

做文摘的艺术

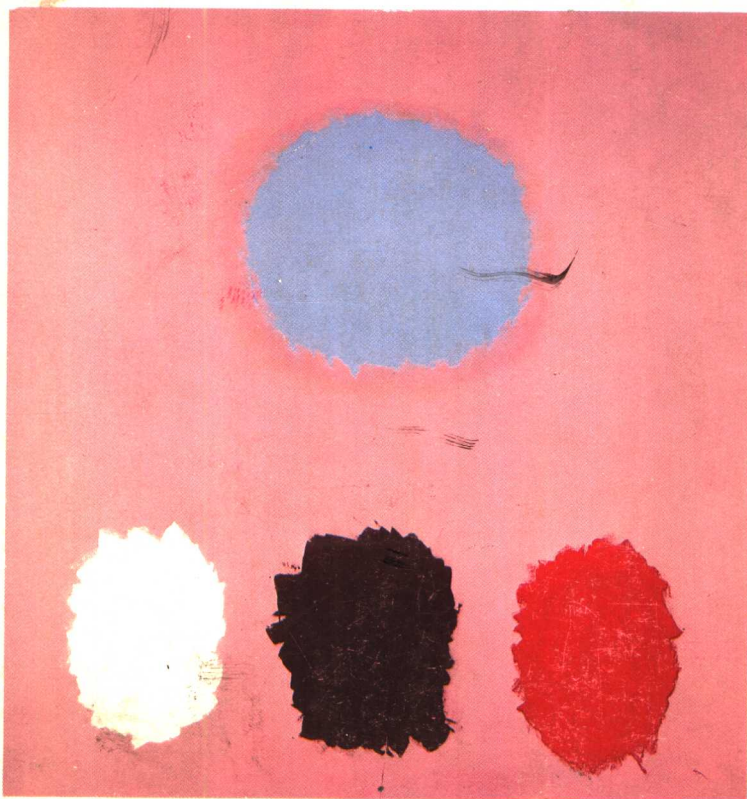
# THE ART OF ABSTRACTING

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# The Art of Abstracting

EDWARD T. CREMMINS

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**ABSTRACT:**

A three-stage analytical reading method is described for the writing of informative and indicative abstracts by authors and abstracting-service (access) abstractors. Good reading, thinking, writing, and editing skills are required for good abstracting. Adherence to rules and conventions for abstracting and the maintenance of cooperative professional relationships also contribute to the preparation of high-quality abstracts.

## Preface

*Writing is one art form that can be practiced almost anywhere at almost any time. Normally, you cannot paint in the office, or sculpture in the classroom, or play the piano in a plane or the trumpet on a train. But, given some paper and a writing implement, one can write in any of these places. What emerges will not always be a work of art; yet it could be. At the very least we can introduce clarity, precision, and grace into the most ordinary of our written communications.*

—THEODORE M. BERNSTEIN<sup>(6)</sup>

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I feel certain that the late Theodore Bernstein, who was a distinguished assistant managing editor of *The New York Times* and a faculty member of Columbia's School of Journalism, would have included abstracting among the subforms of writing. While practicing the art of abstracting for almost 15 years, I have indeed written abstracts almost anywhere at almost any time. Occasionally, the writing has been done as a passenger on commuter buses and trains, but more often it has been done in the offices of information-service facilities. If a panel of my fellow abstractors were formed, it might even judge a few abstracts among the thousands that I have written to be minor works of the abstractor's art. If this were to happen, it would primarily be the result of my efforts to introduce into the abstracts those qualities of clarity, precision, and grace cited by Bernstein, in combination with the greatest possible amount of information within the constraints of time and the specified length of the abstract.

The purpose of this book is to assist authors of scientific and scholarly works and abstractors for abstract journals and information systems in writing abstracts that attempt to meet Bernstein's criteria for consideration as works of art. The book is also intended for use as a textbook on abstracting within library and information-science departments of universities and colleges.

The book is not intended to supplant the excellent general guidebooks and articles on abstracting already in print, nor the many fine style

manuals used by abstracting services. Rather, the aim is to complement them by presenting practical advice on the reading, thinking, writing, and editing tasks that comprise the abstracting process.

In the 14 years since I wrote my first abstract, I have worked on a broad range of information systems as an abstractor, indexer, editor, trainer of other abstractors, translator, and lexicographer. Four of the 14 years were spent at the National Aeronautics and Space Administration (NASA) Scientific and Technical Information Facility. The other 10 years included assignments as managing editor of *Cancer Chemotherapy Abstracts* (now *Cancer Therapy Abstracts*) and *EIS: Key to Environmental Impact Statements* (now *EIS: Digests of Environmental Impact Statements*) and as assistant managing editor of *Mental Retardation Abstracts* (since ceased publication).

While editing the thousands of abstracts of the many abstractors with whom I have had direct contact over the years and those written by authors with whom I have had no contact whatsoever, I have become convinced that far too many informative abstracts from both authors and abstractors fail to inform adequately and that a proportionately equal fraction of indicative or descriptive abstracts from the same sources either indicate or describe too much or too little information. If this book makes a contribution toward alleviating this problem, its primary purpose will have been fulfilled.

One of the themes of this book holds that the development and maintenance of cooperative professional relationships between abstractors, editors, managers, sponsors of abstracting services, and users of abstracts are vital to the composition of well-constructed abstracts. Similar cooperative relationships have been vital to the composition of this book. I am deeply indebted to Ben Weil (rhymes with *style*), who reviewed two versions of the manuscript and offered numerous suggestions on how to make it less indicative and more informative and instructive.

