has historical and philisophical roots running back to the ancient Greeks, it is also "radically new." The central concerns of this new science are the nature of knowing; conjecture about the various vehicles of knowledge; and the role of language in communication. Gardner insists that the new science is also uniquely interdisciplinary, empirically oriented, and inextricably wedded to the computer as a key to the cognitive puzzles being investigated. More explicitly Gardner defines cognitive science as a "contemporary, empirically-based effort to answer long-standing epistomological questions — particularly those concerned with the nature of knowledge, its components, its sources, its development, and its deployment" (p. 6).

Gardner proceeds in three stages. First he attends to cognitive science as one with a "long past but a relatively short history," and briefly traces the antecedants of the field with special attention to recent developments such as information theory, computers, and the cybernetic synthesis. Second, he presents breathtakingly sharp interpretations of the six disciplines he feels are contributing the most to a radically new cognitive science: philosophy, psychology, artificial intelligence, linguistics, anthropology, and neuroscience. Third, and most controversial in a very controversial book, he presents a daring reading of the work at the intersections of these disciplines which point to what Gardner envisions as a "single, unified cognitive science" (p. 8).

The whole argument is startling and compelling, but it is in part three of his book that Gardner speaks directly to the concerns of those of us grappling with a definition of information science and its intellectual domain. For it is here that Gardner aggressively insists that "the crucial divisions within cognitive science are *not* the traditional disciplinary perspectives but rather the specific cognitive content" (p. 390). His is no simple-minded call for interdisciplinary studies, for he insists that the ultimate goal is to organize scientific training and research enterprises into a "coordinated representational account which covers the full gamut of the traditional disciplines without any need even to mention them" (p. 390).

This is a daring proposal indeed, and its fruits would be no less than a "cogent scientific account" of "complex human creative activity." Whether or not one accepts Gardner's optimistic vision of the potential of a unified cognitive science, his book offers a detailed and informed blueprint of an "information science" that would *not* be founded on bibliometrics.

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AGRIS and International Cooperation for the Exchange of Scientific and Technical Information: Proceedings; Tenth Anniversary Seminar. Food and Agriculture Organization of the United Nations, Rome, Italy (1985). 154 pp. (No ISBN. Free from FAO.)

This book is a compilation of the papers presented at a seminar commemorating the tenth anniversary of AGRIS (International information system for agricultural sciences and technology) and gives the reader insight into the development and operation of an information system indexing materials from many sources, in many languages and unifying them into one information system. The work consists of a dozen short papers, eight written in English and four in French, an introduction, remarks by the Director-General of the FAO, and closing remarks in English, French, and Spanish. Each paper is preceded by an abstract in English, French and Spanish.

The first three papers deal with AGRIS's past. John Sherrod recalls the environment that led up to the concept of AGRIS and the seeking of sponsorship from the FAO. Gerard Dubois reminisces about the bringing together of the expertise to implement the system. Ahmed Fassi-Fihri cites the contributions of the CND (National Documentation Centre of Morocco) including the role it played in producing the experimental issue of AGRINDEX.

Attention is then turned to the role of the AGRIS Coordinating Centre in both national and regional information systems and its interaction with existing systems. In his paper, Angel Fernandez outlines the training, tools, and guidelines provided by AGRIS which enabled the Caribbean and Latin American countries to increase their contribution to and effectiveness in the system. Maria Gal discusses the interaction of AGRIS with existing information systems and the development and provision of services. H. C. Molster recounts the support for AGRIS by the European Community and contributions to the AGRIS system by other European agencies.

The next paper moves from Europe to Asia where Syed Salim Agha discusses the effect of AGRIS on national and regional information systems. This paper describes the role of AGRIS in standardizing the bibliography of the world's agricultural literature and what effect AGRIS has had on the trans-

fer of information in Malaysia and Southeast Asia. His paper also lists services spawned by the AGRIS system and touches on the problem of document delivery of materials cited in the system.

The next three papers deal with cooperation between AGRIS and other agencies. Alioune Badara Camara recalls the development of RESADOC and its conscious effort to be compatible with AGRIS. Ernest Mann calls for more cooperation among AGRIS, CAB and AGRICOLA. Ivano Marchesi describes the cooperation between AGRIS and INIS in Vienna. The next to last paper, by A. D'Ambrosio, discusses the need for better transfer of agricultural information from the scientist to the practitioner through inter-regional centers.

The final paper in the work is speculation on the future of AGRIS by John Woolston. The potential for quicker communication and the issuing of special language editions of AGRINDEX are real possibilities. The adoption of AGROVOC will increase the system flexibility by providing multi-language access to the data base. He discusses also the need for improved document delivery as well as formation of specialized information centers.

This small volume is extremely informative and gives insight into the problems of forming a truly international information system. AGRIS depends on participating centers throughout the world and brings together information not normally found in bibliographic sources. The book is easy to read (it can be read in one sitting) and the papers deal well with the subject. With the exception of the D'Ambrosio paper, it provides an excellent picture of an international agency transcending political boundaries to provide bibliographic control for the world's ever growing collection of agricultural information.

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The Role of Data in Scientific Progress; Proceedings of the Ninth International CODATA Conference. P. S. GLAESER (Ed). North Holland, Amsterdam, New York, Oxford (1985). vix + 548 pp., $74.00/Dfl. 200.00, ISBN 0-444-87703-7.

It is difficult for the reviewer as well as for the reader to trace among the 104 papers of these proceedings the common trends in techniques, methodologies and social communication approaches in the field of designing, managing and operating science databases (SDB) systems in rather different scientific disciplines. The editor's merit is that he grouped the papers in the following nine semantic clusters: data in geology and geochemistry; oceanography and ecology; molecular biology and biotechnology; chemical engineering; materials properties; energy systems; database design and management-theory; database design and management-practice; and data retrieval and library systems. For information scientists, the last three clusters are of primary importance, because they show the impact of factographic, expert and knowledge SDB on the future informatic and library institutions and networks in the information age. The content analysis of proceedings has shown that professional profiles of information flow specialists will be broadening, which will lead to substantial changes in their study programmes.

The first six discipline-oriented SDB systems will surely be welcomed by users, who often will act as the originators of scientific evaluated data as well as conceptual designers of such systems in close cooperation with the SDB managers. This is an interesting informatic feature of the present and future science and technology. Users interested in graphic outputs will be pleased at how much work in computational graphics and graphic languages has been done, i.e. electronic atlases, maps, spatial patterns, etc.

The last two clusters will surely evoke the interest of datalogists and information scientists (pp. 489–531). For SDB, Lerner offers an interesting mathematically defined three-step approach to the problem of optimal classification of files and communication situations. Shoshani-Olken-Wang add a typology of scientific data and the technique of partitioning multidimensional data into grids (cells). Most authors tend to relational SDB as the only way to achieve the necessary evolutional step of information services from historical/bibliographic to expert and knowledge systems. Kertes and Wolman describe the cooperation of authors and SDB managers for the automatic transfer of numerical data from the primary chemical literature. Segal and Olson look for improving the often neglected but strained relationships between users and SDB managers, by constituting "integrated data users." This hot problem needs deeper socio-informatic investigation because of the ever-growing accessibility of personal computers and telecommuting services to individual users with their "personal documentation systems."