Preface

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This book is, in a sense, the biography of an idea. The idea is the one of indexing the literature of science by the material cited by that literature. The idea was turned into reality in 1963 by the first annual edition of the *Science Citation Index®* . As with most new ideas that embody a sharp break with traditional thinking or procedures, the first *SCI®* generated as much emotional controversy as it did reasoned interest. Even today, more than a decade later, there are many scientists whose bibliographic inertia has kept them unfamiliar, or at least uncomfortable, with the logic of a citation search. Yet, despite sizable measures of initial hostility and lingering inertia, the acceptance and use of citation indexes have become widespread in little more than one decade. Any novel idea that becomes established so quickly deserves, it seems to me, to be the subject of a book.

I have been writing about citation indexes to the scientific literature since 1955 (1), almost a full decade before the first annual edition of *SCI.* In that time, I have written a series of papers that would easily fill a volume of several hundred pages. This book is a byproduct of those papers, many of which were digested, reprinted, or cited in my *Essays of an Information Scientist* (2). It originated in a plan to publish reprints of all the papers. Robert M. Hayes, one of the editors of Wiley's Information Sciences Series, maintained however that there is too much redundancy inherent in a long series of individual papers on the same subject for effective communication. He convinced me that the interests of information-science students and practitioners, and scientists with an interest in bibliographic techniques, would be served better by a fresh, clear, concise book on citation indexing. Having accepted that position, I decided to compromise by using the collection of papers as the source material for the book.

I am not completely happy with the compromise. This volume does not serve the need for a historical record nearly so well as a collection of reprints of the original papers. It is, in fact, not a history at all, though there is one chapter that deals with the history of citation indexing. Nor is this volume marked by the discursive style I prefer and used in most of my original papers. On the other hand, this account is undeniably a more tightly organized, concisely written, and lucid exposition of citation indexing and its uses than is the collection of original papers. For that reason, I expect that Hayes is right in his prediction that this book will turn out to be considerably more useful than the collection of papers for the majority of scientists interested in citation indexing. The minority who are interested in working with the historical record will find the primary elements of that record identified in the bibliographies at the end of the chapters.

I refer those readers particularly interested in how I arrived at the idea of a citation index to the scientific literature to Chapter Two, "A Historical View of Citation Indexing." There I try to explain how the idea grew out of a particular set of intellectual interests, professional problems, and serendipitous events. To the extent that the chapter identifies those conceptual elements and explains their interactions, it does a reasonably complete job of describing how the idea of a citation index to the science literature was conceived and how that conception led to the production of the *Science Citation Index.* Yet, after rereading that chapter I am struck by the total omission of an element very critical to the act of accomplishment. That element is personal obsession.

Between the lines of Chapter Two, some readers may perceive an implied tale of frustration—frustration with the shortcomings of traditional techniques, frustration with the general acceptance of the shortcomings, and frustration with the general conceptual and economic resistance to ideas that are novel. My response to these frustrations was a steadily increasing personal obsession, first with the subject of machine indexing, then with the concept of a citation index to the scientific literature, and finally with the reality of the *SCI.* This obsession kept me from being distracted by 10 years of academic, professional, and business demands; led me to run the financial risk of launching a novel type of index in the face of knowledgeable prophecies that no market existed for it; and drove me to gamble the financial success of the Institute for Scientific Information® (ISI®) in an attempt to build a market for *SCI* through education.

I make this point about obsession not to reflect any credit on myself (in fact, I doubt that any psychologist would find much commendatory about obsessive behavior), but to provide a personal insight that might be helpful to the sociologists studying and theorizing about the process of scientific discovery. I am sometimes asked to comment on the question of whether the development of the functional equivalent of *SCI* was inevitable, whether someone else wouldn't have developed such an index if I had not. The general form of that question is, of course, one of the classic questions in the sociology of science. Robert Merton has explored the question with more subtlety and answered it in greater depth than I am able to bring to the subject (3). In fact, he has used the development of *SCI* in particular to illustrate the difficulty of deriving a specific discovery from a general conceptual model (4). He identifies a number of gaps in that model that had to be filled in to arrive at the concept of *SCI.* To his comments I would add just one observation: when the discovery is a novel one, the task of going from a general to a specific conceptual model and then from the concept to reality can be done only by someone obsessed with an idea.

One other point that needs to be made in this preface is that the book does not provide a comprehensive review of all the work in which citation analysis has been used. This is due, partially, to the decision to base the book primarily on my own papers and, partially, to the very rapid growth in the use of citation analysis as a research tool for studying the history and sociology of science. While I think I have covered all the areas in which citation analysis is being used, I am certain that I have

not described the work of all the investigators who are using it. I apologize to those who were missed by the broad net of references that I intentionally constructed. If a new edition of the book is required in the future, I will attempt to be more comprehensive.

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References

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