.7 COETZEE, P.C. (1905-1987)

Coetzee, who also served as honorary editor of South African libraries between 1960 and 1968, distinguished himself as a stimulating polemicist in debates on the more fundamental issues of library and information science theory (Kesting, 1969: 77). He developed the conceptual frameworks for subdisciplines which have since been incorporated in the basic professional programmes for education for library and information science at some universities in the Republic of South Africa, most notably those of readership ("Leserkunde", or User Studies), and the study of science as an aspect of the cultural infrastructure of modern civilization (1977a; 1978a).

Coetzee's early concern with fundamental issues is evident from an essay produced more than fifty years ago in which he expresses the view that most writings about libraries at the time were "pretentious and unsatisfactory" (1935: 40). In that early essay he calls for a professional philosophy that would account for the purpose of the library and its function within an organization.

Taken as a whole, Coetzee's writings embrace both practical and theoretical issues of library and information science. For example, he wrote a guide to the preparation of scientific documents, and made several significant contributions to the subject analysis and bibliographic description of documents (1956; 1962a).

Although Coetzee developed a distinctive epistemological position in his doctoral thesis, written in 1952, there is no evidence to show that he was contemplating the application of these views to the study and practice of library and information science. His doctoral thesis wrestles with a basic epistemological problem, namely, the possibility of the human mind to grasp an object external to itself (1952: 4). He contends that attempts to resolve this problem have concentrated essentially on three aspects:

- (i) the nature of transcendental reality;
- (ii) the structure of the mind ("gees"); and
- (iii) the status of the object which the mind comprehends (1952: 4).

The emphasis on one or the other of these three aspects has given rise to three methods of approaching the knowledge problem as well as to several other philosophical problems (1952: 5). These methods are those of:

- (i) abstraction;
- (ii) transcendental deduction; and
- (iii) reduction.

Coetzee postulates that these three methods complement each other. He then proceeds to examine the metaphysico-epistemological concepts of "meaning" and "reduction" in the work of Edmund Husserl and Nicolai Hartmann. This examination culminates in the endorsement of the claim of

Hartmann, a German realist philosopher, that no modern epistemology is possible without a metaphysical foundation (1952: 182). He proposes that any valid epistemological position should explain the notion of transcendental reality in a satisfactory manner. Transcendental reality, for Coetzee, derives from Kant's idea of transcendentalism. This term is used of any philosophy which resembles Kant's in being based upon the recognition of an a priori element in experience (Shorter Oxford English dictionary, 1965: 2229). Kant had demonstrated that there was a very important class of ideas which did not come by experience, but through which experience was acquired instead (Acton, 1967: 114).

It is Hartmann who holds that the epistemic relation between knower and known is really an ontological relation between one being and another; accordingly, the problems in epistemology are, or issue in, problems of ontology (Cerf, 1967: 423). Following Hartmann, Coetzee posits the following metaphysical presuppositions for his epistemological position:

(i) there is a transcendental reality which is made subjective through meaningful representation;

(ii) there is partial overlapping of the categories of knowledge and reality which makes it possible to know a certain part of reality, and

(iii) there is an immanent or intersubjective identity of knowledge categories which makes it possible for one person's knowledge to correspond with (as distinct from being identical with) that of another (1952: 201).

Coetzee characterizes the resultant epistemological position as one of perspectivism, having argued that the consistent accumulation of knowledge broadens one's perspective, thus facilitating the formation of new convictions to substitute those presently held (cf also 8.1 for a more detailed discussion of perspectivism). There is a remarkable correspondence between the ideas of Coetzee and those of De Vleeschauer (cf 5.3). Both produced doctoral dissertations in philosophy. De Vleeschauer's dissertation (1951) preceded that of Coetzee (1952) by just one year. Furthermore, both De Vleeschauer and Coetzee subscribe to a perspectivist epistemological position, but as far as can be determined, they arrived at their positions independently, although De Vleeschauer emigrated to Pretoria, South Africa, the city of Coetzee's entire professional career, in the early post World War II years.

It is essential to note that Coetzee was a pluralist who recognized the distinctness of several realities. He did not endorse the classical view of reality as an organized whole, with patterns subsisting independently of the subjective observer, but believed instead that the subjective individual knows only his own world of experience which is woven from several states of contexts into that of a total context (1978b: 8). He claims that there are spheres of reality to which different sciences subscribe, namely, the inorganic, the organic, the psychic, the mental and the idealist (ie, in the Platonic sense, viz, that of formal Idealism) (1978: 24). It is only within these autonomous realities that individual sciences (both natural and social) attempt to form a coherent whole (1977a: 27). Coetzee

distinguishes his pluralist outlook from Western thinking, which he characterizes as being prejudiced towards holistic or monistic solutions (1978: 8).

In an address to the Philosophical Society of South Africa, Coetzee proposes that the mind ("gees") constitutes a reality with its own structure which is neither material nor psychical, and which inheres in a community of minds, sometimes referred to as the social reality (1959b: 17). He describes this mind as a sineidetic reality (Greek sunoida: "to see collectively"). Sineidetic reality (an ontological system) exerts an educative influence on the community. The potential of such influence is qualified by the nature of the interchange between individuals as sharers and receivers of ideas. Politicians, statesmen, teachers and other vocational groups who convey the ideas of the community act as instruments of this system. Although it is not stated explicitly, and while there are no references to Popper, Coetzee's sineidetic reality or "mind" bears clear resemblances to Popper's "third world" of objective knowledge (cf 5.10). Coetzee regards the discovery of this reality as the most profound achievement of twentieth-century philosophy (1959b: 25).

To appreciate Coetzee's insights more fully it is necessary to understand his use of the terms "enculturation" and the "record". Coetzee holds that the library is a cultural instrument and that its functions are derived from its cultural character (cf 4.4.3 for other views of culture). Libraries strive to perpetuate culture and the cultural progress of a

community (1962b: 6). He traces the roots of the term "culture" etymologically, showing that it originally referred to a process that connotes improvement, even ennoblement. He maintains that the term was originally associated with an intimate knowledge of the works of Latin and Greek writers (1959a: 12). Culture is viewed as that force that supplies uniformity of thought and actions in a community. It is closely associated with education since individuals have to be inducted into the ways of the group to which he/she belongs. Coetzee infers three functions from this conception of the library as a cultural instrument, namely:

- (i) the preservation function;
- (ii) the documentation function; and
- (iii) the sineidetic function.

The sineidetic function, which is absent from subsequent discussions of the library's functions, bears certain resemblances with and differences to education. Whereas education requires a teacher and a student, this function simply presumes the individual's exposure to ideas. The individual is in the position to extract from literature those ideas and opinions that lead to his personal development (1959a: 17; cf 3.4).

In a later essay on the functions of the library, Coetzee retains only the documentation function (of the set of three proposed in 1959), and adds to this a social function (1962d: 122). These two functions, according to him, serve the needs of researchers and lay readers respectively in their attempts to

construct or discover aspects of reality (1962b: 8). It is especially the lay reader, or Homo legens vulgaris, whom the librarian should assist in discriminating between good and bad literature (1953: 66).

Since the library is an indispensable instrument for cultural progress and the self-development of the individual, enculturation is viewed as that process whereby an individual acquires the conceptions, the customs and the behaviour patterns of the group (1950: 2; 1975: 6). Enculturation takes place when a person "picks up" the ethos (a relatively constant system of beliefs and attitudes) and mores (a relatively constant system of behaviour patterns or folkways) of a group. Enculturation is a life-long process and differs from formal education in that it is more spontaneous and is initiated and maintained by the individual's desire to be part of the group (1966b: 30). He says:

"Enkulturasie is... 'n opvoeding deur voorbeeldstelling en voorbeeldnavolging eerder as 'n opvoeding deur onderrig" (1968c: 40).

The librarian should become a "culturologist", who studies the culture, or cultures, of the community he/she serves, with two ends in view: "firstly to discover what books will be most acceptable to those cultural groups; and, secondly to find a means of raising the general cultural level of the group or groups concerned" (1975: 10). For Coetzee, this enculturative function of the social, or public, library, is far more important than its educational function (1975: 8).

Coetzee uses the term "record" to describe the essential features of library science. It is not clear whether he draws a distinction between library science and information science, but he does say that the profession of information scientist began because librarians were unprepared for the task of specialized retrieval of information (1967b: 41). The fundamental core of library science, Coetzee claims, is the problem of storage and retrieval of the record of human experience, learning and imagination, which unites it into an integrated whole. Stated more succinctly, it is the science of the record (1972: 170). He defines science (as Wissenschaft) as follows:

"'n Wetenskap is 'n menslike onderneming wat, uitgaande van 'n bepaalde probleem of groep probleme, daarna strewe om feite te ontdek en te beskryf, met die oog op 'n verklarende insig" (1965a: 105).

This view of science as an enterprise of living men initiated by an interest in a fundamental problem was proposed by the pragmatist philosopher Charles Sanders Peirce (1931-8).

The record is an organic extension - an objective, collective memory of the cultural community, and its conservation and organization for use is the fundamental problem of library science (1975: 78, 117). This record exists mainly in written form and may be divided into the record of act and the record of learning (1962a: 55). The record of learning is of greater importance for subject cataloguing and documentation, and should not be confused with "facts" or "knowledge", which are terms that Coetzee associates with truth and ultimate reality. He declares: "Although [we] may claim to know... a very large number of facts, only bold metaphysicians will pretend to

knowledge concerning the ultimate nature of the universe of facts (that is to know what it really is)" (original emphasis) (1962a: 56).

To explain what is meant by the record of learning, Coetzee draws a sharp distinction between facts, scientific research and the record of learning. He states:

"We are concerned with three sets of realities: a universe of facts, a considerable part of which forms the external world; a universe of research consisting mainly of men engaged in trying to discover more and more of the facts; and, a universe of learning consisting of the notions of men" (1962a: 56).

The record of learning exists both in the subjective mode (in the minds of men and women) as well as the objective mode (on the shelves of libraries) (cf 4.2.2.2). Methods are required to supply from the record of learning in the objective mode those parts that are relevant to the scientist's or individual's needs. The discovery of these methods rests on an understanding of the workings of the human mind and memory. Coetzee says that it is largely a matter of relations. The process of scientific thinking starts with an image which may be regarded as a relatum (or point of support of a relation). Other relata are brought into the consciousness in order to form a whole. When certain important relata are absent from the memory, research is initiated in search of the "missing parts". Coetzee contends that this process has to be duplicated if we are to succeed in making the contents of the record of learning available to students, scholars and scientists (1962a: 58).

Although Coetzee favours a scientific approach to library and information science, his conception of science is not a narrow, method-related one. He demonstrates the value and the validity in certain aspects of both the inductive and deductive approaches (1959a: 11). He also recognizes the shift from internal approaches to external approaches in library and information science research, which stresses the goals of libraries and information centres rather than their internal operations (1962c: 41). While libraries cannot afford to remain out of touch with the times, the blind acceptance of a modern materialist-oriented scientific approach over humanistic scholarship cannot benefit research in library and information science (1965b: 121; 1965c: 34). Human studies form the intellectual basis of library and information science. Coetzee demonstrates that the historical separation of natural science and humanistic scholarship in the late eighteenth and early nineteenth centuries gave rise to a "cultural disinheritance" (1975: 12). Human life lost its meaning, and communication barriers developed between scientists and non-scientists, and even between groups of specializing scientists. In these circumstances the important task of the public library is to restore a general frame of thought and assist the layman and the scientist to find meaning in life. The need to counteract "cultural disinheritance" and preserve the "whole" should be realized in collaboration with other social institutions (schools, universities) and groups (authors, publishers, teachers) (1975: 12).

Library science, according to Coetzee, like other sciences (both natural and social), has its unique worlds of facts and means (1975: 117). All the sciences together exist as a commonwealth, or, plurality of institutions (1977a: 13). Coetzee's study of the sciences, or, "wetenskapkunde", is different from Shera's social epistemology (cf 5.5). The goal of Coetzee's study of the sciences is not the apprehension of knowledge about knowledge, but rather of the truth, or many truths, regarding the sciences (1977a: 15). Coetzee finds Shera's use of the term epistemology misleading, and asserts that what is meant by Shera is really an empirical study of the sciences as social phenomena, that is, a "Wissenschaftskunde" (1966c: 155). This is probably due to Shera's imprecise and half-contradictory definitions of "social epistemology" (cf 5.5). Coetzee points out that Shera's notion of social epistemology was preceded by Butler's "history of scholarship" (acknowledged by Shera in 1960), by the "literary history" of Bacon (whom Coetzee claims as the father of social epistemology) and by the ideas of Peirce (1966c: 156).

In an essay on the "two faces of librarianship", Coetzee contends that Shera's social epistemology may serve as a foundation for documentation (which Coetzee confines to the research library), while the social function of libraries requires for its foundation a "culturology of readership" (user studies) (1975: 9). He envisaged two separate branches of library science based on each of these concepts which would have a common foundation in a more basic science of communication, and would study two aspects of the same fundamental phenomenon (1975:

10). Coetzee's ideas on communication, which are developed systematically in his writings on user studies ("leserkunde"), take into consideration the reality of communication as it is experienced by everyone rather than the literature of communications research (1975: 253). Communication, for him, is essentially a dialectical process in which the sender (act of expression) and receiver (condition of understanding) constantly switch roles (1975: 256).

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5.8 MIKHAILOV, A.I. (1905-1988)

Mikhailov, a Soviet writer, played a significant role in the development of informatics in the Soviet Union. He and his co-author, Giljarevskii, associate the notion of informatics with documentation, and state that "... informatics studies the laws governing all forms of information activities, as well as their theory, history, methodology and organization..." (1969: 21). Houser, however, contends that by information Mikhailov means scientific information, and proceeds to reformulate the definition of informatics as "... that scientific discipline that studies the structure and general properties of scientific information and the laws of all processes of scientific communication" (1988: 17). For Mikhailov, scientific information must be qualitatively scientific and meet all conditions of scientific conceptions, ie, it excludes nominally scientific information, for example, a newspaper report that may be of interest to natural scientists (1988: 480). It is important to note that Mikhailov's notion of informatics also differs from that of Gorn. Gorn views informatics as computer and information science (1983: 121; cf Machlup's conceptions of information science: 5.4).

While for Mikhailov informatics is dedicated to a study of scientific communication, he maintains this understanding that it is "not concerned with the determination of truth or falsehood of information..." (1969: 14). Whether he rather associates truth or falsehood as qualities of knowledge is unclear, although it should be noted that he draws a distinction between information and knowledge by declaring that information does constitute a certain form of knowledge that exists when this knowledge is alienated from its carrier (in particular, from its producer) and is materialized in the form of a document (1983: 14; cf 4.3.5.1.2). He asserts that not every piece of knowledge can be materialized, and not every social structure needs to transform knowledge into information (1983: 15).

Mikhailov reasons that the quality of knowledge/information attained through direct experience (for example, that of a scientist in a laboratory) is superior to that gained via the agency of a document. In this way he accounts for the difference between information (as manifest, externally observable signals) and information (as knowledge). The former is studied by disciplines belonging to the cybernetical group, and the latter by information science and semiotics (1983: 16).

In the absence of an explicit statement in his available writings it is conjectural whether Mikhailov expanded his view of informatics as the study of scientific information to the study of information as knowledge, but in a later article he uses the term information science rather than informatics. He views the

task of the information scientist as the creation of an information environment, and its expansion according to preference to the community of adequately informed users according to their importance to social production (1983: 17). Information science should engage itself in the removal of obstacles surrounding the creation and expansion of the information environment, such as growing paper prices, volume of information, complex relationships between sciences, industry and the economy at large. He contends that because of this complex context, information science is multi-faceted.

It is not easy to draw any firm conclusions from Mikhailov's writings, but it is evident that his conception of informatics favours a narrow emphasis on scientific epistemology, albeit within the general framework of dialectical materialism (1969: 15).

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5.9 FARRADANE, J. (1906-1989)

The Polish-born Farradane, an eminent classificationist, wrote under the name of Lewkowitsch until about 1940. His several writings may be subdivided into two broad categories. The first category contains his ideas on the organization of materials which extends to essays on library classification as well as to original insights into "relational indexing" (1980c: 267). The second category encompasses his attempts to explain the nature and scope of information science as a discipline as well as to develop its theoretical basis. While articles in the second category provide relevant material for this study, they also contain ideas that are seen as a natural progression from the seminal ideas expressed in earlier writings from the first category.

Farradane's concern for the provision of a complete classified record of scientific literature is traced back to an early essay (Lewkowitsch, 1938: 255). He claims that the information problem is most acute in the field of the natural sciences, and proposes that chemistry be given priority regarding the organization of its literature (1959: 20). Farradane propounds the idea that the information problem be made an area of scientific study by which he presupposes the application of the principles of the "scientific method" to the issue of the

organization of knowledge in the natural sciences and technology (1970a: 612). The scientific method, according to him, may be used to resolve the epistemological problem that a true or logically sound classification faces (1950: 83). His understanding of the definition of scientific method is elaborated more fully in a much later publication:

"I define 'scientific method' as a method of enquiry involving processes of observation and experiment, as far as possible under controlled conditions, and as far as possible with the attainment of reproducibility of the phenomena under investigation..., followed by the creation of hypotheses to explain the situations, prediction from such hypotheses and, most importantly, the testing of such predictions by further experiment in order to prove or disprove the hypotheses which, when sufficiently validated, are often called laws" (1976: 94).

Farradane proceeds to say that science is the body of knowledge which results from the application of the scientific method as defined above (*ibid.*). He construes science in its narrower association with the natural sciences. In his association of scientific knowledge with truth he acknowledges that it presupposes relative truth, but that in this respect searches for the best forms of logical processes that provide truth within a relative framework (1950: 84).

Farradane asserts that a classification scheme should be constructed "inductively" (in accordance with the precepts of the scientific method), piecing together known fragments of relations (as distinct from "deductively" where large categories are subdivided by "principles of division"). This process should start with uniquely definable items of knowledge, called "isolates" (1952: 74).

Implicit in his writings on classification, furthermore, are conceptions of the fundamental notions of knowledge and reality. Farradane holds a subjectivist view of knowledge, that is, as something available only in the individual mind. In his essay on the psychological basis of classification it becomes clear that Farradane develops his ideas on knowledge along empiricist lines (cf 2.5 for an exposition of the tenets of empiricism). He postulates a steady progression from the awareness of experience via stimuli to sense-data and perceptions to become knowledge only when assimilated (1955: 191). This idea of progression is evident from the following quotation:

"A percept is a response to a single stimulus. A concept is a structured set of percepts; it may be an individual 'thing' or an abstract or class 'idea'. Let me define mind as the complex of thoughts and certain brain processes, and define knowledge as the structured store of thoughts in the mind (and only in the mind)" (1976: 97).

Reality, in Farradane's view, exists outside ourselves and cannot be apprehended directly (1978: 320). Our knowledge of reality is produced only through the mediation of our brains which translate the primary sense-data into thoughts, concepts and their relations (1952: 78). He rejects claims of direct, holistic apprehensions of reality presumed to have been obtained by extra-sensory perception. In essence, the imperative of scientific epistemology leads him to discount the validity of philosophical, non-experimental or intuitive approaches to knowledge (1952: 78).

In the second category of writings, Farradane expresses doubt that the essential tasks of an information scientist have any affinities with librarianship (1960: 191). From a later

essay it is evident that he views information science as a distinct discipline in its own right (1969: 32). He regards information science as a development of the specialization of the research and development worker's approach to satisfy his/her own information needs and to provide intellectual access to the relevant sources of information. The field encompasses a combination of communication techniques and storage and retrieval techniques, each affecting the other (1970b: 264).

A very clear definition of information is found in Farradane's thoughts on information science. He considers definitions of information based on some assumed mental state of the recipient as "expressions of ignorance of the nature of thought" (1979: 13). Moreover, holistic, "system", concepts of information preclude a study of isolated parts of the system and lead to philosophical speculations which cannot advance our treatment of information science (1979: 17). A true information science, he argues, is one that is experimental and based on observable elements. For this reason, he proposes, as a definition of information, any physical form of representation, or surrogate of knowledge, or of a particular thought, used for communication (1979: 13; cf 4.3.5.1.2).

Farradane has been accused of empirical foundationalism (an epistemological position holding that data constitute a rock-bottom foundation upon which information and knowledge is based) (Hammarberg, 1981: 261). Hammarberg argues that data cannot be apprehended as raw, brute facts since any person is a prisoner of his own representational process, that is, we can

never escape a point of view. Data, like information and knowledge, are human-related and cannot be foundational (1981: 261). According to Hammarberg, Farradane's "physical" definition of information appeals to physics. However, modern physics, especially quantum physics, is no longer epistemically neutral in that it deals with the raw, brute facts of the world. It is, in point of fact, "just as theory-bound as any other human endeavour, and its statements are cast in representational form which always reflects a point of view" (Hammarberg, 1981: 266; cf 7.3.1 for the acknowledgement of this in modern physics).

In his response to Hammarberg, Farradane states that his definition of information is not concerned with "facts", "truth", "belief", or "reality", but merely aims at standardizing the definition by giving it one technical meaning within the field of information science, which is that of the "language" vehicle of communication (1981: 270). In the same response Farradane distinguishes knowledge from truth on the basis of the degree of reproducibility of beliefs. Knowledge is not necessarily truth, while truth is something which is generally accepted and which has not yet been disproved (1981: 270).

Hammarberg's epistemological reading of Farradane's later writings is flawed by failure on the part of the former to recognize other references by Farradane. For example, in an earlier essay, Farradane rejected the correspondence theory of truth, a cardinal feature of empirical foundationalism (1955:

191; cf 3.2.1). He views truth as a consensus of consistent, communicable knowledge, that is, a consensus of experience among a totality of minds (1981: 269).

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5.10 BROOKES, B.C. (1910-)

Brookes, who obtained advanced academic qualifications in mathematics and physics, brings to the field of library and information science the general theories of the philosophy of science as well as the precision of mathematical and statistical techniques. His professional interests are the application of statistical procedures to practical library and information problems, and the development of the theoretical basis of library and information science (Shaw, 1990: 3). His writings, as a whole, reflect a consistent effort to demarcate the field of information science and supply it with the appropriate mathematical tools, in a manner that sets it apart from other sciences or disciplines. It is especially his work on the theoretical aspects of library and information science that is relevant to this study, although his insistence should be noted that the establishment of a precise statistical apparatus and procedure is required to facilitate the testing of hypotheses in the process of developing a general theory of library systems.

One of the first contributions by Brookes to the literature of library and information science is a manual entitled Editorial practice in libraries, for which he served as editor. This handbook was compiled with the aim of assisting librarians and information officers "to design and edit the publications which

they are often expected to guide through the press" (1961: v). Brookes' own contribution to this work sets out the procedure for editing a manuscript. These skills equipped him for his subsequent role as reviewer of publications for the Journal of documentation and the Journal of information science.

It is perhaps helpful, in attempting to assess Brookes' contribution in an appropriate context, to note that he is a dualist, that is, he holds the philosophical position that there is an insuperable gulf between two realms of being (Hall, 1967: 364). On more than one occasion he not only acknowledged this, but proceeded to explain the implications of this position for library and information science. Thus, he points out, for example, that library and information scientists in their professional work are either monists or dualists, that is, they either recognize one ultimate reality or two (1981b: 3; cf 7.1 for a general treatment of this issue & 7.6 for its impact on library and information science). Monists recognize either the physical world or the mental world as ultimate reality. Monists who recognize the physical world as ultimate reality are physical realists. Present-day physical realists, armed with computers, attempt to reduce thought to a purely physical information-processing activity. Brookes is skeptical of the reductionist risk attached to a computer-dependent stance. For example, in a reply to a letter by Sparck-Jones, Brookes asserts that computer programmes that simulate human thought processes run the risk of reductionism in so far as they tend to operate on too narrow a basis (that is, elementary logic, sets or simple arithmetic) (1984c: 43).

As a dualist, however, Brookes recognizes the necessary co-existence of two worlds, namely, the physical and the cognitive. It is essentially the cognitive world that occupies his attention and he proceeds to use several analogies from the physical world in his discussions of the cognitive world. While these two worlds are linked by information processes, the potential contributions of information theory to any theory of knowledge is "stultified unless the dualism of mind and body is recognized" (1981d: 198). This position is the classical Cartesian mind-body dualism as set forth in the philosophical writings of René Descartes. Brookes' concern with the cognitive world leads him to claim that:

"... it is illogical to discard the human mind and yet rely on the concept of information in the metaphysics of the information sciences" (1982: 49).

It is probably Brookes' dualist position that led him to accept Popper's pluralist ontology, since, in a certain sense, dualism is seen as a special case of pluralism (Hall, 1967: 364). Moreover, his dualist position may also explain the difficulty he has with holism. He views the holistic perspective as antithetical to analytical science. The problem with holism, according to Brookes, is that it evades difficulties by raising the level of argument to a higher level of generality, whereas science resolves the difficulty by analysis on a more specific level (1981a: 201).

In one of his early essays, Brookes calls for a general theory of human communication (1964: 7). He submits that the then prevalent theory - namely the Shannon model where someone

wishing to convey ideas to another person simply expresses (encodes) the ideas clearly in natural language which is interpreted (decoded) by the recipient - is closely associated with Wittgenstein's "atomic theory of knowledge". This epistemological position, which was repudiated by the later Wittgenstein, holds that the whole of knowledge is expressible only in the form of atomic propositions, that is, as single, simple facts about objects (1964: 10). This position was adopted and expounded by logical positivists both in Britain and North America and implied the disintegration of coherent knowledge into "a great heap of atomic facts" (1964: 10). The "atomic theory of knowledge" which permeated many fields of thought received further impetus from the mathematical theory of communication, and the successful use of digital computers (1964: 8).

Brookes contends that, while atomic (logical atomism) and positivist (logical positivism) theories of knowledge are not wholly false, they are not adequate for a true information science, which has to establish its own autonomous theoretical basis (1964: 12). He states:

"Waiting for Godot may seem a far cry from Chemical abstracts, but the development of information science depends on establishing a scientific (i.e., hypothetical) general theory of human communication which could embrace the professional activities of Beckett and Ionesco as well as those of research chemists" (1964: 12).

It is clear that Brookes envisages a general theory of communication that would encompass both the speculative and the exact poles of the knowledge continuum (cf 4.3.4).

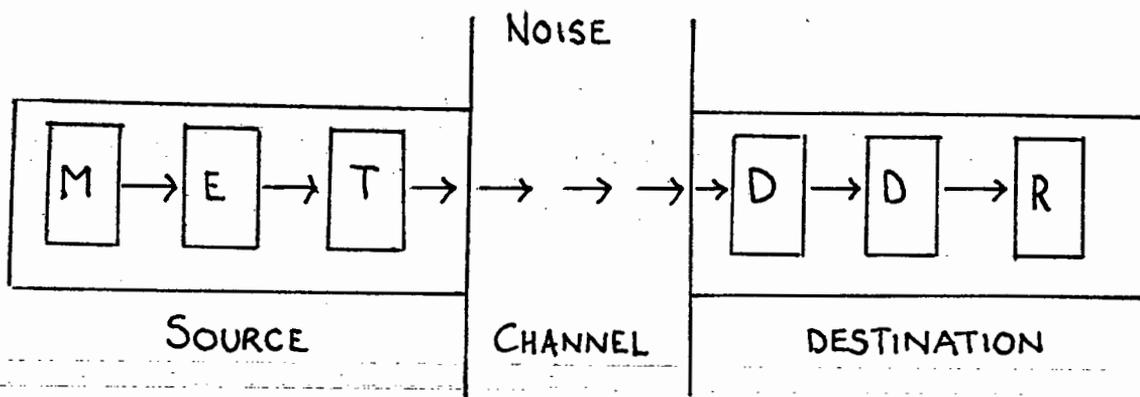
A principal characteristic of Brookes' writings is his sustained argument for a wider interpretation of the term information as a basis for a general theory of human communication, in opposition to the tendency to apply the term in the narrow, technical sense as has been customary in, for example, telecommunication engineering, and for seeking to define the interrelationship between the concepts of information and knowledge. While a narrow, technical interpretation of information, in his view, is tenable for documentation, he has maintained the position that information science (which is seen as a major evolutionary development of documentation) requires a wider interpretation.

It is significant to note in passing that Brookes initially seemed to seek in his general theory of human communication the common ground upon which library science and information science could be reconciled (1973: 245). In a later essay, however, information science is distinguished quite unequivocally from library science as a discipline with "its own unique territory, its own unique problems and its own unique view of human affairs which now has to develop its own principles and techniques" (1980a: 128).

While Brookes concedes that his ideas and theories have always remained open to correction and have indeed often been refuted by others as well as by himself, his later essays evidence beyond doubt a consolidation of many opinions and ideas expressed in his earlier essays (1981c: 89).

An example of his "open approach" is the development of his definition of information science. In 1972 he suggested that information science is the scientific study of information phenomena and is concerned with information both in its widest human, semantic sense, $I(w)$, and in its narrow Shannonian sense, $I(n)$ (1972b: 167). While $I(w)$ is not definable in quantitative terms, $I(n)$ is precisely and measurably defined. Information transfer of $I(w)$ from human to human is mediated by the reduction of $I(w)$ to $I(n)$ in which compact form it is processed by print as well as the computer, and is then transmitted and distributed around the world to those who wish to regenerate the $I(w)$ from the $I(n)$ made accessible to them. Information science is then the study of these reductions and regenerations, and of the intermediate processes and transmissions (1972b: 172).

A few years later Brookes adopts a problem-related approach to information science based on his reading of the writings of Popper, Kuhn and Ravetz. He then sets out to propose that information scientists should identify the fundamental problem of information science, form a social group (in the Kuhnian sense), and work towards establishing an intellectual consensus or paradigm. Accordingly, he finally breaks completely with the Shannon model of communication and presents his own. This may be graphically presented as follows: (see Figure 2)



SHANNON'S MODEL OF COMMUNICATION

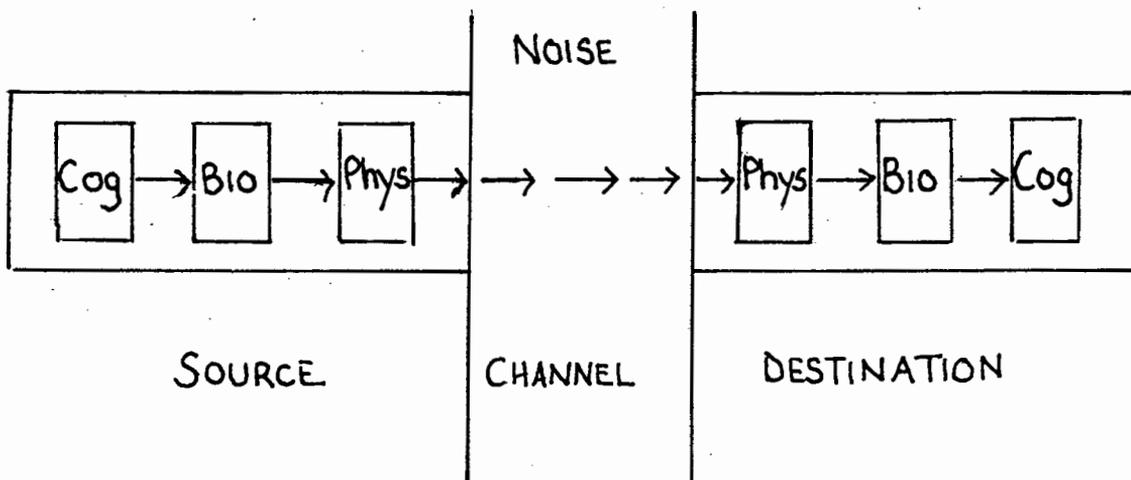


FIGURE 2 : BROOKES' MODIFIED MODEL OF COMMUNICATION

In Shannon's model the source has three components, viz:

- (a) a store of messages to be communicated;
- (b) a device which encodes the messages into some suitable form; and
- (c) a transmitter.

The Shannon destination also has three components:

- (a) a detector of the transmitted messages;
- (b) a decoder; and
- (c) a receptor of the decoded messages.

"Noise" is regarded as a random disturbance which may transform the signals transmitted from one form to another (1975a: 44).

Brookes says that the Shannon model is non-cognitive and non-semantic, and therefore not applicable to human communication of the cognitive kind. (Belkin notes that Brookes was one of the earliest proponents of the cognitive viewpoint in information science (1990: 11)). In his model, which reflects the several components of information, Brookes also has a source and a destination. The components are labelled "Physical", "Biological", and "Cognitive". He assumes that all communication rests on some physical basis of patterns of sound or light or some other form of electromagnetic transmission. It also has a biological basis since these patterns are detected by sensory organs - our eyes or ears - and are transduced into electrical signals which pass from the sensory organs along neural pathways to the central nervous system. Finally, the cognitive basis may be recognized in the assumption that these signals are once again transduced into the signals that we recognize and interpret cognitively (1975a: 46).

Brookes also places information in an evolutionary context, in the Darwinian sense, by pointing out that the increased widening of sensory horizons has led to increasing adaptability to different conditions. The discovery of speech, writing, telescopes and microscopes are cited as significant developments in man's successful adaptation to most parts of the earth. It is especially the rapid expansion of the stores of information external to man's body, or what Brookes calls the "social brain",

knowledge (cf 4.3.5.1.4). Unless information modifies knowledge it is regarded as "noise" - an "unwarranted unhelpful distraction" (1981a: 4).

This fundamental equation of Brookes requires that information science should analyse examples of knowledge structures and observe their response to information received. Knowledge structures may either be "subjective", that is, human knowledge structures which are complex, dynamic and recalcitrant to fixed analytical techniques, or "objective", that is, the knowledge structures of any "compact, ongoing science" which are directly accessible to observation and analysis. It is this latter area of exploration which is unclaimed by any other science and which is suitable for scientific study (1981a: 4).

As a dualist calling for a firmer metaphysic for information science, Brookes sees the need to formalize a set of mathematical and statistical techniques that would be appropriate for the cognitive world or "cognitive space" (1981a: 6). While he recognizes that there are individual subjective cognitive spaces with their peculiar oddities and distortions, there is one objective cognitive space which is that of "scientific consensus" (1981a: 7). It is this space that engages Brookes' thoughts and it is scientific literature that records changes of scientific thought as new scientific theories emerge to displace others (1980b: 164). He contends that information science should develop its own calculus to measure information in a wider sense than its technical meaning and he calls for a new statistics of levels of individuality (1980c: 118). He believes that the

special needs of people with their interest in individuality and social interactions have, from the point of view of quantitative analysis, been neglected for too long. The quantitative studies that he refers to include Goffman's epidemiological theory of dissemination, Bradford's law of scatter, and studies of obsolescence. (He incidentally also views these studies as the initial work on the practical aspects of Shera's social epistemology (cf 5.5)).

Popper, whose ideas feature strongly in Brookes' writings, first came to the notice of the English-speaking philosophical world in the mid-1930's with the publication of his Logik der Forschung (Quinton, 1973: 33). Popper provides an account of the growth of scientific knowledge which is distinguished from non-science or metaphysics by his principle of falsifiability (1959: 73). He claims that science grows not by mechanical induction of general propositions from accumulated reports of particular observations but by the imaginative formulation of hypotheses which are then tested and, unless they elude all efforts to falsify them, revised and replaced (Quinton, 1973: 34).

It is especially Popper's break with subjectivist epistemology that Brookes finds attractive. It is exactly the recognition of the limitations of this "subjectivist blunder" by Popper that Brookes regards as the epistemological progress which may benefit the theoretical development of information science

(1984b: 40). Popper's third world is the basis for an "objective epistemology" for information science instead of the "commonsense theory of knowledge" (1980a: 127).

It is clear that for Brookes an acceptable theory of knowledge would have to make provision for the satisfactory incorporation of the notion of information. His "objective epistemology" for information science is not fully explained anywhere in his writings and is further obscured by the failure to construe the term "objective" in its relation to the true-false distinction. His emphasis is on scientific knowledge and he focuses strongly on the published literatures of the natural sciences.

Brookes' overriding aim is to provide theoretical coherence for information science. He seeks to bring the whole field of information science closer to its avowed aim, namely, that of information retrieval. He claims that the "Cranfield paradigm" still dominates the information retrieval scene and provides physical measures (such as numbers of documents retrieved) which are suitable for document retrieval rather than information retrieval (1981b: 1). His work overall may be seen as an effort to displace this paradigm.

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5.11 DEBONS, A. (1916-)

In a joint essay in 1970, Otten and Debons argued from the premise that, like matter and energy, information is a fundamental phenomenon, and they proceeded to formulate the basis for a metascience of information, which they called "informatology" (1970: 91). They defined informatology as the study of the fundamental principles underlying the structure and use of information (1970: 92). This metascience was intended to serve as "a common basis upon which all information-oriented specialized sciences and technologies can be understood and studied" (1970: 92). Information science (as allied to library science) was considered as being a smaller part of this metascience.

Debons' more recent writings concentrate on theoretical aspects of information science and reveal very concise definitions of key concepts. This is clear for example from the following quotation:

Data: letters, numbers, lines, graphs and symbols, etc., used to represent events and their states, organized according to formal rules and conventions.

Information: the cognitive state of awareness (as being informed) given representation in physical form (data). This physical representation facilitates the process of knowing.

Knowledge: the cognitive state beyond awareness. Knowledge implies an active involvement and understanding and the ability to extend the level of understanding to meet life's contingencies. Knowledge can also refer to the organized record of human experience given physical representation (books, reports).

Wisdom: implies the application of knowledge as contained in human judgment centered around certain criteria or values that are generally accepted by the culture or society" (1988: 8).

Debons et al contend that the concepts data, information, knowledge and wisdom can "be viewed as part of a continuum, one leading into the other, each the result of actions on the preceding, with no clear boundaries between them" (1988: 5; cf 4.3.5.1.4). These transformations from one to the other, for example, from data to information, can be seen as part of a spectrum "of cognition that characterizes human competence in dealing with life's events" (1988: 6). This spectrum is hierarchical, and each transformation represents a step upward in human cognitive functioning (*ibid.*). This spectrum is also characterized as a knowledge spectrum, and forms the environment in which librarianship and information science operates.

Librarianship and library science are defined by Debons et al as follows:

"Librarianship is directly focused on the institution of the library and the services provided to the community. Library science concerns the principles that govern the acquisition, storage, and retrieval of knowledge" (1988: 34).

They contend that, historically, one of the primary roots of information science is epistemology (1988: 9). This claim is, regrettably, not developed further or otherwise substantiated.

Information science is characterized as the study of information systems. Information systems are environments of "persons, machines and procedures that augment human biological potential to acquire, process, and act upon data. It thus improves our chances of survival" (1988: 9). Debons views the information system as the technological component and the library as the institutional component (each as part of the whole) of a complete system for human service (1985: 67).

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5.12 FOSKETT, D.J. (1918-)

Foskett believes firmly in the unity of knowledge, and that "on the highest levels of thought, there is no fundamental antagonism between science and humanism" (1964: 235). His several essays and conference addresses serve to affirm his concern for the division in the intellectual realm and the role of libraries in combating this. He also views the library as an agency that is able to promote inter-cultural understanding. In this regard, he advises the careful use of advanced technology. He states, for example:

"The biggest problem of the Information Age is to use the advances in science and technology to recognize and communicate that information which promotes understanding of and sympathy with, the cultural heritage of other people, their point of view. The mere transmission of information as an end in itself may well result in the opposite" (1984: 11).

In Foskett's view, there ought to be a greater emphasis on the social role of library and information services than on the techniques employed in its practice because "Librarianship is above all a social activity"(1973: 169; 1965: x). Only "A true understanding of our role in society will enable us to judge correctly the role of the machine..." (1966: xx). It is then in the interests of education for library and information science to focus on the sociology of knowledge and general systems theory as necessary studies that will promote a greater integration of library and information services into the wider society. A

knowledge of these disciplines will nourish an education that will provide "the light of truth which guides technology along those paths that are of most benefit to humanity" (1973: 173).

Rather than facilitate access to bits of information, Foskett maintains that the library should "act positively in preserving human values" (1984: 128). He laments that:

"At no time in history has there been a keener awareness of the seamless web that is the structure of knowledge, nor perhaps, a greater danger of its fragmentation into a jumble of separate bits of data" (1986: 316).

Foskett views personal knowledge as unique, in that "... only I know what I know..." and thus different from information which is shared with others (1986: 314; cf 4.3.5.1 for similar views of knowledge). In a collective sense, however, Foskett holds that "...the ways of knowledge and experience continually change" (1986: 313) and that therefore library classifications ought to change from time to time. This is clearly a reference to epistemological shifts, or differences in the modes of knowing that affect or are affected by prevailing classification schemes. This implication is also evident in his claim that "All the basic and traditional processes in libraries are directed towards creating ...an intellectual structure that provides meaning to the research of the past and motive for the research in the future" (1986: 312). This intellectual structure reveals itself in the library classification which reflect the epistemological views of a given historical or social period.

He points out that what is lacking most in the library profession is thought, and that the need to establish a professional purpose is still unfulfilled.

He considers that what passes for theory is no more than a facile manipulation of mathematical and other symbols without any truly general significance. Librarianship, in his view, should not be reduced to a technology, and social epistemology forms the characteristic feature of our professional philosophy (1973: 186; cf 5.5 for the original conception of social epistemology by Shera).

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5.13 ROYCE, J.R. (1921-)

The writings of Royce are considered in this chapter because his ideas on the different paths to knowledge are held to be relevant to a discussion of epistemological aspects of library and information science and because he presented his ideas to librarians and information scientists at the NATO conference of 1973. In the 20-odd years that Royce, a trained psychologist, has investigated cognition and the theory of personality, he developed a psycho-philosophical theory of knowledge that posits three basic ways of knowing. An understanding of these basic ways of knowing requires some insight into the development of his thought.

Royce's work in cognitive psychology makes an appeal towards a fundamental break with the traditional approach to research in psychology. He expresses the need for psychology to "embark on a self-conscious search for a philosophy which emerges from its own problems" and the need for it to "... pay more attention to its indigenous methodology" (1973: 7). He argues that the early history of psychology as a discipline shows that it was dominated by the borrowing of methodology from the natural sciences. He claims that "It was natural for the new discipline of psychology to latch on to whatever scientific method it could find in order to gain acceptability in the scientific fraternity and in order to make headway in solving problems" (1973: 6). He proceeds to explain that it soon became apparent that many problems in psychology would not succumb to traditional scientific methodology. Psychology began to move away from an "outmoded philosophy of science". He states:

"While it seems reasonable to say that a more flexible cognitive psychology has already begun to replace the previously restrictive behavioristic psychology, our discipline seems to be floundering in a philosophic vacuum at present, torn between the irrationality of existentialism at one extreme, and attempting to break loose from the shackles of operationalism and positivism at the other extreme..." (1973: 7).

The many variables of individual behaviour require an equally multivariate research approach in psychology, according to Royce, and psychology itself is a multi-paradigmatic science with a pluralist ontology (1973: 7; cf 5.26 for Harris' view of a pluralist ontology for library and information science).

Royce's views on the three basic ways of knowing or "epistemic styles" should be seen in the context of his elaborate hierarchical conceptual framework for a multi-factor theory of individuality. His several writings constitute a notable contribution to naturalistic epistemology, or as he calls it, psychological epistemology, and even epistemological psychology (1980: 150).

There are three overarching concepts in his multi-factor theory, viz:

(a) "psychological structure (a multi-dimensional, organized system of processes [subsumes mental structure] by means of which an organism manifests behavior and mental phenomena)";

(b) "mental structure (a multi-dimensional organized sub-system of processes [subsumes cognitive and affective structure] by means of which an organism manifests mental phenomena)"; and

(c) "cognitive structure is a multi-dimensional, organized sub-system of processes [subsumes perceiving, thinking, symbolizing] by means of which an organism produces cognitions, where cognitions refer to those mental phenomena which are products of cognitive processes (i.e. perceiving, thinking, symbolizing)". (1973: 313).

simultaneously invokes a valid truth criterion (i.e. leads to a justifiable knowledge claim in addition to being a characteristic mode or way of interacting with the environment) we will refer to it as epistemic style" (1973: 330-1).

Although he originally identified four epistemic styles in his work The encapsulated man, Royce later reduced these to three basic ways of knowing (1964; 1983: 193). It is important to note that Royce's basic epistemic styles reflect the influence of the Jungian scheme of psychological functions (cf 7.4). He characterizes the epistemic styles or "ways of knowing" as follows:

"Empiricism involves knowing via sensory inputs. It is an inductive process whose epistemological validity is primarily dependent on perceiving accurately. Rationalism involves knowing via the formation and elaboration of concepts. It is a deductive process whose epistemological validity is primarily dependent on logical consistency. And metaphorism involves knowing via the construction and elaboration of symbol systems. It is an analogical (or abductive) process whose epistemic validity is dependent on the extent to which the metaphorical patterns (eg. art forms such as plays and paintings) achieve universal significance" (1973: 331).

These ways of knowing are illustrated in Figure 3:

HOW MAN KNOWS

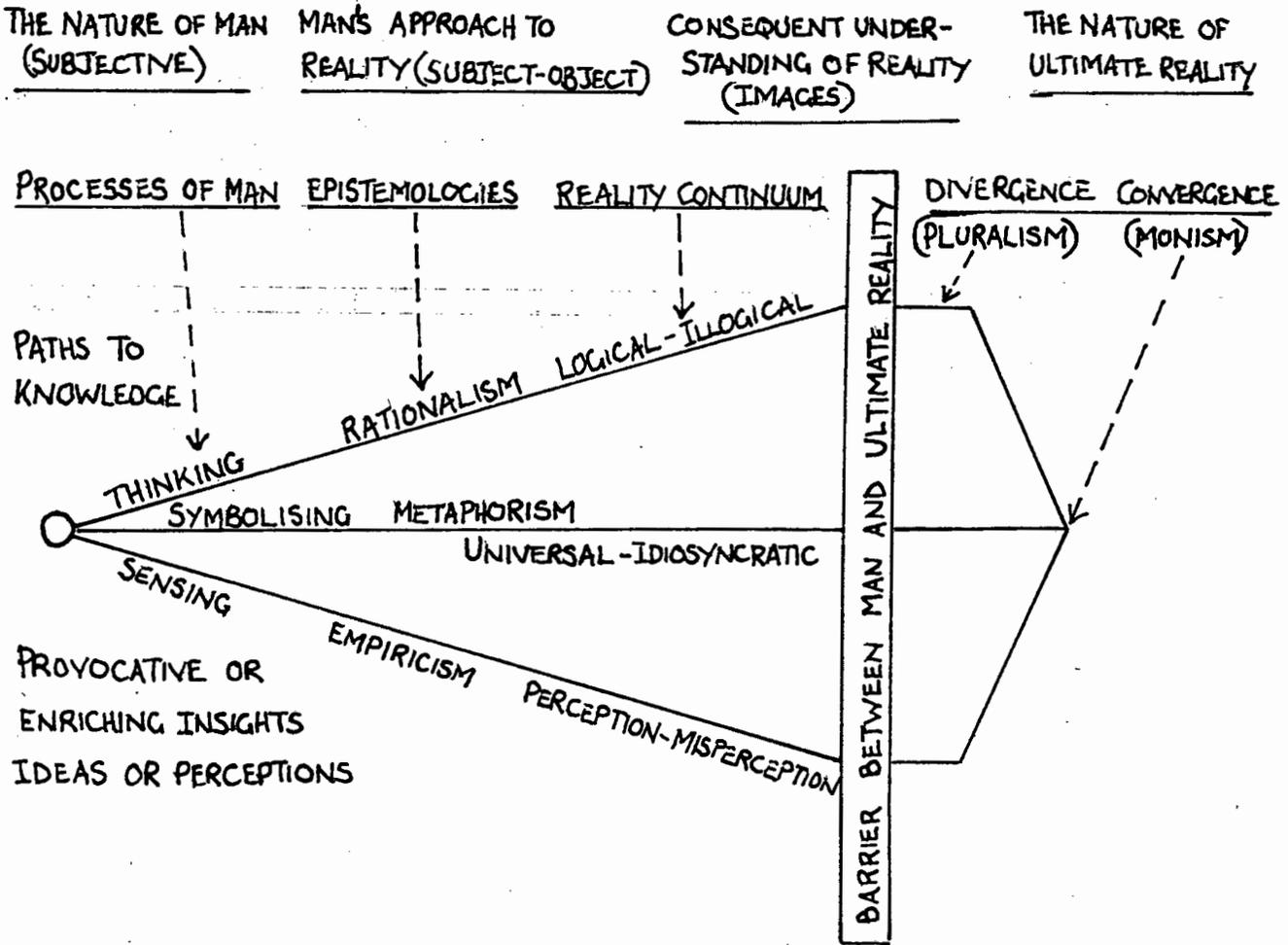


FIGURE 3: ROYCE'S ADAPTED MODEL OF THE PATHS TO KNOWLEDGE

According to Royce, each knowledge process involves uncertainty and the possibility of error, and ultimate reality is unknowable because it is epistemologically untestable (1983: 192). He characterizes these ways of knowing as basic in the sense that both the psychological processes and the truth criterion involved are specifiable and primary, and that uncertainty is clearly recognized. In this manner, Royce demonstrates that his earlier epistemic styles of "authoritarianism" and "intuitionism" (1964) do not qualify. Intuitionism fails to qualify because it does not have a valid truth criterion or epistemology. Royce replaces this with metaphorism (1980: 154). He does, however, state that intuition is actively involved in all three epistemologies

(ibid.). Authoritarianism fails because "both its psychological processes and its truth criterion are based on some other (ie, an authority) epistemic approach - ie, authoritarianism is a derived way of knowing, not a basic way of knowing" (1983: 192).

In a "final comment" on encapsulation Royce proclaims that:

"While different paths to knowledge such as rationalism or empiricism, may provide penetrating insights into reality or enriching images of the world, none (individually or in combination) can hurdle, or otherwise overcome, the barrier that stands between humankind and ultimate reality. Furthermore, to the extent that a particular way of knowing is not made use of, images of reality will be impoverished" (1983: 239).

Royce suggested these ways of knowing to information science, and his framework provides significant insights into the task of developing an epistemological position for library and information science (1975).

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5.14 NITECKI, J.Z. (1922-)

References by Nitecki to epistemological issues emanate from a more fundamental and enduring concern for a unified theory for library and information science. Nitecki's approach is essentially an eclectic one, and he postulates the following prerequisites for a theory of library science:

(a) "it should be necessarily flexible so that it can respond to the variation in the nature of demands of library service";

(b) "it should be sufficiently broad, so that it can accommodate the findings of specific sciences";

(c) "it should be logically consistent to assure a degree of uniformity in the formulation of general principles of library science";

(d) "it should be satisfactorily defined, so that it distinguishes library science as an autonomous science" (1968a: 105).

In the same essay Nitecki lays a foundation for his conception of library science which he develops further in subsequent essays. He locates the basis for library science in a triadic relationship that exists between the book (B), the user (U) and knowledge (K), and he defines library science as the knowledge of relations between B-U-K (1968: 109; cf 4.3.5.1.4 for his ideas on the information-knowledge continuum).

In a later essay, Nitecki consolidates library science and information science as subspecies of the same basic intellectual approach which he calls "metalibrarianship" and which he defines tentatively as a theoretical discipline that studies relationships between the already-mentioned three basic components of knowledge transfer: the generic book (B); its

subject matter, or knowledge (K); and its readers or users (U), considered simultaneously as an actual process of information transfer, the impact of that process on its participants, and an expression of the meaning of knowledge or information transferred (1981: 106). He views the mission of this generic concept of librarianship as the acquisition, organization and preservation of knowledge resources; the provision of reasonably unrestricted access to these resources, and the assistance to patrons in the proper use of bibliographic tools (1983: 406).

Fairthorne criticizes Nitecki's claim that knowledge (defined by Nitecki as relations known) is a legitimate subject of study of library science. Fairthorne takes "discourse" to be that subject, and he explains the difference between the two as being informed about a document (Fairthorne's conception) and being informed by a document (Nitecki's conception) (1968: 363; cf 5.6). In his rejoinder Nitecki refutes this charge, arguing that an author communicates to a reader the insights of his message, yet the character of that message itself informs the librarian about the relevance of a particular book to the total library collection and its users. In other words, knowledge enters the subject matter of library studies only to the extent that it affects the B-U-K relationship. Nitecki further distinguishes his approach from Fairthorne's by claiming that the latter's mathematically oriented approach produces a model free from semantic and epistemological implications in the flow of information (1968b: 373).

In the subsequent development of a model that would supply a metaphysical interpretation of the philosophy of librarianship, Nitecki elaborates his B-U-K relationship into the concept (CO), its meaning (ME), and the response to it by its interpreter (R) as primary components of library and information science (1979: 35). In this model, concepts (knowledge) are communicated in vehicles carrying the conceptual messages to the receivers of these messages. Together, these components are stated as COMER, and imply an open-ended epistemology (1979: 38). He proceeds to qualify his conception of knowledge within such an epistemology as a non-physical, or metaphysical, entity, whose essence is the relationship between various aspects of reality and whose substance is a linguistic structure (1979: 32). Individual interpretations of a message, or of its meaning, is a fundamental characteristic of his model, and he proposes that with any new insight into a conceptual relationship "knowledge is unwinding in the helical fashion of a spiral, giving us at each analytical turn different glimpses of a shifty and kaleidoscopic reality" (1979: 39).

In a subsequent essay on the nature of creative reading, Nitecki applies the open-ended epistemology of his COMER model of library and information science. In this essay he concentrates on the interpretation by a reader of the content of a message:

"Interpretation of the text's meaning by an individual reader is a domain of philosophical speculation about subjective relations between the meaning of the text formulated by the author and its effectiveness in communicating meaning to the reader" (1986: 230).

Through reading, an individual is able to interrelate previous understandings of the meanings of a particular concept with new interpretations of that meaning as it emerges in a creative reading (ibid.). In this way, Nitecki argues, "Reading as a part of the thinking process contributes to a definition of reality as a subjective image of the 'world'" (ibid.). He re-affirms his conception of knowledge by claiming that it is not "neatly packaged ideas in books classified within a static system. Knowledge is a process, not a commodity, a dynamic process of relating previously known experiences with new ones. It is a constantly changing network of relations" (1986: 232; cf 4.3.5.1).

Nitecki's relational approach to the theory of library and information science offers a model that provides a philosophical exposition of library science as a domain of epistemological study of differences between the various relationships within the model, but which he assigns to other disciplines, such as sociology and psychology, regrettably, without further discussion (1979: 37).

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5.15 ZAAIMAN, R.B. (1922-)

Zaaiman views the development of information science as a form of scientific revolution (in the Kuhnian sense) and states that it emerged as a result of a cross-fertilization of ideas between scientists and librarians. Following the Kuhnian interpretation of "normal science" in which research is based upon one or more past scientific achievements and which provides the foundation for further practice, Zaaiman contends that anomalies arose in the "information paradigms" of both the community of natural scientists and that of librarians (Kuhn, 1970: 10; Zaaiman, 1978).

He traces the origins of the information paradigm of the natural sciences to seventeenth-century science, specifically to the inductivism of Bacon and Galileo (1978: 7; cf 3.1). Observation and experiment were the essential means for the

creation of new knowledge in the inductive method as advocated by Bacon and Galileo. Whatever information problems confronted natural scientists in their work were investigated by the natural scientists themselves. He maintains that: "This Baconian paradigm provided a satisfactory basis for the variegated fulfillment of real needs of the scientific community, and the paradigm remained valid until the 19th century" (1978: 7). The anomaly that would ultimately lead to a "paradigm shift" and the origin of information science was the rapid growth in the number of publications and the subsequent need for more advanced bibliographical control.

Zaaiman establishes the information paradigm of the library in the seventeenth century also, specifically with the ideas of Gabriel Naudé, and describes it as a "preparation-and-management" paradigm (1978: 11). This paradigm failed to develop for libraries a scholarly tradition in relation to their users (1978: 13). This scholarly tradition developed with the appearance of the professional librarian and the emphasis on personal service to users, and constituted "... one of the great contributions of library science to the development of information science" (1978: 13-14). By this, Zaaiman means that the shift in reference work philosophy from the provision of literature to the provision of information emphasized the librarian's role as direct participant in the process of investigation. However, he contends that Naudé's paradigm did not "provide the librarian with the theoretical basis by means of which he could comfortably handle the required role" (1978: 16).

The difficulties in the handling of information experienced in both the natural science and library communities led eventually to the historic Scientific Information Conference of 1948. The convergence of these two communities realized the establishment of information science as "two kinds of information activity which formerly had existed largely independently of one another... [and had now come] together" (1978: 20). Whether information science possesses its own paradigm and its own research community consisting of librarians and natural scientists or whether it simply refers to separate paradigm shifts within each community is unclear. Zaaiman describes a paradigm for natural scientists and a paradigm for librarians and speaks of "The new paradigms for both the scientists and the librarians..." (1978: 18-19). In other words, while he explains the historical emergence of information science as a development of the information activities of the two communities, there is no clarity on its identity, ie, as an independent new discipline or as associated with either natural science or library science.

This ambiguity reappears in his analysis of the differences in educational programmes for librarians and information officers. Zaaiman submits that the absence of a strong research tradition in library education has contributed to the reluctance of natural scientists to study information science. He appears to suggest that natural scientists should take educational matters into their own hands in this regard, as:

"... in view of historical involvement of scientists in the performance of information work, in the development of information science, and in information science education, it cannot be said that librarians hold a senior partnership in determining the nature and contents of the education of scientists for information work" (1984: 101).

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5.16 SWANSON, D.R. (1924-)

Swanson has academic qualifications both in physics and library science. His early writings in library and information science investigate the feasibility of natural language searching by computer. His later essays cover such aspects as library automation, cataloguing, information retrieval, education for library and information science, and its intellectual foundations.

In his writings he is significantly influenced by Popperian epistemology (cf 5.10 for Brookes' application of Popper's ideas to information science). Swanson's reflections on the nature and aims of cataloguing and information retrieval in particular have prompted him to adopt a Popperian epistemological framework for library and information science. In a study concerning the requirements for future catalogues he conducts a memory

experiment to discover the things about books that are remembered in order to improve catalogue use (1972: 302). In this study he explores the assumption that users tend to remember attributes about books that are too fragmentary and incoherent to encourage use of existing catalogues (hence libraries). This leads him to suggest that more effective search strategies would take guesswork, or, conjecture, into account (1972: 315). Conjecture is a central tenet of Popper's theory of knowledge. Swanson argues that knowledge is forever conjectural (involving guesses and trial-and-error), and that the designers of catalogues should take this feature into account.

Applying Popper's notion of an "objectivist epistemology", Swanson likens knowledge to "a structure or an edifice" and submits that the "objectivity of knowledge derives not from the objectivity of its creators, but from its public character and its accessibility to criticism and to logical argument (1980: 114). This edifice has a life of its own and "can undergo continual reshaping" (*ibid.*). Swanson urges librarians to become familiar with Popper's conception of the growth of scientific knowledge and to "create suitable aids for organizing and facilitating it" (1980: 115).

Swanson maintains the proposition that the essential role of libraries in the growth of knowledge is to facilitate "problem-oriented" access to knowledge, that is, to recognize the method (Popper's) by which knowledge grows, and to adapt bibliographic tools in accordance with this philosophical

doctrine (cf also Bergen's view on Popper's "falsificationist" conception of the growth of knowledge as applied to libraries-6.3.2).

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5.17 WILSON, Patrick (1927-)

Wilson, who holds degrees in both philosophy and library science, provides thought-provoking comments on epistemological matters surrounding library and information science. He describes his book, Second-hand knowledge; an enquiry into cognitive authority, as a work of social epistemology (as distinct from formal philosophical epistemology) (cf 2.1 & 5.5 for more discussion of this distinction).

Wilson claims that epistemological questions are social questions, and that social epistemology is the only epistemology (1983: 202). His book, in its ultimate essence, is about cognitive authority, or, in Royce's terminology (cf 5.13), epistemic authority. He describes a cognitive authority as one to whom we turn for information but also one to whom we turn for

advice, even in cases where it is clear that there is no knowledge to be held at all. Knowledge is viewed as a closed question as opposed to an opinion, but what is knowledge may become a matter of opinion (1983: 17; cf 4.3.6). Wilson also interprets knowledge in its social or public sense and defines it as:

"... the view of the world that is the best we can construct at a given time, judged by our own best procedures for criticism and evaluation of the published record" (1977: 5).

Wilson's book culminates in a chapter that investigates the cognitive authority of libraries and the printed word. He demonstrates the need to evaluate the quality of texts (which would consequently improve the quality of research). However, he concedes that while this is desirable, it is impossible. Even librarians, who by virtue of their professional capacities seem to be the best group of persons to pronounce judgements on the cognitive authorities of authors and texts, do not have a reliable basis for such a task.

In the light of these considerations, Wilson suggests that librarians should supply works on all subject areas without predisposing readers against or for certain materials. The librarian should maintain a "studied neutrality" and should be "professionally non-committal" (1983: 190). Wilson characterizes this approach as professional skepticism about claims to knowledge or claims of the superiority of one opinion over another (1983: 194). More specifically, this position is characterized by Wilson as one of Pyrrhonian skepticism, that is, the attitude of one who neither asserts nor denies the

possibility of knowledge but continues to inquire, though always unsatisfied that certain knowledge has been found (Hallie: 1967: 36). For Wilson, Pyrrhonism is a state of mind (as distinct from a doctrine) - a state of mind in which its adherents would not conclude that nothing could be gained by inquiry of some sort, but would rather find themselves unconvinced that anything had been established so far (1983: 194). In this regard, he pleads that the librarian should:

"... like the world watcher, be absorbed in watching the play of opinion, and help others make their way through the jungle of the bibliographical world to find what people have to say on various questions, without feeling inclined or required to take a position on the cognitive value of what we find there. We may well learn what they have to say, but for us it remains just that - what they say. Skeptic, world watcher, librarian: all take the same attitude toward the world of ideas" (1983: 196).

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5.18 KOCHEN, M. (1928-1989)

Kochen's writings, which are characterized by the fusion of ideas underpinning the natural sciences and the humanities, invest library and information science with a distinctive intellectual quality. Although he contends that it is "unproductively restrictive" to suggest that the primary focus of

information science should be library and information work, his view on the relationship between library science and information science may be best summarized in his own words, viz, "What matters is that investigators who identify with the information disciplines formulate researchable problems and make discoveries, and contribute insights that clarify the nature and dynamics of information and knowledge" (1983: 373). He views the library as a potentially "growing encyclopaedia system" that summarizes and organizes knowledge. Its function might be "primarily to teach, secondarily to inform, and to elicit and serve the needs of ordinary citizens and their key social problem-solvers" (1974: xiv). The "world encyclopaedia" idea of H.G. Wells influenced Kochen's thinking about libraries, leading Swanson to argue that this concept "probably inspired Kochen's earliest interest in the problems of fragmentation and synthesis of knowledge" (Wells, 1938; Swanson, 1990: 10). Kochen presented his own version of a world encyclopedia which became the basis for a later work which he edited (1972; 1975a).

For Kochen, the fundamental concern of information science is to coordinate the increasing growth of knowledge and the complex political, social, and economic issues of modern life in such a way that the quality of life is improved (1975b: 576). His writings present a consistent, systematic view of problems related to the growth of knowledge. The growth of knowledge generates specialization and, in turn, evokes integrative responses such as syntheses, reviews and the creation of links between fragments of knowledge (1974: 6). His concern with the growth of knowledge extended to both the development and growth

of bodies of knowledge, ie disciplines, and the growth of knowledge in the individual's mind. With regard to the latter, he was attracted to the perspectives of cognitive science, and proposed the view that new knowledge structures are derived from existing ones (1988: 251).

He expects that information systems should not only communicate knowledge, but that it should repackage and re-organize knowledge as well. Conventional information systems merely impart understanding and awareness; Kochen contends that they should also modify behaviour (1975b: 576).

He provides a brief intellectual history of information science in which he discusses Wundt's departure from Kant's belief that the mind cannot know itself, the revolution in theoretical physics (for example, Einstein's relativity theory and Heisenberg's uncertainty principle), Gödel's mathematical theorem, Wiener's cybernetics, Shannon's mathematical theory of communication, and Neumann's conception of the modern computer (1974: 5).

When Kochen claims that information science should explicate the dynamics underlying the growth of the literature of scientific research, it finally becomes clear that his reference is confined to the natural sciences.

Kochen recognizes the search for conceptual unity in the information sciences and characterizes the central issue as a coherent conceptualization of how knowledge, understanding and

wisdom is generated and used by people to enable them to cope with whatever problem situations they encounter. He maintains that library scientists concern themselves with only one special aspect of this problem, namely, how to organize the graphic records of civilization for maximal and effective social utilization (1974: 7).

There is some ambivalence in his conception of information. He explains the term information as the removal of uncertainty (in the Shannon/Weaver sense) and suggests that the mathematical theory of communication has much to offer to information science, yet, in another article, he calls for a "broadened concept of information" in which its cognitive component is placed in perspective as "a relatively small factor compared with affective and other components" (1965: 145; 1984: 343; cf 4.2.2). Knowledge, according to him, is information interpreted according to a point of view (cf 4.3.5.1). Understanding goes beyond information in that it reflects the comprehender's awareness not only of what he knows but also of what he does not know, and needs to know, and how these interrelate. Wisdom goes beyond understanding in that it not only prepares a person to act but guides and evokes an appropriate action at the right time and place on the basis of knowledge and understanding (1975a: 5; cf 5.11 for a similar hierarchy of these related concepts as perceived by Debons).

Kochen envisages the emergence of a new discipline which he calls "epistemo-dynamics". This discipline is to investigate the processes by which the growth of knowledge occurs. More specifically, he states that it is concerned with:

"... the lawful regularities governing the acquisition of information and its transformation into knowledge, the assimilation of knowledge into understanding, and the fusion of understanding into wisdom" (1974: 38).

This new discipline has strong epistemological commitments, so that its practitioners have as their supreme loyalty the devotion to truth, and, more specifically, these truths are capable of helping users to cope with problems (1975b: 583). Kochen expresses the hope that this discipline will become the core of information science and supply its scientific foundation. Like Shera (cf 5.5), who also proposed a new discipline (social epistemology) to librarians and information scientists, Kochen does not explain in sufficient outline and detail the essential content of "epistemo-dynamics". He has, however, left in his writings a "rich intellectual legacy" from which library scholars may derive rewarding insights into library and information problems (Swanson, 1990: 15).

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5.19 WRIGHT, H.C. (1928-)

As a student of Shera, Wright also investigates foundational aspects of library and information science and also prefers the term librarianship as an overarching label for library and information work.

The most prominent feature of his writings is the fundamental distinction between what he refers to as the physical and metaphysical aspects of library and information science. As a result he has been characterized by one commentator as an epistemological dualist (Donohue, 1977: 371; cf also the dualism of Brookes-5.10). Wright consistently advocates the precedence, in this dualism, of the metaphysical over the physical. By this he means that "The human mind is the ... source and subject

matter of... librarianship..." (1978b: 396). The physical aspects of library practice are necessary, but of secondary importance to the "immaterial", metaphysical aspects.

He declares:

"Librarianship is not a function of literacy derived from the physical configurations of visual characters; it is the dependent variable of ideas, which constitute the irreducible constituents of all knowledge and information, regardless of their expressive modes. Literacy, libraries and computers are, after all, only the instruments of librarianship, things by means of which human thoughts are communicated and explored. These distinctions are important, for a profession must be based upon its substance, not upon its instruments... We must go completely beyond our instruments, clear back to the immaterial realities of thought, in order to place librarianship on its only sure foundation" (1978b: 396).

It is precisely in regard to the "immaterial realities of thought" that Wright draws the sharp epistemological distinction which has earned him the label of a dualist. He proclaims that "The capacity of the intelligence to manage only the dual realizations of material and ideal form imposes the severest constraint of all on the possibilities of human knowledge" (1977: 17). As a result of this, he states, there are "only two kinds of truth, two kinds of thinking, two kinds of knowing, two kinds of learning..." (*ibid.*). The two kinds of knowing are:

(a) a gnostology, or "the experiential knowledge which results directly from actual sensory contact with or exposure to something in the ambience of intelligence"; and

(b) an epistemonic, or "the intellectual knowledge deriving directly from abstract thought and only indirectly from the [sensory] ambience" (1977: 17).

He also describes two kinds of truth which correspond with the two kinds of knowing. Experiential (artistic) truth refers to (a) above and requires something to be true to a perceiver's

experience. Intellectual (scientific) truth refers to (b) above and relates to the objective realities of perceived entities (ibid.). There is a bond that ties the two kinds of truth, thought, knowledge and learning together, and which is labelled the "sensory-noetic disjunction" (1977: 21). Wright traces the historical origins of his philosophical views to the Greek philosophers. He supports the perspective of the scholar, Guthrie, who claims that the division of philosophy into matter-philosophers and form-philosophers "is perhaps the most fundamental that can be made in any age, our own included" (1960: 21).

Two basic problems in the history of philosophy are, according to Wright:

(a) "...the study of man, in which the phenomena of human expression are instrumental to the communication of ideas"; and

(b) "...the study of physical realities in which ideas are instrumental to the rational manipulation of phenomena" (1981: 37).

Wright's work may then be seen to be an effort to align librarianship with (a) above, ie, with "the formal realities of the ideational order, not with the physical realities of the statistical order" (1981: 38).

Wright contends that a critical philosophy of librarianship would have to ask questions about:

(a) "metaphysics (our beliefs about the realities librarians must deal with)";

(b) "epistemology (our theories explaining how the realities are known)"; and

(c) "ethics (our theories explaining how best to act in relation to those realities)" (1983: 11-12).

Librarianship can choose either "ideas" (the "noetic" world of formal thought) or "data" (the physical world of matter and energy) as its ultimate realities, but cannot have it both ways (1983: 12). Those librarians who evade this choice by claiming that "information" is the ultimate reality for librarianship still have to choose between the conception of "information-as-ideas" and "information-as-data", which is, once again, an instance of the form versus matter dichotomy (cf 4.2.3). Wright expresses his own bias by submitting that librarians should regard it as their sacred duty "to reject the physical concept of information-as-data, which reduces librarianship to notation science, and re-assert the metaphysical concept of information-as-ideas, which regards it as the cartography of knowledge" (1983: 14). By intellectual cartography he means the "human art of orienting people to ideas" (1983: 15).

The epistemological positions for librarianship are connected with the choice of what the ultimate realities are. He states that if our ultimate realities "reduce to data" then the best ways of thinking about them are empirical. This is what has, unfortunately, happened. Hence:

"The librarians and information scientists by accepting materialistic ways of thinking about their formal realities, have reified information (by reducing ideas to data) in order to study it scientifically" (author's emphasis; 1983: 14).

However, if our ultimate realities "reduce to ideas", then the best ways of thinking about them are rational, not empirical (1983: 15). He explains that "This implies commitment to the recognitive methods of critical humanism, which are essentially introspective and perceptive as in the arts, not observational and reflective as in science..." (*ibid.*). This "exclusivity" feature in his thinking leads him to view librarianship and the natural sciences as antithetical. He contends that each focuses on a "different order of reality" (1978a: 261). As a metascience, librarianship is concerned with knowing about knowledge (1985b: 18). Information science also needs to abandon its use of the physical methods of natural science if it is to be of greater assistance to librarianship. He believes that information science is part of librarianship and that it can only help librarianship in its "communicative tooling" (1983: 17; cf 4.4.2.1 for other proponents of this view).

Wright eventually realizes the inevitable dilemma of a dualist epistemology, which Sellars puts as follows: "How can ideas in a purely mental realm know things in a physical domain?" (1941: 409). Wright proposes a "psychophysical interactionist" solution to this dilemma. He suggests that "the separate worlds of form and matter do come together in man" and that librarianship is deeply involved with the mind-body problem of philosophy, since:

(a) "knowledge is composed of formal subsistents in the world of mind, whereas"

(b) "all expressions of knowledge consist of physical existents in the world of atoms in motion" (1986: 730).

Wright states that what is needed is a truly comprehensive theory of communication "that integrates the realities at both ends of a wire connecting human beings to their physical and cultural environments - a psychophysical theory that explains all of their complex interactions with both of those environments" (1986: 740).

Wright proceeds to develop this psychophysical, interactive theory by employing the ideas of symbolic interactionism, a theory that Shera (cf 5.5) claimed in one of his final articles would supply the proper foundation for librarianship (1983: 386). In this theory the physical symbols become instruments of communication that arouse ideas in the mind. Wright associates symbolic interactionism with rationalist epistemology because it (symbolic interactionism) "studies formal objects which are communicated by natural language but cannot be described mathematically, and rationality is its only criterion of truth" (1986: 751; cf 2.5 for the rationalist epistemological position).

Wright's preference for a rationalist epistemology for librarianship leads him to also reject a pragmatist epistemology (which he associates with anti-intellectualism). He maintains the proposition that pragmatism is an indefensible philosophical stance for the librarian since:

- (a) "...it constitutes an experientially biased philosophy of action derived from scientific materialism"; and
- (b) "...librarians are in the knowledge business, not in the action business..." (1986: 765).

He claims that American librarians, in applying the precepts of a pragmatist outlook, mistakenly reduce their knowledge problems to action theory in order to solve them scientifically. However, "... action theory cannot resolve the knowledge problems of librarianship because theories of knowledge (epistemology) are not reducible to theories of action (ethics/sociology/ science) or vice-versa" (1988: 51).

For Wright, then, a rationalist epistemology is preferred to an empiricist epistemology and a pragmatist epistemology for library and information science. A rationalist epistemology supports his basic view that librarianship deals with the "intellectual realities of thought" and not with the "sensibles of experience", ie, it is "idea science, not data science" (1978b: 388; 1983: 15).

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5.20 SARACEVIC, T. (1930-)

Saracevic relates the term information to that of knowledge by asserting that knowledge is to be viewed in a static sense and information in a dynamic sense. For him, information is a broader concept embracing knowledge (cf 4.3.5.1.2 for this conception of "information"). He also characterizes knowledge as potential energy, and information as kinetic energy to demonstrate the latter's association with communication-related manifestations of knowledge (1975: 347).

In an early essay, co-authored with Rees, Saracevic distinguishes between librarianship and information science on the basis of the distinction between a science and a profession, or theory and practice. They state that the most fruitful relationship between a science and a profession applies the

results of scientific investigation in development and practice (1968: 4098). In this essay the hope that information science might supply a theoretical basis to librarianship, is proclaimed:

"Paralyzed by decades of philosophical and literary argumentation, librarianship has much to gain from information science. The insights, tools, and methodologies of mathematics, logic, statistics, linguistics, systems analysis, behavioural sciences, etc., have much to offer librarianship. Flippantly, it is possible to suggest that we have tried formal philosophy, sociology, and technology, so why not try science?" (1968: 4100).

In a more recent essay, Saracevic calls for an independent information science. Arguing against the integration of education for library science and information science, he claims as bases for his independent approach:

- (a) "the growth of unique information science knowledge and know-how";
- (b) "the growth and high demands of unique information market places", and;
- (c) "social pressures caused primarily by unpredictable changes and effects of information technologies" (1982: 32).

This argument is used by Saracevic to ensure the growth and even survival of traditional library schools, and his efforts at separating information science from library science culminated in a total curriculum revision for education in information and library science at Case Western Reserve University - Shera's academic base until his retirement and death in 1982. Expressing her dismay at this approach of Saracevic, Bohnert contends that the disappearance of library science from the joint designation "library and information science" suggests that information science could handle all the diverse communication activities in the world (1982: 44).

Saracevic's support of the methods of the natural sciences to library problems appear, at the same time, to exclude the failed methods of other disciplines such as "formal philosophy and sociology". This suggests a narrow focus on an empirical epistemological position.

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5.21 MEIJER, J.G. (1931-)

Meijer holds the view that library science and information science share the same goals and carry out the same functions (1988: 78; cf 4.4.2.1 for a discussion of this view). While both libraries and information centres aim to provide users with access to the content of recorded knowledge regardless of physical format, the depth of analysis in information science is

greater than in library science. Meijer concedes that it is for historical reasons that he prefers the term librarianship ("bibliotheekwezen") to information science (1978: 52).

The notions of both universality and divergence feature strongly in Meijer's writings on the content of library collections and librarianship. Of library collections he asserts:

"Documents in a library collectively represent all human thought in written form, and therefore have a universal dimension. Contrasts between people, ethnic groups, outlooks on life, scientific views, etc., are reflected in the documents. Temporary as well as permanent controversies are incorporated in them. Apart from its universal character, the content of library documents therefore also has a divergent character" (1982: 13).

Meijer uses the phrase "the cultural heritage of mankind" to reflect the universal and divergent qualities of the content of library collections ("containing both positive and negative elements") (1982: 15). These same qualities of universality and divergence characterize librarianship (*ibid.*), and Meijer concludes, in the light of these central features, that the main function of the library is:

"... to stimulate people to make optimal use of that part of mankind's cultural heritage preserved in libraries. The aim of this stimulation is *inter alia* to support decision-making and scientific and technical progress (which cannot occur without adequate information) through optimum provision of sources of information - or, to put it differently, to enable society to progress in a positive or a negative sense" (1982: 16).

Against this background Meijer investigates the logical requirements for a logically tenable definition for librarianship. He proposes the following definition (which is analysed in 4.4.3):

"Librarianship is a form of cultural enterprise whose main characteristic is the stimulation of the optimum use of mankind's cultural heritage insofar as it consists of coded thoughts recorded in documents that are and must be held in readiness for use with the ultimate objective of making possible cultural progress (also in the fields of religion and science) in its particular spheres" (1982: 26).

While Meijer characterizes the main feature of librarianship as the "stimulation of the optimum use of mankind's cultural heritage insofar as it consists of coded thoughts..." he contends that the actual transfer of these thoughts is an "extralibrary" affair. He argues that:

"The transfer of knowledge after all does not occur at the moment when the user is handed a document by a librarian, but only afterward, during cognition. The interaction between book and user is a typically extralibrary matter. Librarians and archivists, who functionally and fundamentally share the same task, enable this interaction by stimulating people to make the optimum use of their collection but they do not establish any active communication between authors (or their works) and the users. The transfer of knowledge, an extralibrary matter, is therefore not characteristic of librarianship and is wrongly included with library activities ... Libraries ... do not produce thoughts but place them in readiness for use" (1982: 21).

Here Meijer is clearly concerned with the professional activities of librarianship rather than the academic study of its essential substance (cf also 4.4.3). In this regard, Meijer expresses the view that the "action radius" of libraries does not include the generation of coded thoughts, and that, therefore, librarianship should not "... enter the field of philosophy to lay claim to a large part of epistemology" (1982: 20). From a scheme of six activities regarding coded thoughts, namely:

- (a) generation;
- (b) recording;
- (c) duplication;

- (d) distribution;
- (e) holding in readiness (facilitating access (1988: 75));
- and
- (f) use,

Meijer demarcates librarianship's radius of action as "the documentary recording, the holding in readiness for use, and the use of coded thoughts" (1982: 21). In a later investigation into the establishment of a scientific basis for curriculum planning for library and information science in South Africa, Meijer et al identify the following complex of library and information science functions:

- (a) "collection building/development", which include:
 - (i) "selection of references for acquisitioning"; "preselection, selection or evaluation of documentary information sources", and "selection";
 - (ii) "acquisitioning"; and
 - (iii) "preservation";
- (b) "Inligtingontsluitingsfunksies" ('Information storage functions' - there is no adequate English equivalent for this Afrikaans term), which include:
 - (i) "cataloguing, bibliographic description/organization";
 - (ii) "classification";
 - (iii) "indexing";
 - (iv) "abstracting";
 - (v) "translation"; and
 - (vi) "publishing of catalogues, etc";
- (c) "Information retrieval functions", which include:
 - (i) "user profiles";
 - (ii) "finding information references" or "documentation";
 - (iii) "reference/information services";
 - (iv) "user guidance"; and
 - (v) "packaging and repackaging of information";
- (d) "document delivery";
- (e) "management";
- (f) "education" and "training"; and

(g) "research" (1988: 18-27).

Meijer et al also provide a critical analysis of the notion of information as a proposed central dynamic for library and information science in the study mentioned above (1988: viii; cf 4.1.2). "Information management" and "biblioculture" are the other two proposed central dynamics. After an intensive review of the several different conceptions of the definitions of information, they conclude that the notion of information, from the point of view of the purposes of curriculum development for library and information science, remains obscurely demarcated thus failing the test of unequivocal identity for those purposes (1988: 75; cf 4.2.2.2.4). However, in their analysis, they acknowledge the validity of a content (information as content) plus process (information as process) view of information (1988: 74-5; cf 4.2.2.2.3). These conceptions of information are considered by Meijer as still being provisional.

Meijer's conception of knowledge is associated pertinently with "coded thoughts", or, thoughts that have been expressed and recorded in permanent form and that may be preserved in libraries. He therefore discards Shera's "total knowledge-situation" as unspecific because:

"... - to mention one thing - wordless thoughts and views that are never propagated are inaccessible... a large part of the total knowledge situation must therefore still be excluded. The part of human thought important to librarianship consists of those thoughts expressed through codes... [The] field of activity of librarians falls within the limits of coded thoughts recorded in documents" (1982: 20).

It should also be noted that the notion of the "progress of knowledge" is the criterion in his investigation into the periodization of library history. In each of the three successive periods of the periodization model he associates the library with its concern with knowledge respectively in its narrow, its broadened and its specialized aspects (1977: iv).

Meijer expresses concern for the lack of adequate scientific foundations for librarianship in a recent unpublished essay (1990: 37). He points out that librarianship cannot hope to progress scientifically unless it develops its theory and metatheory. He declares in this regard that, "Without metatheoretical study the essence, aim and mission of a profession do not enter into the scientific picture and the horizons of professionally oriented disciplines" (1990: 15). He considers that the kind of metatheoretical reflection in librarianship that will "... answer the ultimate 'why' question of the discipline, is indispensable..." (1990: 38).

Meijer clearly recognizes the need for library and information science to investigate fundamental theoretical issues and he has made significant contributions to this end.

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5.22 HARMON, G. (1932-)

Harmon's notion of information science emerges from a more fundamental general systems approach. He proposes the view that information science appears to be a member of a set of communication-oriented disciplines which emerged almost simultaneously during the time of World War I (1973a: 116), expressing the hope that, with active programming, information science and other communication-oriented disciplines "... could serve to form a suprasystem of knowledge potentially capable of unifying the arts, sciences and professions" (1973a: 116). According to him, this suprasystem could provide a basis for the more complete interpretation of reality (ibid.).

The notion of a suprasystem finds its origins in the world encyclopaedia concept of H.G. Wells that Harmon discusses in relation to improved library classification systems (1938; 1973: 221). He demonstrates that memory limitations influence human organization of knowledge and that attempts at an encyclopaedic organization of knowledge could lead to the development of a "world brain" (1973a; 1973b: 229). Harmon cites as practical

examples of contributions to such a world brain as large information and reference networks and advances in communications and computer technology (ibid.).

The movement towards this world brain that Harmon envisages is one that is reflected in an emerging, new social order in which information professionals play a major role (1979: 98). He defines information professionalism in a broad sense, viz, that it "draws upon, contributes to, and provides integration for nearly all organized disciplines and professions" (1979: 99). He proceeds to claim that information professionals might bear the titles of "statistician, analyst, project manager, appraiser, consultant, terminal operator, legal aid planner, researcher, programmer or chemist" (1975b: 59). Harmon makes the strong claim that in this new social order "...institutions like post offices and libraries, appear to be artifacts of a social order drawing to a close" (1979: 102).

Harmon contends that in this new age of high technology and frantic change we need more abstract and rigorous definitions of information (1987: 223). Consequently, he conceives of information as metaenergy, and he defines metaenergy as that which occurs between, with, or after energy, and is instrumental in its change, transformation and control (1975a: 93). In this view information is seen as "a residual or catalytic form of energy which regulates other forms of energy in natural and artificial systems" (1984: 193). According to Harmon, concepts of energy together with recent contributions in systems theory and thermodynamics have served to demonstrate the energy-like

properties of information (1984: 193). He argues that information, conceived in this way, can be measured directly or indirectly through the use of conventional energy equations (ibid.), posing the question: "If we cannot measure information, do we know what we are talking about?" (1984: 198). While he does not provide the grounds for a more natural or sufficient link between the notions of energy and information, he associates his concept with that of Otten and Debons (cf 5.11) (who have demonstrated that information and energy share certain fundamental attributes) (1975a: 98).

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5.23 McGARRY, K.J. (1934-)

McGarry's concern with the "philosophy of librarianship", which for him is the quintessence that sets library and information science apart from other disciplines and professions, cannot afford to ignore the unifying theoretical base of librarianship and information work (1981: 8; 1983a: 5). The concern with basic theoretical issues is reflected inter alia in his claim that "We still search for the theoretical underpinnings of a curriculum for the 1990's" (1985: 97).

Regarding the relationship between librarianship and information science, he asserts that:

"Information science grew out of the use of and research in automated retrieval systems and took on the mantle of the older activity of documentation. But automation is also at the base of modern library systems, so the computer alone does not divide librarianship and information science... Perhaps the safest statement to make is that they are overlapping but not co-extensive studies" (1981: 150).

McGarry notes that the several definitions of information reflect gradations and varieties of epistemological standpoints, that is, one defines information in accordance with one's world view or ideology (cf 4.1 for the philosophical presuppositions of definitions):

"At the one end of the spectrum is the view that information exists in the structure of the material world and would still be there whether we existed or not; at the other end is the view that the non-human world - the movement of rivers, the direction of prevailing winds, etc, - can only become information when acted upon by the concept system of the knower" (1983b: 99).

The two fundamental views stated in the quotation above reveal McGarry's conviction that "the history of epistemological theory has always been battleground between the rationalist and

the empiricist" (1969: 127). He believes, however, that, from the point of view of library and information science, epistemological studies need to be given a social context, fearing that "epistemological studies [would] become arid and irrelevant if they are not rooted in social realities" (1969: 126).

In a recent essay McGarry reasserts the personal persuasion that fundamental issues require urgent attention, declaring that we still need to find out "... where librarianship begins and ends, what librarians and information officers need to know, and what special kind of knowing is it that distinguishes us from other related professions" (1985: 97). While McGarry does not articulate a full-fledged epistemological position for library and information science, he does recognize the validity and appropriateness of the adoption of more than one epistemology in professional theory, advocating however that a study of these epistemologies be placed at all times in a social context. Furthermore, it is clear that he holds the view that the establishment of an epistemological position for library and information science would help to set it apart from other related professions by delineating its unique "kind of knowing".

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5.24 BEKKER, J. (1939-)

Bekker regards library science as an applied, vocationally-directed social science which also contains elements that are related to the natural sciences and the humanities (1987: 17). As one of "four bibliothecal disciplines", library science is perceived as a holistic discipline in the sense that it synthesizes the results of bibliology (a discipline that has information records as its object), information science (which is concerned with means of information retrieval which brings library records and library users together) and readership (which has the library user as its object) (1978: 29). Bekker explains that the bibliothecal disciplines, as mentioned above, study "artificially created fields of study" rather than "nature (ie the reality which has not been created by human beings)" (1978: 31).

In his doctoral thesis (which investigates the application of professional ethics to librarianship) Bekker combines a functionalist approach to the philosophy of librarianship with a systems approach in order "to show that libraries and library-like agencies form a unity" (1976b: 174). In this

regard, he seeks a unifying principle in the "basic library function distinguished by Shera" (1976b: 148). He analyses Shera's statement that the library's function is to maximize the social utility of graphic records for the benefit of humanity (Shera, 1968: 9; 1972: 197). Bekker's critical analysis of this statement results in a slightly different formulation, viz. "... the basic function of the library is to optimize the social value of recorded information for mankind; or to optimize the value of recorded information for mankind" (1976b: 147). He claims that this basic function has "remained the same throughout history" in spite of changes in emphasis, in services offered, tasks performed and techniques used (1976b: 110).

It is worth noting that many of Bekker's central ideas appear to derive from Aristotelian philosophy. This is acknowledged in his use of systems theory (1976b: 169), his application of functionalism (1976b: 132), and his search for "a practical ethics with one basic guiding principle" (1976b: 63, 67 & 395).

Bekker's concern with unities or single guiding principles is evident in his argument that the two-cultures debate of Snow sets forth an artificial division of culture. Culture, according to Bekker, consists of spiritual and material aspects, and both should be given equal recognition. He proposes a broad view of culture, declaring that "'Kultuur' is 'n omvattende begrip wat diachronies en sinchronies variasies kan akkommodeer. In hierdie sin is daar net een kultuur..." (ie, 'Culture' is a comprehensive concept which may accommodate diachronic and synchronic

variations. *In this sense there is only one culture...*) (1987: 15). Bekker maintains that the basis of the two-cultures debate displays a materialism-idealism dualism. Dualisms or dualities ought to be rejected in favour of continua. He contends that it is important "... om dualistiese 'kulture' uit te roei en ontslae te raak van destruktiewe dualiteite" (ie, to remove dualistic 'cultures' and to get rid of destructive dualities) (1987: 16). For this reason, he rejects the sharp contrast of hard sciences on the one hand and literature on the other (as in the two-cultures debate), and proposes a continuum of natural sciences, social sciences and the humanities so that knowledge is to be seen as a whole (1987: 15).

According to Bekker, the two-cultures debate reveals itself in library and information science as the distinction between library science on the one hand and information science on the other ("the term librarianship is often preferred to library science in order to deny a scientific nature") (1987: 18). In contrast to this perspective, Bekker maintains that library and information science forms a unity primarily committed to the communication of information and the librarian should be able to reconcile the human and the non-human, ie the two cultures (1987: 20).

Bekker recognizes the need to investigate the epistemological foundations of the library phenomenon as part of a broader investigation into the ontological and epistemological status of recorded knowledge and submits that such a study could develop into a sub-discipline of library science. This

sub-discipline should be called bibliothecal epistemology ("bibliotekale epistemologie") because of its connections with the library phenomenon (1984: 30).

For Bekker, the key question whose answer will determine the epistemological status of the record, that is, its meaningful content, is: "to which extent are the statements contained in the record true?" (1984: 3). He clarifies his use of the term "record" by saying that it is "die vergestaltung wat 'n gëeksternaliseerde gedagte aanneem" (ie, *the concrete form or substance that an externalized idea assumes*) (1984: 3). He argues that non-fiction (as "literature of knowledge") and fiction (as "literature of imagination") form a continuum and that each of these categories of literature have an independent epistemological character.

The epistemological status, or, truth-quality, of factual records is determined by comparing their claims with the reality of sense experience. He considers it imperative that such records be truthful because of their increasing use for practical applications and the growing reliance of modern man on recorded information (1984: 17).

In the case of fiction, the epistemological status of statements is based not upon their correspondence with sense-experience outside the record, that is, external reality, but with the overall message within a given record, that is, its own reality of the author, or imaginary world. He contends that:

"Die aanvaarbaarheid van 'n storie vir die leser kan egter afhang van die outeur se werklikheidsiensing. In so 'n geval moet daar in die laaste instansie na die empiriese werklikheid as sodanig verwys word" (ie, *The reader's acceptance of a story can, however, depend upon the author's perception of reality. In such a case empirical reality would have to serve as a final point of reference*) (1984: 19).

The two categories of reality, as outlined above, should be recognized along with the limitation that he places on all records, or documented information to reveal aspects of reality. He argues that documented information can only supply a partial view of reality:

"Selfs wanneer die grootste moontlike mate van vryheid bestaan, kan die bibliotekaris nie verseker dat die biblioteekgebruiker 'n volledige beeld van die werklikheid (dws 'n wêreldbeeld en 'n beeld van die lewe) kry nie. Dit is die geval omdat alles wat ervaar word nie in die vorm van gedokumenteerde inligting beskikbaar gestel word nie..." (ie, *Even when the greatest measure of freedom prevails, the librarian cannot assure the user of receiving a complete picture of reality, ie a world view and an image of life. This is so because all possible experience cannot be made available in the form of documented information*) (1976a: 4).

It is evident from Bekker's thoughts on the epistemological status of the record that his approach presupposes a broad conception of knowledge which also accommodates its narrower conception. He asserts that knowledge in the narrower sense, is, in fact, a part of knowledge in the broad sense (cf 4.3.5.1.2 for this view). He explains his reason for adopting this position by arguing that in philosophy (especially in epistemology and logic) knowledge has connotations of truth and validity; in the social sciences (especially in the sociology of knowledge) knowledge is what passes for knowledge (1977: 5; cf 4.3.2 & 4.3.3 for related discussions). Since the disciplines which study communication phenomena are classified as social sciences, he

prefers the broad conception of knowledge (1977: 6). In this way, library and information science focuses on knowledge in the broad sense and the librarian should endeavour to disseminate works espousing all possible viewpoints (eg orthodox as well as unorthodox opinions) so that the library user may be allowed to develop a critical attitude in the search for truth and thus "... in 'n groter mate in die waarheid te deel" (ie, *participate to a greater degree in the truth*) (1976a: 6-7).

Bekker's views are particularly instructive for the development of an epistemological position for library and information science. He provides significant perspectives on the epistemological aspects surrounding the content of libraries and information centres, ie, recorded knowledge.

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5.25 De MEY, M. (1940-)

De Mey, who is attached to the Belgian university of Ghent's department of logic and epistemology, discusses the relevance of the cognitive view for information science. The cognitive view is essentially the view that:

"any form of information processing, whether natural or artificial, requires a device that has in some way or another, an internal model or representation of the environment in which it operates" (1982: xv; cf 2.4).

De Mey considers the cognitive orientation as the most recent stage in a series of stages that characterize the evolution of theories on perception, communication and information processing. He outlines the development of these stages as follows:

"(a) a monadic view during which information units are handled separately and independently of each other as if they were simple, self-contained entities";

"(b) a structural stage where the information is seen as a more complex entity consisting of several information units arranged in some specific way";

"(c) a contextual stage where, in addition to an analysis of the structural organization of the information-bearing units, there is required information on context to disambiguate the meaning of the message"; and

"(d) a cognitive or epistemic stage in which information is seen as supplementary or complementary to a conceptual system that represents the information-processing system's knowledge of its world" (1980: 49).

Scientific knowledge (as the kind of knowledge generated in the natural sciences), according to the cognitive view, is merely a special instance of the general conditions governing the acquisition of knowledge. He claims that "The dynamics of scientific thinking exemplifies the dynamics of cognitive processes in general" (1984: 107).

From an epistemological point of view, the cognitive view recognizes that the constraints on knowledge are no longer in terms of some neutral truth, but in terms of the knowing system's "action equipment". The "actions" referred to here are those of the knower. They are also known as "procedures", so that any knowing system is equipped to know its own "micro-world" in terms of the feasibility and the effects of the basic set of actions it can perform. De Mey points out that the "micro-world" approach, in which knowledge is fragmented, eschews and fails to account for the opposite approach which searches for unity. In this connection, he claims: "Some see life as more attractive if there are many different worlds to know, others feel safer to think of it as one solid unit" (1980: 57).

De Mey associates pluralism with the cognitive view and speaks of a multiplicity of world views, or, world models, according to which "the world can be known in a multitude of ways and retains the potentiality for surprises and challenges all the time" (1982: 256). At the same time he cautions against the

epistemological risks of pluralism, ie relativism, or, the notion that a plurality of world views implies the acceptance of the validity of every possible view (1982: 256).

The key component elements in the cognitive view are:

(a) a shift in the focus from the object and signal to the subject or the receiver; and

(b) a shift in focus from clearly delineated units handled in isolation towards handling information processing in terms of world models.

With regard to the former element, cognition connects a knowing subject to a known object. In contrast to crude empiricism, where reality is "out there" unfolding itself to a passive subject, the cognitive view emphasizes the active organizing activity of the subject.

With regard to the other element in the cognitive view, larger and larger wholes are involved in understanding even simple messages.

Since the cognitive view recognizes the importance of knowledge contributed by the knower in a knower's processing of information, a library user has a "world-model" which generates expectations to make sense of the data he receives. In this view, knowledge assumes a dynamic character in which the knowledge user is an active manipulator of knowledge sources. De Mey claims that this approach may promote a fuller understanding of the interactions between librarians and users (1984: 109).

De Mey recognizes the value of epistemological considerations for library and information work and his cognitive view provides many rich insights into the nature of a suitable epistemological position for library and information science.

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5.26 HARRIS, M.H. (1941-)

The intellectual tradition that nourishes the epistemological views of Harris is that of critical social reform in the U.S.A. This is evident in his essay on a revisionist interpretation of the history of the public library in the U.S.A. He argues that "library historians have generally been in agreement with the standard interpretation of American reform as a struggle for human betterment and a challenge to injustice and a repressive status quo. The movement was seen as liberal, humanitarian, and idealistic" (1975: 40).

The revisionist view challenges this claim and regards it as "little more than a regressive fantasy" (1975: 41). In his application of this revisionist interpretation to the American public library, Harris contends that in spite of its idealized history, the American public library has always been an elitist and authoritarian social institution which has never been certain of its purpose (1975: 21).

In a later essay Harris calls for a "... rethinking of the epistemological foundations of research in library and information science" (1986a: 516). He argues that positivism, and its logical derivative, logical positivism, which has been widely discredited by social scientists when viewed as the only legitimate epistemic path to knowledge, is still espoused by many library researchers. He maintains that the current positivist epistemology in library and information science arose from a "scientific delusion" fostered by the work carried on at the University of Chicago's Graduate Library School in its early years (1986a: 517).

Harris contends that research in library and information science and even the practice of librarianship is guided by a paradigm (in the Kuhnian sense). However, this paradigm has "been so widely and uncritically adopted that it has become very nearly invisible to practicing librarians and researchers alike" (1986b: 213). He characterizes this paradigm as being "pluralistic", which views librarians as "apolitical servants of the 'people'" and libraries as "simple mirrors, neutral reflections of society's 'racial memory'" (1986b: 215).

Consequently, research in library and information science tends to concentrate on "administrative problems" that are amenable to "technical solutions" (1986b: 216).

Coupled to this pluralist "ontology" is a positivist epistemology that has "... led us to make a fetish of certain methodological approaches to our research and has blinded us to the right questions" (1986b: 217). He poses the question: "What are the characteristics of the positivist epistemology that has become so dominant among researchers in library and information science?", and proposes the following set of answers:

(a) "Library science is a genuine, albeit immature, natural science. It follows then that the methodological procedures of science are applicable to library science; that quantitative measurement and numeration are intrinsic to the scientific method; that complex phenomena can best be understood by reducing them to their essential elements and examining the ways in which they interact";

(b) "The library (broadly defined) must be viewed as a complex of facts governed by general laws. The discovery of these laws and theories is the principal project of research";

(c) "The relation of these laws and theories to practice is essentially instrumental. That is, once the laws are in place we will be able to explain, predict, and control - produce a desired state of affairs by simply applying theoretical knowledge"; and

(d) "The library scientist can, and should, maintain a strict 'value neutrality' in his work" (1986b: 219-20).

While Harris demonstrates the limitations of positivist epistemology, he cautions against a return to the "old subjectivism" that prevailed in library science before the advent

of the GLS of the University of Chicago. He declares that what is needed is "... an attempt to transcend the dialectic of defeat and move beyond positivism and subjectivism" (1986a: 522).

In a review of Harris' perceptions of the prevailing epistemological framework for library service in the U.S.A., Bergen accuses him of the fallacy of "Gnosticism" or solipsism in the sense that "he is privy to a Truth about library service in the U.S. denied to those colleagues untutored in his brand of Hegelian, essentially idealist, Marxism" (1987: 71). According to Bergen, Harris holds that positivist epistemology is uniquely adapted to address "those questions of logistics and implementation, managerial and technical" and has the added advantage that it has "declared itself apolitical and value-neutral" (1987: 72). Bergen contends that Harris does not prove that positivist epistemology cannot successfully be applied to other library problems such as political economy and culture (1987: 73). He also criticizes Harris for not indicating whether his epistemology precedes or issues from his ontology (cf Royce's treatment of this dilemma in psychology-5.19). Such a decision, for Bergen, is significant since he maintains that, "presuppositions about social reality, its pluralistic and democratic character... flow from choice of epistemology. Because the epistemology selected tends to sensitize an observer to certain aspects of the phenomenal world, it is more fundamental than the world views, perspectives, and outlooks which are at issue..." (1987: 73; cf 5.28.8 for a fuller treatment of Bergen).

Irrespective of such dismissive assaults Harris' perspective nonetheless remains significant insofar as it provides fresh terms for debate by displaying an unorthodox viewpoint of one of the epistemological issues pertaining to library and information science.

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5.27 SCHRADER, A.M. (1944-)

Schrader's epistemological views are placed within the context of his more central concerns with the definitional adequacy of library and information science. He summarizes the major research focus of his doctoral dissertation as follows:

"It is rudimentary theoretical research into concept formation for the domain of library and information science with three objectives: to bring together from the published literature all the major generic definitions of the domain, to evaluate their logical and conceptual adequacy, and to assist in promoting and in achieving enhanced consensus about what ought to be taken as the essence of the domain" (1984: 61).

Schrader's doctoral dissertation investigates the problem of definition of library and information science and provides also, in bare outline, an epistemological position for the discipline

(cf also 4.4.3). He claims that the definitions analysed in the thesis (more than 1 500), reveal no clear notion of what the user obtains "when interacting with the librarian/information consultant - [is it] information, knowledge, recorded information, recorded knowledge, documents, information communication, records of intellectual activity, facts, ideas, messages, graphic records, signs and symbols or data?" (1984: 65). The "something" that the user obtains, according to Schrader, is "a selection from available reproduced symbolic culture" (1983: 356). "Symbolic culture" is central to Schrader's definition of library and information science, so that it is viewed as the study of the symbolic culture accessing system in which librarians guide users seeking access to symbolic culture. Schrader explains that " 'culture' encompasses ideas and values internalized by persons operating in their human groups, and the products of behaviour and action which take the forms of symbols and artifacts" (*ibid.*; cf 4.4.3 for an analysis of Schrader's notion of culture). It is the "representational dimension of human culture expressed as ideas and values in object form" that the user acquires (*ibid.*). This is called symbolic culture and it is preferred to such notions as "information", "knowledge", or "cognition". Schrader supports his preference for symbolic culture by noting that:

"In the literatures of library and information science, the concepts of information, knowledge, facts, data...and similar expressions are conflated with the notion of all human experience.

However, not all human experience, not all culture, is manifested as symbolic culture; all human experience, all culture, encompasses more than 'symbolic culture'. Such notions as information, knowledge, or like expressions, when taken as synonymous with all human experience, suppress standards of rationality and judgment, whether in science, philosophy, art, or social practice. 'Facts' or 'data' taken as synonymous

with 'knowledge' rules out not only all non-scientific knowledge, but also all conceptual structures - theories, methods, logic, and mathematics - in which scientific knowledge is grounded" (1983: 357).

Schrader submits that symbolic culture contains both positive and negative components, and that it is an axiological problem for the library whether to preserve and make accessible negative manifestations of culture such as "...opinion, perverse culture, misinformation, rhetoric, slogans, propaganda, slander, lies, superstition, scientific fraud, prejudice, hate literature, irrationality, insanity..." (1983: 358). He adds, importantly, that the conceptualization of symbolic culture must be "large enough to admit them as a theoretical possibility" (*ibid.*).

Schrader reveals his own view as to what should be made available to the user. In this regard, ethical and epistemological views are merged in a well-defined stance. He claims that, "from a philosophical point of view, total comprehensiveness is undesirable" because some cultural manifestations are intrinsically less valuable than others. "Ideas and values which meet truth criteria are the symbolic culture that ought to be made available. Transmission of knowledge is what is wanted.." (1983: 361). Knowledge, according to Schrader, is a component of symbolic culture. The other component is opinion. He proclaims that: "Following Plato, symbolic culture can be sorted along the 'divided line' into knowledge taken as the ideal and opinion taken as imagery" (1983: 376). This may be illustrated as follows (Figure 4):

Schrader declares that the application of the criterion of knowledge or truth-seeking as the way of selecting "system content" (materials) will, to a degree, determine the intrinsic worth of accessing systems.

It is not clear whether Schrader's symbolic culture subsumes a number of disparate modes of knowing with related truth criteria. He merely divides symbolic culture into two large components, viz, knowledge and opinion (following Plato), and proceeds to recommend knowledge (truth-seeking) as a selection criterion that will ensure "library goodness".

However, on the broader level of library and information science research, he does provide a more detailed epistemological description. According to Schrader, research in library and information science investigates problems of fairly different kinds that require, concomitantly, different methods of inquiry. Different ways of knowing (epistemologies) underlie these methods of inquiry. He describes these "ways of knowing" as:

- (a) quantitative which includes scientific, philosophical and praxiological;
- (b) qualitative; and
- (c) performative.

He characterizes these "ways of inquiring or producing knowledge" as follows:

"...empirical analysis is used to produce scientific knowledge about the empirical properties of the symbolic culture accessing entities; conceptual analysis is used to produce philosophical knowledge about the inherently valuable properties of these entities; empirical and conceptual analysis is used to produce praxiological knowledge about the instrumental properties, or the means-end relations, of these

entities; perceptual analysis is used to produce qualitative knowledge about the unique qualities of these entities, and, transactional analysis is used to produce performative knowledge about symbolic culture accessing system processes" (1983: 370).

In Schrader's view research in library and information science requires different epistemologies to investigate different types of problems. Rather than advocating a single or absolute epistemological foundation, he acknowledges the equal validity of different ways of knowing, or, discovering, that should characterize library and information science research.

Schrader thus offers epistemological considerations on two levels, namely, a narrow focus (micro-level) on a single "unit" of library and information science practice, that is, reproduced symbolic culture, and a broad focus (macro-level) on library and information science practice as a whole, that is, research.

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5.28 MISCELLANEOUS SEMINAL POSITIONS

Besides the exponents of different theories listed above, there are a number of writers (not all of whom are librarians or information workers) who have made provisional, exploratory

contributions to the proposition that library and information science is concerned with the transfer of knowledge. These include the following positions:

5.28.1 Stäber and Schmidt argue that library practice proves that library science and epistemology should be linked because library science should be seen as an integral part of the theory of knowledge (1983: 348-52). They contend that more research into the connections between the two will provide a deeper understanding of library history.

5.28.2 In his book, The nature of knowledge: an introduction for librarians, Kemp offers a survey of the most significant features of knowledge (following the Popperian model--cf 5.10) he believes that librarians ought to be acquainted with. Although he does not provide a cogent argument for his preference for the term knowledge to information, he avers unequivocally that, in the choice between the two, "libraries are sources of knowledge rather than information" (1976: 12). Moreover, librarians should concern themselves with the study of knowledge because libraries and information centres not only collect knowledge contained in documents, but they "strive to facilitate its communication. For this reason, the librarian or information scientist must know something of communication... of the creation and use of knowledge" (1976: 12).

as a possible foundation for a philosophy of librarianship. They document the surrender of the claim by the natural sciences to yield absolute, or objective truth (1978: 50; cf 7.3). They locate their epistemological position in what they refer to as "story systems". They postulate that story systems are:

"organizations of information constructs that describe, explain, and partly constitute the world of lived experience. The story system of a culture is co-extensive with all that is known, with all that a culture recognizes as knowledge or opinion... A culture's story system contains its inventory of reality" (1978: 16).

Accordingly, they claim that story systems are central in the creation by human beings of real worlds adapted to themselves - alterable and communicable worlds that are transmitted in a traditional linguistic code (ibid.).

5.28.6 This idea of the social construction of reality also features prominently in Mukhopadhyay's essay on the foundations of informatics and the theory of reference (1984: 20). In Taranto's proposal on the epistemological foundations of information theory the related idea that reality cannot be apprehended directly is expressed as follows:

"cognitive reference to an object has to be mediated by some means, which will say that a particular object... is never free of interpretation... This is where traditional epistemology cannot serve as analytical tool" (1985: 292).

5.28.7 The notion of "mediation", mentioned in the quotation above, is acknowledged in the context of libraries by Engle who contends that through the "... medium of physical symbols, the metaphysical entities, such as ideas and information, are evoked and communicated..." (1986: 31). In

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preliterate/oral societies where there is an immediate presence of both speaker and listener, the mediation of physical symbols is unnecessary. However, literate society separates the text from its interpretation, and the mediation of ideas through the physical symbols lead to altered conceptions of mind and reality (cf conceptions of unrecorded knowledge-5.28.11.2 & 6.24).

5.28.8 The recognition of the interdependence of the physical and the metaphysical in the knowledge-transmitting process, constitutes, for Bergen, the essential foundation for a successful theory of librarianship, which, he asserts, promotes the dialectical interplay of ideas and matter (1986: 399). He states that "the metaphysicians of librarianship are wrong in believing that one can be devoted to form in our discipline without reference to content" (emphasis added; 1986: 399). More than twenty years earlier, Bergen suggested that an understanding of the physical aspects of library operation should be accompanied by equal insight into socio-psychological foundations of librarianship (1963b: 479).

In his review of Harris (cf 5.26), Bergen advocates the application of many epistemologies for librarianship because each one enables us to note different things about the social world. He claims, in his discussion of the pros and cons of the Hegelian Marxist and positivist epistemologies, that, "Better an anarchic hospitality to all world views than to assign canonical status to either" (1987: 74). In support of the proposition that no single world view should predominate, he contends that:

"... we should use everything at hand, poetic intuition, Thomistic metaphysics, symbolic interactionism, as well as pluralism-positivism and Hegelian Marxism. It would not hurt us to relax and be more neutral, even anarchic, with respect to different ways of obtaining knowledge" (1987: 75).

By recognizing the validity and equal importance of several approaches, librarians, in Bergen's view, strive to become scholars in the classical sense (1963a).

5.28.9 Arguing that there is a need for librarians to break free from the functionalist (ie, "logical empiricist") orientation in library and information science research, Olaisen expresses views consonant with the transdogmatic thrust of Bergen's position. He contends that we should recognize that paradigms and metaphors can provide only partial and incomplete truths and that, therefore, we should espouse a "paradigmatic tolerance" which enables a more effective means of investigating the "... totality of types of information needs, information resources, and information transfer mechanisms" (author's emphasis; 1985: 147). In this way, the recognition of the validity of several ways for obtaining knowledge is assured.

5.28.10 Similar themes characterize Kesting's theoretical writings. Bergen's "anarchic hospitality to all world views" and Olaisen's references to "paradigmatic tolerance" and "totality" are consonant with Kesting's central ideas of "organic wholeness" and "supradoctrinalism" as necessary features of human knowledge. A cursory analysis of thematic concepts and terms that distinguish his theoretical views reveals a consistent attempt to apply the central idea of wholeness in a systematic manner to an

understanding of the role of libraries in the transfer of knowledge. For example, the terms "universality", "interdisciplinary", "cross-disciplinary", "total context" (1969: 60-1), "organic wholeness", "total human culture", "indivisibility" (1973b: 101, 103, 106), "holistic view", "undivided universe" (1977: 163, 165), and "geheelmens" (ie, *total person*) (1973a) all suggest the theme of wholeness, and holism as a systematic philosophical outlook (cf 7.1.1; 7.6 & 7.7 for fuller discussions of this approach).

This dominant theme that defines Kesting's theoretical position emanates from his fundamental conviction that "... reality in its ultimate essence is synonymous with wholeness" (1973b: 103; cf also 6.3). Consequently, he views library science as an inclusive discipline, ie, it encompasses "the universal coverage of knowledge", including the "micro-information services in science and industry" (claimed implicitly as the disciplinary domain of information science) (1969: 59). For this reason, library science, by virtue of its undisputed historically-defined quality of universality, is able to incorporate information science. Conversely, the narrower focus of information science at the same time precludes an accommodation of the broader scope of library science (1969: 79). This narrower focus manifesting itself in an emphasis on "... specificity, speed and exhaustiveness in providing specialist information...", is viewed as an "... offspring of the traditional function of information - as performed by the

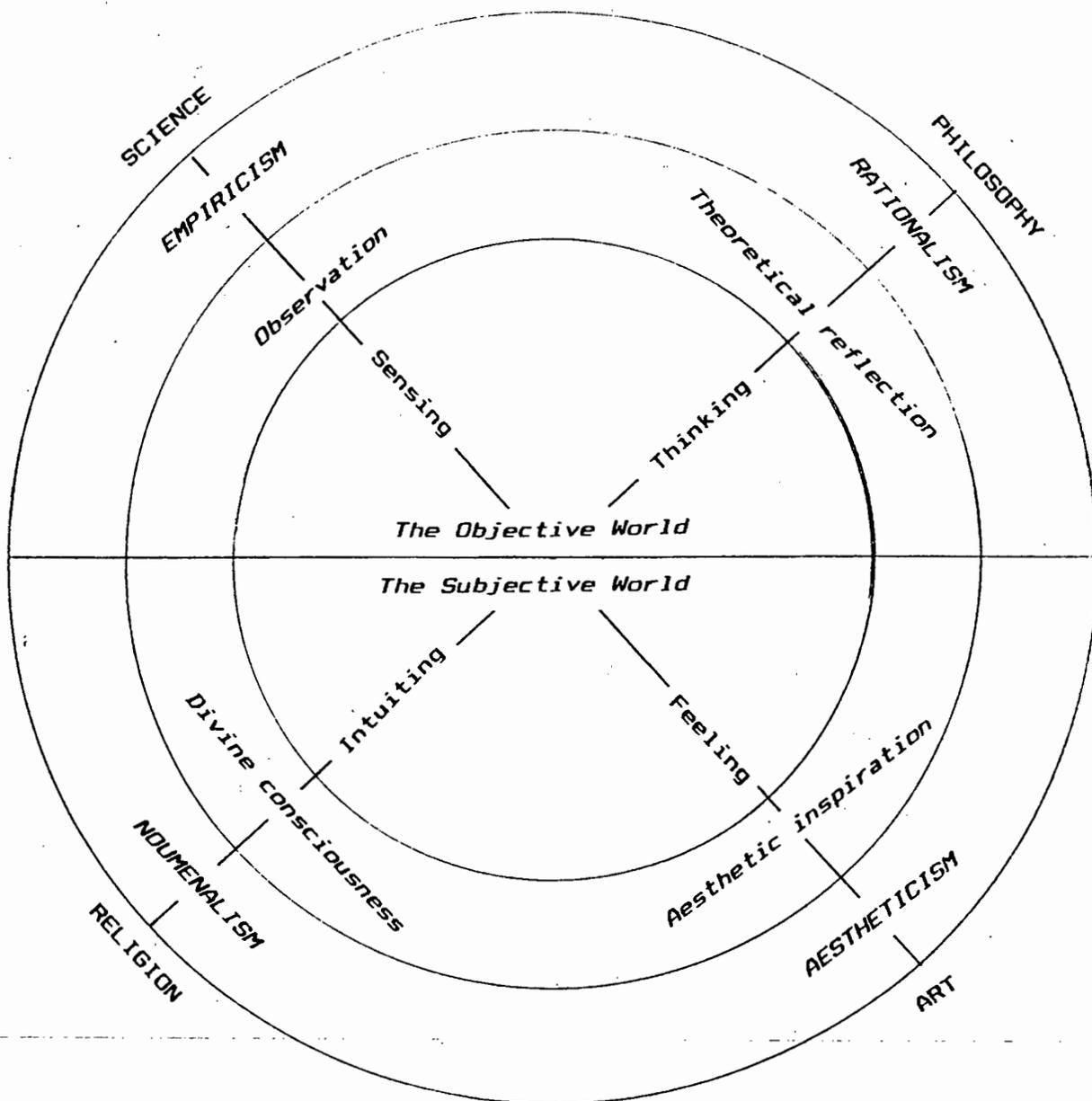
conventional library down the years...", but which has been inhibited in its growth by practical limitations such as the lack of basic equipment and skilled manpower (ibid.).

Another application of the notion of wholeness is found in his proposition that human knowledge is organically indivisible. His views on knowledge are inseparable from those concerning library and information science because he makes a plea for a science committed to dealing with all the phenomena of an undivided universe and which presupposes the organic wholeness of human knowledge as reflected in the corporate holdings of libraries (1977: 165). This perception of the organic wholeness of human knowledge proposes a fusion of the "speculative" and "exact" poles of knowledge (as set forth in Snow's two-cultures metaphor", which characterizes one conception of the opposite poles of human culture) and an attempt to encompass the several modes of knowing that has proliferated since the "... onset of rationalism in the 16th century" (which manifest themselves as "specialized branches formerly contained in a comparatively limited range of disciplines") (1973b: 103; 1985b: 381). This fusion and encompassment really imply the recognition of the connections (interdisciplinary and cross-disciplinary) among (and between) the "hard" sciences and the "soft" or "speculative" sciences (1973b: 106). He suggests the mould of a receptacle, an inverted cone, as a metaphor to delineate the essence of this perception of human knowledge. The lower end of the cone is the "proper domain" of the "exact" end of the knowledge spectrum. Vertical lines of connection between different disciplines extend from the "exact" base of the cone to its outer reaches where it

intersects with the "speculative" sciences. In addition to vertical interactions, there are also horizontal interactions that manifest themselves as hybrid disciplines such as biochemistry and physical chemistry (ibid.).

Kesting has more recently adapted the classical Jungian model of the cardinal functions of consciousness or "psychological orientations to reality" (cf 7.4 for an explanation of Jung's schema) to represent his conception of the structure of human knowledge in the context of library and information science. This structure is illustrated in Figure 5 (cf also Figure 13 for a further adaptation of Kesting's model and Figure 15 for its inclusion in a proposed epistemological position for library and information science). According to Jaffe the four functions of consciousness described by Jung - thought, feeling, intuition and sensation - equip man to deal with the impressions of the world he receives from within and without (1964: 267). The necessary integration of these four functions that man (both individually and collectively) has to achieve reflects the wholeness of the human psyche, of which the consciousness is as much a part as the unconscious (ibid.: 268). Although Kesting considers his adaptation of Jung's classical schema as provisional and still embryonic, it reflects a useful attempt at postulating the major modes of knowing that need to be acknowledged in the context of the dynamic complex of functions of librarianship as a professional discipline. Kesting's model also reflects the influence of the ideas of another pioneer in identifying epistemological positions in professional groups, viz that of Royce (cf Figures 1 & 3).

PSYCHOLOGICAL ORIENTATIONS TO REALITY
 METHODOLOGIES
 EPISTEMOLOGIES
 DISCIPLINARY MANIFESTATIONS



308a

Human modes of knowing: an adaptation of Jung's schema of the functions of human consciousness (*Psychological types* [1921], 1971)
 - J G Kesting, unpublished notes, 1991

Figure 5

This holistic view of human knowledge, which emphasizes its essential unity and interrelatedness, also proposes the "innate complementarity" and interconnectedness of all approaches to the ways of knowing and the absence of the dominance of one approach over another. This perception forms the basis for a professional view that is characterized by Kesting as "supradoctrinalism" and which illuminates the epistemological and ethical dimensions of library and information science (cf in this respect the perspectivism of De Vleeschauwer-5.3, and Coetzee-5.7). As a professional ethos for library and information science, supradoctrinalism espouses an active neutrality insofar as it "encompasses all legitimate doctrines" in the attempt to accumulate "all the genera and species of recorded human thought" (1985a: 170-171). In an attempt to reconcile supradoctrinalism with his holistic outlook of reality, Kesting argues that:

"Only supradoctrinalism enables man to encompass the multidimensional faces of ultimate reality: the [juxtaposed] opposites, the eternal flux of change. In this sense, Neo-Marxism is as real and valid as Liberal humanism or Traditionalism" (1985a: 170; cf also the view of Heraclitus-7.1 and that of Bergen-5.28.8).

The multiplicity of epistemological approaches (which often exist as polarized or contrasting approaches to reality) that supradoctrinalism accommodates is patently evident, for example, in the many schools of thought identified in any major encyclopaedia of philosophy. This rich variety of paths to knowledge highlights the wide range of choices available to the individual on the one hand and the necessity of selecting and applying a given epistemological position through which reality may be organized on the other.

Through supradoctrinalism, Kesting not only establishes a basis for the delineation of the essential foundation for an ethical position for librarians and information scientists, but he also offers a serviceable insight regarding the fundamental characteristics that an epistemological position for library and information science should have.

5.28.11 While many of the exponents discussed thus far in Chapter 5 emphasize in their writings the perception of knowledge in recorded form as the major source for a consideration of epistemological issues of library and information science, there are a few who acknowledge the coexistence of knowledge in recorded and unrecorded form. Examples of such positions include, inter alia, Coetzee's reference to the "subjective mode of the record of learning" (in the minds of men and women) (cf 5.7), Brookes' "subjective knowledge structures" (cf 5.10) and Kochen's mention of "knowledge in the individual's mind" (cf 5.18). However, it should be noted that no systematic discussion of the significance of the personal, private or subjective aspect of unrecorded human knowledge emerges from their writings.

From the point of view of the focus of this study, recorded human knowledge and unrecorded human knowledge are considered to be of equal importance for an investigation into the epistemological aspects of library and information science, insofar as the library user (human knower) ipso facto appropriates the content of library material (recorded human knowledge) to attain and/or augment personal knowledge which does

not necessarily become recorded. This mental process presumes an organic link/fusion of the two states of human knowledge. This link is evident at the level (1) of the research scholar, and (2) of the ordinary person in preliterate and literate cultures.

5.28.11.1 The invisible college

At the level of the research scholar the informal communication of personal knowledge in research communities (ie, between individual researchers) is referred to as "invisible colleges". This phrase was coined by De Solla Price in the early 1960's. (Incidentally, Kochen, for one, considers De Solla Price to be one of the greatest pioneers of information science and its greatest intellectual leader (1984: 147-8)). The phenomenon of "invisible colleges" should be viewed against the background of De Solla Price's analysis of the natural sciences. In contrast to Kuhn's "paradigm" analysis of the natural sciences (cf 7) De Solla Price's analysis is based upon his attempt to describe the structure of science "in terms of aggregates of people, monies, and results" in which such notions as "...elites of persons, institutions, and nations" clearly emerge (Griffith, 1980: 56). The notions of "elite" and "invisible colleges" are inseparable. Members of an "invisible college" are an "elite" of highly productive researchers in a given field of specialised knowledge. De Solla Price contends that "invisible colleges" are "... thrown up automatically by the scientific community", and consists of "... the hierarchical elite resulting from an expectable inequality, and numbering about the square root of the total population of people in that area of research front" (1971: 75). This small group of highly productive researchers are closely

connected by an "information flow" that is more direct and quick than the formal means of communication. He states that the "... whole raison d'être of these groups was to substitute personal contact for formal communications" (1966: 843).

The features of informal communication and personal contact in "invisible colleges" presuppose the existence of a literate tradition, or, human knowledge in recorded form. This is evident from several observations. First, the cumulative nature of the growth of scientific knowledge operates on the principle that new ideas, theories, etc, which are communicated personally in "invisible colleges" derive from those already documented in the literature of a given scientific discipline. Second, one of the purposes of the "invisible college" is to supply a means of quick access (bypassing the conventional, formal and time-consuming procedures of scientific publication) to relevant ideas of colleagues with the ultimate goal of publication, since the stature of a scientist is, in part, measured by the quality, amount and currency of his actual peer-reviewed publications. Third, many of the actual media of informal communication are print-based, eg, pre-prints, conference reports, draft copies, etc. De Solla Price himself could only explore this phenomenon through the medium of recorded knowledge as distinct from an "invisible college of invisible colleges". At the level of the research scholar, then, the link between recorded human knowledge and unrecorded human knowledge is firmly in place.

5.28.11.2 The dynamics of oral communication in preliterate or semi-literate cultures

At the level of the ordinary person the argument turns on the questionable value of literacy as a measure of cultural progress, ie, should the ability to access recorded knowledge be viewed as a necessary advancement from a reliance on personal knowledge that is not recorded, ie, human memory.

5.28.11.2.1 Coomaraswamy calls in question the belief that literacy should be held up as an absolute standard "... by which to measure the cultures of unlettered peoples" (1979: 45-6).

In oral cultures it is personal knowledge that is considered to be of greater significance. From the Indian point of view, for example, "... a man can only be said to *know* what he knows *by heart*; what he must go to a book to be reminded of, he merely knows of" (Coomaraswamy, 1979: 41). Literacy, which is assumed in the matter of access to recorded knowledge, is not to be seen as the line that demarcates "culture" from backwardness and ignorance, according to Coomaraswamy. He provides a cogent argument for the proposition that while literacy may be a necessity of modern industrial societies, there is no necessary connection of literacy with culture, and "... that to impose our literacy... upon a cultured but illiterate people is to destroy their culture in the name of our own" (1979: 35).

From the point of view of the focus of this study it is not so much the issue of superiority or inferiority of either the literate or the preliterate (oral) tradition that is considered

to be a significant one. What is crucial is the need to view the two as complementing each other to form a whole so that unrecorded knowledge and recorded knowledge, ie, oral and literate traditions constitute, in essence, a dynamic unity. In support of this, Coomaraswamy points out that "... the whole class of prophetic literature that includes the Bible, the Vedas, the Edda, the great epics, and, in general the world's 'best books'... existed long before they were written down" (1979: 35). Furthermore, since their transmission was oral, there was no notion that a written copy of any of the great religious works was a sacred object by itself. Satgoor, for example, points out that it was the sound of Veda in itself that was considered to be sacred and potent and that great emphasis was placed on the correct pronunciations and recitations of the texts (1990).

5.28.11.2.2 The idea of mutual complementarity as distinct from a superiority differential is relevant also to the issue of epistemological differences that are present in the oral and literate traditions. In his investigation of communication patterns in traditional West African societies, the librarian, Benge, notes the epistemological character of the personal knowledge of so-called non-literate persons. He claims that types of linear thinking are foreign to them and that they do not think in terms of cause and effect (1972: 78). Benge documents the observation by de Sola Pool (a distant relation of de Solla Price) that Western logic which has been dominated by the law of the "excluded middle" (ie, the either/or distinction), has never

been accepted in classical Indian logic where statements can simultaneously be true and false (ibid.). Benge notes in this regard:

"In the Western tradition 'truth' is valid in itself and independent of who says it, but in Brahminical philosophy this is not so and facts must be validated by an in-group authority. Therefore the spoken word is more trustworthy than a written source, and a statement is valid in a traditional society if it comes from the right oracle. In such societies the social function of a communication is more important than its truth value" (1972: 79).

It is the social dimension that predominates in epistemological aspects of the oral tradition, and the emphasis is on personal relations, ie, personal knowledge. Benge makes the poignant observation that literate and oral traditions may co-exist as a fertile combination that influences communication in traditional societies in a mutually regenerative way (1972: 77).

The interpenetration of these traditions manifest themselves also in modern societies in a discussion surrounding the epistemological status of fiction as a broad category of recorded human knowledge (cf also 8.5.3.1.1 for a related discussion). The connections are evident in an analysis of the historical development surrounding the transference of elements of myth and allegory in the oral tradition to the earliest forms of literature such as epics, legends and fairy tales. Myth occurs in the history of all human traditions and communities and is a basic constituent of human culture (Smith, 1986: 710). No matter how completely different they may be from the ordinary world, myths present themselves as authoritative accounts (ibid.). Myths in ancient civilization are known by virtue of

the fact that they became part of a written tradition. In the case of Greece, according to Smith, "... virtually all myths are 'literature' in the form in which they survived, the oldest source being the epics of Homer" (ibid.: 715). These myths are reinterpreted and passed down from one generation to the next through allegorical understanding. Allegory contributes to bringing order to mythological interpretation. As every culture embodies its basic assumptions in stories whose mythic structures reflect the society's prevailing attitudes toward life, allegory arouses in the reader or listener a response to different levels of meaning (Fadiman, 1986: 110-111). This raises the issue of interpretation which is a critical aspect in the consideration of fiction as a valid representation of reality (This is discussed in greater detail in 8.5.3.1.1).

Thus, at the levels of both the research scholar and the ordinary "unlettered" person there are claims relating to the necessary interdependence and equal value of unrecorded knowledge and recorded knowledge, and to the dynamic relationships that fuse them into states of cognitive unity which have a fundamental bearing on the knowledge-transmitting modes of traditional librarianship and information science.

5.29 Summary

This chapter has attempted to provide, as fully and coherently as possible, the several contributions by writers concerned with, to a lesser or greater degree, the transfer of knowledge role of libraries. It has been necessary to be selective in the treatment of the ideas of the several writers in

order to concentrate our thoughts on the purpose of this study - which is to explicate the central elements for establishing a proposed epistemological position for library and information science. A critique in the form of typologies of these contributions has been reserved for the next chapter.

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6 Critique of the contributions

Preamble

The critique presented in this chapter is not directed at the individual contributions nor at the individual contributors listed in Chapter 5. Rather, it sets forth an evaluation of the collective body of thought on epistemological orientations and issues relevant to establishing an epistemological position for library and information science, as it is provided in that chapter. Hence the analysis offered here refers to a corpus of thought as a whole as distinct from a position or concern articulated by any individual contributor. However, with a view to attaining certain general insights, it has nonetheless been necessary to make critical comparisons between individual contributors in particular instances. In all cases, cross-references are supplied in order to identify given views and perceptions.

The critique here assumes the form of analytical typologies insofar as the predominant views of the contributors from Chapter 5 are arranged according to selected categories that represent the issues considered to be important for this study. Nonetheless, no specific contribution has been evaluated from a given vantage position on the part of the researcher, since the fundamental purpose of the typology is rather to identify the main strands of diversity that typify Chapter 5. The critique aims essentially at describing and highlighting the different viewpoints relating to those aspects considered to be fundamental to establishing an epistemological position for library and

information science. A lack of uniformity of viewpoint - qualitatively and quantitatively - characterizes the contributions throughout Chapter 5. The critique in this chapter is intended to systematize this absence of uniformity, and make the diversity more readily apparent to the reader. The mode of approach inherent in analytical typology has been found to be useful for this purpose.

To an important extent the categories of viewpoint underlying the typologies suggest themselves in the writings of the contributors selected. This has eliminated the need to impose a preconceived structure on the several viewpoints since they are collocated and separated in accordance with their dominant characteristics. The unavoidable difficulty of this approach, however, is that the resultant categories are not necessarily mutually exclusive as may be required by the rules of any unequivocally dichotomous classification.

The presentation of the subjective views of individual theorists is not well served by a classification based on the rigours of traditional logic. There is support for this notion in the literature regarding the application of typological methods in the natural and the social sciences.

Hempel, for example, whose views on this matter are significantly authoritative since they are consensus-supported, contends that "systematic fruitfulness" should be the overriding consideration in arriving at workable models of type. He argues that "The characteristics which serve to... define the different

types should not merely provide neat pigeonholes to accommodate all the individual cases in the domain of inquiry, but should lend themselves to sound generalization..." (1970: 156-7).

Following Hempel, the categories of the typology presented here are patently not water-tight pigeonholes. In an application of the principle of "systematic fruitfulness", the categories are, as far as possible, derived from the actual viewpoints of the contributors as distinct from being imposed in a deliberate or preconceived manner. For this reason, the positions of individual contributors may justifiably be placed in more than one category in given cases. However, the attempt by the researcher to categorize an individual's position according to a predominant viewpoint only once has precluded the possibility that the exponent features in a given juxtaposition of variant categories.

It should also be noted that two factors emerging from an analysis of chapter five have complicated the task of attempting to present a definitive critique:

(a) First, the unsettled nature of the scientific/unscientific status of library and information science and the resultant unresolved debate of the relationship between library science and information science has led to a diversity of ambivalent, speculative and even obscure claims (cf 6.1). With regard to the former, an exponent's perception, for example, of library and information science as essentially an art, a natural science

or a social science, would appear to influence directly his predisposition towards an appropriate epistemology. With regard to the latter, the relationship between library science and information science is discussed in 4.4.2 as an issue related to the definition of library and information science. (The critique classifies the several exponents according to their views of this relationship).

(b) Second, it is unclear as to whether epistemological issues in library and information science are of a primary or secondary (ie, derivative) nature - which poses the question: should epistemology precede ontology or should ontology precede epistemology? Contrasting views in this respect have been expounded by Wright and Bergen. For Wright, ontological assumptions are of primary importance (cf 5.19). Bergen, on the other hand, maintains that epistemology is more fundamental (cf 5.26 for his view in the context of Harris' contribution). The position adopted in this study is that since no single approach to reality nor any single mode of knowing can claim to be the only valid one, it follows that it is not necessary to be forced into a choice of the precedence of epistemology or ontology. On the contrary, certain epistemological approaches sensitize one to certain realities in a more helpful way than others and therefore all approaches should be recognized for their advantages as well as limitations (cf Victor Cousin's eclecticism-6.3.2).

development in library and information science in the Republic of South Africa, confirms the absence of sufficient interest in the theoretical definition of library science and information science and in the demarcation of these fields of study. Consequently, they argue, this impasse has led to several theoretical difficulties for library and information science such as, for example, an identity crisis, a diversity of opinions regarding the central goal and dynamics of professional education, an inadequate balance between theory and practice, uncertainty regarding its relationship with the social environment, and so on (1988: 1-5).

The ambivalent claims surrounding the conjunction/disjunction of library and information science, coupled with the lack of consensus regarding the scientific status of library science or information science, complicate the formulation of an appropriate epistemological position for library and information science. It is especially the unresolved identity of information science and the nature of its specific relationship with library science that confuses the issue. The contributions reveal widely divergent perceptions of the issue (See Figure 6).

6.1.1 Information science as part of library science

In this view the information-disseminating function, of which information science is perceived as a logical institutional development, is considered to be one of the traditional functions of libraries (cf for example 5.28.10; Kesting, 1969: 60; Malan,

INFORMATION SCIENCE AS PART OF LIBRARY SCIENCE (cf 6.1.1)	LIBRARY SCIENCE AS PART OF INFORMATION SCIENCE (cf 6.1.2)	INFORMATION SCIENCE AND LIBRARY SCIENCE ARE IDENTICAL (cf 6.1.3)
SHERA, J.H. - 5.5 WRIGHT, H.C. - 5.19 KESTING, J.G. - 5.28.10	MACHLUP, F. - 5.4 WILSON, P. - 5.17	MEIJER, J.G. - 5.21 SCHRADER, A.M. - 5.27
LIBRARY SCIENCE AND INFORMATION SCIENCE AS SEPARATE ENTITIES (cf 6.1.4)	INFORMATION SCIENCE AND LIBRARY SCIENCE AS PARTS OF A LARGER WHOLE (cf 6.1.5)	NO WELL-DEFINED VIEW (cf 6.1.6)
MIKHAILOV, A.I. - 5.8 FARRADANE, J. - 5.9 BROOKES, B.C. - 5.10 ZAIMAN, R.B. - 5.15 KOCHEN, M. - 5.18 SARACEVIC, T. - 5.20	DEBONS, A. - 5.11 NITECKI, J.Z. - 5.14 BEKKER, J. - 5.24	BUTLER, P - 5.1 RANGANATHAN, S.R. - 5.2 DE VLEESCHAUWER, H.J. - 5.3 FAIRTHORNE, R.A. - 5.6 COETZEE, P.C. - 5.7 FOSKETT, D.J. - 5.12 SWANSON, D.R. - 5.16 HARMON, G. - 5.22 MCGARRY, K.J. - 5.23 HARRIS, M.H. - 5.26 MISCELLANEOUS GROUP - 5.28

FIGURE 6: THE CONJUNCTION/DISJUNCTION OF LIBRARY SCIENCE AND INFORMATION SCIENCE

1969: 159). Information science is perceived as being grafted on to library science and capable of improving certain areas of library science. This is the view of Shera:

"Information science can provide the librarian with some important and useful tools to expedite library services, but the ability to communicate a message with incredible speed over long distances through the use of glass fiber bundles or laser beams or to store vast quantities of recorded knowledge in computerlike mechanisms does not in any way alter the purpose of the library" (1983: 387).

Similarly, Wright views librarianship as the more encompassing field. He declares of librarianship, "I... see it, not as a subculture of information science, but as a larger discipline which includes information science... Information science can help librarianship with its communicative tooling; but that's all it can do..." (1983: 17; cf 5.19).

The opposing view, that library science is part of information science, is presented below.

6.1.2 Library science as part of information science

Central to this view is the conviction that libraries are not the only institutions that deal with information and that library science is not the only science studying information (cf 4.4.2.3). Library science is perceived as constituting a part of information science which is itself a metascience consisting of a number of integrated disciplines.

Although Wilson states that the distinctions between library science and information science have become blurred, he does point out that:

"... library scientists, if there are any, might also claim to be information scientists; library science would be the name of the species, information science the name of the genus" (1983: 394).

The only other major exponent who may be listed in this category is Machlup who considers library science as a sub-field of information science - the latter conceived in its broadest sense (cf 4.4.1.2 & 5.4). In this regard, information science is regarded as connoting the systematic study of information as content and as process and may embrace all or any combination of several academic disciplines (1983: 18). However, it should be pointed out that Machlup and Mansfield have detected at least three other uses of the term information science, one of which is adjoined to library science. It would appear that the claim of this viewpoint should be seen in the light of (for them) the still unresolved identity of information science.

6.1.3 Library science and information science are identical

In this view library science and information science are regarded as sharing the same goals and functions (Meijer et al, 1988: 78). Moreover, they are considered to form a single, unified discipline (Borko, 1984: 185). Meijer provides a strong argument for the adoption of the notion of the common identity of the two fields by demonstrating that in practice both libraries and information centres provide access to the content of recorded knowledge irrespective of physical format (cf Meijer's complex of major functions of library and information science-5.21, and the view that advocates the identity of library science and information science, 4.4.2.2).

Schrader's in-depth analysis of the definitions of library science and information science culminates in the view that the two fields of study share the same conceptual domain, and are hence identical.

6.1.4 Library science and information science as separate entities

This perception holds that there are no real connections between library science and information science and that they are independent and self-sufficient fields of study with disparate practical applications (cf 4.4.2.4).

Kochen observes an overt distinction between library science and information science:

"To suggest that the primary focus of information science should be library and information work is stifling and unproductively restrictive" (1983: 372);

and he refers to:

"... the confusion generated by superficial interpretations of 'information science and documentation' in its popular sense with reference to such institutions as libraries or media centers" (ibid: 375).

Having originally distinguished information science from library science on the grounds that the former is a science (theory) and the latter a profession (practice), Saracevic later proposes a complete separation of information science and library science (cf 5.20). Saracevic cites in support of this separation the increase of "information science knowledge and know-how", the growth of unique information market places and social pressures caused by unpredictable changes and effects of

information technologies (1982: 32). He argues that this separation could ensure the survival of traditional library schools.

Farradane's writings on the nature of information science lead to the conclusion that it has no affinities with librarianship and that it is a discipline in its own right (1960: 191; cf 5.9). He regards the development of information science as the resultant specialization of the research and development worker's approach to satisfy his/her own information needs and to provide access to relevant sources of information. In similar fashion, Zaaiman views information science as a development that emerged from the needs of natural scientists to satisfy their information needs and to systematize their literature in order to maximize access to its intellectual content in a way that library science has failed to do (eg, through heuristic retrieval mechanisms). Furthermore, the scientist is unable to receive much help from a librarian who is not a specialist in a given field of inquiry in the natural sciences and technology. Zaaiman characterizes the research that was undertaken to explore the problems of investigating alternative information systems of effective communication of information to natural scientists as information science (1969: 128; cf 5.15). This research offers library science the opportunity of developing its scientific basis, according to Zaaiman (1969: 130).

Also viewing information science (as informatics) as primarily serving the information needs of natural scientists, Mikhailov locates its origin with the division of labour in the

scientific community (cf 5.8). This division of labour came about when the number of scientists and scientific organizations became very large and the problem of communication among scientists and organizations became basic to the survival and development of science. Informatics is seen by Mikhailov as a natural development from bibliography and library science, with a narrower focus on the communication of scientific information (1969: 21). He regards library science as a "pedagogical discipline" to distinguish it from informatics but, regrettably, fails to explain the meaning of his usage of this appellation (ibid.).

Brookes was already working in the methodological areas of information science before the term was invented (Shaw, 1990: 3; cf 5.10). His knowledge of statistics, his interest in the philosophy of science and his work on the presentation and communication of scientific and technical literature determined the nature and direction of his contributions to the development of information science (ibid.). Although he originally sought to reconcile library science and information science, he eventually distinguished information science from library science, the former constituting a discipline with "its own territory, its own unique problems and its own unique view of human affairs which now has to develop its own principles and techniques " (1973: 245; 1980: 128).

6.1.5 Information science and library science as parts of a larger whole

This view differs from the proposition that information science and library science are identical (cf 6.1.3). According to this view, library science and information science are smaller parts of an encompassing whole that serves larger purposes. However, it is not unequivocally clear what the specific relationships between library science and information science within this whole are.

For Debons this whole is described as the "knowledge environment":

"... an environment that deals essentially with the total domain of recorded experiences and the means for using these experiences towards human development and survival. The information system is the technological component, the library the institutional component (each being part of the whole) of a complete system for human service" (1985: 67; cf 5.11).

From a more theoretical vantage point, and quite apart from the unspecified practical benefits of library science and information science in service of mankind, Nitecki also holds that library science and information science are subspecies of a whole, termed "metalibrarianship" (cf 5.14). Metalibrarianship is defined as a theoretical discipline which studies the relationships between the "generic book", knowledge and readers /users (1983: 406). Its broad practical applications are to acquire, organize and preserve knowledge resources; to provide unrestricted access to these resources and to assist users in the proper use of bibliographic tools (*ibid.*; cf also 5.21- Meijer's complex of functions of library and information science).

Rejecting a "two-cultures" metaphor in which library science and information science are diametrically opposed to each other, Bekker proposes rather that the two together, while not being identical, form a unity primarily committed to the larger role of the communication of information (cf 5.24; 1987: 20).

This so-called whole, of which library science and information science share equal or unequal parts, is not formulated unequivocally by its proponents. Also, it is not clear whether the different perceptions of this whole, as they are held by those contributors mentioned in this section, can be reconciled. For example, Debons restricts his notion of this whole to "recorded experiences" (cf quotation above), while Bekker does not make a corresponding delimitation explicitly. Moreover, Nitecki's whole, which is labelled "metalibrarianship", appears to be nothing more than a re-statement of the standard complex of the major functions of library and information science.

6.1.6 No well-defined view of the relationship between information science and library science

The majority of the contributors do not present consistently-held views of the relationship between information science and library science. For Butler, Ranganathan, De Vleeschauwer and Coetzee the issue of the conjunction/disjunction of library science and information science was not as significant as the issue of the scientific status of library science. With regard to the other writers it is difficult to claim with any degree of certainty whether the two fields are considered

co-extensive, identical, overlapping, separate or linked in any significant way. McGarry does make the claim that librarianship and information science are "overlapping but not co-extensive studies" (1981: 150). However, the nature of this relationship is not delineated by McGarry. Benge does not commit himself to a specific position on the issue, but observes, as a consequence of the characteristic reductionist features of science where the part is set up as the whole, that there is a "... danger that traditional librarianship will become an awkward 'sub-culture' within the main field of information science" (1972: 27).

6.1.7 Conclusion

It is very clear that the several categories of viewpoints of the relationships between library science and information science, as they are set forth in the contributions in Chapter 5, reflect divergent, and often directly conflicting, opinions. An attempt at establishing an epistemological position for library and information science requires a coherent, consistently maintained, consensual view of the discipline, ie, one that is uniformly held and understood. By and large, the contributions summarized in that chapter reveal a serious shortcoming in this regard, since some writers prefer the term library science (or librarianship), others prefer information science and still others prefer library and information science, while many are unsure whether and how the two are related to each other.

6.2 The issue of divergent conceptions of knowledge/recorded knowledge

A well-defined view of knowledge is of pivotal importance in any discussion of epistemology (cf 2.1 & 2.5). The attempts at defining knowledge in the context of library and information science, as set forth in 4.3, manifest a patent lack of consensus, and is perhaps a consequence of inadequate theoretical development, and more specifically, the absence of an appropriate epistemological position. Moreover, a well-articulated view of human knowledge is not self-evident in the contributions in chapter five. Rather, a multiplicity of widely divergent perceptions complicates the attempt at establishing an appropriate epistemological position for library and information science. It would appear that this issue is related to the previous one. For example, the view that library science concentrates on the speculative and information science on the exact pole of Snow's "two-cultures" conception of the division of general culture, leads to narrow conceptions of knowledge. In this way, eg, the humanities are aligned with the speculative pole, thereby separating them from the natural sciences, technology and those social sciences that apply natural scientific methods of research.

On the other hand, if information science is perceived in its relationship with library science in such a manner that they jointly constitute a unity committed to the communication of all human knowledge as it is manifested in recorded form, then

the perception of the essential wholeness of knowledge is preserved in so far as it reflects the principles of timelessness and universality (Kesting, 1969; 1973; Bekker, 1987).

There is no consistently-held or uniform perception of knowledge in the contributions. (The notion of knowledge is analyzed more systematically in 4.3). The several references to human knowledge in Chapter 5 range from tentative and speculative considerations to more systematic, rigorously-analyzed views. In order to ascertain the general perceptions of knowledge encountered in Chapter 5 a broad typology may assist to reveal certain distinctive features as they are held by individual contributors. The categories of this typology are not mutually exclusive but serve only to express the emphases of certain features as they are stated by individual contributors. For this reason, the typology is not about knowledge as such, but presents, rather, a helpful schema of the several views of human knowledge as they are expressed in Chapter 5 (See Figure 7a).

6.2.1 Knowledge as an interrelated, dynamic unity/whole

In this view, knowledge is conceived in a comprehensive, holistic way so that it forms an essential dynamic unity, and serves as the proper domain for library and information science, which concentrates on the communication of all human knowledge to all potential users. In this view, knowledge is not necessarily perceived as being restricted to recorded knowledge. Instead, the existence of both oral and literate traditions, ie, recorded and unrecorded knowledge, are assumed in this perception of knowledge.

**KNOWLEDGE AS AN INTERRELATED, DYNAMIC
UNITY/WHOLE (cf 6.2.1)**

BUTLER, P.	- 5.1
RANGANATHAN, S.R.	- 5.2
DE VLEESCHAUWER, H.J.	- 5.3
SHERA, J.H.	- 5.5
FOSKETT, D.J.	- 5.12
HARMON, G.	- 5.22
BEKKER, J.	- 5.24
KESTING, J.G.	- 5.28.10

**KNOWLEDGE AS DIFFERENTIATED INTO DISTINCT
TYPES (cf 6.2.2)**

MACHLUP, F.	- 5.4
ROYCE, J.R.	- 5.13
WRIGHT, H.C.	- 5.19

**KNOWLEDGE AS EXOSOMATIC AND PUBLICLY
ACCESSIBLE (cf 6.2.3)**

COETZEE, P.C.	- 5.7
BROOKES, B.C.	- 5.10
DEBONS, A.	- 5.11
SWANSON, D.R.	- 5.16
WILSON, P.	- 5.17
KOCHEN, M.	- 5.18
MEIJER, J.G.	- 5.21
SCHRADER, A.M.	- 5.27
KEMP, A.	- 5.28.2

**CONCEPTIONS OF UNRECORDED KNOWLEDGE
(cf 6.2.4)**

DE SOLLA PRICE, D.	- 5.28.11.1
COOMARASWAMY, A.	- 5.28.11.2.1
BENGE, R.	- 5.28.11.2.2

Butler's notion of scholarship, which implies the "total intellectual content of a culture" confirms the emphasis on the whole realm of human knowledge. The chief function of librarianship is "... to communicate the whole scholarship to the whole community", according to Butler (1951: 246). Ranganathan maintains the view that human knowledge is a unity which should be made readily accessible to all (cf 5.2). Continuing in the same vein, De Vleeschauwer postulates, as a central object of librarianship, the communication of all human thought in writing, or, "the transmission of ideas through the instrumentality of books" (1960: 44; cf 5.3). He characterizes his approach as an "objectivistic" one in which the library aims at being a complete record of intellectual life which reflects "... a high degree of intellectual many-sided and wide interests" (1960: 216).

Shera's support of a unified, holistic view of knowledge is stated explicitly in the declaration, "... knowledge is unitary... the world of knowledge is a unity..." (1970: 100; cf 5.5). Moreover, his initially proposed discipline of social epistemology emphasized the "whole man, the whole society and all their ways of thinking, knowing..." (1968: 24). In this way, knowledge is conceived in its widest possible sense but is at the same time a dynamic whole. Referring to an "artificial division in human knowledge", Foskett confirms his view of the unity of human knowledge when he claims that on the highest levels of thought there is no fundamental antagonism between science and the humanities (1964: 235; cf 5.12). He refers to the structure

of knowledge as a seamless web and to the danger of its fragmentation into "a jumble of separate bits of data" (1986: 316).

Harmon's idea of a "suprasystem", which is patterned after Wells' notion of a world encyclopaedia or world brain, manifests a concern for the need for a synthesis or unity of all human knowledge (1973: 80; cf 5.22). He demonstrates the emergence of such a "suprasystem" in modern information and reference network systems.

Bekker's broad conception of knowledge rejects the duality of hard sciences at the one pole and literature at the other pole of Snow's "two-cultures" metaphor, and proposes in its place a continuum of natural sciences, social sciences and the humanities so that knowledge is seen as a whole (1987: 15; cf 5.24). This totality of human knowledge becomes the focus of library and information science so that all possible viewpoints are revealed to the library user in a search for truth (1976: 6-7).

Kesting's view that knowledge is organically indivisible also repudiates a polarity of the "exact" sciences at one end, and the "soft" or "speculative" sciences at the other end, of Snow's "two-cultures" metaphor (cf 5.28.10). He proposes, instead, that these two poles should be perceived as deriving "... their vital solidarity from the continuum of our total human culture" (1973: 103).

These writers are clearly motivated, in their views of human knowledge, by the notions of unity, wholeness and that of interrelatedness as critical features.

Nonetheless, significantly different conceptions of human knowledge emerge in the writings of a number of exponents, and may be conveniently grouped together below.

6.2.2 Knowledge as differentiated into distinct types

In this category, human knowledge is perceived as differentiated into distinct types of knowledge according to various qualitative/epistemological criteria. These narrower conceptions of knowledge are related to the formal philosophical notion of truth as opposed to the broader conceptions of the first category where truth in its narrow, logical conception is not a critical feature. In contrast to the perception set forth in the first category where knowledge is viewed by and large as a dynamic unity (cf 6.2.1), this view of knowledge emphasizes more narrowly-defined, separate modes of thought. This view is not sustained adequately, ie, the proponents do not demonstrate how they interact or may be interrelated in any meaningful way.

While these writers stress the different types of knowledge, ie, distinctiveness and separateness rather than essential unity, it is not possible to assert that the proposal of the former view implies a rejection of the latter view. It is only possible to infer, without fear of prejudice, that they prefer to view human knowledge as consisting of fairly discrete and distinctive types

rather than as a dynamic and interrelated whole. The types are merely presented as alternatives and no attempt is made to arrange them in any order of priority.

Machlup classifies knowledge into five distinct types, viz, practical, intellectual, ephemeral, spiritual and unwanted. According to Machlup, these five types of knowledge emanate from different ways of knowing (1980: 27; cf 5.4). Royce's psycho-philosophical epistemology recognizes three kinds of knowledge which emanate from three epistemologies, viz, empiricism, rationalism and metaphorism (1973: 331; cf 5.13). Each of these types of knowledge is valid because they subscribe to specifiable truth criteria. Royce advocates the use of all three paths to knowledge in order to avoid "encapsulation", or, being "locked in" to a single, rigidified approach to reality.

Wright's dualistic epistemology recognizes only two types of knowledge, ie, experiential knowledge and intellectual knowledge (1977: 17; cf 5.19). Each of these two types is validated by a specific notion of truth, viz, experiential (artistic) truth which requires something to be true to a perceiver's experience, and intellectual (scientific) truth which relates to the objective realities of perceived entities (*ibid.*). Wright is unequivocal about the suitability of intellectual knowledge (and hence a rationalist epistemological position) to his own perception of the nature of librarianship (cf 5.19).

6.2.3 Knowledge as exosomatic and publicly accessible

The writers in this category stress the totality of human knowledge as it is expressed in the entire corpus of recorded writings. In this collective sense the total sum of human knowledge, as it is expressed in recorded form, provides the raw material for systematic investigation by researchers in library and information science. Knowledge is perceived as objective, or more accurately, as objectified, and is publicly, as distinct from personally, privately and subjectively accessible.

The writers grouped together here, while not conceiving of knowledge solely in this way, do emphasize these features more strongly than other features. Other perceptions that these writers may have of knowledge are therefore not enlarged upon. The most prominent feature that unites the members of this category is their views of knowledge as recorded in more or less permanent form as distinct from the holistic views of knowledge as espoused in 6.2.1, and the conceptions of unrecorded knowledge delineated in 6.2.4.

The conception of knowledge proposed by the members of this category may be loosely described as "Popperian", in the sense that it bears strong similarities with Popper's view of world three of his three-world view of knowledge, or knowledge without a knower (1959: 73; cf 5.10). This view maintains the proposition that the content of libraries may be construed as knowledge, ie, knowledge which does not require the recognition of a relation between the knower and the known. This knowledge

is viewed as "objective" and "public" (in the sense that Ziman uses it) and refers to exosomatically recorded writings (Popper, 1973: 122).

Coetzee's references to a sineidetic reality may be viewed as an indication of the recognition of this conception of knowledge (cf 5.7). For example, he holds that the sineidetic function of the library enables an individual to extract from the literature those ideas and opinions that lead to his personal development. Furthermore, Coetzee's notion of the record of learning (in its objective mode) confirms a view of knowledge as it is found "on the shelves of libraries" (1962: 56).

Brookes' fundamental equation of information science relates the notions of information and knowledge in such a way that knowledge may be viewed as structured information, and he conceives of knowledge structures as "subjective" and "objective" (1981: 4; cf 5.10). It is his conception of objective knowledge structures that provides productive opportunities for systematic investigation through observation and analysis. It is particularly the literatures of the natural sciences that Brookes considers suitable for quantitative studies, such as, for example, bibliometric research (Shaw, 1990: 3).

Debons et al claim that knowledge "... can also refer to the organized record of human experience, given physical representation (books, reports)" (1988: 8; cf 5.11). The reference to human experience is perhaps broad, but the view that

this experience is confined to its representation in recorded form confirms an objective (objectified) status in contrast to a purely private and personal mental condition.

Swanson's "Popperian" approach is evidenced by the view that knowledge may be likened to a "structure or an edifice" whose objectivity derives from "... its public character and its accessibility to criticism and to logical argument" (1980: 114; cf 5.16). This structure or edifice may be continually reshaped and librarians should facilitate this by developing and effectively applying suitable bibliographic tools. Many of Swanson's recent essays deal with what he refers to as "undiscovered public knowledge" and which investigates little-known links between the literatures of relevant subjects (1986: 103-118).

Kochen distinguishes between personal knowledge and objective bodies of knowledge, and he explicates the latter as the proper focus for information science with specific emphasis on the literature of scientific research (1988: 251; cf 5.18).

Meijer applies the principle of the universal dimension to recorded knowledge, proclaiming that "Documents in a library collectively represent all human thought in written form..." (1982: 13). These documents contain both positive and negative elements, ie, they "... contain a mixed collection of commendable (as well as harmful) thoughts" (1982: 19). In contrast to Shera's "total knowledge situation" (1972: 118), Meijer contends that librarianship is concerned with "that part of human thought"

that is recorded since "Something that has not been recorded cannot be collected, preserved, opened up, retrieved, and made available to users..." (1982: 20). Meijer's view of knowledge may be epitomized in the phrase, "coded thoughts recorded in documents" (1982: 21; cf 5.21).

Kemp's notion of social knowledge, as distinct from personal knowledge, may be construed in two different ways:

"... as documents containing knowledge which, at the time, is believed to be credible... it corresponds to Ziman's public knowledge as being current consensus. Alternatively, it may be seen as including any document which forms part of the 'entire cultural heritage': which is to say it corresponds to Popper's World Three" (1976: 170; cf also 5.28.2).

According to the first view social knowledge is selective and according to the second view it is comprehensive and libraries holding one or the other of these view will adopt different selection policies (ibid.).

In a similar manner, Wilson interprets knowledge in this social or public sense, so that it is "... the view of the world that is the best at a given time, judged by our own best procedures for criticism and evaluation of the published record" (1977: 5; cf 5.17). And it is the published record that encompasses knowledge in this case.

Schrader's view of knowledge should be seen in the context of his notion of symbolic culture, which is described as "... the representational dimension of human culture expressed as ideas and values in object form" (1983: 356; cf 5.27). Knowledge is a component of this symbolic culture and is

characterized as truth-seeking and permanently conjectural, and distinguished from opinion in the Platonic sense (1983: 377). While this view of knowledge confines itself to intellectual knowledge as distinct from sensory and other modes of knowledge, as part of symbolic culture it is necessarily recorded in documents and accessible to the library user.

Those who maintain conceptions of knowledge as recorded knowledge do not emphasize its relationships with unrecorded knowledge. The usual approach is merely to acknowledge that knowledge does not only appear in recorded form, but then to argue that library and information science is concerned primarily with the forms of recorded knowledge.

Nonetheless, there is a need to recognize the links that relate recorded knowledge and unrecorded knowledge.

6.2.4 Conceptions of unrecorded knowledge

While there are a number of references to "personal knowledge" in Chapter 5, for example 5.7-Coetzee, 5.10- Brookes, 5.18-Kochen, and Kemp in this chapter (see previous quotation), only De Solla Price (cf 5.28.11.1), Coomaraswamy (cf 5.28.11.2.1) and Bengé (cf 5.28.11.2.2) provide cogent arguments for the validity of conceptions of unrecorded knowledge in the context of a total knowledge-transmission culture.

De Solla Price highlights the phenomenon of informal communication between individual researchers within "invisible colleges". The epistemological validity of the knowledge

exchanged in this way is unquestioned. Its justification as true knowledge appears to be linked to the authority of the participants in the "invisible colleges", but this cannot be stated unequivocally. Nevertheless, what remains certain is that there is an exchange of personal knowledge, ie, unrecorded knowledge, between individual researchers. The communication, albeit in an informal manner, of unrecorded knowledge, presupposes an organic link with recorded knowledge because researchers derive their ideas from existing literature of the subject and intend to publish their own findings which are eventually incorporated into the literature of that subject.

The caution against placing an undue emphasis on the distinction between unrecorded knowledge and recorded knowledge is echoed in the writings of Coomaraswamy and Benge (cf 5.28.11.2). These two writers contend that oral traditions need not be associated with cultural backwardness, but that such traditions require, and in fact apply, different standards for evaluating the quality and truth-value of personal knowledge. Moreover, the interconnections between, and co-existence of, unrecorded knowledge and recorded knowledge are emphasized in their writings. Coomaraswamy records the transition from oral to literate traditions of prophetic literature and the so-called world's "best books" (1979: 35). Benge makes the proposition that literate and oral traditions may co-exist as a fertile combination that influences communication in traditional societies (cf 5.28.11.2.2).

The co-existence of literate and oral traditions also signifies the co-existence of more than one mode of knowing, ie, more than one epistemology, within such societies. In oral or non-literate traditions, or even in the case of children who cannot read, no distinction is made between the form and meaning of a message since the speaker is present to convey directly what is said (form) and what is meant by what is said (meaning). When meaning is lost a listener would ask, "what do you mean?" instead of "what does *it* (the message) mean?" The Canadian psychologist, Olson, proclaims that literacy entrenched this distinction by preserving the words but not the meaning, ie, separating text from interpretation (1986: 305). He states:

"In an oral society there were, of course, 'texts', fixed bodies of ritual and poetry, along with intentions and interpretations. All language necessarily involves all of those. But literacy provides the means for splitting those things apart, fixing part of its meaning as the text and permitting interpretations to be seen for the first time as interpretations" (1986: 306-7).

In an oral or preliterate society there is little or no distinction between a text and its interpretation. "The preliterate attitude is that the interpretations arrived at by the listener were actually intended by the speaker" (Olson, 1986: 306). We observe then that while writing solved the problem of "memory" for oral traditions, it created a problem of "meaning" or "interpretation" of a text. According to Olson, this leads to altered conceptions of mind and reality (1988: 28).

The point made here is that there appears to be significant epistemological differences in oral and literate traditions, or between unrecorded knowledge and recorded knowledge but that these may be accommodated within a broad, encompassing notion of human knowledge.

In contrast to the view that emphasizes knowledge as recorded knowledge (cf 6.2.3), the emphasis of knowledge as unrecorded knowledge highlights the presumed arbitrariness of distinguishing between the two, and the consequent need to view them as complementing each other. The majority of librarians argue that there is an ineluctable professional need to demarcate the boundaries of library and information science, and in this respect, inter alia, to exclude unrecorded knowledge from its scope. However, such a delimitation shifts the emphasis away from the communication or transfer of knowledge to a concern with the narrower focus on the physical aspects of the forms of recorded knowledge (cf Shera-5.5; Meijer-5.21).

6.2.5 Miscellaneous conceptions of knowledge

Besides the more well-defined perceptions of knowledge as noted above, there are a number of writers whose view of knowledge may be conveniently arranged in a category of miscellaneous conceptions (See Figure 7b).

KNOWLEDGE IN ITS RELATIONSHIP WITH INFORMATION (cf 6.2.5.1)

MIKHAILOV, A.I.	-	5.8
FARRADANE, J.	-	5.9
SARACEVIC, T.	-	5.20

KNOWLEDGE AS PERSONAL/SOCIAL CONSTRUCTIONS (cf 6.2.5.2)

NITECKI, J.Z.	-	5.14
MCGARRY, K.J.	-	5.23
DE MEY, M.	-	5.25
VON FOERSTER, H.	-	5.28.3
BELKIN, N.J.	-	5.28.4
WILLIAMS, P. & J. PEARCE	-	5.28.5
MUKHOPADHYAY, A.	-	5.28.6
TARANTO, R.E.	-	5.28.6

KNOWLEDGE AS A DIALECTICAL PROCESS (cf 6.2.5.3)

HARRIS, M.H.	-	5.26
BERGEN, D.	-	5.28.8

NO WELL-DEFINED VIEW (cf 6.2.5.4)

FAIRTHORNE, R.A.	-	5.6
ZAAIMAN, R.B.	-	5.15
STÄBER, P. & K. SCHMIDT	-	5.28.1
ENGLE, M.O.	-	5.28.7
OLAISEN, J.L.	-	5.28.9

FIGURE 7b: MISCELLANEOUS CONCEPTIONS OF KNOWLEDGE

6.2.5.1 Knowledge in its relationship with information

Saracevic, Farradane and Mikhailov primarily seek to relate the notions of knowledge and information in a systematic, consistent manner (cf 4.3.5.1).

Saracevic subscribes to a hierarchical view of this relationship, postulating, more specifically, a superordinate perception in which information is a broader concept embracing knowledge as a smaller component. Information is dynamic while knowledge is static, according to Saracevic (1975: 347; cf 5.20). By this he means that information is associated with the more active communication-related manifestations of knowledge.

Farradane's perception of knowledge may also be classified under the hierarchical rubric, but more specifically the coordinate mode, in which knowledge and information are not identical but rather on the same level and in different forms. In this way, Farradane views knowledge as "... the structured store of thoughts in the mind (and only in the mind)" and information as the physical manifestation of this structured store of thoughts (cf 5.9).

Mikhailov expresses a similar view, declaring that information is a certain form of knowledge that exists when this knowledge is alienated from its carrier and is materialized in the form of a document (1983: 14; cf 5.8 & 4.3.5.1.2). Knowledge is, in his view, a subjective version of the materialized document, although he claims that not every piece of knowledge can be materialized.

6.2.5.2 Knowledge as personal/subjective constructions

Stressing the active, individual role of the subjective knower in the construction of knowledge, there are a number of contributors who construe knowledge as personal views of the world. Knowledge, in this conception, is interpreted as a subjective creation of the individual's consciousness in its relation with the environment. This position is distinguished from the view of knowledge as unrecorded (cf 6.2.4) since here the emphasis falls on the manner in which knowledge is created/constructed rather than on the mode in which it manifests itself.

This view is particularly typical in the cognitive viewpoint in which "... states of knowledge, beliefs and so on of human beings... mediate that which they receive/perceive..." (Belkin, 1990: 12). In this way knowledge results from perception mediated by constructs that people hold of themselves and their worlds, which are not only individually, but also socially constructed (Schutz, 1970).

Nitecki argues that knowledge is a "... system of relations as they are perceived by an individual" (1985: 389; cf 5.14). He maintains the view that the traditional perception of knowledge as neatly-packaged ideas in books classified within a static system will not do, but that knowledge is a dynamic process (as distinct from a commodity) of relating previously known experiences with new ones (1986: 232). Knowledge is "... a continuous expansion of known relations about everything around

and within us" (1979: 32). It is viewed as a nonphysical entity whose essence is the relationship between various aspects of reality and whose substance is a linguistic structure (ibid.).

De Mey and Belkin stress the importance, as maintained in the cognitive viewpoint, of the active knowing subject in creating knowledge (cf 5.25 for De Mey's views; Belkin, 1984: 111). McGarry contends that knowledge does not exist in an abstract sense as "something out there", but that it has to evolve in response to human needs, ie, those of a given knower. "It is a creation of the human mind..." (1975: 65; cf 5.23).

Other contributors that emphasize the private, personal role of the knower in the knowing process include Von Foerster, Williams and Pearce, Mukhopadhyay and Taranto all of whom are listed in 5.28.

6.2.5.3 Knowledge as a dialectical process

Arguing against a "... commitment to positivism as the only legitimate path to knowledge" with regard to research in library and information science, Harris declares that a dialectical approach would recognize the "... change, conflict and tension as the foundations of reality rather than stability and consensus" (1986a: 525; cf 5.26). He claims that this "... dialectical emphasis on contradiction... enables the analyst to be far more sensitive to social potentialities than the more conventional positivist approaches..." (ibid.).

Harris advocates, albeit within the confines of the subject of research in library and information science, a view of knowledge in its essential linkages with political and economic power in society (1986b: 225). The kind of knowledge that ought to be generated through research in library and information science should not merely be of an administrative, technical character, as in the application of positivist methods, but should also be of the kind that reveals the underlying forces that, in Harris' view, seek to reproduce, in the U.S.A., the "dominant effective culture".

Harris' dialectical approach to knowledge seeks to reveal its hidden ideological character. This view of knowledge is central to his theory of library service in the U.S.A. which will, he claims, assist in understanding "... the extent to which asymmetrically distributed political and economic power determines the nature and extent of the knowledge forms we acquire, preserve, and disseminate..." (1986b: 245).

Bergen's view of knowledge emphasizes both dialectical and "constructivist" features, viz, "knowledge ... is constructed, not discovered, although there is a dialectical interplay, a dialogue, between theory and fact" (1985: 401). There appears to be a different interpretation of "dialectical" in Bergen's application. Whereas Harris clearly has in mind the need to attend to political and economic influences on the ways in which knowledge manifests itself in society, Bergen's conception of

knowledge as a dialectical process recognizes the interplay between the subjectivity of the knower and the objectivity of that which is known.

6.2.5.4 No well-defined conception of knowledge

It has not been possible to trace sustained arguments for a specific conception of knowledge in the case of a few contributors. They are identified in Figure 7b.

6.2.6 Conclusion

The divergent conceptions of knowledge in Chapter 5 enrich the debate surrounding the question of which one is suitable for library and information science. The view that advocates alternative modes of knowledge confronts the dilemmas of choice of the most suitable one, and of defending the choice of an inevitably narrow epistemological position (cf 6.2.2). Furthermore, the perception of knowledge as recorded knowledge cannot be distinguished from that of unrecorded knowledge in an unequivocal manner since the two categories are perceived as being dynamically interrelated (cf 6.2.4). The fluid nature of human knowledge is evident in its manifestations both as recorded knowledge that may be stored in libraries/information centres and as ideas that may be exchanged between highly literate researchers in an "invisible college" or between illiterate/non-literate persons (cf 6.2.4). The blunt distinction between recorded knowledge and unrecorded knowledge, while being useful for certain purposes, is an insufficiently warranted one.

If the emphasis in library and information science falls on the communication/transfer of human knowledge the distinction between recorded knowledge and unrecorded knowledge becomes less meaningful. Bengé proclaims that in traditional African societies, "... the focal point of the communication system was not literacy... The oral mode of instruction persisted and persists long after literacy is available" (1972: 76). He continues by adding that "... books are to be memorized... so that the 'golden chain' which Professor Irwin claims as the historical role for libraries is embodied not in books but in a succession of teachers" (ibid.). The idea expressed in this observation by Bengé is that the communication/transfer of human knowledge is the primary concern and may combine oral and literate modes.

The view of knowledge that encompasses all the others and which does not face the dilemmas noted above is the conception of knowledge as a holistic, dynamic unity. This conception maintains the equal validity and recognition of all modes of knowing, recorded and unrecorded. Furthermore, it proposes that, at the highest levels, human knowledge is characterized by the features of interconnectedness and unity. This view of human knowledge is regarded by a number of philosophically-inclined library scholars as a tenable one for library and information science (cf 6.2.1). However, a sound argument defending this view and its central idea of wholeness still needs to be provided (cf Chapter 7).

It is manifestly evident from the several views of knowledge described in this section that there is no unanimous or consensus-supported view of human knowledge in Chapter 5. The views of the contributors are more complex than the typology used here may suggest, but the overwhelming tendencies in points of view have been arranged to provide a helpful classification to confirm their widely divergent views.

6.3 The issue of truth/ultimate reality

Another area of conflicting views in the contributions of Chapter 5, is that of notions of truth and reality (or ultimate reality). The relevance for library and information science of approaches to reality is affirmed in Benge's declaration that:

"Our descriptions of the meaning of information rest on our concept of reality, eg, Soviets subscribe, in their descriptions of information, to a materialist concept of reality and the 'correspondence theory of knowledge', ie, information is simply a data system of the world around us. These philosophical foundations... have to be mentioned... since everything depends on what we consider reality to be" (1984: 188-9; cf 4.2.1).

Questions that require answers in the attempt to formulate an epistemological position for library and information science are: "should knowledge be related to the notion of truth in its absolute sense or in its relative sense?" and, "is there a tenable view of reality for library and information science, and, if so, what should it be?"

A fuller treatment of the different conceptions of truth and reality is presented in Chapter 7. This section merely aims to highlight the general positions adopted by the writers in Chapter 5 according to their predominant views of truth/ultimate reality.

It is significant to note that certain distinctions may be maintained between reality and ultimate reality, and that there are different points of view whether ultimate reality may be achieved. Royce, for example, claims that ultimate reality is unattainable (cf 5.13), while Conradie affirms a connection between "... the deepest being of man with the Ultimate Reality of the Universe" (1983: 52). Further to this is the dilemma of the means of achieving this ultimate reality. Harman, for example, contends that "... ultimate reality is contacted, not through the physical senses, but through the deep intuition" (1989: 6).

It is Medawar's view that the physical senses, which are fundamental to modern science, do not make any pretence to attaining ultimate reality. Modern science is unable to answer "ultimate" questions and is only able to show the direction toward Ultima Thule, "where the truth lies" (1984: 5).

It is not fruitful to pursue the issue of ultimate reality any further at this point, since the view adopted in this study is that there are many kinds of truth/reality as distinct from a single, absolute conception thereof. Le Shan suggests different "systems of construing reality" or "ways of inventing-discovering reality", all of which are valid "in order to give our total

being the nourishment it needs" (1976: 112; cf Chapter 7). As in the case of notions of reality, so also in the case of notions of truth there is no fixed and unalterable conception. Medawar, for example, mentions two equally valid notions of truth in science. According to the first view:

"... truth takes shape in the mind of the observer; it is his imaginative preconception of *what might be true* that provides the incentive for finding out, so far as he can, what is true. Every advance in science is therefore the outcome of a speculative adventure, an excursion into the unknown. According to the opposite view, truth resides in nature and is to be got at only through the evidence of the senses: apprehension leads by a direct pathway to comprehension, and the scientist's task is essentially one of *discernment*" (author's emphasis) (1983: 13).

Medawar's notions of truth provide a useful framework for arranging the perceptions of truth as they are held by the contributors of Chapter 5 (See Figure 8).

6.3.1 The objective/external view of truth/reality

According to this view, truth or reality is perceived to "reside in nature" (Medawar, 1983: 13). It exists in an objective sense, ie, independently of the knowing observer and is acquired through the evidence of the senses. In this way, reality or portions thereof are discovered through systematic investigation and does not involve any subjective involvement. Reality is, as it were, "out there" as distinct from "in here" (Le Shan, 1976: 55). Truth and reality, in this view, exists only in their extreme positions as absolute truth and as ultimate reality. These conceptions of truth and reality are not dependent upon human consciousness but are discoverable through the senses or intuition.

OBJECTIVE/EXTERNAL VIEW (cf 6.3.1)	SUBJECTIVE/INTERNAL VIEW (cf 6.3.2)	NO WELL-DEFINED VIEW (cf 6.3.3)
FARRADANE, J. - 5.9	RANGANATHAN, S.R. - 5.2	BUTLER, P. - 5.1
ROYCE, J.R. - 5.13	DE VLEESCHAUWER, H.J. - 5.3	MACHLUP, F. - 5.4
	SHERA, J.H. - 5.5	FAIRTHORNE, R.A. - 5.6
	COETZEE, P.C. - 5.7	MIKHAILOV, A.I. - 5.8
	BROOKES, B.C. - 5.10	DEBONS, A. - 5.11
	NITECKI, J.Z. - 5.14	FOSKETT, D.J. - 5.12
	SWANSON, D.R. - 5.16	ZAAIMAN, R.B. - 5.15
	WRIGHT, H.C. - 5.19	WILSON, P. - 5.17
	MCGARRY, K.J. - 5.23	KOCHEN, M. - 5.18
	BEKKER, J. - 5.24	MEIJER, J.G. - 5.21
	DE MEY, M. - 5.25	HARMON, G. - 5.22
	VON FOERSTER, H. - 5.28.3	HARRIS, M.H. - 5.26
	BELKIN, N.J. - 5.28.4	SCHRADER, A.M. - 5.27
	WILLIAMS, P. & J. PEARCE - 5.28.5	STÄBER, P. & K. SCHMIDT - 5.28.1
	MUKHOPADHYAY, A. - 5.28.6	ENGLE, M.O. - 5.28.7
	TARANTO, R.E. - 5.28.6	DE SOLLA PRICE, D. - 5.28.11.1
	BERGEN, D. - 5.28.8	COOMARASWAMY, A. - 5.28.11.2.1
	OLAISEN, J.L. - 5.28.9	
	KESTING, J.G. - 5.28.10	
	BENGE, R. - 5.28.11.2.2	

FIGURE 8: THE ISSUE OF TRUTH OR ULTIMATE REALITY

Among the contributors' expositions in Chapter 5 it is Farradane's who comes closest to representing this view (cf 5.9). He maintains that reality exists outside of ourselves and that this external reality may be known through the mediation of our brains (1952: 78). It is noteworthy that his concept of truth does not uphold such a strict "externalist" interpretation. He views truth as a consensus of consistent, communicable knowledge, ie, a consensus of experience among a totality of minds (1981: 269). This interpretation, it should be noted, reveals a social aspect of the construction of truth.

For Royce, ultimate reality is beyond the grasp of man (ie, it is unknowable), but is hypothetically monistic in character, ie, it is essentially of one kind (cf preamble to Chapter 7, and 7.1). However, at the same time, the idea of three legitimate pathways to knowledge in Royce's model (cf 5.13) is premised upon separate sets of reality continua, ie, they assume three different approaches to reality. Each approach to reality is validated or invalidated by means of a different set of truth criteria. In this way it is possible for man to derive more than one conception of reality and truth.

The view of truth/reality as objective and external is thus not held uniformly or consistently by any contributor.

6.3.2 The subjective/internal view of truth/reality

The majority of contributors, in so far as they refer to truth or reality, consider that it is privately and/or socially constructed. As Medawar puts it: "Truth takes shape in the mind

of the observer..." (1983 : 13). In this perception, human consciousness is not only responsible for creating reality but is a constituent part of it. This view is central to the cognitive viewpoint in which the constraints on knowledge are not in terms of some "neutral" truth but in terms of the knowing system's "action equipment", ie, it is not abstract truth but personal truth, or, truth for someone (De Mey, 1980: 57). In this way the individual constructs his own subjective view of truth. The means for justifying subjective conceptions of truth are different from those for justifying objective conceptions but are by no means "inferior".

Ranganathan's Hindu religious outlook espouses an identification of universal (absolute) or ultimate reality (Brahman), with individual reality, or the reality within, (Atman) (Chappell, 1985: 382). This view suggests that each individual may relate to ultimate reality in a unique way, ie, through an Atman-Brahman relationship that recognizes the participation of the subjective individual in absolute, universal reality (cf 5.2).

De Vleeschauwer's perspectivistic epistemology holds that a multiplicity of truth perspectives stand in harmonious relation to each other (1952: 267; cf 5.3). None of these perspectives is superior to the other. For De Vleeschauwer, according to his student, Rauche, the human mind is the critical denominator in all human truth and, because of man's changing experience of reality, truth-perspectives change in accordance with man's historically changing world-consciousness (1983: 31). Truth is

then perceived as a dialogue that is carried on between man and his contingent experience of reality. This view corresponds closely with the eclectic philosophy of Victor Cousin (1792-1867) which proposes that each philosophical system is not false, but incomplete, and in reuniting all incomplete systems, we should have a complete philosophy, adequate to the totality of consciousness (no date).

Shera's views of truth/reality are not evident in the texts considered in this study. However, his suggestion that librarianship should look to symbolic interactionism for its "proper foundation" would appear to suggest that he was aware of the notions of truth/reality as they are construed in that school of thought. Symbolic interactionism "refers to the process by which people relate to their own minds and the minds of others" (1983: 386; cf 5.5). The emphasis in symbolic interactionism is on subjective meanings and on man as an active thinker, according to Wright (1986: 749). It requires "... the observer's intimate and personal involvement with the empirical social order..." (ibid.: 750). Symbolic interactionism influences the cognitive viewpoint in which the active self plays a key role in the knowing process. From the brief references by Shera to symbolic interactionism it is, however, not possible to infer that he agreed with all its precepts, and hence his views of truth/reality remain inconclusive.

Coetzee, who may also be characterized as a pluralist-perspectivist, recognizes the distinctiveness of several realities which become known to individuals according to

their subjective experiences. He claims that different sciences subscribe to different spheres of reality (1978: 24; cf 5.7 & 7.6).

As a dualist, Brookes affirms the existence of two realities, ie, the physical world and the mental (cognitive) world. His concern with the cognitive world, however leads him to concentrate on "objective" knowledge structures which are accessible to observation and analysis rather than "subjective" knowledge structures which, he contends, are recalcitrant to fixed analytical techniques (1981: 4; cf 5.10 & 7.6).

For Nitecki, reality is described as "shifty" and "kaleidoscopic" and is responsible for the developmental features of knowledge. His perception of reality as a subjective image of the world is evident in the view:

"The reality of the so-called material world is existential in nature. Its perception is selective and subjective, responding to the external stimulation, or it is initiated by one's own intellectual curiosity. Its comprehension is always relative to the previously absorbed perceptions, interwoven into a system of personal relations known at any one time" (1985: 403).

Nitecki maintains the view that it is personal knowledge that matters in librarianship, thereby confirming his conviction that a relational approach to knowledge and reality is a tenable one for librarianship:

"It is not an issue of building separate theories for ideal and real worlds, since both, form and content, reflect each of the two worlds" (1985: 401).

Swanson's and Kemp's references to truth are characteristically "Popperian" in that it is viewed as a "regulative principle" or as a "postulated reality" (as distinct

from its absolute or ultimate conception) and provides a goal, or a sense of direction, for the growth of knowledge. Furthermore, the truth of statements is based on the extent to which they are compatible with other statements that are believed to be true (cf Swanson, 1980: 115; Kemp, 1976: 166). Supporting the "falsificationist" view of Popper as a defensible view of the growth of knowledge in libraries, Bergen adds that one purpose of the library:

"... should be to facilitate the refutation of theoretical propositions. This is a revolutionary shift since libraries have historically served as a source of evidence supportive of the theoretical propositions of their clients" (1985: 402).

Wright's dualist approach to truth/reality is applied consistently in his writings (cf 5.19 & 7.6). He postulates two kinds of truth, viz, experiential (artistic) truth and intellectual (scientific) truth (1977: 17; cf Medawar's quotation in 6.3). He also proposes that the ultimate realities for librarianship are either "ideas" or "data" and, in his view, it ought to be "ideas". This culminates in his espousal of a rationalist epistemology in which rationality is the only acceptable criterion of truth (1986: 751; cf 2.5).

Although "documented information" can only supply a partial view of reality according to Bekker, the categories of non-fiction and fictional writings are required to measure up to two different categories of reality (cf 5.24). In the case of non-fiction he postulates a correspondence with "external reality" to achieve truth, and in the case of fiction truth is achieved through a correspondence with the reality of the author, or the imaginary world created by the author (1984: 19).

De Mey's cognitive viewpoint supports a multiplicity of world views and hence the recognition of several realities which recognize the active role of the subjective knower. In contrast to crude empiricism, where reality is "out there", unfolding itself to a passive subject, the cognitive view emphasizes the active organizing activity of the subject. McGarry maintains the view that reality is based on "private experience" and that it is "socially constructed" (1975: 41; cf 5.23). The cognitive view is also shared by Von Foerster (cf 5.28.3, Williams and Pearce (cf 5.28.5), Mukhopadhyay and Taranto (cf 5.28.6) and Belkin (cf 5.28.4). Benge's emphasis on the personal element in the creation of knowledge underscores the recognition of the active knower as in the case of the cognitive view (1972: 189).

Olaisen sets forth alternative realities for library science that invests it with the qualities of tolerance and pluralism. These realities represent a necessarily partial and incomplete conception of truth (cf 5.28.9; 1985: 148).

Kesting proposes that reality in its ultimate essence is synonymous with wholeness, which also affirms the recognition and consideration of the validity of all "legitimate doctrines" (cf 5.28.10). This holistic view of reality maintains its essentially multidimensional character, and the equal claims to truth by manifestly disparate modes of knowing, such as, for example, Neo-Marxism and Liberal humanism, are upheld through the professional ethos of supradoctrinalism.

6.3.3 No well-defined view of truth/ultimate reality

Many of the contributors listed in Chapter 5 do not make any references to the significance of conceptions of truth/ultimate reality in their writings and there are others whose references require elaboration and interpretation. The names of these writers are arranged in a chronological order in Figure 8.

6.3.4 Conclusion

The different conceptions of truth/reality and of the realities of library and information science reflect the divergent, and often speculative perceptions of the contributors. As with the other issues, this one is characterized by a lack of uniformity. One is struck, however, by the widespread support among the contributors of the view that reality is multidimensional and the result of individual and social construction, and that truth, as it may be applied to library and information science, is not conceived as fixed or absolute.

When notions of truth and reality are conceived in broader, holistic terms there is a greater tolerance of differences and contradictions. In this conception, judgements, theories and theses are regarded as partial aspects which can be reconciled in the whole which maintains its "unity through differences" (Walker, 1911: 7; cf 7 1.1 & 7.7). The philosopher, Bradley, relates the notions of wholeness, truth and reality in the pronouncements that:

"Reality is the unity in which all things, coming together, are transmuted, in which they are changed all alike, though not changed equally... every advance in the evolution of reality logically implies the

progressive 'absorption' (into a body of knowledge, together with subordination to a truer point of view)-of every real within the whole..." (1893: 72); and

"... every aspect of reality, every appearance... is preserved within the whole" (1893: 77; cf Kesting-5.28.10).

A conception of knowledge in its holistic sense (cf 6.2.1) as a suitable one for library and information science would appear to require an equally broad conception of truth/reality. Nevertheless, while Chapter 5 does offer brief references by certain individuals to the merit of holistic conceptions, a more sustained, cogent argument for the validity of its application to an epistemological position for library and information science is still required (cf Chapter 7).

6.4 Summary

The texts that are examined in Chapter 5 reveal both well-defined and speculative views of issues that are significant for developing an epistemological position for library and information science. Moreover, these views are manifestly uneven in their treatment, thereby complicating the emergence of a clear-cut presentation of how such a position should look. This critique intends only to highlight concerns by several theorists for epistemological aspects as these concerns are revealed in their texts, as examined in Chapter 5. Another difficulty of the examined texts is that no cumulative progression of ideas on the issues is discernible. In very few instances may the influence of one writer be discerned in the theoretical views of another, eg, Shera's influence on Wright, or De Mey's influence on Belkin (cf 5.19 & 5.28.4).

The contributions reveal, to a large extent, the application of individual philosophical perspectives, as they are held by the contributors, to the interpretation of key issues in library and information science. With the application of these different philosophical outlooks it is not surprising that very little uniformity of thought emerges. This lack of uniformity is, indeed, the most significant feature of the texts. However, these contributions provide a source of evidence of genuine concerns for epistemological aspects of library and information science. They also supply the general insights from which an appropriate epistemological position for library and information science may be explicated.

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7 Conceptual requirements for a general framework within which to establish an epistemological position for library and information science, and the criteria for evaluating such a position

Preamble

There is no individual exponent in Chapter 5 from whose writings a singularly suitable epistemological position may be developed and applied to library and information science. Moreover, no single writer discussed in that chapter devoted himself single-mindedly to this task. This does not imply that none of these writers is able to do so, or that references to these matters are too sparse and fragmentary for serious consideration.

Of those that are eminently qualified to contribute to a discussion of epistemological issues in library and information science, De Vleeschauwer (cf 5.3) and Coetzee (cf 5.8) do not reveal in their writings (in library and information science) any consistent application of their systematically articulated epistemological positions (as established in their respective doctoral theses) to library and information work. To some extent it is nonetheless possible to trace in their writings on library and information science the influence of their "perspectivistic" epistemological views.

Shera's conviction that "librarianship" is truly based on epistemological foundations is not given adequate logical support in his writings, nor is the content of his notion of "social

epistemology" delineated in an unambivalent way (cf 5.5). Brookes' support of Popper's epistemological approach for information science should be viewed in the light of his self-limiting perception that library science and information science are separate disciplines (cf 5.10 & 6.1.4). Wilson (cf 5.17) and Bekker (cf 5.24), both of whom are philosophically-trained librarians, offer useful, yet still tentative, contributions towards the establishment of a suitable epistemological position for library and information science. Wright (cf 5.19) suggests an epistemology that is supported by a perhaps too narrow view of the nature of "librarianship": for example, he holds that librarianship is antithetical to natural science. He does propose, however, that a rationalist epistemological position is the only one that is suited to the ultimate realities of "librarianship" which he perceives to be "ideas" rather than "data".

Harris' investigation into epistemological aspects of library and information science appears at best to constitute a sustained argument against the dangers of an uncritical acceptance of positivist epistemological approaches to research. He contends that research methods that are supported by these epistemological approaches are suited primarily to investigating technical aspects of library and information science. According to him, however, there is a critical need to investigate also the non-technical aspects of library and information science, ie, political and economic forces that influence the knowledge forms that manifest themselves in society and which are distributed by libraries. He proposes for the consideration of researchers in

library and information science the application of a Hegelian Marxist epistemological approach to investigate these issues (cf 5.26). While Bergen's response to Harris endorses the validity of Hegelian Marxist, positivist or, for that matter, any other credible epistemology, his views are not explicated in sufficient detail for the purpose of serious consideration. It is therefore unclear how he would defend such a position against the charge of relativism, ie, the view that any possible approach to knowledge and reality is valid.

The acknowledgement of the limitations and shortcomings that emerge in the contributions of the "more qualified" individuals in Chapter 5 (as they are described above), and the widely divergent conceptions on key issues that are relevant for developing an epistemological position (as they are presented in Chapter 6), does not necessarily give cause for despair. Instead, a more constructive approach is suggested by the seeming impasse: it appears possible indeed to develop the scattered, fragmentary and speculative insights delineated in that chapter into a logically tenable epistemological position for library and information science.

The uncohesive nature of the viewpoints on epistemology-related matters that emerge from the examined texts of the writers listed in Chapter 5 confirm the need to find a general framework that is sufficiently comprehensive in scope to address the key issues considered to be relevant to the establishment of an epistemological position for library and information science. These key issues are the establishment of:

(a) a position regarding the conceptual and semantic relationship between library science and information science;

(b) a tenable view of the conception of knowledge of primary relevance to library and information science; and

(c) a tenable view of truth as ultimate reality and its implications for library and information science.

The most essential feature of this general framework would have to be its capacity to accommodate the broadest notions of human knowledge. The need for this is evident from the agreement in several contributions that libraries and information centres, in a corporate sense, seek to collect the entire sum of human knowledge as it is expressed in recorded form (inter alia, Butler's notion of "scholarship"; Meijer's notion of "coded thoughts", Schrader's notion of "symbolic culture" and Kesting's view of knowledge as organic wholeness - cf 6.2.1). In addition to this notion of the "universality" of human knowledge, the quality of "divergence" is also considered to be a critical feature, and can only be accommodated within a framework with the broadest possible scope. This quality of "divergence" of human knowledge is demonstrated in the writings of individual contributors in the following ways:

(a) it includes, in principle, the possibility of both positive and negative elements (cf Meijer-5.21; Schrader-5.27);

(b) it encompasses distinctive perspectives and approaches to knowledge and truth/ultimate reality such as rationalism, empiricism, metaphorism, existentialism and Marxism (cf inter alia: De Vleeschauwer-5.3; Coetzee-5.7; Royce-5.13; Wright-5.19; Harris-5.26; Bergen and Olaisen-5.28.9); and

(c) it recognizes the organic links between oral (unrecorded knowledge) and literate traditions (recorded knowledge) (cf De Solla Price, Coomaswamy and Bengtson-5.28.11 & 6.2.4)

Only a general framework that encompasses the widest explanatory principle appears to be suited to the critical feature mentioned above. Moreover, that principle should self-evidently be one that is supported in formal academic debate as one that by virtue of a rich historical background has proved to be worthy of serious consideration, and that stands up to consistent critical examination.

It is postulated that the principle suggesting itself as the most suitable to meet the requirements stated above is that of the notion of holism. However, this explanatory principle and the theoretical perspective which embodies it needs to be evaluated in relation to rival theoretical perspectives before it can be proposed as one worthy of application in the field of library and information science.

Two apparently opposing theoretical perspectives that are implicit in the several contributions in Chapter 5 subscribe to conflicting philosophical outlooks. These outlooks embody the central notions of wholeness on the one hand and of fragmentation on the other. On a more fundamental level, wholeness and fragmentation constitute the basic attitudes or orientations towards the vexing issue of the nature of reality which manifests itself in systematic philosophy as the problem of the One and the Many, or as monism and pluralism (and, as a matter of course, dualism as a special case of pluralism). Monism maintains the fundamental oneness or unity of reality while pluralism postulates that "... there are many kinds of thing, or that there

are many things" (Hall, 1967: 364). Dualism, as a special case of pluralism, holds that there are essentially "... two things or two types of thing" (ibid.). Philosophical holism, as a serious philosophical orientation that also stresses the essential unity underpinning reality, is closely allied to monism (Digby, 1985). Its major features will be described a little later (cf 7.7). The important point that is stressed here is that wholeness and fragmentation as explanatory principles have rich intellectual traditions that support them, and provide valuable insight into their essential character.

7.1 Wholeness and fragmentation in Western thought

In early cosmological theories in Western philosophy the debate surrounding the issue as to whether reality is One or Many had already been prominent in the thought of the Pre-Socratic philosophers (c. 600-400 BC). The monistic view that maintains the oneness or unity of reality is encountered in a developed form in the Pre-Socratic philosophy of Parmenides (c. 513 BC), whose ideas were to serve as a point of departure for the diverse conceptions of the nature of reality held by subsequent philosophers. This view insists on "... the unity of things in time (their freedom from change) or in space (their indivisibility) or in quality (their undifferentiatedness)" (Hall, 1967: 363-4). According to Parmenides, this view of the universe maintains that change is impossible, and that the changes we perceive in the world are mere illusions of the senses. His view denied the existence of empty space and is also called the "block view" of the universe, since its conception of

reality is that "It remains one - a timeless, changeless, motionless, homogeneous mass, which he compared to a sphere" (Guthrie, 1967: 443).

Other Pre-Socratic philosophers of the Eleatic school who supported and expanded the view of the fundamental unity of reality were Zeno (c. 490 BC), Eubulides (active in 400 BC) and Melissus (active in 440 BC) (Digby, 1985: 191). It should be noted that philosophers from the Ionic, or Milesian, and the Pythagorean schools also offered views of the development of variety from a single substance (unity) but, none developed the notion of the essential unity of reality as fully as Parmenides.

Although the Parmenidean view is normally contrasted with that of Heraclitus (c. 540-475 BC) who taught that all changes in the world arise from the dynamic and cyclic interplay of opposites, there are distinct commonalities. Heraclitus also acclaimed the unity of reality, a unity sustained by a tension of opposites (Guthrie, 1967: 443-4). He called this unity the Logos, "... an intelligent governing principle materially embodied as fire..." (ibid.).

We observe then, at a more fundamental level, that both the Parmenidean and Heraclitean views endorse the monistic, and, consequently, holistic conceptions of reality which uphold the notions of wholeness (and nonduality) (Loy, 1988: 2).

The early Greek tradition at that time was, however, a rich one abounding in competing views of reality. Fragmentation, which is characteristic of the pluralistic view and which holds that reality is more importantly Many than One, also originates with Pre-Socratic thought. The first of the pluralistic systems was that of Empedocles (c. 490-430 BC) who proposed that reality is composed of four elements (or that there are four realities) - fire, air, earth and water - which continually mingle and separate under the influence of love and strife (Guthrie, 1967: 444). The reference to love and strife in the conception of reality reveals the blend of rational and mystical elements in Empedocles' thought. Following Empedocles, the atomistic theories of Leucippus (5th century BC) and Democritus (born c. 460 BC) develop further the pluralist viewpoint of reality. The atomistic theory proposes that "Reality consists of innumerable microscopic and indivisible (a-tomos = uncuttable) bodies in motion in infinite space" (ibid.: 445). This view is a direct response to the Eleatic challenge that denies the existence of empty space, and according to Capra was later sustained by Western science:

"The ancient Greek atomists drew a clear line between spirit and matter, picturing matter as being made of several 'basic building blocks'. These were purely passive and intrinsically dead particles moving in the void. The cause of their motion was not explained, but was often associated with external forces which were assumed to be of spiritual origin and fundamentally different from matter. In subsequent centuries this image became an essential element of Western thought, of dualism between mind and matter, between body and soul" (1981: 20).

The dualism referred to above received its clearest articulation in the writings of René Descartes (1596-1650) in seventeenth-century Western thought, but it may be traced

plausibly to its early origins in the ideas of Pythagoras (c. 582-501 BC) and Anaxagoras (c. 500-428 BC). The Pythagoreans taught that all things are composed of contraries such as One and Many, limited and unlimited, odd and even, right and left, straight line and the curve, and so on. They also distinguished the soul from the body, as is evident from the dictum attributed to them as well as the Orphics, viz, "The body is a tomb" (Pétrement, 1973-4: 40). The dualism of Anaxagoras proclaimed that "Mind" was a causative agent that animates matter (Guthrie, 1967: 445). In his response to Parmenides' view that there is no coming into being of new substances, Anaxagoras also proposed that there is a portion of everything in everything else, which has been interpreted by some scholars of early Greek thought to characterize monistic approaches to reality (Ogilvy, 1977: 209).

The recognition that interpretation is critical in deciding which philosophers supported either the monistic view or the pluralistic view of reality cannot be denied. For example, it is claimed that the dualistic view was developed to its highest form in early Greek thought in Plato's (c. 427-348 BC) theory of forms. In this theory the world of the senses is juxtaposed with the world of pure reason. Plato submitted that it was the world of pure reason that was real and that the world of the senses was mere illusion. He also associated the world of pure reason with knowledge and the world of the senses with opinion (Ryle, 1967: 330). Another view of Plato, however, is that his cosmology, as set forth in Timaeus, is sympathetic to a monistic view of reality (Loy, 1988: 2; Laszlo, 1973: 123). Moreover,

it is claimed by Vaught that the confrontation between Euthyphro and Socrates in Plato's Euthyphro is transformed by Plato from the "... religious quest for wholeness into the reflective attempt to answer the question, 'What does it mean to be whole?'" (1982: 12). What is certain from these conflicting interpretations is that pluralism and monism, and their abiding polarity, were lively themes for debate in early Greek thought, including Platonic philosophy.

The observations from Pre-Socratic thought reveal the source of two competing, or rather, complementary views of reality. Monism maintains the view of the unity and interconnectedness (and hence the wholeness) of reality while pluralism (and its variant, dualism) claim that reality is many and essentially disconnected (and hence fragmented).

The treatment of monism and pluralism in the thought of philosophers in the West may be summed up in the words of Pétrement: "The history of Western philosophy appears to be an alternation of dualism and monism" (1973-4: 41). Moreover, the possibility that these distinct approaches to reality do coexist, and have coexisted, in any given historical period of Western civilization cannot be excluded. For example, some writers submit that Aristotle (384-322 BC) is considered to have been more monistic in his outlook than Plato, while it is possible at the same time to trace aspects of Platonic dualism in his thought, particularly in his theory of the prime mover (unmoved mover) as an incorporeal and separate substance (Kerferd, 1967: 161). Monism may also be found to be manifested as features of

philosophical thought in the schools of Stoicism and Epicureanism, both of which originated in the fourth century BC. The first school espoused a spiritualistic monism according to which the whole world is mind, while the second endorsed a materialistic monism which reduces everything to its atomic essence (Pétrement, 1973-4: 40).

Neoplatonism, a philosophical and religious system which combined the Platonic ideas with oriental (Middle rather than Far East) mysticism and which was founded by Plotinus (AD 205-270), emphasized the notion of unity and wholeness. Plotinus seeks in the Enneads to explain in mystical language the central idea of the One in the Many, ie, unity-in-plurality. He states that the Many rises from the One which itself remains unaltered. In this way "the whole is in every part" (Plotinus, Fourth Ennead ix.5). Plotinus associates the "whole" with the One which gives rise to the Many and yet remains undiminished itself. We find in the ideas of Plotinus a variation of the One-and-Many theme which proclaims a more basic reconciliation of monism and pluralism, and is echoed in the holistic view of reality (cf 7.1.1).

In the seventeenth century a revival of the atomistic theories of Leucippus and Lucretius (c. 99-55 BC) contributed to the firm establishment later of the Cartesian tradition with its distinctive emphasis on dualism, which was destined to uphold a mechanistic world view as a valid one for natural science in the centuries to come (cf 7.4). As already pointed out in Chapter 2.5, the dualism of René Descartes (1596-1650) separated mind (res cogitans) from body (res extensa). However, in his

affirmation of monism, the rationalist Baruch de Spinoza (1632-1677) converted extension and thought as two substances into two mere attributes of one substance, viz, God (Williams, 1967: 72). The writings of the monadologist Gottfried Wilhelm Leibniz (1646-1716) paradoxically reflect features of both monism and pluralism. Hall, for example, points out that, "... a substantival pluralist, Leibniz... maintains that the plurality of substances... do form a systematic unity 'ideally' or when looked at from the viewpoint of an omniscient being" (1967: 364).

Immanuel Kant (1724-1804) criticized dualism insofar as it signified that thinking substance and extended substance are things in themselves, but he admitted it insofar as it could signify that subject and object are quite distinct phenomena. Kant's own dualist approach may be observed in his distinction of two worlds, ie, one of phenomena and another of things in themselves (Pétrement, 1973-4: 41).

Philosophers after Kant attempted to remove these profound divisions of dualistic thought. G.W. Fichte (18th century) made the free subject the basis of everything, while Georg Wilhelm Friedrich Hegel (1770-1831) brought "... the whole of reality in a single chain by making contradiction, first posited and then transcended, the law of all thought and of all nature" (ibid.).

The alternation of monism and pluralism, and hence also of wholeness and fragmentation continued, and, in the twentieth century, pragmatism developed the pluralistic theme in its

tolerance of "... the many ways in which experience is apprehended, systematized, and anticipated" (Thayer, 1967: 435). This reference to experience establishes the empiricist origins of the pragmatist movement in the United States of America. As one of its most influential exponents, William James (1842-1910) opposed monism, maintaining that the substance of reality may never "get totally collected" and that "... in nature and in history the continuous flux of change and chance transforms every being" (Kallen, 1986: 489). He argued that there are different forms of consciousness (in addition to our normal waking consciousness) that require equal regard in our interaction with the totality of reality (James, 1902: 54).

James' ideas (among others) on the "continuous flux of change" influenced Whitehead's (1861-1947) philosophy of organism and its process view of reality. This philosophy of organism expresses the cosmological views of Whitehead, viz, that "... the universe consists entirely of becomings, each of them a process of appropriating and integrating the infinity of items ('reality') provided by the antecedent universe and by God (the abiding source of novel possibilities)" (Lowe, 1986: 636). Whitehead's process view of reality introduces an element of personal creativity so that the individual participates in the unfolding of new aspects of reality. He states: "My unity - which is Descartes' 'I am' - is my process of shaping... the activities of the environment into a new creation... and is a continuation of the antecedent world" (1938: 228). This perspective affirms a process or "movement" element of reality, ie, the development from earlier experiences to newer ones, and

highlights a similarity between the views of James and Whitehead (Lowe, 1962: 342), viz, that a dynamic ("process") quality is to be attributed to their conception of reality.

Up to this point we have noted the intellectual antecedents of the critical notions of wholeness and fragmentation as they manifested themselves in many of the cosmological theories proposed in Western thought (as doctrines of monism, pluralism and dualism). Wholeness is implied in monism which proclaims an essential unity and oneness of reality while fragmentation is implied in pluralism which maintains that there is more than one reality.

In the case of wholeness, these implications are as far one may go because although actual references to the word "whole" may be identified in Plato (Theaetetus, 204B), Aristotle (Politics, I.2. 1253a 20), in Plotinus (see the reference in the Enneads mentioned above), and in the works of later philosophers in the West, there appears to be few coherent statements of a holistic conception of reality, and hence no cohesive defence of wholeness as a serious explanatory principle.

7.1.1 The holism of Jan Christiaan Smuts (1870-1950)

The term "holism", which derives from the Greek holos (the whole) was coined by Smuts. This is confirmed in the second edition of the Oxford English dictionary where holism is defined as:

"A term coined by Gen. J.C. Smuts (1870-1950) to designate the tendency in nature to produce wholes (ie, bodies or organisms) from the ordered grouping of unit structures" (1989: 307).

Smuts' conception of holism was the first attempt at a systematic treatment of a holistic view of reality in modern Western thought. His ideas are presented in its most coherent form in his Holism and evolution (1926). Smuts' thoughts, however, should be seen as a development of that stream of the Western intellectual tradition that emphasized the value of wholeness. For example, Smuts draws on the philosophies of Plato, Aristotle, Kant, Hegel, Bergson, Whitehead, Broad, Morgan and Alexander in his writings. He was likewise familiar with the scientific ideas of the physicists Einstein (1879-1955) and Bohr (1855-1962), was particularly influenced by the thoughts of the post-Darwinian biologists Weismann and Lewes, and acknowledged the inspiration of the poets Goethe and Whitman (Brush, 1984: 290-294).

The seminal ideas were already contained in his earlier studies entitled, Walt Whitman: a study in the evolution of personality, and An inquiry into the Whole (ibid.). Although Smuts never made any claim to being either a professional scientist or a professional philosopher, he was acutely aware of the close relation between the two disciplines, and claimed that scientific advances had given great impetus to philosophy (1932: 1). Moreover, although he drew upon the philosophical and scientific writings of his predecessors, the holistic views which emerged from his conclusions were, according to Brush, "... not an esoteric abstraction but a philosophy of life to be relied upon everyday in the personal and political decisions he was constantly pressed into making" (1984: 290). Meanwhile, the

term holism has become firmly established in the vocabulary of the natural sciences, the social sciences, the health sciences and religion (cf for example 3.3, 3.4, 3.5, 7.3 & 7.4).

Smuts' conception of holism should be viewed in the light of its opposition to mechanism and mechanistic explanations that characterized seventeenth-, eighteenth- and nineteenth-century science (cf 7.3). The mechanistic view of nature is closely related to a rigorous determinism, the philosophical basis of which is the dualism of Descartes. "As a consequence of this division", according to Capra, "it was believed that the world could be described objectively, ie, without ever mentioning the human observer, and such an objective description became the ideal of all science" (1981: 58). Smuts declares:

"The mechanical model or mechanism became, not the symbol, but the very soul of reality. The machine bestrode the universe. All this is changed today" (1929: 3).

Arguing for a "fresh synthesis of knowledge", Smuts proposes holism as a tendency in the universe to create greater and greater wholes (1926: 341). These wholes are empirically observable, such as atoms, cells and personality and are unit structures "... whose ordered groupings produce natural wholes" (1926: 86). Holism applies a fresh interpretation of the evolutionary process as a cosmic principle which is both emergent (following Alexander and Morgan) and creative (following Bergson). In this view, evolution cannot be seen to be mechanistic or tied to a dualism of the mind and the body. Brush

explains that "Smuts deplored divisions not only theoretically but practically. The vision he held was one of wholeness, creativity and continuity throughout the universe" (1984: 296).

Through holism Smuts seeks to explain the essential wholeness of reality and the universe as a fundamental principle. The onward movement of developing forms and phases in the organic and the inorganic worlds are moments in the unfolding of greater wholes in accordance with the dictates of this principle. He proclaims that holism is:

"... the ultimate synthetic, ordering, organizing, regulative activity in the universe which accounts for all the structural groupings and syntheses in it, from the atom and the physico-chemical structures through the cell and organisms, through Mind in Animals to Personality in Man. The all-pervading and ever-increasing character of synthetic unity and wholeness in these structures leads to the concept of Holism as the fundamental activity underlying and coordinating all others, and to the view of the universe as a Holistic Universe" (1926: 317).

Smuts submits that this view offers a surer foundation to science than mechanistic ideas (1929: 13). Holism then, according to Smuts, is a fundamental feature of the universe and expresses itself in its trend to ever higher forms (*ibid.*).

The notion of holism as articulated by Smuts is not beyond criticism. In his own lifetime, Wolstenholme, a close friend, was Smuts' sharpest critic (Brush, 1984: 289). Later, Radhakrishnan, the eminent scholar and statesman, offered a critique of Smuts' holism (1980). In spite of these criticisms,

those aspects of Smuts' holistic concept which explains the process of creative synthesis and the tendency towards greater wholes have remained sound (Hope, 1988: 176).

The emphasis of holism on wholeness provides an opportunity to reconcile the unity of monism on the one hand and the diversity of pluralism on the other. For example, the appearance of the separate wholes such as cells, organs and so on result from the dynamic principle of holism that synthesizes parts into wholes. This synthesis causes the function of the parts to be altered in such a way that they function towards the whole. The whole and the parts reciprocally influence and determine each other so that parts appear to merge their individual characters to some extent. In this way the whole is contained in the parts and the parts are in the whole. This mutuality of parts and wholes makes each a function of the other (Smuts, 1932: 11). Yet, the whole is greater than the sum of its parts in that a new whole displays features that are incompatible with those of its constituent parts. This idea is central to systems philosophy and organismic biology (cf 7.3.2).

The holistic conception, which received its clearest formulation in the writings of Smuts, is today applied with growing interest in several areas of intellectual and moral life (cf 7.3 & 7.4).

7.2 Wholeness and fragmentation in early Eastern thought

In contrast to the West, starkly dichotomous conceptions of reality are well-nigh absent in Oriental thought. According to Capra, the idea of unity predominated in the early Eastern view of reality. It is worth quoting Capra at length here:

"Although the various schools of Eastern mysticism differ in many details, they all emphasize the basic unity of the universe which is the central feature of their teachings. The highest aim for their followers - whether they are Hindus, Buddhists or Taoists - is to become aware of the unity and mutual interrelation of all things, to transcend the notion of an isolated individual self and to identify themselves with the ultimate reality. The emergence of this awareness - known as 'enlightenment' - is not only an intellectual act but is an experience which involves the whole person and is religious in its ultimate nature. For this reason, most Eastern philosophies are essentially religious philosophies.

In the Eastern view, then, the division of nature into separate objects is not fundamental and any such objects have a fluid and ever-changing character. The Eastern world view is therefore intrinsically dynamic and contains time and change as essential features. The cosmos is seen as one inseparable reality - for ever in motion, alive, organic; spiritual and material at the same time" (1981: 23).

Notions of fragmentation (and pluralism) appear to be almost non-existent in Eastern thought. Capra's review of Buddhism (including the Indian and Ch'an - Chinese or Zen - Japanese varieties), Hinduism, Confucianism and Taoism culminates in his observation that the one essential characteristic that they share is "... the awareness of the unity and mutual interrelation of all things and events, the experience of all phenomena in the world as manifestations of a basic oneness" (1981: 133).

This does not imply that there were absolutely no dualistic or pluralistic views (which denied the unity of reality) in the East. In India there were dualistic philosophies such as, for

example, Atman versus Brahman. The very ancient and important Sāmkhya teaches that both matter (or nature) and the Spirit have existed throughout eternity (Pétrément, 1973-4: 41). It may even be possible to argue that the Yin and the Yang of ancient Chinese thought represents a dualism, but Needham proffers convincing arguments against this proposition. Needham submits that Chinese "correlative coordinative thinking" assumed, rather, an organismic view of the universe which emphasized its essential unity: "The Yin and the Yang... move parallel to each other... The implication was that the universe itself is a vast organism... with all the parts of it cooperating in a mutual service..." (1956: 288).

In the Hellenized Near East of the first centuries AD a dualistic attitude characterized certain Gnostic religious teachings. The two main types of dualism were known as the Manichaeism and the Valentinian, both of which proposed a "... rift between God and the world, world and man, spirit and flesh" (Jonas, 1967: 341). It should be noted that other proto-Gnostic sects, for example the Essenes, were characterized as being pluralistic and even as syncretistic, and hence monistic in their religious traditions (The Nag Hammadi..., 1977: 7, 9).

It is clear, in spite of the occurrence of dualistic approaches, that the dominant view of the nature of the universe and reality in early Eastern religions was one which was consonant with the conception of wholeness, unity and the interconnectedness of all things.

7.3 Wholeness and fragmentation in the natural sciences

The holistic movement, which emphasizes wholeness, has manifested itself today primarily as a development within science (McKinney, 1988: 299). Major conceptual revolutions in such fields as physics, mathematics, chemistry, biology and neurophysiology have led to what Briggs and Peat call the "emerging science of wholeness" (1984). They submit that the articulation, and success in application, of newer theories in these "hard" sciences has made it possible to think about wholeness as "more than just a mystical affirmation" (1984: 294). Holism is now regarded as a serious mode of approach in the theory of the natural sciences, although a note of caution has been sounded that it may itself be displaced by other approaches:

"Perhaps other theories will replace those... which express wholeness... Perhaps the fragmentary view will continue to dominate science. But the theories of wholeness are, at last, new expressions of an ancient insight and of a more ancient longing, one which will come now into dramatic conflict with the equally ancient longing to possess and control through knowledge and ownership the various separate things of this world..." (Briggs, 1984: 294).

The essential view of the universe that emerges from these holistic theories is that of one "without edges" and which is continually unfolding (cf Smuts' view of holism in 7.1.1).

The need is expressed today for a re-orientation or restructuring of science so that its wider Germanic sense as Wissenschaft, which embraces a systematic study of all phenomena whether of nature or of the mind, is emphasized. Such a restructuring would enable the accommodation of "... all, rather than just part, of human experience" (Harman, 1989: 18). This

call for a change in Western science emanates from the general dissatisfaction with the major assumptions of seventeenth-, eighteenth- and nineteenth-century science, viz:

"The objectivist assumption, that there is an objective universe, more or less separate from and independent of the observer, which can be explored by the external probes of scientific inquiry, and which can be approximated, progressively more precisely, by analytical models;

The positivist assumption, that what is scientifically 'real' must take as its basic data only that which is physically observable; and

The reductionist assumption, that scientific explanation consists in explaining complex phenomena in terms of more elemental events (eg, gas temperature in terms of the motion of the molecules; human behavior in terms of stimulus and response)" (author's emphasis; Harman, 1989: 9).

Using physics and biology as examples, we observe the response to the difficulties that these assumptions present.

7.3.1 Contemporary physics

The sweeping changes in approaches in physics should be viewed against the background of the problems related to the mechanistic approaches that are based on the Cartesian division or dualism of mind and body, and which were developed and applied with great success in the eighteenth and nineteenth centuries (cf 7.1 & 7.1.1) The success of the application of Newtonian mechanics was halted with the discovery in the second half of the nineteenth century of the identity of electromagnetism and light which could not be described appropriately by the mechanistic

model (Capra, 1981: 60-1). This event signalled the beginning of the decline of the universal application of Newtonian physics and a fresh interpretation of physical phenomena.

This fresh interpretation was set forth by Minkowski who proposed in 1908 that space and time (fundamental concepts in both science and philosophy) were indeed not independent entities: hence the notion of these two separate concepts was replaced with that of one, viz, space-time. Following upon this discovery in science, Einstein demonstrated that motion was not derived from space and time, as classical mechanics taught, but that, instead, space and time were both dependent on motion (Capra, 1981: 65). In this way space and time were no longer seen as fixed quantities each subsisting in isolation; both, in unison, became relative to the velocity or motion of the observer. In fact, Einstein proclaimed that all forms of matter were in motion relative to one another (1956: 229). In addition, the traditional concepts of matter required radical revision so that the solid, weighty corporality of things had to give way to the idea of energy as the basic stuff of reality (ibid.).

Together with the relativity theory of Einstein, the conception of the behaviour of subatomic particles in quantum theory led to radical changes in prevailing understandings of physical reality. Quantum theory has demonstrated the inadequacy of classical mechanics at the subatomic level, viz, the joint consideration of the velocity and the position of ultimate particles leads to a paradoxical situation where the more

accurately the one can be determined, the less accurately can the other. This means that it is impossible to measure accurately both the position and the momentum of any particle simultaneously (Heisenberg, 1958: 50). This principle became known as Heisenberg's (1901-1976) Law of Indeterminacy, or Uncertainty.

The role of the observer, ie, the presence of human consciousness, became crucial in establishing the fundamental nature of subatomic units of matter, or ultimate particles. Conradie states this succinctly: "When we try to detect an electron, it responds like a particle, but when we are not looking at it, it behaves like a wave" (1986: 1). This dual aspect of matter introduces the realization of the influence in observation of the observer, or of human consciousness, ie, there is an essential relation between the object being observed and the observer. Bohr's notion of complementarity acknowledged the close and necessary relation of what he called the interaction between the measuring apparatus and the object to be observed, and revealed the inadequacy of the Cartesian dualism between observer and observed, or between mind and body. Conradie's observation aptly summarizes these radical changes in physics: "Physicists began to realize that the universe could not be divided into an observing subject and an observed object. The two were one" (*ibid.*: 2). The observer became a participator whose consciousness played an integral role in the process of observation itself.

The conclusions drawn from comparisons of these findings in physics with Eastern mystical thought affirm a shared conception of the unity or oneness of reality and the unity of opposites (Zukav, 1980; Capra, 1981; cf 7.2). Capra, for example, identifies the "new physics" world view with the Taoist vision of reality, according to which the Tao represents a process of continual flow and change (1981: 111). Moreover, his investigations led him to conclude that there is a need to see the world not in a mechanistic-reductionist way but as a dynamic, ecological whole so that the One is in the Many and Many dwells within the One (cf 7.1).

A systematic discussion on the treatment of wholeness in contemporary physics is found in the work of Bohm. However, an attempt to apply a holistic interpretation to recent discoveries in physics had already been undertaken by Smuts in 1932. After reviewing the discoveries of space-time by Minkowski and the relativity theory by Einstein, he declares:

"When once we realize that space and time are not separates or absolutes, but abstractions from a whole, functions of something deeper, coordinates or relations of things springing from a more fundamental physical reality, we begin to sense a very different world from that which superficially appears to our senses" (1932: 3).

For Smuts such developments as, for example, the merging of space and time into a greater whole of space-time, merely confirm the holistic character of the universe which seeks to overcome the separation of mind and matter in order to achieve a greater synthesis (1932: 2, 12).

In a similar interpretation of the findings of contemporary physics, Bohm asserts that the "... interconnectedness of the whole universe is the fundamental reality, and that relatively independently behaving parts are merely particular and contingent forms within this whole" (1975: 22).

Bohm distinguishes furthermore between the implicate and the explicate orders of the universe. The implicate order is the primary realm of wholeness, regarded by Bohm as a flowing movement out of which we abstract the different "parts" of the explicate order. This implicate order is like a holographic plate in which each part contains encoded information about the entire whole. It is the implicate order which provides the ground or code for the manifestation of multiplicity in the explicate order of everyday experience. While science has regarded the explicate order as the only reality, it is really the wholeness of the universe that is primary and which allows for all the interaction of relatively stable parts in the explicate realm of perceptual experience (1981).

Bohm contends further that our theories are merely insights into reality which are neither absolutely true nor absolutely false but, rather, clear in certain domains and unclear when extended beyond these domains. For example, the Newtonian form of insight worked well for several centuries on the macroscopic level, or with large bodies, until the difficulties presented by newer discoveries arose, when newer forms of insight were required to resolve these difficulties. In this way new forms of insight develop to clarify certain domains that cannot be

clarified by earlier ones (1981: 3). He concludes that "... there can be no conclusive experimental proof of the truth or falsity of a general hypothesis which aims to cover the whole of reality" or that there will be a final form of insight corresponding to absolute truth. Rather, one may expect the development of new forms of insight which will assimilate certain key features of the older forms to allow ways of looking at the world as a whole (ibid.).

We witness then in contemporary physics the emergence of a world view with a more holistic character that is capable of offering explanations for problems that were seemingly intractable to mechanistic models. While the holistic view has not displaced the mechanistic one, it is regarded as one that merits serious consideration by physicists today.

7.3.2 Biology

The use of physics as a model for other sciences has for long been a customary intellectual practice. Capra explains how his arguments for the replacement of the Cartesian paradigm with a new one in physics (cf 7.3.1) was itself an example of "Cartesian thinking", ie, that he still saw physics as the model for other sciences and hence physical phenomena as the "primal reality and basis for everything else" (1988: 72). This is why, subsequently, his The turning point represents physics only as a special case of a much more general framework rather than as a model for other sciences. He explains this as a change from "physics thinking" to "systems thinking" (cf 7.4) which provided a more general framework within which to develop his observations

(ibid). (Bernstein argues that the Cartesian either/or dualism still infects intellectual debates in which alternatives are proposed and selected. He claims that a better insight is gained if the whole framework of this type of thinking is called in question. His suggestion to move towards a post-Cartesian framework is echoed in the holistic principle in which dualisms are reconciled in an attempt at achieving a higher synthesis (1983: 23; cf 7.1.1)).

For this reason, we may note also changes in the field of biology where a dissatisfaction with the mechanistic model led to the gradual emergence of holistic approaches. It should be noted that although there are holistic approaches in biology, there are also scientists who emphasize the usual mechanistic interpretations, which is applied successfully in many areas of biology. The point made here is simply that there is also a greater awareness of the limitations of mechanistic models and of the availability of holistic explanations as valid alternatives.

We may turn again to the observations of Smuts for an insight into the limitations of the mechanistic model in biology with special regard to the evolutionary process. In its adoption of the mechanistic model from physics the assumption was made in biology that living beings are governed by the same laws as inanimate matter. However, life is more than its detailed reactions and living things "... follow a routine and display a behaviour different from those of non-living things" (1929: 4). Smuts concludes that mechanists in biology are wrong in their view of life largely because they are wrong in their view of

matter (ibid; cf 7.3.1). In contrast to this mechanistic view he postulates the holistic view which supplies a creative feature to the evolutionary process in which parts in a whole display entirely different characteristics from that of the whole itself.

These ideas did not originate with Smuts. Similar views had already been advocated by Bergson (1859-1941) in 1911 in his work, Creative evolution, and by Morgan in 1912 in his book entitled, Instinct and experience. Nevertheless, it was Smuts who emphasized the more fundamental notion of the "whole" in creative evolution as a cosmological principle according to which "Life is nothing but the emergent behaviour of certain advanced types of wholes" (1929: 8; cf 7.1.1). Bergson's rejection of a mechanistic interpretation of certain aspects of Darwin's (1809-1882) theory of evolution, specifically the explanation offered concerning the natural selection of variations that are passed on to subsequent generations and that ensures the maximum value for survival, led to the resurgence of the doctrine of vitalism (Goudge, 1967a: 294). This doctrine postulated the existence within living things of a unifying factor or vital spirit, referred to as the entelechy (cf 3.3.1) a term taken from Aristotle. Bergson called this force the vital impetus (élan vital) which gave evolution a distinctive creative character, but the cause of the creation lay within the organisms rather than outside them, as Darwin's theory of natural selection had postulated (Phillips, 1976: 25).

Another form of reaction against the mechanist model in biology was organicism. The biological organicists, most notably, J.S. Haldane (1860-1936), differ from the vitalists (as represented in the thought of Bergson) in that the former denies (and the latter holds) "that the characteristic features of organic activity... are caused by the presence in the organism of a nonphysical but substantial entity" (Goudge, 1967b: 550). Of greater importance than its quarrel with vitalism, organicistic views are more consistent with those of Smuts' holistic outlook. Participating in a discussion before the British Association for the Advancement of Science which included Smuts, Haldane proclaimed that if we "... disregard the holism or coordination of life - we can give no more than a disjointed and incoherent physical and chemical account of life" (1929: 34). By this, Haldane means that the organism's relations with the environment is more readily susceptible of holistic conceptions "... of life as a unity which maintains or asserts itself" (1929: 32).

More recently, Briggs and Peat have identified several theorists in biology whose fundamental ideas correspond strongly with the central tenets of the notion of holism (1984: 163-255).

Thus the proposition that there are views in the field of biology that emphasize wholeness is a plausible one. These perceptions exist alongside those that emphasize mechanical, and hence more fragmented, views. The mechanical outlook, according to some of its exponents, remains as valid as ever for the three-dimensional realm in which it was developed to operate

(Hogben, 1929: 26). However, holistic views are today also regarded as valid for the explanation of certain biological problems that have proved to be recalcitrant to traditional mechanical solutions, and have hence been accepted as being equally valid, especially in four-dimensional apprehensions of reality.

7.4 Wholeness and fragmentation in the social sciences and the humanities

The acknowledgement of a crisis in the natural sciences has been echoed in the social sciences. Mitroff and Kilmann have proposed that:

"The main reason why the social sciences have given a fragmentary and incomplete account of the nature of man is that the social sciences have themselves been conceived of and practiced in a largely fragmentary and incomplete manner" (1978: 3).

It is important to point out that for a long time the social sciences were regarded as genuine, albeit immature, natural sciences that differed in degree, and not in kind, from the rest of the natural sciences. According to this view, progress in the social sciences require the adoption of those methods, procedures and criteria for testing hypotheses and theories that proved successful in the natural sciences (Bernstein, 1983: 27). As a consequence, the mechanistic methods of the natural sciences were applied in several of the social sciences (cf for example Education-3.4 & Communication-3.5).

Of course, there has been a dearth of significant attempts to approach the problems in the social sciences within the framework of holistic assumptions. Phillips submits that there

is an enormous body of literature on holism but that a student of the social sciences is unlikely to encounter it in any ordered way (1976: 1). He states that debates on methodological individualism versus methodological holism, the place of psychological explanations in sociology, and structuralism versus functionalism are all indicative of the presence of holistic theses in conflict with others (ibid.). Hence, the observation may be made that instead of an absence of holistic ideas in the social sciences there appears to have been the lack of a widespread awareness that the above-mentioned debates are instances of the influence of holism.

As distinct from its conceptions as broader, cosmological principles (as encountered in philosophy and the natural sciences; cf 7.1-7.3), the notions of wholeness versus fragmentation reveal themselves as methodological debates in the social sciences, more specifically in ways of explaining the relations between individual and society. According to James, competing social theories embody incompatible conceptions of the relations between these two, and culminate in relations of parts to wholes, and leading to the contrasting positions of methodological holism on the one hand and methodological individualism on the other (1984: 1). The positions of methodological holism and methodological individualism have a long and complex history (Phillips, 1976: 37). Methodological individualism holds that every "complex situation, institution, or event is the result of a particular configuration of individuals, their dispositions, situations, beliefs, and physical resources and environment" (Watkins, 1959: 504). This

position is analogous to mechanism in that the whole is explained exclusively in terms of the parts and hence espouses a reductionist approach in the explanation of social phenomena.

Methodological holism on the other hand denies that complex situations or social wholes can be reduced to individuals. James explains that methodological individualism has been more prominent in the social sciences and that this has forced methodological holism to assume a defensive position, but she concludes that holism is a fruitful approach to social explanation and rivals the position of methodological individualism (1984: 9).

A quest for the most appropriate way of studying any organic whole was also a problem that preoccupied the biologist Von Bertalanffy (1901-). He acknowledged the limitations of mechanism in this regard and sought to establish a new standpoint which - at variance with mechanism - takes account of organic wholeness (1962: 46). He became convinced, however, that such a holistic view would throw light not only on biological systems but on all systems. His General Systems theory is a logico-mathematical field which seeks to formulate and derive those principles which hold for systems in general, system being defined as a complex of elements standing in interaction (1960: 199). This theory aimed at becoming a general science of "wholeness" as distinct from merely vague, hazy and semi-metaphysical speculations, holding that there are general principles which hold for all systems regardless of the nature of the component elements and the relations or forces between them

(ibid.). The general failure of the successful application of this theory in the social sciences may be ascribed to its heavy reliance on mathematical concepts which are of limited application in the social sciences, and to the general acknowledgement of the limitations of this theory as a scientifically sustainable one. Bertalanffy himself identifies the shortcomings of this theory:

"The decisive question is that of the explanatory and predictive value of the 'new theories' attacking the host of problems around wholeness... There is no question that new horizons have been opened up, but the relations to empirical facts often remain tenuous" (1968b: 21).

Its failure to serve as a useful method of explanation in the social sciences is also an instance of the limitations of applying natural scientific (in this instance mathematical) procedures to social phenomena generally. In the field of library and information science, Harmon has attempted to apply notions of General Systems theory to enhance an understanding of the concept of knowledge (cf 5.22).

The role of human consciousness in the study of social events and phenomena is an important element that cannot be ignored. Moreover, the discoveries in modern physics confirm even in that field of study the increasing recognition of the integral role of the consciousness of the subjective observer and the need to take this into account in the process of observation (cf 7.3.1). The dualism of subject and object is disappearing and the old word "observer", according to Conradie, is being

replaced with that of "participator" (1986: 2). The notion of participation is thus linked to that of wholeness. Skolimowski confirms this link:

"Wholeness means that all parts belong together, and that means that they partake in each other. Thus from the central idea that all is connected, that each is part of the whole, comes the idea that each participate in the whole. *Thus participation is an implicit aspect of wholeness* (author's emphasis; 1985: 25).

The idea of participation also connotes the idea of interrelatedness, since to participate requires an involvement or relation. In the field of psychology, the Gestalt psychologists seek to explain how one system (eg, the physical realm) relates to another (eg, what it is that is perceived) and express the wholeness of, or relation of, individual and environment. The Gestalt psychologists are the forerunners of the application of holistic ideas in psychology (Phillips, 1976: 120).

However, the work of Carl Gustav Jung (1875-1961) also manifests a consistent attempt to apply notions of wholeness and unity. His "collective unconscious" emphasizes an essential relationship between the individual and the rest of mankind. According to Jung, this domain of consciousness contains elements, usually present in dreams, that cannot be derived from the dreamer's personal experience. Jung calls these elements "archetypes" or "primordial images", which stem from "... the biological, prehistoric, and unconscious development of the mind in archaic man, whose psyche was still close to that of the animal" (1964: 57).

Jung's schema is particularly valuable as a comprehensive model of human cognition because it seeks to encompass the widest inclusion of psychological types. Through an application of the dimensions of introversion and extraversion to the four cardinal functions referred to above, Jung proposes eight basic psychological types for consideration in the study of individual psychology. He emphasizes, however, that these eight types are by no means the only ones that exist (1933: 621). Furthermore, each view that characterizes a psychological type is, according to Jung, as true as another although it may be difficult for any individual subscribing to a given view to agree with this claim (ibid.: 623; cf Royce-5.13 & Figure 13 for Kesting's adaptation of Jung's schema). Although there is such a striking differentiation of individual psychological types, at the foundation of human consciousness, according to Jung, there is a fundamental uniformity (ibid.: 624).

If the psyche may be a source of the wholeness of human consciousness in the orientation to the fullness of experience, then, as Vaught contends, it may equally be a source of fragmentation. He argues that a more fundamental source of fragmentation than that of cultural affiliation is one which lies at the foundation of human experience and reveals itself as a permanent structural feature of the human psyche (1984: 156). Within the context of Vaught's perceived spiritual dimension of man this feature may be described as the need for the psyche to orient itself beyond its reach (as the intentionality of

consciousness, ie, its orientation towards objects of consciousness), but also to return to the place where it started. He explains this as follows:

"In the final analysis, human fragmentation is not merely a cultural phenomenon, but is a function of the much more fundamental conflict that can arise between the two directional orientations of the human soul. We long for what lies beyond, but also for a sustaining ground. We are oriented toward a larger world, but we cannot escape the wish to return to our origins... It is finally the conflict between these two tendencies that lies at the foundation of our fragmented condition" (1984: 157).

Vaught's observations confirm the emergence of a pattern of alternation of holistic (wholeness) and pluralistic (fragmentation) explanations that stem from the fundamental conflict of the One and the Many. This pattern in the social sciences manifests itself, inter alia, in philosophy (cf 7.1) and religion (cf 7.2).

In sharp contrast to holistic approaches in the social sciences there are those which emphasize fragmentedness. An example of such a paradigm is found in the field of aesthetic and literary criticism. Despite its origin in the humanities, it strongly influences the broader contemporary intellectual scene. It is referred to as "postmodernism" and is characterized by the predominance of the following terms: pluralism, fragmentation, heterogeneity, deconstruction, ambiguity and uncertainty (McKinney, 1988: 299).

Postmodernism is a development from modernism and takes its essential character from a reaction to the modernist movement in literature. McKinney submits that the debate between the two

movements may be viewed at a more basic level as a manifestation of the conflicting conceptions of reality as One (the monistic position) or Many (the pluralistic stance). He traces the postmodernist versus modernist debate in literature to the organicist view that emphasizes classical values and that perceives unity as a multiplicity of parts on the one hand and the Enlightenment drive to demystify such values on the other (1988: 306). Altieri distinguishes postmodernism from modernism in the following way:

"Modernist poetics can be seen as stressing the presence or absence of a single privileged system of explanation giving meaning and purpose to particulars, whereas self-conscious postmodern writers have become increasingly conscious of multiple systems each having equal explanatory power in appropriate circumstances" (1984: 113).

It is apparent from the quotation above that the postmodernist approach in literature emanates from a pluralistic outlook. As an example of the postmodernist emphasis on pluralism, Derrida's deconstruction approach to literary criticism seeks to undermine the existing hierarchical oppositions within whatever text is being considered (Culler, 1982: 86). For example, the dominant tendency in Western thought opposes certain concepts to each other with the first one having priority over the latter (eg, essence over appearance, presence over absence, identity over difference, being over becoming and so on). However, the deconstructionist considers neither polar term to be more essential than the other. In addition, a simple affirmation of their equality is not enough to disrupt a given hierarchy (Culler, 1982: 166). Rather, the critic must show how the very affirmation of a hierarchy leads to its reversal. The marginal,

for example, is demonstrated to be of more importance than what was thought to be essential, thus resulting in the very blurring of such distinctions altogether (ibid.).

However, the distinctions should not be abolished, nor the first abandoned in favour of the second. Nor is the aim to create some dialectical synthesis of opposites into something new. On the contrary, the deconstructionist aims at following a "double procedure" whereby he or she relies on one concept in order to criticize the other and then reverses the direction of the criticism as soon as the former has been achieved. This involves an oscillation between two poles of opposition and "... destroys the pretensions of any systematic interpretation at having the final word" (Culler, 1982: 150). In this way, the promotion of one interpretation leads to its own destruction and to the subsequent promotion of its opposite. Culler proposes that this is why the deconstructionist cannot do "... without the principle of non-contradiction as well as why he or she cannot avoid violating it as well" (1982: 150).

McKinney contends that the debate between the modernist and the postmodernist is based on the more primordial dichotomy of the One and the Many, ie, that this debate is merely an instance of the long-standing holism versus pluralism theme (1988: 308). He explains that while modernism opts for the "centripetal forces of unity, sameness, truth, systematic harmony, commitment and being", postmodernism chooses the "centrifugal realm of difference, multiplicity, contradiction, ambiguity, uncertainty, relativity and becoming" (ibid.). He concludes that their

conflicting approaches emanate from their divergent world views, ie, unity on the one hand and multiplicity on the other - without recognizing the ultimate coherence between the two poles of the One and the Many (ibid.).

The existence of holistic and pluralistic paradigms in the social sciences and the humanities confirm the pattern of competing world views that has dominated intellectual life since the time of the early Greeks (cf 7.1). If one analyses the underpinning theoretical bases of several techniques or strategies that are applied in different fields of study, the connections may be made, even if they are indirect, with the basic tenets of a specific world view. These world views tend to support either predominantly monistic, and hence holistic, conceptions of reality expressing wholeness, or predominantly pluralistic, or dualistic conceptions of reality affirming fragmentation.

The existence of these apparently opposing views are evident also, and as a crucial concern for the purpose of this study, in conceptions of human knowledge emanating from major paradigms of thought that have emerged in the natural sciences, the social sciences and the humanities. The perception that library and information science is a knowledge-transmitting profession requires further clarification regarding its approach to characterizing the essential features that typify its understanding of human knowledge. The acknowledgement of

differentiation in viewpoint regarding conceptions of human knowledge complicates the task for librarians and information scientists and requires further examination.

7.5 Wholeness and fragmentation in conceptions of human knowledge

Definitions of knowledge reflect divergent conceptual approaches and reveal a wide variety of inconsistent, even conflicting meanings (cf definitions of knowledge, 4.2). In an attempt to systematize this divergence there has been a helpful division of the conceptions of human knowledge into broad conceptions as applied in the social sciences and narrower conceptions as found in systematic philosophy (cf 4.2.4). In addition to these conceptions, several theorists in the field of library and information science have expressed the need to define this term for its effective application in several areas of the profession, and many have proposed their own conceptions in this regard (cf 4.2.1). In this study the views of the exponents that are listed in Chapter 5 have been presented in the form of a typology (cf 6.2.5). These views are also discussed again in the context of holistic conceptions of recorded knowledge in library and information science (cf 7.6). This section, however, aims at a broad overview of a few attempts (other than those in Chapter 5) to perceive knowledge as whole or holistic on the one hand, and attempts to emphasize its fragmentedness on the other.

The fragmentation of human knowledge, according to Skolimowski, may be traced to the separation of knowledge from values. In a periodizing schema, he describes four positions that developed historically in the relation between knowledge and

values. First, there is the position held by Plato and which predominated during classical antiquity. In this position values and knowledge were fused together and the possession of superior knowledge led to the leading of a superior life. Second, the position that prevailed during the Middle Ages was one that fused knowledge with values but which, at the same time, subordinated knowledge to the values established by the Roman Catholic Church (values, in other words, were superior to knowledge). Third, the post-Renaissance position separated knowledge from values without giving supremacy (or censure) to either. Finally, classical empiricism, which is associated with positivism and logical empiricism, separated knowledge from values and attached supreme importance to knowledge of physical things and ruled that values are not proper knowledge - knowledge, in other words, being held superior to values (1981: 1-4).

Skolimowski's concern extends to intellectual and moral realms. He contends that the separation of knowledge from mankind's actions and judgement divided man into halves and that this has led to fragmentation in intellectual and moral life (1981: 12). He blames this division on the Cartesian, mechanistic conception of the world which, he argues, needs to be replaced with a much broader and richer one that is founded on holistic notions (1981: 28). In his regard for the equal importance of all facets of life and human experience and his attempt to reconcile knowledge with values once again, he advances what he describes as an "epistemology of life". He explains:

"The epistemology of life signifies mapping out the territories of our implicit faculties and resources of knowledge, including the subconscious, intuitive, and extrasensory, which participate in our acts of perception and comprehension, which guide us through the labyrinth of actual living, of which we are aware..."(1981: 112).

This may be explained as a kind of holistic knowing which involves participation of the consciousness of the knower in the process of the acquisition of knowledge. The role of human consciousness in current scientific thinking has already been established as a critical factor that cannot be ignored (cf 7.2).

The essential unity of mind and matter in epistemological issues is a conclusion that Smuts inferred from his own observations of the holistic principle at work in the universe (cf 7.1.1). As distinct from the mechanistic view that separated mind from matter, Smuts contends that the holistic view implies that "Mind in knowledge has commerce with matter" (1932: 9). Comparing knowledge to a prism, Smuts submits that while experience, as a necessary procedure of the mind, is refracted or divided so that it appears to be separate, the truth is that the full spectrum of knowledge is much larger than the sum of separate things that the mind focuses on. In this way, the separate things that the mind attends to are, in essence, parts of a larger whole that reflects the holistic nature of reality, as Smuts perceives it to be (1932: 10).

This holistic kind of knowing also emphasizes the multidimensional character of human knowledge and its tolerance for different modes of knowing or forms of cognition.

The biological basis for this claim receives support from clinical evidence in split-brain research. Traditional thinking about the functioning of the brain is that the left hemisphere controls the right side of the body and the right hemisphere the left side, and that each hemisphere controls distinctive characteristics that could manifest themselves as different cognitive styles if the left and right hemispheres were to operate independently. Recent research in split-brain surgery has yielded evidence to suggest that higher mental functions utilize what is common to both hemispheres (Ornstein, 1975). According to the view that emerges from this research, the whole brain is involved and transcends the overall individual capacity of each hemisphere. In this way, the holistic view that the parts tend to merge their individual functions with the complete functioning of the whole, is reinforced. In his application of these findings to educational possibilities, Hope urges educators to aim at developing the whole brain rather than one part thereof. For him this means the recognition of the "holistic mode of knowing", which "... integrates all forms of cognition from the innate impulse of instinct, to the rational faculty of the intellect, to the apprehensive powers of intuitive perception" (1988: 193). This mode of knowing appears to allow the expression of different ways of perceiving reality but to recognize, at the same time, that all are contained within a greater whole that develops to a higher synthesis of the individual parts.

The notion of development mentioned above is another characteristic feature of the holistic conception of knowledge as perceived by its proponents. This notion expresses a dynamic growth rather than a final state, ie, knowledge grows in such a way as to become a greater whole that is not a complete or final state of knowledge, but that contains the potential for even further development. Bohm's interpretation of the "holomovement" of the growth of knowledge implies the assimilation of certain aspects of older theories by new ones without the claim of absolute truth or finality by the new theories (1981: 63; cf 7.3.1).

Knowledge assumes a fluid and dynamic character that develops into larger wholes without the assertion that the whole is the ultimate state of knowledge (Watson, 1979: 240). When Vaught states that: "... the quest for wholeness as a cognitive activity transcends the fragmentation which a mere capitulation to the complexity of experience would entail, but it does this without transforming the quest for wholeness into a quest for complete comprehension", he may be seen to be making a similar claim (1984: 160). The point made by these authors is that the growth of knowledge is holistic in that parts are integrated into newer and greater wholes, but these wholes contain within themselves the potential of evolving to even greater ones.

Merrell takes into consideration the ideas of part and whole in his articulation of an epistemology of written texts and comes to a similar conclusion. His views regarding the growth of knowledge through the production of texts rest upon a hypothesis

of what he calls "the potential infinity of texts and mental worlds". He continues by suggesting that "... this hypothesis allows us to maintain the idea that any particular system and any particular theory constitutes only an approximation, only a relative truth, along with the optimistic vision of there perpetually existing the possibility of discovering-inventing newer and more broadly-based portions of truth ad infinitum" (1984: 148).

We may safely infer from the observations by different proponents of the holistic outlook that holistic conceptions of knowledge are characterized by the qualities of wholeness, unity, multidimensionality, dynamic creativity and infinite potentiality. The pluralist on the other hand conceives of knowledge as being essentially fragmented and its growth as a piece-meal process. The latter's reliance upon the Cartesian paradigm and its mechanistic outlook appears to emphasize the separation of human consciousness from nature. However, developments in several areas of intellectual life note the shortcomings of this approach and suggest the increasing evidence for the acceptance of the scientific credibility of notions of wholeness and holism. The argument for the recognition of the holistic explanatory principle as an intellectual rival to the reductionistic explanatory principle is enriched by its association with long and distinguished intellectual traditions in the West and the East (cf 7.1 & 7.2). Holism appears to be more than just a mystical affirmation or a religious quest, although these aspects are themselves integral to a true understanding of the conception of wholeness, ie, holism

recognizes all forms of cognition as being valid within their own epistemological criteria for establishing truth (cf Jung-7.4 & Royce-5.13).

The suitability of the holistic principle as a basis for a general framework for developing an epistemological position for library and information science may be tested partially by an overview of the success or failure of attempts to apply the ideas of wholeness (holism) and fragmentation (pluralism and dualism) in several areas of this field of study.

7.6 Wholeness and fragmentation in library and information science

Although there are no readily available records of systematic and explicit discussions of the application of the notions of wholeness and fragmentation in the field of library and information science, several references may be found that provide speculative and tentative opinions regarding their values and limitations. Moreover, if techniques and strategies that are applied in several areas of library and information science are carefully analyzed, certain definite connections with holistic or pluralistic world views may be ascertained. Furthermore, close analysis of the ideas of several theorists and their approaches in this field of study suggest that their predominant ideas may be loosely associated with the central notions of either wholeness or fragmentation.

The exponents in Chapter 5 serve as an example of this diversity of conceptions. A simple typology of these approaches may highlight the major divisions that characterize the general world views of these theorists. Admittedly, these divisions are based on inferences drawn from their writings, and may for that reason not be entirely accurate or necessarily comprehensive in coverage. The purpose of this typology is simply to support the view that, although wholeness and fragmentation may not be explicit in the views of major thinkers in library and information science, the more fundamental notions underlying their theories appear to influence the general outlook of those theories (See Figure 9). Figure 9 suggests a fairly even distribution of views and hence of the ambivalence regarding an explicitly stated, unanimous acceptance or rejection of either wholeness or fragmentation. The views of theorists who have treated the notions of wholeness and fragmentation either directly or indirectly in their writings are summarized briefly below.

Butler appears to find holistic ideas useful in his more pivotal conceptions that the library should be viewed within the context of a larger whole, viz, a broader cultural context (cf 5.1). Moreover, his interpretation of "scholarship" as the total intellectual content of a culture serves to reinforce this idea. Ranganathan's Hinduistic religious views affirm the notions of unity and interrelationship of all things, and it is little wonder that he sought, in his approach to librarianship, to unify library practices as a whole (cf 5.2). The notions of unity and synthesis are characteristic features of Shera's views of

THEORISTS WHO ARGUE FOR INCLUSIVENESS EXPLICITLY

RANGANATHAN, S.R. - 5.2
 SHERA, J.H. - 5.5
 BEKKER, J. - 5.24
 KESTING, J.G. - 5.28.10

THEORISTS WHO APPEAR TO BE SYMPATHETIC TO INCLUSIVENESS

BUTLER, P. - 5.1
 DEBONS, A. - 5.11
 FOSKETT, D.J. - 5.12
 NITECKI, J.Z. - 5.14
 KOCHEN, M. - 5.18
 MEIJER, J.G. - 5.21
 HARMON, G. - 5.22
 MCGARRY, K.J. - 5.23
 HARRIS, M.H. - 5.26
 KEMP, A. - 5.28.2
 BENGE, R.C. - 5.28.11.2.2

NO WELL-DEFINED VIEW

STÄBER, P. & K, SCHMIDT. - 5.28.1
 VON FOERSTER, H. - 5.28.3
 WILLIAMS, P. & J. PEARCE - 5.28.5
 MUKHOPADHYAY, A. - 5.28.6
 TARANTO, R.E. - 5.28.6
 DE SOLLA PRICE, D.J. - 5.28.11.1
 COOMARASWAMY, A.K. - 5.28.11.2.1

THEORISTS WHO ARGUE FOR DISJUNCTION, BUT NOT EXPLICITLY

DE VLEESCHAUWER, H.J. - 5.3
 MACHLUP, F. - 5.4
 FAIRTHORNE, R.A. - 5.6
 COETZEE, P.C. - 5.7
 MIKHAILOV, A.I. - 5.8
 ROYCE, J.R. - 5.13
 ZAAIMAN, R.B. - 5.15
 SWANSON, B.R. - 5.16
 WILSON, P. - 5.17
 SARACEVIC, T. - 5.20
 DE MEY, M. - 5.25
 SCHRADER, A.M. - 5.27
 BELKIN, N.J. - 5.28.4
 BERGEN, D. - 5.28.8
 OLAISEN, J.L. - 5.28.9

THEORISTS WHO ARGUE FOR DISJUNCTION EXPLICITLY

FARRADANE, J. - 5.9
 BRÖOKES, B.C. - 5.10
 WRIGHT, H.C. - 5.19

FIGURE 9: TPOLOGY OF VIEWS OF SELECTED THEORISTS IN LIBRARY AND INFORMATION SCIENCE REGARDING INCLUSIVENESS (WHOLENESS) AND DISJUNCTION (FRAGMENTATION).

librarianship. He urges that "fragmentation" and "centrifugation" in human knowledge should be countered with a "powerful cohesive force". His conviction of the value of holistic approaches extended to his efforts to reconcile librarianship with information science, but he later conceded that there was no necessary connection (cf 5.5). Debons' "informatology" may be perceived as an integrative approach in information science, and hence holistic in its outlook. He envisaged, along with Otten, that this metascience would serve as common basis upon which to study all information-oriented and specialized sciences and technologies (cf 5.11).

Foskett contends that the unity of knowledge is evidenced in the fundamental affinities that exist between the sciences and the humanities. He warns of the dangers of the potential ethical consequences of the fragmentation of knowledge (cf 5.12). Nitecki also reflects a holistic approach in his expression of the need for a unified theory for library and information science. This emerges clearly in his notion of "metalibrarianship" which seeks to examine the interrelationships that may be found between the generic book, knowledge and readers (cf 5.14).

Kochen's interest in the fragmentation and synthesis of knowledge was inspired by the conception of a "world encyclopaedia" as proposed by H.G. Wells. He proceeded to develop his own version of a world encyclopaedia, and his proposed new discipline called "epistemo-dynamics" aimed at an investigation of the growth of knowledge. In this regard he was

especially concerned with holistic aspects of knowledge, such as syntheses, reviews and links between fragments of knowledge (cf 5.18). Universality and divergence as critical features of knowledge also characterize librarianship, according to Meijer (cf 5.21). These ideas correspond closely with that of unity and diversity (as it is subsumed within unity), and hence with a holistic outlook. Also inspired by Wells' "world encyclopaedia" idea, Harmon proposes a suprasystem of knowledge that would unify the arts and the sciences in order to provide a "more complete interpretation of reality" (cf 5.22). Moreover, his application of the tenets of General Systems theory to library and information science would appear to confirm his fundamental holistic approach.

In Bekker's theoretical ideas the central notion of "continua", as distinct from dichotomized dualities (eg, the hard sciences and literature, library science and information science, non-fiction and fiction, external reality and "internal" reality), reveal the need to see things as a whole rather than as separate individual parts (cf 5.24). Moreover, Bekker calls for the elimination of "destructive dualities" from library and information science. Whether it is possible to characterize Harris as a holist, or even a monist, is complicated by the observation that while he is articulate about his rejection of a "pluralist ontology" and a "positivist epistemology", very little is said about what should replace these faulty frameworks for thinking about library and information science, except his insistence on the need to transcend the dialectic of positivism and subjectivism (cf 5.26). Finally, Kesting's plea for a

science committed to dealing with all the phenomena of an undivided universe, and his view that knowledge is indivisible, stem from a commitment to the notion of wholeness and to holism as the position that best describes his philosophical outlook (cf 5.28.10).

Both De Vleeschauer and Coetzee subscribe to a perspectivistic epistemological position which recognizes a multiplicity of truth perspectives (cf 5.3 & 5.8). Perspectivism affirms a pluralistic world view as distinct from a monistic one (cf 8.2 for a discussion of the compatibility of perspectivism and holism). The pluralistic approach of Royce recognizes three basic ways of knowing, each with its own truth criterion or epistemology (cf 5.13). The pluralist affirmation of a multiplicity of world views, each with equal claim to validity, is also an essential component of the cognitivist approach. De Mey (cf 5.25) and Belkin (cf 5.28.4) refer, in this regard, to the several ways in which the world can be known. In similar fashion, Schrader suggests different epistemologies or "ways of knowing" that may be applied in research in library and information science (cf 5.27). Bergen may also be regarded as being essentially pluralistic in his approach. He calls for an "anarchic hospitality" to all world views as a better approach than the assignment of "canonical status" to only one (cf 5.28.8). In a similar way, Olaisen argues that "paradigmatic tolerance" espouses the perception that paradigms provide partial and incomplete truths, but that each paradigm may be considered as being a valid way of obtaining knowledge (cf 5.28.9).

Besides the pluralists, there are also a few theorists who maintain a strict bifurcation of reality as two distinctively different types. These dualists appear to be compelled to accept the superiority of one type at the expense of the other. For example, Brookes' dualism of the physical world and the cognitive world emphasizes the latter, although he draws several analogies from the physical world in his descriptions of the key features of the cognitive world (cf 5.10). His quarrel with and consequent dismissal of holism as a profitable conceptual framework for library and information science is that it raises the level of an argument to a higher level in its resolution of difficulties and is hence rendered incapable of verification. Natural science, on the other hand (which he contrasts in this instance with holism), resolves the difficulty by analysis on a more specific level. The application of holistic explanations in the natural sciences repudiates a simplistic dichotomy between natural science and holism (cf 7.3 & 7.4).

Another dualistically-inclined thinker, Farradane, also questions the validity of holism (cf 5.9). His essentially mechanist outlook (as manifested by his strict adherence to the traditional "scientific method") leads him to discount the validity of philosophical, non-experimental and intuitive approaches to knowledge.

Wright, whose dualism emerges from his consistent distinction of the physical and metaphysical aspects of librarianship, also faces the difficulty of having to make a selection between the two (cf 5.19). The ultimate realities for

librarianship, according to him, are either data or ideas, and the choice of one or the other leads to the adoption of either a rationalist or an empiricist epistemological position. His own preference is that of rationalism since, he proposes, librarianship deals with the "intellectual realities of thought" and not with the "sensibles of experience".

No firm views reflecting holistic, pluralistic or dualistic approaches in library and information science may be inferred from the other theorists listed in Chapter 5.

The recognition of the concept of wholeness as a valuable one for theory of library and information science is not new. In 1949, Broadfield introduced his A philosophy of librarianship with the observation that philosophical thinking requires a holistic attitude. He notes the dominant trend in philosophy to rid itself from the need to see things as a whole, while science, on the other hand, finds the need to re-examine its metaphysical underpinnings (and its holistic aspects, cf 7.3). Broadfield puts the point succinctly: "It is the totality of all that is the case" (1949: 1). Whether Broadfield implies by this statement that wholeness is a dubious category for modern systematic philosophers or that it is a valuable one for theorists of librarianship is unclear. What remains unequivocal is the relevance of wholeness as a theme worthy of debate in the philosophy of librarianship.

Perhaps the impetus for this debate arose from the ideas and work of Paul Otlet (1868-1944) and Henri La Fontaine (1854-1943). These men were clearly motivated by holistic ideas in their efforts to preserve the total sum of recorded human knowledge. In 1895 they founded the Institut Internationale de Bibliographie, and "... addressed themselves to the task of organizing the world's knowledge in the form of a classified central card catalog of the literature, illustrations, and institutions of all countries, ages and languages" (Arntz, 1974: 377). Although this catalogue, Repertoire bibliographique universel, has been discontinued, the initial idea to place the world's knowledge in a systematized form at the disposal of the individual library user is still the governing principle of the International Federation for Documentation, albeit with the significant addition "strictly selected and only to the necessary extent" as opposed to unlimited collection (*ibid.*).

Following the pioneering work of Otlet and La Fontaine, it is not surprising that the idea of wholeness in the field of library and information science has been predominantly applied to conceptions of recorded human knowledge. The perceptions of certain exponents in Chapter 5 who stress the holistic features of the entire corpus of recorded human knowledge and knowledge in general, confirm the recognition of the valuable application of the notion of wholeness to conceptions of knowledge (cf 6.2.1).

This idea of the wholeness of recorded human knowledge is transferred to library and information science itself as manifestly the only profession that concerns itself in the

collective, corporate sense with the entire corpus of recorded knowledge. Universal libraries, such as those that were found at Nineveh and Hattushash and the Royal library of Alexandria, the Mouseion, and the large national and university libraries today, aim at accessibility to the widest range of materials that represent the totality of human knowledge in recorded form. The holistic character of library and information science in its effort to effect this, gives it a distinctively interdisciplinary outlook. Kesting explains that an ideal conceptual model for library and information science that would manifest this perception of its essential character would incorporate all aspects of the collection-development and use-promotion functions, such as the following:

"All the fields of recorded human knowledge, such as would be displayed in typical classification and indexing systems;

All the media of recorded human knowledge, from stone inscription, clay tablet, papyrus and parchment roll and codex to the printed book, the serial, the reprographic print, audio-visual material and the latest forms of record produced by the technologies of electronics and laser which are preservable and their message retrievable;

All the languages of recorded information and other symbols of interpersonal communication, such as music, mathematics and other consistently structured coded messages;

All the individuals and groups in every age and gender category who have a desire and ability to communicate with records or their recitals by others, a process dependent on resource-sharing as a sub-function of collection-development;

All the modes of knowing underlying or dominating the nature of recorded knowledge: a modification of the Jungian schema of the functions of human consciousness (viz thinking, sensing, feeling and intuiting) yields an epistemological model which highlights the cardinal roles of the philosopher as rationalist, the natural

scientist as empiricist, the artist as aestheticist, and the religious mystic as noumenalist, respectively, both as 'authors' and 'users' of human records;

All ideologies, beliefs and value systems reflected implicitly and explicitly in recorded human thought: it seems almost impossible for either 'author' or 'user' not to presume some form of ideology in knowledge transmission, and even the apparent absence of a philosophy may be seen as a philosophy which is important in the dynamics of the knowledge cycle;

All the methodologies of scholarship in general, and in the specialised disciplines to which each is suited; and

The full range of the 'genres' reflecting the entertainment-recreational and the educational-research expressions and communication needs in recorded human knowledge" (1990: vii-viii).

This broad concern emanates from the more fundamental conviction that human knowledge is an organic whole and essentially indivisible (Kesting, 1973: 101-112; cf 5.28.10). In support of this perception, the following statements from library and information science theorists may be seen to strengthen the holistic view of the nature of librarianship and recorded human knowledge:

(a) The aim of the librarian is "... side by side with the philosopher, to provide a gestalt for all of the specialisms; to point to the inevitable unity of knowledge, the wholeness of the universe" (author's emphasis; Shores, 1975: 222);

(b) "... the tradition of the written word is whole and single and entire and cannot be dismembered" (Macleish, 1940: 790);

(c) "Libraries are the sum total of the recorded ideas of all men... a microcosm, the fullest image of the universe that exists... the common basis of unity" (Richardson, 1927: 293); and

(d) The domain of librarianship is "... the whole of knowledge, the whole of culture" (Kaplan, 1964: 304).

In an attempt to apply the idea of wholeness to library and information science in a more systematic and consistent way, Beagle appropriates the ideas of the physicist, Bohm, and explains the growth of recorded knowledge as a holistic process (1988: 30). According to Beagle, it is often noted that library and information science originally developed in the context of the mechanistic world view (1988: 27). However, he contends that the changes in the conceptual outlook in several disciplines has led to the gradual acceptance of the concept of unity and interconnectedness as basic principles for researchers (cf also 7.3 & 7.4). This holistic perspective has been noted by researchers in library and information science, and holds that it is impossible for the researcher to fully comprehend any single entity without considering its context or environment taken as a whole in order to better comprehend the nature of the subject being studied (Grover & Glazier, 1986: 241).

Beagle argues that the growth of knowledge defies a central tenet of the mechanistic world view, viz, the disintegration process that the second law of thermodynamics postulates. In direct contrast to this law knowledge and libraries reflect a movement towards greater synthesis and integration (cf also 7.1.1 & 7.3.2). He avers: "... libraries are not some negentropic aberration from a fundamental law of cosmic disintegration, but rather are an expression of an integrative law of underlying order" (1988: 44).

The holistic and integrative features of knowledge have not gone unnoted by classificationists, and is evidenced in the more recent developments to construct more effective general bibliographic classification schemes, eg, the attempts by the Classification Research Group to apply the theory of integrative levels to the arrangement of main classes, and the work on the Broad System of Ordering conducted under the auspices of UNISIST. Notions of the possible value of the idea of wholeness are implicit in these projects.

Holistic approaches have also been applied in other areas of library and information science. For example, it is claimed that a holistic approach to library organization could counteract the unfortunate bifurcation in the profession that hinders the delivery of superior services (Murray-Lachapelle, 1983: 349). The prevailing dichotomous model of organization along functional lines which separate public services from technical services (eg, reference and cataloguing departments respectively) lead to the appearance that they are different disciplines rather than subsections of the same discipline (ibid.). According to Murray-Lapachelle, the recent manifestations in library and information science of information brokers, free-lance librarians, information managers, librarians without walls, and so on, "... do not respect this age-old duality" (ibid.).

Although pluralism is associated in a neutral manner with fragmentation and the mechanistic world view inspired by Cartesianism, Harris gives pluralism a socio-political meaning in his view that the pluralist perspective dominates research in

library and information science in the United States of America (1986; cf 5.26). Harris submits that the pluralist perspective dominated research in the social sciences since the 1930's, and that it is based on the supposition that the prevailing social and political consensus is one that has been democratically derived through mutual adjustment to conflict between power groups (1986: 214). It is assumed further that this achieved consensus is a "good thing" and that the social sciences merely express and reflect this consensus in their research. In its application to libraries, the pluralistic perspective holds that libraries "... came to be seen as simple mirrors, neutral reflections of society's 'racial memory'" (1986: 215). Since libraries merely reflect the "pluralist and democratic consensus", its research should focus on themes of "... performance, productivity, and usefulness, that is, research that has come to be called 'administrative'" (*ibid.*). To this end, Harris reasons, researchers developed a positivist epistemology to resolve the technical problems that the pluralist perspective identifies. Non-technical problems such as the political and economic influences on the ways that knowledge is distributed in society are ignored because they are not susceptible of treatment by positivist methods. At best, the positivist epistemology, in Harris' view, can only provide a limited view of the social context of librarianship, and what is needed is to give up the single-minded adherence to a pluralist perspective (also referred to by Harris as a pluralist ontology), and to search for an epistemology capable of understanding what libraries do and why (1986: 222).

Harris' analysis suggests the need to develop an epistemology that is sufficiently broad to offer a more comprehensive understanding of the rich diversity of the complex of professional functions in library and information science. Such an epistemology should provide not only a wider range of research techniques and strategies to investigate technical and "non-technical" problems in the field, but should also supply a deeper appreciation of the diversified content of libraries and information agencies as manifestations of several different "ways of knowing".

It would appear that such an epistemology could be constructed within a general framework that is sustained by holistic notions which emphasize wholeness and interrelatedness as distinct from one supported by essentially pluralist notions which endorse fragmentation. The mechanistic world view reveals limitations that have been recognized generally in several academic disciplines (cf 7.3 & 7.4). Its pluralistic outlook does recognize the validity of several "ways of knowing", but does not go far enough for library and information science, ie, in uniting these several ways as parts of a greater whole that characterizes the growth of knowledge (cf 7.5 & above). Moreover, although the mechanist (positivist) approaches may be applied with success in certain areas of library and information science, its narrow outlook cannot accommodate holistic approaches, whereas the holistic world view conversely may accommodate other approaches. Its integrative character allows it to incorporate newer methods and to develop higher syntheses which establishes internal relations between all its parts.

This does not mean that holism does not leave itself exposed to criticism. For example, the view that holism is antithetical to reductionism neglects to observe the necessity for holism to accommodate reductionism and mechanism as a necessary requirement of the holistic principle. McKinney argues that the question arises as to whether the whole, consisting of several complementary world views, has its own opposing polarity with which it must be integrated to be true to the spirit of holism (1988: 309). The significant point to be observed, however, is that holism suggests itself as the principle that appears to do justice to the established features of universality and diversity (and specialization) of the continually developing body of recorded human knowledge. As a world view that is currently emerging in several fields of study it may offer deeper and more coherent insights into the nature of knowledge and libraries.

The principle of holism provides a suitable framework within which to develop an epistemological position for library and information science. Such a framework contains the qualities that facilitate the development of the speculative and tentative observations by theorists (cf Chapters 5 & 6) into a more coherent position that may be applied in theoretical aspects of library and information science. These qualities may, at this point, be articulated in a more or less systematic definition of holism as it is applied in this study.

7.7 Holism defined

It may serve the purposes of this study to summarize briefly here the most salient features of holism as it has been discussed in this chapter.

The word holism is derived from the Greek word holos which means whole. Holism is a universal principle which involves the creation of greater and greater wholes as a dynamic evolutionary process. The whole is greater than the sum of the parts, whose function merges with the overall function of the whole. Holism emphasizes wholeness rather than fragmentation, but accommodates world views (as parts of a whole) that support fragmented approaches as a natural consequence of its inclusive orientation.

As a mode of inquiry, holism considers all fields of human knowledge as being essentially interrelated and interconnected. Each field of human thought is regarded as a valid discipline that investigates a more specific realm of reality with its own strategies and techniques. The commitment of holism to the interrelationship of all fields of study fosters the creation of newer syntheses which provide a more comprehensive understanding of the phenomenal and supraphenomenal world. Holism is eminently suited to the interdisciplinary nature of library and information science and may serve as an integrative force that counteracts the fragmentation that could accompany an uncritical acceptance and application of techniques and strategies based on mechanistic models.

7.8 Criteria for the evaluation of an epistemological position for library and information science

To ensure that the body of thought regarding epistemological aspects of library and information science (that has emerged from an analysis of the views of several theorists of library and information science, cf Chapters 5 & 6) corresponds as closely as possible with the characteristic features of a tenable epistemological position, a set of criteria may be postulated. These criteria may prove helpful in testing the adequacy of the epistemological position regarding its satisfactory provision for the essential features that such a position should manifest. Furthermore, the set of criteria may contribute to the formulation of a coherent and clearly articulated position, thereby enhancing its theoretical value.

7.8.1 An epistemological position for library and information science should proceed from the proposition that library science (or librarianship) and information science constitute a single discipline, or, at the very least, share the same disciplinary basis

Chapter 5 reveals the several different perceptions as held by a wide range of prominent theorists in the field of library and information science of the relationship between library science and information science. These several views are presented in the form of a typology in Chapter 6.1 which yields five clearly conceived relationships that are distinctively different from each other. One may only speculate as to whether this divergence of perceptions may actually be attributed to the absence of a clearly defined epistemological position.

Irrespectively, however, the argument in favour of the application of holism to library and information science suggests that an inclusive approach holds out the possibility for more enriching insights than one that stresses the differences that may apparently exist between the two disciplines (cf 7.6).

7.8.2 An epistemological position for library and information science should be based firmly upon notions of wholeness and unity as distinct from fragmentation and disunity.

This wholeness, as embodied in the principle of holism (cf 7.1 & 7.7) should account for the development of the creative synthesis of the manifest diversity that exists in the library and information science profession as demonstrated in Kesting's proposed comprehensive conceptual model (eg the range of bibliographic activities; the complex of library and information science functions; the diversified content of recorded human knowledge; the variety of research strategies and techniques, and so on; cf Kesting's quotation-7.6), viz, as parts of a greater unity and wholeness. Holism presents a defensible alternative to the mechanistic view and has been applied with a reasonable measure of success in the natural sciences, the social sciences and the humanities (cf 7.3, & 7.4). Its application in library and information science has been tentative and cautious, but its essential message is implied, in some cases, even in the early efforts of library and information workers (cf Otlet and La Fontaine, 7.6).

The specific application of holism to conceptions of recorded human knowledge recognizes the validity of all forms of human cognition and the fundamental interrelatedness of all fields of human knowledge. Conceptions of human knowledge as an interrelated and dynamic unity are represented in the theoretical writings of a number of exponents in Chapter 5. These views are categorized, along with other conceptions of human knowledge, in Chapter 6 (cf 6.2.1). At a more specific epistemological level, holism recognizes the interaction of the reader and the content of a document (ie, recorded knowledge) and transcends a dualistic approach that denies the constitutive role that subjective interpretation (human consciousness) plays in the acquisition of knowledge.

7.8.3 An epistemological position for library and information science should subscribe to the notions of relative truth, relative certainty and ultimate reality as variable, alterable entities.

The idea of absolute truth is one that no longer features as a crucial element in the natural sciences and the social sciences (cf 7.3 & 7.4). Evidence from investigations in several academic disciplines suggests that the emergence of newer theories implies the assimilation of certain features of older ones that are replaced, and its subsequent application, with greater success, in other contexts. Hence, claims its most eloquent exponent, any particular theory will constitute an approximate, conditional, and relative truth (Bohm, 1984: 165).

The overwhelming majority of theorists whose texts regarding epistemology-related issues are analyzed in this study concur with the proposition that truth or reality is privately and/or socially constructed (cf 6.3.2). This consensus conflicts with the predominantly mechanistic view that truth or reality "resides in nature" and that it exists in an objective sense and independent of the knowing observer (cf 6.3.1).

These three criteria for an epistemological position in library and information science are adequate in their accommodation of the perceived key features that are considered to be relevant to the establishment of an epistemological position of library and information science (cf preamble to Chapter 7 above).

7.9 Summary

This chapter has identified the manifest interrelationships that library and information science, in all its major professional functions and subfunctions, displays with the notion of wholeness. Although these interrelationships are also evident in the analysis of other knowledge-transmitting professions such as education (cf 3.4) and communication (cf 3.5), it appears that the unique nature of library and information science's multidimensional involvement in, for example, the "Alls" of Kesting's quotation above distinguishes it from those professional disciplines.

This perception of the exclusive professional features of universality and multidimensional interconnectedness has led several theorists to emphasize its singularly exceptional synthetic, interdisciplinary, metascientific (in the broadened sense of an inclusive study of human inference that encompasses scientific inference) and hence holistic characteristics (cf, for example, Kaplan, 1964; Shera, 1966: 176-7; Wright, 1985; Kesting, 1990: i-ix).

Holism as a philosophical outlook which embodies these qualities provides a congenial conceptual framework within which to establish an epistemological position which matches the perceived nature of library and information science.

The criteria postulated above reflect the view endorsed in this study that wholeness, and holism as an embodiment of its essential qualities, may offer deeper and richer insights into the nature of the relationships between recorded knowledge, readers and librarians and information officers. This view is echoed in the apt statement by Butler-Adam, although he excludes the librarian as a key component: "World, writer, text and reader are all separate and individual creators/creations. Yet all are linked, too" (1983: 7). It is this latter emphasis on the links of unity that are extrapolated in order to construct a tenable epistemological position for the field of library and information science.

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be relevant to a discussion of epistemological issues in library and information science. This variation of opinion has been explicated in considerable detail in Chapter 6.

The multiplicity of approaches identified in the writings of the exponents who were selected for closer investigation in this study may be accommodated within the proposed holistic framework as interpenetrating parts of a larger whole whose essential character differs significantly from that of any individual part. This implies that each approach is a valid perspective in itself, viz as an attempt to identify the perceived central dynamics of library and information science and their interaction in knowledge-transmitting functions, as well as the roles of librarians and information scientists as intermediaries in this process. When these approaches are viewed as perspectives within a larger whole that dynamically interact with each other in an ongoing process of development into a more inclusive whole, we observe the mutual interrelations between the principles of holism and pluralism as themselves being parts of a process that may be described here as "holistic perspectivism".

Holistic perspectivism is the view that the several approaches to the acquisition and validation of human knowledge is located within the broadest possible context as parts within a whole. As a purportedly valid perception of reality, each perspective is, in essence, a partial view of ultimate truth/reality, and its dialectical conflict with contrary perspectives ensures the continuous evolution and growth of human knowledge.

Holistic perspectivism is not perceived to be the mere juxtaposition of two apparently contradictory views about the nature of reality, viz wholeness and fragmentation (cf Chapter 7 for a fuller discussion of these concepts). Rather, it is the expression of the continuous generation of newer perspectives that emanate from earlier ones. As it has been stated in the definition of holism (cf 7.7), each traditionally demarcated field of human thought is itself regarded as a valid discipline that investigates a given, more specific, realm of reality with its own strategies and techniques. As a proposed epistemological position, holistic perspectivism is viewed as being committed to the interrelationship of all fields of study and fosters the constant creation of newer syntheses which may provide potentially more comprehensive understandings of the supposedly "external" world and the inner (internal) self. These syntheses manifest themselves as perspectives held by individuals whether in their use of recorded human knowledge or within specific disciplines as paradigms of thought. These perspectives embody personal or collective insights gleaned from the content of recorded human knowledge, and are applied in an attempt to extend an understanding of reality.

8.1 Perspectivism

According to the Dictionary of philosophy and religion, perspectivism is a term used to facilitate the presumption that "... every point of view is in some sense true and offers a valuable and unique perspective of the universe" (1980: 425). The epistemological writings of Friedrich Wilhelm Nietzsche

(1844-1900) provide a rich context for understanding perspectivism as an epistemological position. One commentator construes Nietzsche's application of the term as follows: "perspectivism means that the world is always understood within the perspective of some point of view; all knowledge is thus an interpretation of reality in accordance with the set of assumptions that makes one perspective different from another" (Small, 1983: 99). This perspectival approach of Nietzsche emphasizes the anthropomorphic character of all human knowing which implies a recognition of both its limitations and its potentialities (Breazeale, 1979: xlvi; cf also De Vleeschauwer's position on the anthropological context of knowing-5.3, and his interpretation of perspectivism below).

Since Nietzsche was himself partially influenced in his philosophical development by traditions of Eastern mysticism and Oriental philosophy, it is not surprising to note that perspectivism constitutes a central doctrine in Indian philosophy. It manifests itself on the one hand as an apparent paradox in Indian thought that expresses the catholicity of styles or modes of thinking, worship, art, etc, which all strive to attain one truth. On the other hand it maintains the proposition that each individual has his/her own perspective on it (Kaplan, 1962: 228). This doctrine is known as syadvada, ie, the "maybe so", "up to a point" or "in a manner of speaking" doctrine (ibid.: 230). It proclaims that, however carefully elaborated a philosophy may be, it remains only a human point of view since it is inseparable from a particular viewpoint and, therefore, unavoidably expresses only a single perspective on

reality (ibid.). Furthermore, no proposition is completely true but only up to a point or in a manner of speaking (cf for example Victor Cousin's philosophy of eclecticism-6.3.2). Kaplan elaborates this outlook by arguing that no man can assume an absolutistic perspective since "... we approach truth, not by choosing among alternative beliefs and philosophies, but by broadening our perspectives so as to find a place for the several alternatives" (1962: 231). According to Saral, this approach to truth is applied in Hindu philosophy of communication (1983: 53). This implies that truth is relative and dependent upon the perspective from which a given object/event is observed or experienced. The same object/event may be perceived and/or experienced differently by different individuals and by the same individual at different times (ibid.).

This process of the broadening of perspectives as a means of encompassing contradictory standpoints underscores an important link between holism and perspectivism.

8.2 Holism and perspectivism

The notion of perspectivism appears to be entirely consonant with that of holism as it is construed in this study. Brockriede, for example, perceives perspectivism as an attempt to overcome the dichotomies that "... abound in the history of scholarship..." (1985: 151). He continues by asserting that "Perspectivism... recognizes that everything is related to everything" (ibid.: 153). By this, Brockriede implies that, rather than choosing one view to the total exclusion of others (a strategy of selectiveness), perspectivism stresses a strategy of

emphasis. This means that a specific view is emphasized without discarding the others as irrelevant. This principle operates in a manner similar to the metaphor of "figure and ground" as applied by gestalt psychologists (cf 7.4). While a given perspective is featured as the figure in the foreground, other perspectives make up the background. This principle of emphasis in perspectivism echoes the notion of tolerance as advocated in holistic approaches, ie, the espousal of one perspective does not imply the automatic rejection of all others. Rather, at the broadest levels of human thought, all perspectives are mutually complementary and interrelated. Perspectivism hence allows also for "... a kind of coexistence of opposites" (Brockriede, 1985: 153; cf also Kesting's notion of supradogmatism or transdogmatism-5.28.10).

Similar thoughts are expressed in the writings of the two theorists in library and information science whose epistemological positions may be described as being specifically perspectivistic, viz De Vleeschauwer-5.3 and Coetzee-5.7). De Vleeschauwer maintains the view that our knowledge of the truth is perspectival and that we are confronted in our search for knowledge with more than one kind of knowledge, viz moral knowledge, aesthetic knowledge and so on. These types of knowledge are methodologically constituted in terms of man's changing experience of reality which results in the generation of several truth-perspectives. This insight, in De Vleeschauwer's view, encourages open-mindedness and tolerance for all

ideological trends. Hence the link between holism and perspectivism appears to have been established indirectly in De Vleeschauwer's writings.

Coetzee's perspectivist epistemological position, as developed in his formal philosophical works, is not elaborated in any significant way in his writings on library and information science. However, his concern with the historically-induced problem of cultural disinheritance seems to identify the need to preserve the "whole" of culture. In order to achieve this preservation of the whole, according to Coetzee, libraries should collaborate with other social institutions (eg, schools and universities) and groups (eg, authors, publishers and teachers) to this end (1975: 12). Furthermore, Coetzee's acknowledgement of the value of both inductive and deductive approaches to scholarly investigation may be interpreted as being supportive of the underlying holistic assumption of tolerance for several research methodologies.

However, these inferences from Coetzee's writings remain speculative rather than substantive in the light of his emphasis upon other central concepts in library and information science.

8.3 Holistic perspectivism

The similarities as noted above between holism and perspectivism do not imply that there is therefore no need to use both appellations in a single comprehensive description of the proposed epistemological position. Each term emphasizes an important dimension or component of the position as a whole. The

holistic component accounts for the qualities of interrelatedness of all fields of human thought, the interconnectedness of conceptions of recorded knowledge and unrecorded knowledge as parts of a dynamically evolving whole, and the unity of the knower and the object of knowledge in the process of the acquisition of knowledge. In Figure 9 the theorists listed within the range of 0 to +5 are proponents, in variable degrees of commitment, of the notion of inclusiveness and hence with equal force of holism.

The perspectivistic component seeks to explain the existence of the development of individual and collective viewpoints that result from the inquiries involving the use and application of the content of recorded knowledge. In the case of an individual user, the inquiry may result in the broadening and deepening of perspectives and the stimulation of new knowledge. In the case of a group (eg an academic community), systematic research may lead to the further refinement of existing paradigms of thought or may lead to the questioning of prevailing assumptions with a view to revising or reformulating such paradigms of thought (cf for example the so-called Kuhnian "paradigm shifts"). Systematic expositions of perspectivism as an epistemological position are found in the formal philosophical writings of De Vleeschauwer (cf 5.3) and Coetzee (cf 5.7). Other exponents in Chapter 7 who discuss similar views in considerable detail include Royce (cf 5.13), Schrader (cf 5.26), Bergen (cf 5.28.8) and Olaisen (cf 5.28.9).

The merging of holism with perspectivism offers an epistemological position that not only reveals continuities with traditional epistemological thought but also accommodates the departure from absolute notions of truth and certainty towards a greater tolerance for the perception of a never-ending development of human knowledge and the qualitatively infinite dimensions of reality. Rather than implying that wholeness (holism) and fragmentedness (pluralism) and their attendant methodological approaches are antithetical visions of reality, they are construed to be complementary perspectives within a more inclusive whole. Even if the former view is maintained it would be incontestable that holism is capable of accommodating pluralism rather than the other way round.

Holistic perspectivism advocates an allegiance to the notion of a "non-hierarchical, dynamic interplay of opposites" (McKinney, 1988: 309) and a constant emergence of higher syntheses of human knowledge that emphasizes its organic interrelatedness, regardless of disciplinary boundaries or modes of expression (eg oral, script or electronic media).

Holistic perspectivism as it is construed in this study bears certain epistemological similarities with, as well as contrasts to, the systems approach or systems theory. The similarities include a commitment by both to the unity of the knower and the known in the epistemological process and an emphasis upon the active role of the subjective knower's derivation of individual perspectives in the knowledge process (Kriek, 1976: 34). However, the difference lies in their

conceptions of human knowledge. For systems theory, the conception of knowledge is confined to scientific knowledge in the original logical positivist attempt to reduce all the sciences to a single empirical basis (thereby claiming to unify them) (Kriek, 1987: 222, 232). Holistic perspectivism, on the other hand, is broader in its inclusivist conception of human knowledge. A further implication of this distinction is that whereas systems theory rejects reductionist methods of the validation of knowledge, holistic perspectivism incorporates both reductionist and anti-reductionist methods (or mechanist and anti-mechanist approaches) as parts of a larger whole or as extreme poles along a continuum that encompasses a range of approaches to the validation of human knowledge (cf 8.4.2.2 for the application of this view to research in library and information science).

As an epistemological position for library and information science, holistic perspectivism meets all the criteria as set out in Chapter 7, viz:

(a) an epistemological position for library and information science should proceed from the proposition that library science (or librarianship) and information science constitute a single discipline, or, at the very least, share the same disciplinary basis;

(b) an epistemological position for library and information science should be based firmly upon notions of wholeness and unity as distinct from fragmentation and disunity; and

(c) an epistemological position for library and information science should subscribe to the notions of relative truth, relative certainty and ultimate reality as variable, alterable entities.

With respect to the first criterion, library science and information science are perceived as constituting a single discipline as distinct from being two separate fields of study (cf also 4.3.3). This argument is defended by several theorists, albeit for different reasons (cf Figure 6).

Holistic perspectivism also subscribes to notions of unity and wholeness as required in the second criterion. This theme has been explored at great length as a critical one in this thesis. In Chapter 3 the holistic epistemological position featured as a prominent one in the fields of medicine (cf 3.3), education (cf 3.4) and communication theory (including mass communication) (cf 3.5). Furthermore, the theorists in library and information science whose writings reflect underlying assumptions of wholeness are discussed in Chapter 7 (cf Figure 9).

The notions of absolute truth and ultimate reality as fixed, unalterable entities are not supported by holistic perspectivism. For example, the emergence of holism in several broad areas of human knowledge (cf the natural sciences-7.3 & the social sciences and the humanities-7.4) acknowledges the fallacy of an objectivistic notion of truth, and the doctrine of perspectivism also emphasizes the view of a multiplicity of truth-claims rather than absolute truth. Hence, holistic perspectivism satisfies the third criterion.

Many of the essential characteristics of holistic perspectivism may be observed in its application to certain areas of library and information science.

8.4 The application of holistic perspectivism in an explanation of the intermediary role of librarians in the transmission of knowledge, and as a philosophical basis for the selection of research methodologies in library and information science

As a proposed epistemological position for library and information science, holistic perspectivism is viewed as a suitable framework for explaining the philosophical assumptions underlying the dynamics of the intermediary role of the librarian in the broadening and deepening of the individual user's knowledge perspectives through the reading process (considered as a means of knowledge transmission) (cf 8.4.1 & 8.4.2). Furthermore, it may clarify the implications of holistic perspectivism as an underlying philosophical basis for the selection and application of research methodologies considered to be appropriate in the field of library and information science (cf 8.4.2.2). Finally, holistic perspectivism offers an opportunity to establish tenable views of the epistemological concepts of human knowledge and truth/ultimate reality within the context of this profession. These applications are discussed below under the headings "the individual user" (cf 8.4.1), "the librarian" (cf 8.4.2), "conceptions of recorded human knowledge" (cf 8.4.3) and "approaches to truth/ultimate reality" (cf 8.4.4).

Admittedly, exhaustive treatment of these applications is not possible within the scope of this thesis, nor is it the intended purpose of this study to pursue these issues as a central feature. However, the broader characteristics of these applications are highlighted as a means of typifying holistic perspectivism as an epistemological position in library and information science.

8.4.1 The individual user

The interactive processes between the source and the user whereby recorded knowledge in its entirety is absorbed and assimilated, is construed in a generic conception of the reading process as the most typical mode of interaction in the context of library and information science. The term "reading" is hence used as an umbrella term to connote the wider perspectives of interaction or engagement between the user (active/passive) as seeker (of truth, enjoyment, enlightenment and education) and the generic text - the fabric of organized recorded human knowledge. In this view, the activity of reading as an example of communicative interaction has been cast within an epistemological framework by certain writers in library and information science.

Although reading has many purposes and effects, the kind of reading that is emphasized here is that kind that increases one's knowledge of oneself and of the external environment. In this view, reading may lead to the potential understanding of the self and the physical world as it is mediated through the symbols of human language. Neill has claimed, for example, that:

"Reading can contribute in a special way to the broadening of our human experiences, our self-knowledge and our horizons; for everything that is mediated through reading and understanding is mediated along with ourselves. Each adds a unique personal meaning to the dictionary definition of words, and to the author's definition as well. Reading is not merely for "information retrieval." Readers make themselves as they make meaning in partnership with the author" (1985: 59).

Neill's claim highlights the development of personal perspectives through the reading process, and he adds an acknowledgement of the holistic interconnections that exist between the individual as knower and society as the object of knowledge in his declaration that when librarians quote Emily Dickinson's lines: "There is no frigate like a book to take us lands away" (1961: 267), it is a "positive action in social epistemology - a statement about the human mind and the individual's role in society and in history" (Neill, 1985: 59; cf 5.5 for Shera's conception of social epistemology). For Neill, the individual user should be allowed to gain access to all facets of human knowledge in libraries as a means of counteracting the reductionist methods of empirical or positivist science proposed implicitly as the only way to valid knowledge (*ibid.*: 60). The wholeness of human life, according to him, can only be preserved when libraries become sources of knowledge "... that leads to an understanding of all life... - the kind of understanding that gives the necessary distance, depth and meaning to make judgements for the whole person, not merely plugging a temporary information gap" (*ibid.*: 61).

Neill's perceptions of the reading process clearly imply what is understood by holistic perspectivism in that an individual reader is able to widen his perspectives of himself as a person and of the physical world through the interaction of subjective meaning and the symbols to which such meaning is attached.

In a similar way, Nitecki has recently stressed the value of reading as an effective and efficient way of understanding oneself and the world. He argues that reading as a part of the cognitive ("thinking") process contributes to a definition of reality as a subjective image of the world (1986: 230). Nitecki focuses on reading for knowledge or "creative reading" as distinct from reading for entertainment and reading for information. He applies a cognitivist approach to reading so that one's interpretation of the content of what is read is in accordance with a view or theory of what the world is like which underlies all one's perceptions and understanding of the world (1986: 231; cf De Mey-5.25 for a fuller treatment of the cognitivist approach). Nitecki maintains further that the knowledge acquired through this kind of reading is not its traditional perception as "... neatly-packaged ideas in books classified within a static system... Knowledge is a process, not a commodity, a dynamic process of relating previously known experiences with new ones. It is a constantly changing network of relations" (1986: 232). This view of Nitecki is entirely consistent with holistic perspectivism in that it proposes the

development of knowledge perspectives from previous ones and emphasizes the ascription of personal, subjective meaning to the content of what is read.

The self-referential dimension of the reading process and the epistemological dynamics surrounding this feature have been examined in recent approaches to reading in the field of literary theory. For example, the transactional view of the reading process as expounded by Rosenblatt (1978) highlights the reader as a dynamic re-creator of the text rather than a mere passive receptacle of messages. Readers are not detached observers, according to this view, but are constitutive of communication between authors and themselves (*ibid.*). In an elaboration of the epistemological implications of this approach, Merrell claims that the act of reading involves feedback channels which allows an interchange or exchange process that influences the shaping of meaning for the individual reader (1984: 145; cf 7.4). Merrell's proposition that the knowledge gained in this way is oriented towards obtaining increasingly larger insights into truth as distinct from the ideal of attaining a state of absolute truth in a static sense, is one that typifies the holistic framework within which he postulates these views (cf 8.4.4 for a fuller treatment of approaches to the concept of truth).

The individual user of the content of recorded knowledge is also a potential contributor to that content, as one link in what may be referred to as "the knowledge cycle" or "the knowledge system". This knowledge cycle which encompasses the processes of

knowledge production, organization and storage, distribution and use (Holzner & Marx, 1979: 13) interrelates the user and the library with other broader social arrangements and patterns as components of a larger framework within which an explanation for the constant growth of knowledge and the variety of perceptions of its validity may be sought.

Holistic perspectivism, as an epistemological position in library and information science, provides a suitable context for examining and perhaps explaining the acquisition of knowledge by the individual user and highlights the role of the reading process as a valid activity for developing perspectives of reality. The application of holistic perspectivism may be depicted graphically as follows (Figure 10/component B of the comprehensive model in Figure 15):

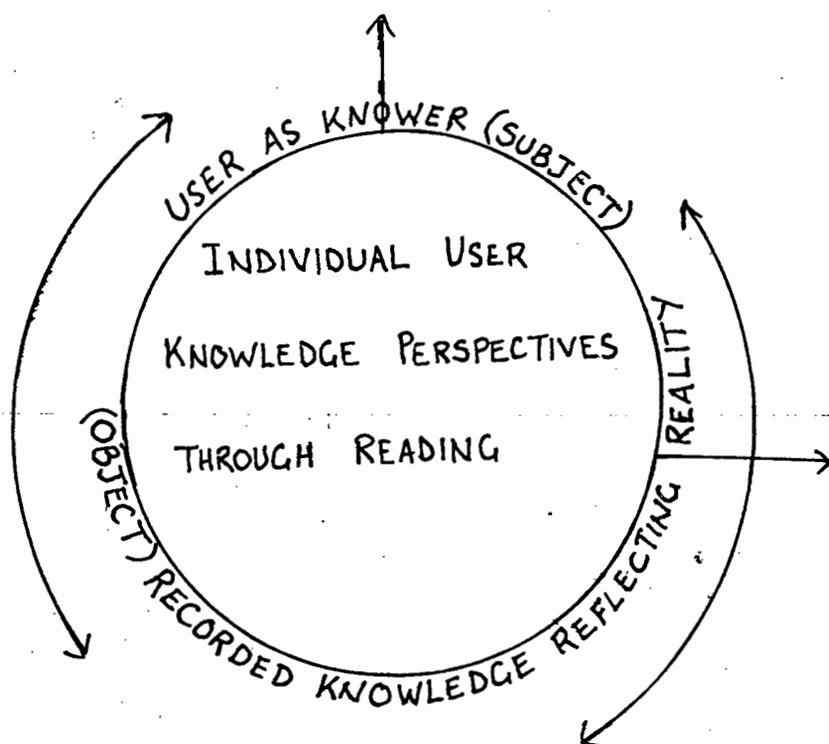


FIGURE 10: INTERRELATION OF THE USER AND RECORDED KNOWLEDGE

The user as the knowing subject is dynamically linked with the content of recorded knowledge as the object of knowledge as may be observed by the circular rotation indicated by the arrows. This figure reflects the perception of the nature of the reading process described above as an example of user/recorded knowledge interaction.

The role of both fiction and non-fiction categories of literature in this process is examined in 8.4.3, below.

8.4.2 The librarian

The epistemological status of the librarian may be observed within the contexts of the roles played in the transmission of knowledge on the one hand and in the acquisition of new knowledge related to improving professional services on the other, ie as a researcher.

8.4.2.1 As an intermediary in the knowledge-transmission process

The professional world view of the librarian embodies "... a combination of ideas, values, prejudices, moral and aesthetic principles, and fundamental philosophical assumptions", according to Winter (1988: 133). The latter regards such a world view as an occupational or professional "ideology". He explains his interpretation of "ideology" as follows:

"While this notion is obviously rooted in a much more general concept of ideology, we are looking here at its occupational form. When we study occupational or professional ideology, we are looking at the fundamental outlook that shapes everything else: the sense of what is important, what counts as a serious problem, what modes of thought dominate discussion, what methods of solving problems are approved, and in

general how the work should be carried out" (ibid.: 134; cf 3.2 for an interpretation of "ideology" in an educational context).

Winter's perception of an occupational or professional ideology is perhaps best encapsulated in his own questions: "What does it mean to 'think like a librarian'? To look at the world from the viewpoint of the librarian?" (ibid.: 133). The answers to these pertinent questions would contribute to an understanding of the role of the librarian in the knowledge-transmission process.

A professional position of neutrality is advocated by several of the theorists whose writings were examined in Chapter five (cf for example De Vleeschauwer-5.3; Wilson-5.17; Bekker-5.24; Bergen-5.28.8; Olaisen-5.28.9; Kesting-5.28.10). This conception of neutrality is not perceived as a timid avoidance of involvement in the many intellectual, moral, spiritual, aesthetic, political and other kinds of debate, but a positive, and ultimately even an "ideological" stand in its own right based on the commitment of library and information science to the "Alls" referred to at the end of Chapter 7. This standpoint rests upon a more secure epistemological position, viz holistic perspectivism, that advocates a particular professional attitude emanating from the mode of thought and action which typifies librarians as individuals and as a professional group.

This professional preoccupation with the whole (ie the several "Alls" as highlighted in the quotation from Kesting-7.6) implies that librarians are not arbiters of either absolute truth or particular claims to kinds of truth in the transmission of

knowledge functions that they perform. The basic professional commitment is rather to "... the flow of all kinds of information without regard to its truth or falsehood" (Swan, 1986: 46).

In the systematic collection, making optimally available (heuristics) and promotion of use of all kinds of materials that underscore the universality (and underlying divergent qualities) of recorded knowledge, the librarian is not only expected to guide or to facilitate access but to secure the freedom and spontaneity of access for any or all users who wish to use library collections. Swan submits that the librarian's truth is one dispensed through the mediation of "... freedom, freedom of access" (*ibid.*), arguing that the knowledge of truth and the knowledge of untruth, like the knowledge of good and evil, are indissolubly joined and that our cause, professionally and politically, is with both ends of the scale (*ibid.*: 52; cf 8.4.4 for a fuller discussion of approaches to truth). The implication of this position in respect of systematic collection, for example, is that even the presumed "errors" of mankind ought to be preserved in library collections for their potential contribution to the broader learning process. Furthermore, comprehensive, systematic collection acknowledges the possibility that what was dead, unknown or useless to one generation may suddenly become important for the next (Kristeller, 1983: 113 cf also Meijer-5.21).

In the intermediary role that librarians play in knowledge transmission, holistic perspectivism implies that they should apply methods of collection development and use promotion that

emphasize inclusiveness, and that they ought to advocate those values that advance intellectual freedom both in selection and the provision of access to library collections in a corporate sense. This implies that the execution of those professional functions that involve an ethical dimension, such as collection development for example, require as a basis the postulation of given principles. Bekker claims unequivocally that the guidelines of occupational conduct for librarians proposed as the culmination of an extensive investigation in his doctoral thesis had been drawn up in accordance with all the principles established in that study (1976: 316). It is suggested here that holistic perspectivism may provide a firm principle as a foundation for supporting a code of professional ethics for librarians.

The intermediary role of the librarian in the knowledge transfer process may be illustrated as follows (Figure 11/component A of the comprehensive model in Figure 15):

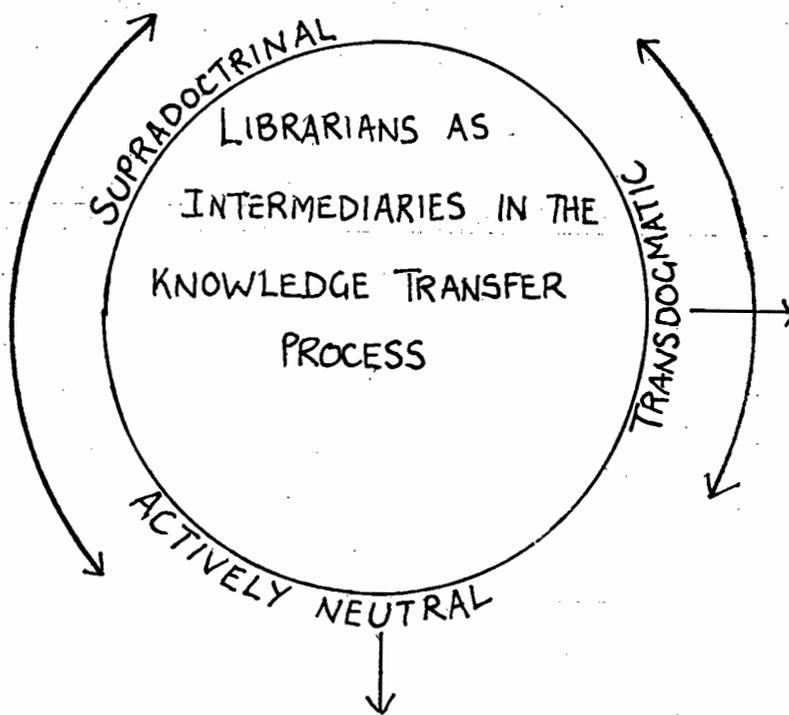


FIGURE 11: THE LIBRARIANS' INTERMEDIARY ROLE

Although the full value of this figure is diminished if viewed in isolation, the significant features are the indications of the qualities of supradocrinalism or transdogmatism, as well as the identification of its interrelatedness with other components of the epistemological position. These connections are evident via the outgoing arrows (cf Figure 15 for the relative context of this component in the proposed epistemological position).

8.4.2.2 As a researcher

Research in library and information science, according to Schrader, of necessity serves to investigate problems of fairly different kinds and require different methods of inquiry which in

their turn are supported by different epistemologies or "ways of knowing" (cf 5.27). Schrader himself regards these divergent epistemologies as being equally valid as underpinnings to the given research design concerned, urging though that each, when applied in a specific area of research in library and information science, should be appropriate in context (cf also Bergen's view of "anarchic hospitality"-5.28.8 and Olaisen's notion of "paradigmatic tolerance"-5.28.9). Moreover, a knowledge of the variety of research methodologies may enhance the quality of library and information service to users who could employ several widely different research techniques in their own searches for knowledge and truth.

Such pleas for the tolerance of several research approaches have not always been heeded, according to Harris (cf 5.26). Instead, he claims, many library and information science researchers either implicitly or explicitly espouse methods that are undergirded by a positivist (logical positivist/logical empiricist) epistemology which has been widely applied in the natural sciences (cf 7.3-7.4 for a more detailed treatment of this epistemology in the natural sciences and the social sciences). Harris argues that while positivist epistemology is uniquely suited to the problems of certain aspects of library and information science such as the technical, logistical and managerial, it ignores other valuable questions surrounding its cultural, political and economic dimensions (1986: 221-2). Although Bergen has questioned the validity of Harris' view that a positivist epistemology is only suited to technical and administrative aspects of library and information science, the

influence of the positivist approach upon research in this field has been well documented (cf. for example Shera, 1972; Wright, 1978; Busha, 1980; Houser, 1982; Odi, 1982; Lynch, 1984).

According to Bergen, Harris' own attempt to transcend the perceived limitations of the positivist epistemological position is unfortunately equally parochial in its proposal of a "Hegelian Marxist" epistemological position to research in library and information science research (1987: 74-75). Bergen advocates the application of many epistemologies to (and hence acknowledges the suitability of several research methods for) studies in library and information science, because each one sensitizes us to different aspects of the full professional role under scrutiny. Furthermore, such tolerance for the adoption of a diversity of several research methods is manifestly consistent with the inclusive and interdisciplinary nature of this profession.

Holistic perspectivism in particular is eminently appropriate as an epistemological position for guiding the conduct of research in library and information science because its emphasis upon the whole implies an accommodation of the ranges of both quantitative and qualitative research methods as distinct from either/or points of departure. (Houser's insistence, for example, that the choices for research in library and information science are confined to mere ones of "... science or nonscience" amply illustrates the latter concern (1982: 102)). Holistic perspectivism acknowledges the interrelationships of library and information science with

several fields of study and its role as a mediating profession that derives knowledge from a range of disciplinary bases, and hence recognizes the value and validity of applying research methods from those fields of study to library and information science problems.

Qualitative and quantitative research methods have equivalent epistemological status (Mouton, 1985) and may be applied hence in appropriate areas of the multi-disciplinary base of library and information science. As an epistemological foundation for research in library and information science, holistic perspectivism suggests an interconnectedness of seemingly divergent methods - a notion which has become increasingly more widely accepted in modern scholarship. Writing in the context of library and information science research, Grover and Glazier note this trend:

"The concept of unity or interconnectedness... is one of the basic principles that typify the philosophical position of many thinkers today. In this holistic perspective, it is impossible to fully comprehend any single entity without considering its context or environment, taken as a whole, that provides the researcher... the opportunity to better comprehend the nature of the subject being studied" (emphasis added; 1985: 241).

This observation by Grover and Glazier encapsulates in essence the principle of the wholeness-context which should be implicit in the diverse approaches to research by several theorists in library and information science already referred to above. As such the statement is entirely consonant with the position of holistic perspectivism.

As a researcher, the librarian is hence able to select from a wide array of research methods according to its appropriateness to the problem at hand. Such an approach is based on the philosophical assumptions of unity, wholeness and interconnectedness as qualities of holistic perspectivism that acknowledges several "ways of knowing" as parts within a greater whole. The two major categories of research method, viz qualitative and quantitative, are illustrated below as parts of a continuum in which the librarian as researcher may select that method that is the most appropriate in context (Figure 12/component C of the comprehensive model in Figure 15).

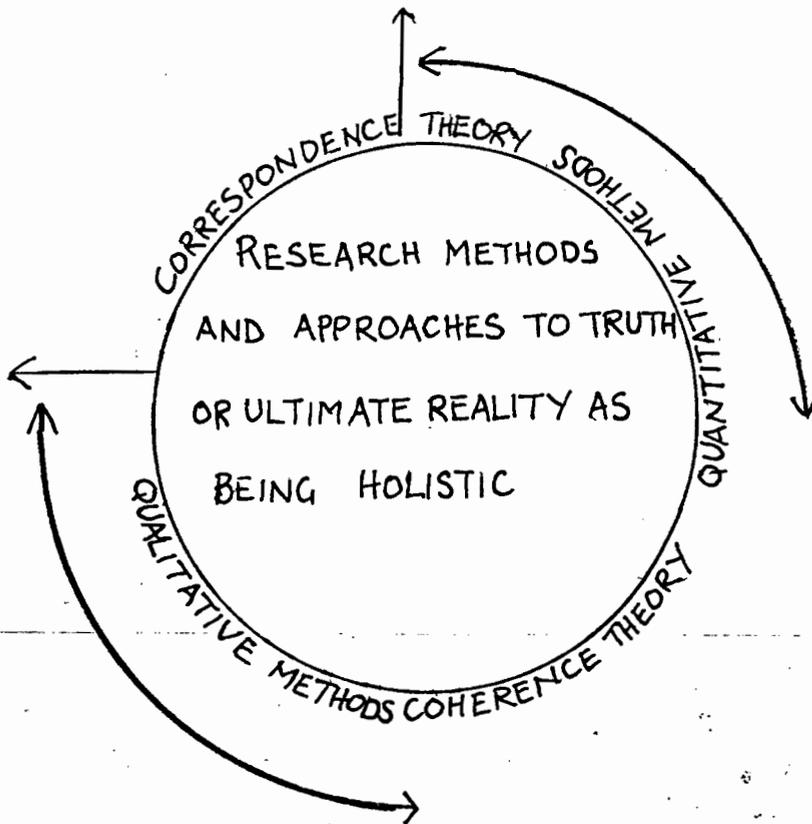


FIGURE 12: RESEARCH METHODS AND APPROACHES TO TRUTH

This figure incorporates the approaches to truth or ultimate reality as discussed in 8.4.4.

8.4.3 Recorded and unrecorded knowledge

Holistic perspectivism offers a fertile framework for understanding and explaining the epistemological status of recorded and unrecorded knowledge and of their ongoing interdependence and interaction within the context of library and information science as a knowledge-transmitting profession.

8.4.3.1 Recorded knowledge

The claim that recorded knowledge conveys insight and understanding of reality, eg of the external physical world and the internal subjective self, may be made for both the fiction and non-fiction categories of literature.

8.4.3.1.1 Fiction

The view that fiction conveys knowledge of reality has been propounded forcefully in literary theory (cf for example Hirsch, 1976; Schick, 1982; Scholes, 1982; Lamarque, 1983; Kundera, 1990). However, the conceptions of reality and truth that are applied to fiction require substantial elaboration in order to explicate and outline its epistemological status (cf 5.28.11.2 for the association of fiction with myth and allegory).

The cognitive function of fiction has been critically analyzed in studies of the novel as a literary form. Scholes, for example, argues that:

"When a writer calls his book Dubliners, and situates the fictional names of his characters among the real names of his city, he is asking us to use the 'fiction' not as some pure artifact but as information about the way real people behave in a real place... the real context is always present; the fictional one does not efface it but brings some aspects of it into a particular focus for our scrutiny. All fairy tales tell us something about reality" (1982: 33).

The thrust of this proposition is that fiction as works of the imagination can enlarge significantly our experience of real life through the depiction of fantastic characters and places in unison with ordinary life-like situations.

In respect of the nature of the conception of reality, Bekker (cf 5.24) has argued that the reality of the work of fiction (as "literature of the imagination") is not the empirical reality of sense experience (ie external reality) but rather the reality of the author's imaginative inner world (although this may itself be subjected in the final instance to a comparison with empirical reality).

Whether such a comparison is necessary as a means of determining the degree of correspondence and continuity with external reality has been disputed, especially by Marxist literary theorists. Lukács contends, for example, that every significant work of fiction creates its own "world" (1978: 35) and that this unique "world" is a reflection both on reality as well as of reality which is different from and complementary to, rather than inferior to, other epistemological categories such as philosophy or science (Blake, 1989: 34). It is suggested,

accordingly, that the novel makes the attempt to reveal other dimensions of reality rather than to confine itself to a depiction of its empirical conceptions only.

Moreover, the notion of truth when applied to fiction appears to require a wider interpretation than its narrower positivist meaning as a correspondence with physical reality. Although there have been firm proposals that the status of truth in fiction is logically equivalent to that applied more usually in the natural sciences (cf for example Beardsley, 1966; Olsen, 1978, & Schick, 1982), such a need for comparison with the natural sciences has not been a strong feature in the writings of literary theorists generally. Gray, for example, claims that truth in literature should not be perceived in its ontological monistic conception as absolute truth nor in its ontological pluralistic conception as extreme relativism (1975: 532). He contends that knowledge gained through literature is not true in the sense of being beyond further revision but true in the sense of fidelity to an objectively established frame of reference (ibid.; cf Merrell's view of the epistemology of written texts for a similar interpretation of truth-7.5 & 8.4.1).

Fiction encourages the broadening of traditional ways of understanding and insight, and may lead to the acquisition of valid perspectives beyond the range of those that may be grouped with empirical modes. Furthermore, it highlights the expression of the interrelatedness of individuality with the rest of reality. Kundera characterizes this holistic quality of fiction in the statement: "In the age of the excessive division of

labor, of runaway specialization, the novel is one of the last outposts where man can still maintain connections with life in its entirety (emphasis added; 1990: 67).

8.4.3.1.2 Non-fiction

According to Bekker, the truth-quality, or epistemological status, of non-fiction is determined by comparing their claims with the reality of sense experience, ie empirical reality (1984: 17).

However, whether all the major traditional non-fictional divisions of human knowledge, viz the natural sciences, the social sciences and the humanities should maintain this approach to truth and reality has not been established unequivocally. The reductionist approach, according to which everything may be explained in terms of a single perspective, had itself been challenged in the natural sciences when its most admired exemplar, physics, acknowledged the limitations of mechanistic methods (cf 7.4 for an exposition of this issue). The emergence of a more holistic outlook in contemporary physics led to the greater awareness of other dimensions of reality and of different conceptions of the interrelationships between (and status of) the natural sciences, the social sciences and the humanities.

Bekker himself argues in a later article for the perception of human knowledge as a whole, ie as a continuum of natural sciences, social sciences and the humanities (1987: 15) - a view entirely consonant with that of holistic perspectivism.

Holistic perspectivism as a proposed epistemological position for library and information science may provide a suitable framework for the explanation of these developments and hence for an understanding of the epistemological status of factual recorded knowledge, ie non-fiction. In this view, there are several truth-perspectives that are considered to be parts of a larger whole so that the epistemological status of non-fiction need not be exclusively based upon its correspondence with empirical reality as the sole criterion of a test of validity (cf 8.4.4 for a fuller treatment of approaches to truth).

8.4.3.2 Unrecorded knowledge

In Chapters 5.28.11 and 6.2.4 the equal validity and recognition of all modes of knowing, recorded and unrecorded, in the context of library and information science were discussed and characterized as typical features within a holistic conception of human knowledge for this professional discipline. The organic coexistence and mutual interdependence of oral and literate traditions, and hence of unrecorded and recorded knowledge, are evident at the levels of the research scholar in the form of "invisible colleges" and at the level of the ordinary person in preliterate societies (cf for example De Solla Price-5.28.11.1; Coomaraswamy-5.28.11.2.1; Bengé-5.28.11.2.2).

Although sound arguments have been proposed in support of the claim that libraries are concerned exclusively with recorded knowledge (thereby denying its concern with unrecorded knowledge), the equally cogent arguments for the perception of the interrelatedness and unity of human knowledge require that

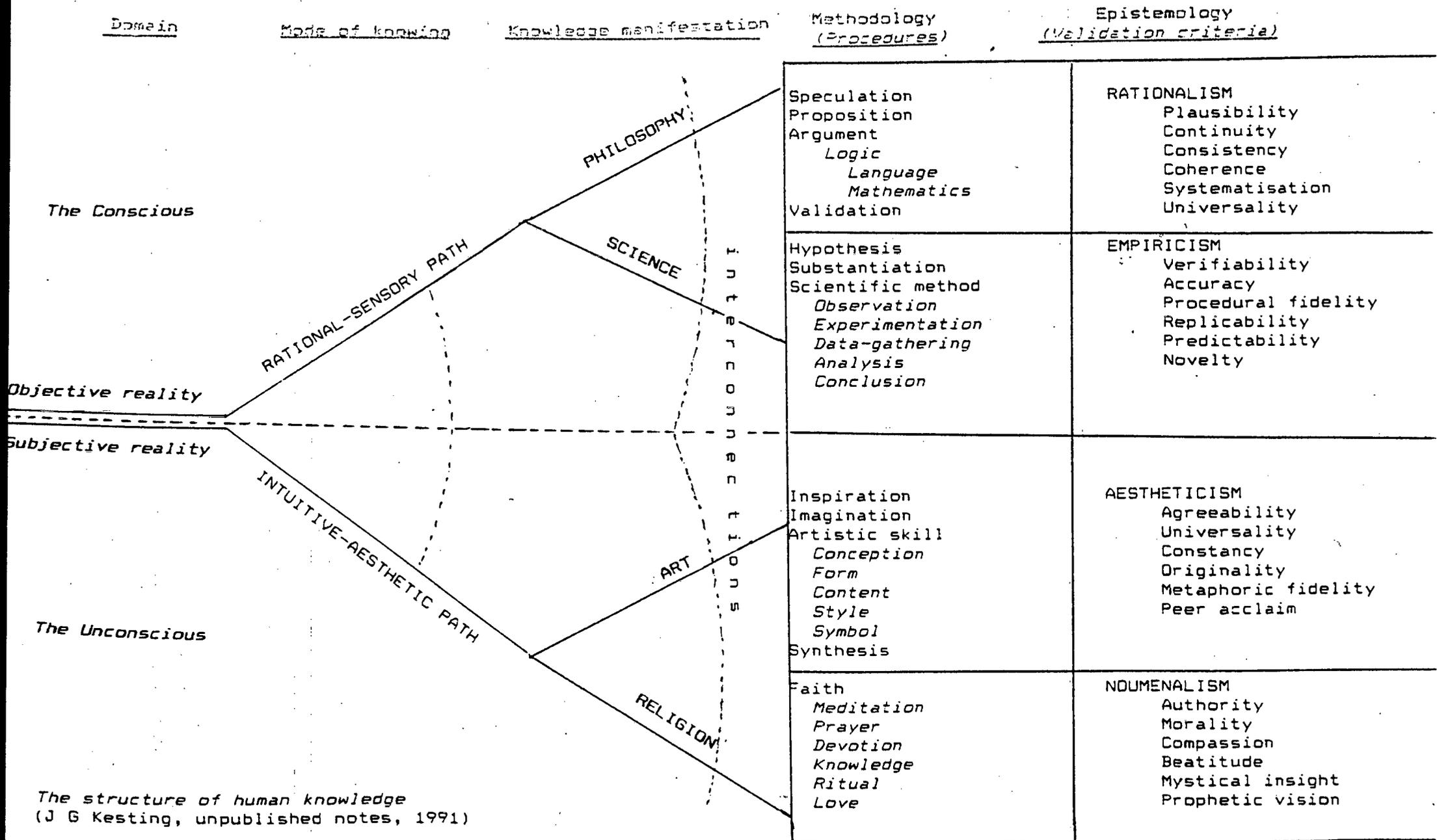
librarians should acknowledge both their interconnectedness and complementarity, and hence a dual acceptance of both categories. The notion of complementarity implies that although there are distinctively divergent epistemological styles that typify oral and literate traditions, a superiority differential is not an inevitable consequence. Finnegan has argued convincingly, for example, that it is unjustifiable to assume that since the oral tradition, whether in preliterate society or in predominantly literate cultures, has its own set of problems regarding truth and reality it is therefore fundamentally different in its modes of thought than those manifest in recorded culture (1973: 144).

Librarians as intermediaries in the knowledge transmission process ought to be aware of the interrelations between recorded and unrecorded knowledge as well as their dynamics of interaction in the growth of human knowledge both in a collective sense and as the development of valid perspectives as they are held by individuals. The reasons for this are: (a) the knowledge cycle encompasses, for example, both the "invisible college" and the content of recorded knowledge as essential components (cf 8.4.1 for the individual user as another component of this cycle), and (b) an awareness of the broader contexts of the dynamics of knowledge will improve the quality of service to users. Holistic perspectivism implies that library and information science as a knowledge-transmitting profession is committed to the communication of all human knowledge regardless of mode, whether unrecorded or recorded.

The unity of all modes of thought as reflected collectively in both fiction and non-fiction is depicted in Figure 13. This graphic model is a further adaptation of Kesting's conception of the structure of human knowledge (cf Figure 5) which, in its turn, reflects the influence of Jung's schema of the four cardinal functions of consciousness (cf 7.4) and Royce's model of the basic paths to knowledge (cf Figures 1 & 3). In the comprehensive model in Figure 15 (Component D), the interconnectedness of these modes of thought is manifested through the use of the circle as a continuum that encompasses all the individual modes of thought as parts of a whole. The Kesting model has simply been rearranged in a more symmetrical manner to: (a) indicate the prominence in society of the rational and empirical modes of knowing (cf Chapter 2), and (b) to highlight the interrelatedness of, and the need to integrate, all the major modes of knowing as a requirement of holistic perspectivism.

8.4.4 Approaches to truth or ultimate reality in library and information science

In Chapter 6.3 the notions of truth and ultimate reality as inferred from the writings of theorists in library and information science appear to lack consensus. Figure 8 reflects this divergence of opinion. Irrespective of such differentiation in viewpoint, the notions of truth and ultimate reality are central to an epistemological position and need to be articulated as unambiguously as possible.



The structure of human knowledge
(J G Kesting, unpublished notes, 1991)

By themselves, the traditional theories of truth, ie, the correspondence theory and the coherence theory, are incomplete and inadequate in the context of library and information science. The correspondence theory of truth locates truth in the relation between ideas and the material world apart from them (Sayers, 1985: 178). This quality of truth is construed in logical positivism as the correspondence between a statement and an empirical fact (Snyman, 1987: 245). The limitations of logical positivism and the inadequacy of this theory of truth have been acknowledged widely (cf 7.4 & 7.5). The coherence theory of truth locates truth not in the relationship between ideas and objects independent of them, but rather in the logical relations of ideas as a whole which guarantees their truth. The validity of mathematical statements, for example, is determined by the coherence theory of truth because their rational consistency with a specific system of mathematics is sufficient to establish it. According to Sayers this theory is inadequate because it makes truth a purely internal property of ideas with no reference to external reality (1985: 178).

A more useful approach appears to be the perception of the correspondence and coherence theories of truth as moments within a larger whole that may also encompass other theories. In this way, truth and ultimate reality are viewed as being associated with the notions of unity and wholeness rather than with any individual theory. Instead of absolute truth, a range or spectrum (multiversum) of truth perspectives is accommodated in holistic perspectivism. These truth-perspectives are continually changing in an ongoing, dynamic quest that stimulates philosophical

argument, according to Rauche (1985: 263). This proposition excludes the possibility of absolute knowledge, total knowledge or absolute truth, and affirms, as Bradley has argued, the interrelation of the notions of unity and wholeness with truth and reality, which in its turn holds out the distinct potential of revealing larger portions of the truth as aspects within the whole (1893: 72, 77; cf Bradley's quotation-6.3.4).

On a practical, personal level holistic perspectivism implies that truth is always "truth for someone", ie a valid perspective held by some or other individual person. Holzner and Marx have proposed a view that is consistent with this approach. They suggest the application of so-called "truth tests" or "reality tests" which are ways of validating descriptions and are always situated within given frames of reference, or embedded within specific contexts. Holzner and Marx distinguish empirical, pragmatic, authoritative, rational, consensual, magical and mystical truth or reality tests (1979: 106). Any additional dimensions of reality manifestations with their own acknowledged, scholarly sanctioned methodologies and truth criteria that may be included in this list are to be viewed in consequence as parts of the larger whole, ie, as ways of describing the several aspects of ultimate reality conceived as a multidimensional, dynamic unity.

In the context of library and information science, this approach to truth and ultimate reality may be applied to several areas. For example, as intermediaries in the knowledge-transmission process, librarians corporately promote the

systematic collection of all recorded knowledge in the belief that truth for library and information science is necessarily holistic and requires inclusivist rather than exclusivist approaches to collection-development and use-promotion (cf 8.4.3 above). Furthermore, at the level of the individual user, truth is the result of the validation of a perspective within a given frame of reference (cf 8.4.1 above). As a researcher, the librarian may apply quantitative or qualitative methodologies as they are required, with the confidence that each methodology - as long as it is internally consistent - is supported by an epistemology or "way of knowing" that is regarded as a valid (and hence perspectivistically true) perspective within an objectively established frame of reference. Moreover, an understanding of the range of available research methodologies that users may apply will improve the quality of service rendered by the librarian.

The accommodation of several conceptions to reality, including the overlapping of such conceptions, has been discussed by Nitecki in the context of library and information science. He distinguishes between empirical and fictional concepts of reality which may, in their turn, be interpreted respectively in objective or subjective terms (1979: 30). He submits that the "... juxtaposition between the empirical and fictional concepts of reality with their objective and subjective interpretations may emphasize either the similarities or differences between the concepts and their interpretations" (ibid.; see Figure 14).

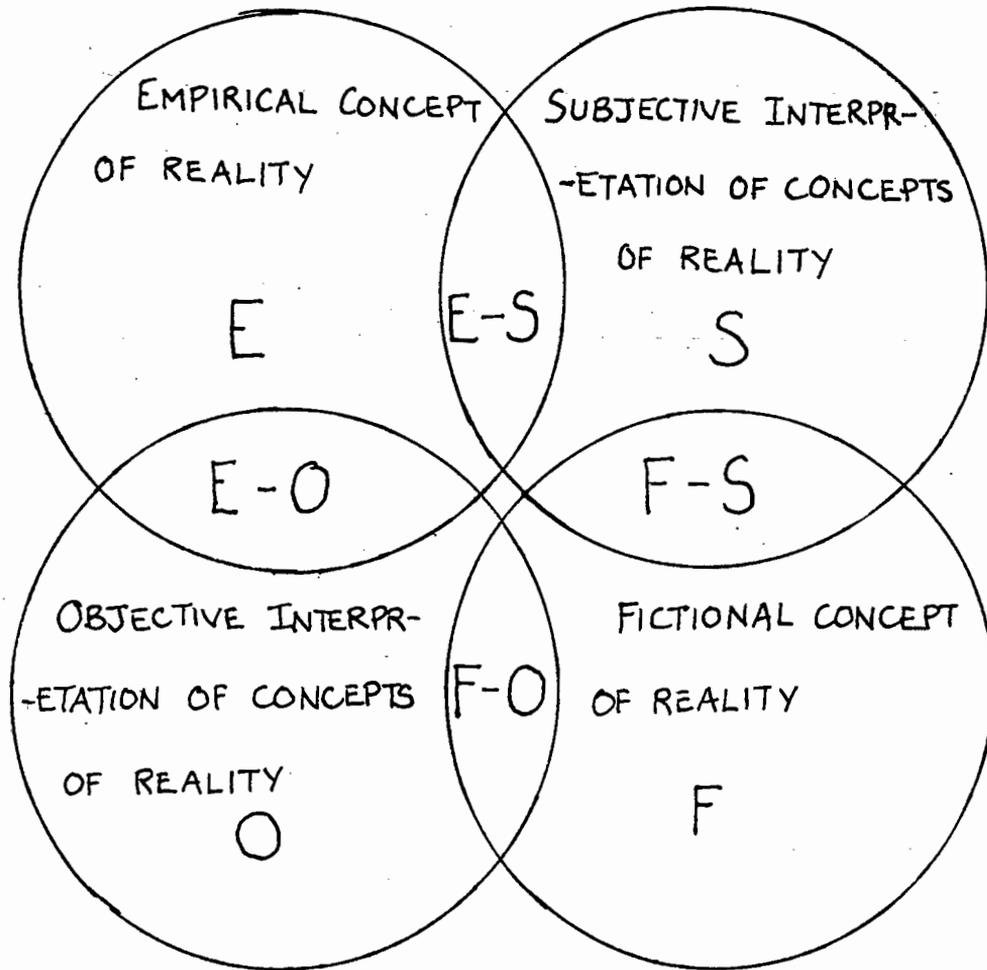


FIGURE 14: NITECKI'S CONCEPTIONS OF REALITY

These approaches to reality are consistent with Nitecki's open-ended epistemology for library and information science in which knowledge is constantly growing through the absorption of new relationships with reality (cf 5.14 for more detail on Nitecki's ideas).

This conception of truth or ultimate reality is a key feature of holistic perspectivism as an epistemological position for library and information science and is echoed in the following quotation:

"In trying to understand the mystery of life, man has followed many different approaches. Among them, there are the ways of the scientist and mystic, but there are many more: the ways of poets, children, clowns, shamans, to name but a few. These ways have resulted in different descriptions of the world, both verbal and

non-verbal, which emphasize different aspects. All are valid and useful in the context in which they arose. All of them, however, are only descriptions, or representations, of reality and are therefore limited. None can give a complete picture of the world" (Capra, 1981: 321).

The different approaches referred to in the quotation above lead to different descriptions or representations of reality and correspond with the conception of perspectives as it is understood in holistic perspectivism. Furthermore, no single perspective can provide a complete picture of ultimate reality or absolute truth, but each one remains a valid viewpoint as a partial perception of, and an opportunity to discover, larger portions of truth or ultimate reality, ie as an evolving, dynamic whole.

The holistic conception of truth is graphically illustrated in conjunction with the conception of the librarian as a researcher in Figure 12/component C of the comprehensive model in Figure 15.

In this figure it is evident that no single theory of truth, and hence also no given research method, takes precedence over another, and that each is part of the larger encompassing whole.

8.5 Graphic representation of a model of holistic perspectivism as an epistemological position for library and information science

When the major components, as noted above, are brought together in an attempt to provide a comprehensive overview of holistic perspectivism in the context of library and information science, the following graphically illustrated theoretical model emerges (See Figure 15).

8.5.1 Explanation of the model

The theoretical model in Figure 15 is a composite of: (a) personally conceived, and (b) consensually sanctioned models that provide a unique synthesis which attempts to depict the epistemological position of holistic perspectivism in library and information science. The final synthesis (Figure 15) is original.

The essential holistic qualities of constant motion and dynamic interaction are reflected in the rotation of each component circle on its own axis and the interrelatedness of each with the others. The symbol of a rotating circle conveys the notions of wholeness and dynamism as significant features of holistic perspectivism. The four components of the comprehensive model, in turn, collectively constitute a spherical framework, suggesting an interconnectedness and continuous movement of the individual parts within the model as a whole.

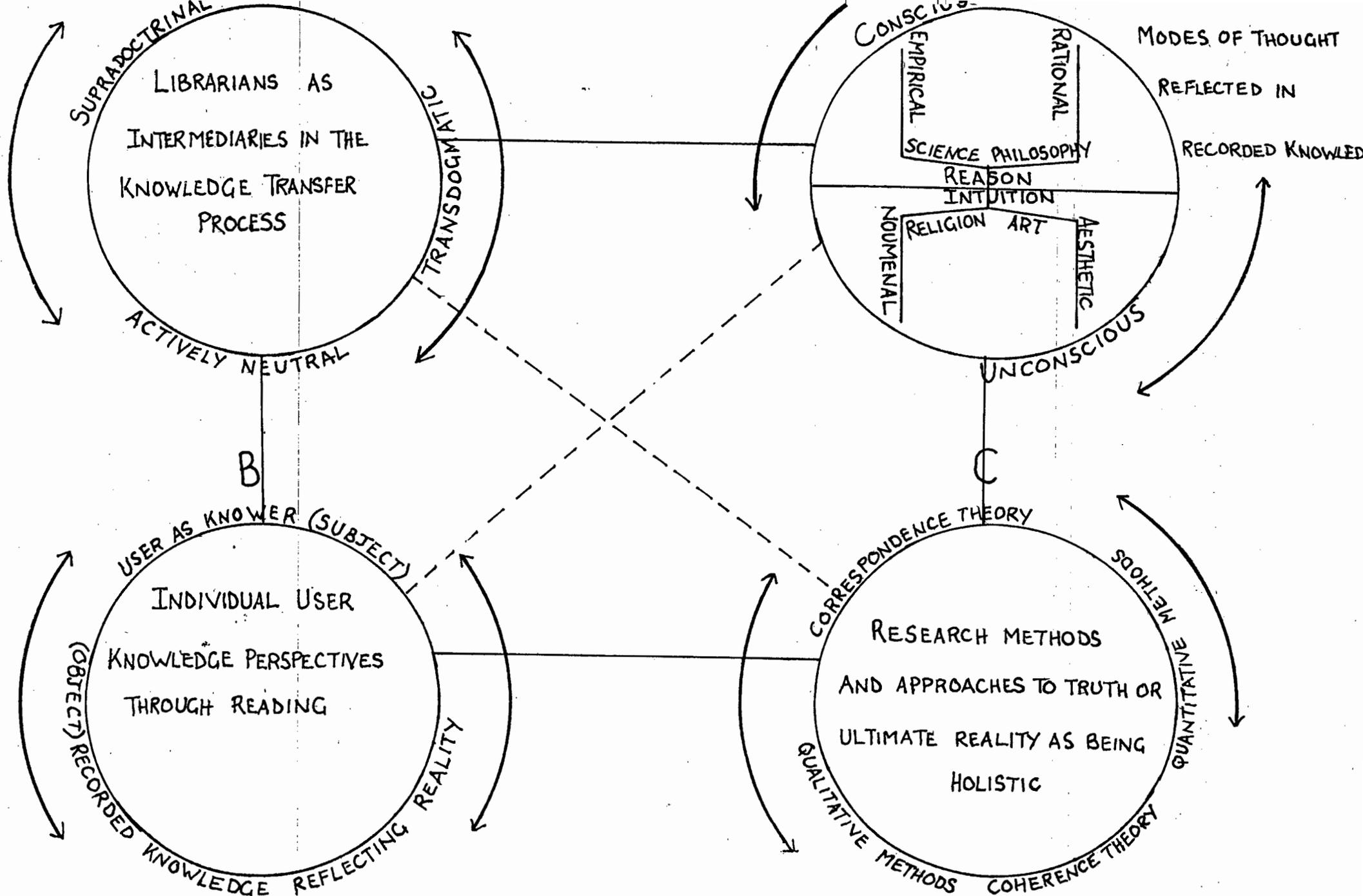


FIGURE 15: MODEL OF HOLISTIC PERSPECTIVISM AS AN EPISTEMOLOGICAL POSITION FOR LIBRARY AND INFORMATION SCIENCE

The shape of this framework and its quaternity of components are influenced by the symbol of the circle and the mandala as a basic form representing the idea of wholeness (cf Jung's application-7.4). In this way, the entire model is perceived as an open-ended spiral which espouses the hypothesis of infinite potentiality in the growth of human knowledge as an integral and critical epistemological feature (cf 8.4.3). This growth may be explained as the result of a dialectical interaction between postulated opposites or conflicting tensions that may appear within each component. The perspectives that emanate from this interaction reveal a human or anthropological dimension in the process of the acquisition and validation of human knowledge both by individual users and librarians themselves (cf 8.4.1 & 8.4.2).

The component identifying the librarian as an intermediary in the knowledge transfer process (A) is located between the components that characterize recorded knowledge (D) and the individual user (B). Component D identifies most of the major epistemological styles that are reflected in the entire compass of recorded human knowledge, ie both fiction and non-fiction. In his/her intermediary role, the individual librarian endeavours to represent, through systematic collection-development, as many of these modes of thought as may be possible. In a corporate sense, and through programmes of cooperation and networks, all the major modes of thought as perspectives of truth should be reflected in the collective holdings of libraries, in accordance with the holistic perspectivist principle. Each individual user who avails himself/herself of the services of a library would be in a position to acquire knowledge perspectives in the process of

individual cognitive development. These perspectives may be tested for their validity in a number of ways (cf 8.4.4), as suggested in the dynamics of Component C. The acquisition of knowledge emerges from a dynamic interaction between the user (Component B) and the content of recorded human knowledge (Component D) within an objectively established framework, ie valid knowledge is produced as a result of the application of a set of criteria that is considered to be relevant to that context.

As a researcher, the librarian should also be aware of the several distinctive sets of epistemological assumptions that underpin the design of given research methods. Component C highlights the need for this awareness. A wider range of selection of potentially useful research methods are made available to the librarian (viz quantitative and qualitative methods) as a necessary feature of holistic perspectivism.

Each component is interconnected with the other. In this way, for example, individual users (Component B) may also apply one of a range of research methods and subscribe to different notions of truth, which the librarian needs to acknowledge in order to render optimal service. The librarian himself or herself (Component A), although essentially an intermediary between recorded knowledge and the individual user, is also linked with the research method and truth continua (Component C). The individual user (Component B) is linked with recorded knowledge (Component D) in a more direct manner not only without possible mediation by the librarian, but also as a potential

contributor to its growth (cf the knowledge cycle-8.4.1). Finally, the link between the librarian (Component A) and recorded knowledge (Component D) implies also that he or she is both a user of and potential producer to the growth of recorded human knowledge.

Holistic perspectivism maintains the view that the validity of knowledge is firmly based upon the proposition that the interrelation of the knower (as the subject of knowledge) and the object of knowledge accounts for the generation of perspectives that can be justified, and hence authoritatively maintained, within specified domains of application as parts of a larger whole. It is propounded in this thesis that such a view, viz that knowledge perspectives may be appropriate in some contexts and inappropriate in others, is suitable for professional librarians both as intermediaries in the knowledge-transfer and as researchers.

As a proposed epistemological position, holistic perspectivism may offer a theoretical foundation or context for understanding and explaining many of the practical aspects of library and information work, thereby contributing to a resolution of the problem of discontinuities in the theory-practice relationship in library and information science. An awareness of the influence of given philosophical assumptions upon modes of professional practice is acknowledged in many professional disciplines (cf 3.3, 3.4 & 3.5). The proposal of this epistemological position aims at integrating theory and practice in this profession as a necessary improvement to the

well-documented long-standing predominance of its practical orientation coupled with a striking indifference to theory (cf, for example, a confirmation of this in several of the contributions in Chapter 5, beginning with the concerns expressed by Butler in 1933).

This model advocates neither an "anything goes" nor an "everything goes" approach to truth in the context of library and information science. It supplies the basis for a comprehensive structure that accommodates several approaches to truth that derive their criteria for validation from objectively established frames of reference (cf 8.4.4); and the suitability of such a basis is inferred inductively from a thorough analysis of the writings of library and information science theorists as well as the considered perception of the essentially holistic character of this profession (cf Chapters 6 & 7 for fuller discussions of these claims).

8.6 Summary

This chapter has attempted to synthesize the inductively-inferred conclusions of theorists in library and information science as a basis on which to construct a model for a suitable epistemological position for this profession. This epistemological position is described as holistic perspectivism and appears to satisfy the postulated criteria. Holistic perspectivism is applied to certain areas of library and information science in order to explicate the philosophical assumptions that underpin the activities and professional outlook of librarians in these areas.

The theoretical model is graphically illustrated as a composite of other personal and consensually sanctioned models, and its essential features are characterized as particularly suited to the perceived holistic nature of library and information science.

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9 Conclusions and recommendations

This study has provided sufficient evidence in response to the informal assumptions that are articulated as the major points of departure in Chapter 1.

(a) First, it has been demonstrated that a significant feature of professional development is the identification of the major epistemological positions that guide and influence modes of professional practice, as well as the selection of suitable research techniques. The professions examined in this investigation have included medicine (cf 3.3), education (cf 3.4), and communication theory (including mass communication) (cf 3.5), with brief references to the professions of social work and law (cf 3.1);

(b) Second, no cohesive statement on epistemological positions in library and information science have been traced in the literature. The references to epistemology-related issues in library and information science reflect little consensus. This differentiation in viewpoint has been highlighted in the form of typologies analyzed in Chapters 6 & 7 (cf also Figures 6-9);

(c) Third, despite the characteristic feature of divergent perceptions in the examined theoretical writings, certain criteria for establishing and evaluating an appropriate epistemological position for library and information science were generated from presumed continuities and commonalities

in the seminal ideas of these exponents. The intellectual tradition, viz holism, that underlies these ideas was identified and traced from its early philosophical origins to its more recent disciplinary applications. In this way a general framework was established as a context within which to articulate the criteria for an appropriate epistemological position for library and information science (cf 7.8.1-7.8.3);

(d) Fourth, the analysis of the views of the library and information science theorists has suggested an epistemological position called holistic perspectivism. This epistemological position satisfies the postulated criteria and was inductively supported by the majority of exponents (cf Figure 9 & Chapter 8.3); and

(e) Fifth, the application of this epistemological position in given areas of library and information work has contributed to an enhanced understanding of, for example, the user's range of possibilities in the acquisition of knowledge; the critical role of the librarian as intermediary in the knowledge-transfer process; the librarian's intellectual outlook as a professional, a researcher, and an awareness of the range of research methods adopted by users; and, conceptions of knowledge and truth or ultimate reality in the context of library and information science (cf 8.4.1-8.4.4).

Kaplan contends that "An adequate theory of knowledge must be comprehensive enough to do justice to the whole range of cognitive experience - in art and religion, in myth and mysticism, as well as in science" (1962: 150-1). Holistic perspectivism proposes such a theory of knowledge for library and information science.

This epistemological position accounts both for the development of knowledge perspectives by individuals as users (and hence also accounts to some degree for the growth of human knowledge in general) as well as the development of knowledge perspectives by librarians as researchers (and hence also accounts to some degree for the growth of library and information science as a discipline). It is an explicit statement of the philosophical assumptions that underlie the mode of knowing that typifies the professional librarian and characterizes the content of the librarian's world view. As a mode of thought, holistic perspectivism influences the professional life of the librarian in all its facets. The specific implications and applications of this theory of knowledge may be explored in other major empirical investigations that will test the appropriateness of this epistemological position.

This theoretical analysis of the views of several philosophically-inclined thinkers in library and information science and those concerned about the process of knowledge-transmission suggest the suitability of an open-ended theory of knowledge that affirms the continuous growth of human knowledge in its recorded dimension as well as the dynamic

interdependence of this dimension with unrecorded knowledge as a key element in such growth. The perceived holistic character of the discipline of library and information science requires that it maintain a view of truth or ultimate reality that is consonant with that character. Such a view has been described as holistic perspectivism in this thesis. It advocates an open-ended theory of knowledge in which each stage in the development of knowledge is justified for the time and conditions to which it owes its origin, ie it is true and correct relative to a particular stage of development, but is always open to further improvement. Bradley asserts his contention in this regard:

"... the foundation in truth is provisional merely. In order to begin my construction I take the foundation as absolute - so much certainly is true. But that my construction continues to rest on the beginnings of my knowledge is a conclusion which does not follow. It does not follow that, if these are allowed to be fallible, the whole building collapses... A foundation used at the beginning does not in short mean something fundamental at the end, and there is no single 'fact' which in the end can be called fundamental absolutely" (1914: 210).

The above-mentioned feature of provisionality and capacity for eternal growth in the apprehension of truth by man - as outlined in Bradley - is a significant one in holistic perspectivism and its implications may be applied in several areas of library and information science (see 8.4.1-8.4.4).

Holistic perspectivism as a proposed epistemological position needs to be examined and tested empirically in order to discover the suitability thereof in explaining aspects of library and information work and of justifying the selection of given

research methodologies for investigating problems in this field of study. It is recommended that such empirical testing should be a major undertaking in a future study.

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