Other debts of gratitude I hasten to acknowledge are to three colleagues who reviewed a draft version of the manuscript: Bevin Grylack, Linda Sexton, and Nancy Wright (who also steadfastly furnished worthwhile advice on the effective management of the research and writing and the drafting of correspondence related to the manuscript).

I would like to express my appreciation to many of my present co-workers at Tracor (JITCO). Marji Trachtman has been an inspirational model as she progressed rapidly through the assignments of abstractor-in-training, proficient abstractor, editor, and manager and trainer of abstractors. Other co-workers who contributed generously of their management, technical, or information-processing expertise include Bill Theriault, Randy Huffman, Hal Halpin, Esther Asaki, Tim Morrison, Nancy Adams, Linda Suit, Marjorie Roher, Karen Bowman, Dottie Beauregard, Lois Blaine, Reva Fox, Ginny Shreve, Mark Pielmeier, and Rita Mazzitti. The

Chinese-American artist Diana Lin shared pertinent thoughts on the art of abstract painting.

Other colleagues from the fields of information science and scholarly publishing who made worthwhile suggestions during the preparation of the book are Edmond Sawyer, Karl Heumann, Mark Carroll, Elizabeth Fake, Barbara Meyers, Josh Smith, Emil Levine, Toni Carbo Bearman, Gene Allen, David Batty, Madeline Henderson, Samuel Beatty, Lynn Barnett, and Pat Foreman.

William Wilson and Ruth Zeender furnished guidance and full access to research materials in the collection of the College of Library and Information Services at the University of Maryland.

Finally, I thank Estella Bradley, my manuscript editor at ISI Press, for furnishing me with the necessary finishing touches in the process of my transition from access abstractor to author.

Cooperative familial relationships were also indispensable. In appreciation, I dedicate this book to my wife Jo-Ann and to Edward, Julie, and Danny.

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## PART I

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# ABSTRACTS AND ABSTRACTING

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### INDICATIVE ABSTRACT:

The functional and creative writing characteristics of abstracting are discussed. The types of published materials that are abstracted are described, and the value of abstracts to readers, authors, professional abstractors, primary publishers and editors, and information specialists is mentioned. The content and types of abstracts are also described. The processes of human and computer-assisted abstracting and translating are compared.



# Chapter 1

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## About Abstracting

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### **What Is an Abstract?**

Within the literature on information science, scholarly publishing, and technical writing, answers to the question “What is an abstract?” are as varied in length and content as the actual abstracts that are published in different abstract journals. The American National Standards Institute’s definition is one of the most terse: “An abstract is defined as an abbreviated, accurate representation of the contents of a document, preferably prepared by its author(s) for publication with it. Such abstracts are also useful in access publications and machine-readable data bases.”<sup>(2)</sup>

Good abstracts are highly structured, concise, and coherent, and are the result of a thorough analysis of the content of the abstracted materials. Abstracts may be more readable than the basic documents, but because of size constraints they rarely equal and never surpass the information content of the basic document.

Well-written abstracts have been described by Ashworth as the product of the highest craftsmanship:

To take an original article, understand it and pack it neatly into a nutshell without loss of substance or clarity presents a challenge which many have felt worth taking up for the joys of achievement alone. These are the characteristics of an art form.<sup>(4)</sup>

The art of abstracting demands the application of extensive reading, thinking, writing, and editing skills. In Parts II through IV of this text, this fact is discussed in detail. The remainder of Part I presents additional background information on the abstracting process.

### **What Is Abstracted?**

Primary publishers furnish abstracts with almost all of the articles on theoretical or experimental research that they publish. These publishers

normally do not provide abstracts with editorial material, short communications, or letters to the editor. "Access" (abstracting and indexing) publishers either publish collections of abstracts in abstract journals or maintain them in files that now are generally stored in computer memories for retrieval on demand. In addition to comprehensive coverage of the items that are abstracted in relevant primary publications, access publishers also selectively abstract books, editorials, patents, research progress reports, conference proceedings, and letters to the editors of scholarly publications that contain substantive information of lasting value. Other access publishers abstract the information contained in such nonprint materials as filmstrips, cassette tapes, and visual aids.

### **Value of Abstracts**

Abstracts assist readers in deciding whether they should consult the full text of the material that is abstracted because it contains information that will satisfy their needs.

Besides their primary value to readers of scholarly and technical monographs and journals, abstracts are of importance to authors, professional abstractors, primary publishers, editors, and information specialists. When authors of research papers and monographs write their own abstracts, they are given an additional opportunity to evaluate the style and content of their writing and to identify and correct shortcomings.

Professionals who abstract documents that have been published without an abstract or who revise author-written abstracts to conform to the specifications of alerting or information-retrieval systems can earn substantial income if they are proficient and highly productive. Subject specialists or volunteer abstractors who write abstracts as an avocation are aided in keeping abreast of advances in their fields of interest.

Author abstracts that accompany manuscripts submitted for publication ease the selection process for the editorial staffs of primary publishers. Staff editors can use the abstracts to estimate the depth of treatment and degree of originality of such material. The information in the abstract may even indicate portions of the text that need to be expanded, clarified, or eliminated. Author abstracts also can be used as a primary source of ideas for promoting the contents of the journals or conference proceedings in which they are published.

Information specialists who depend on abstracts to assist them in their work include indexers, information-retrieval analysts, and lexicographers.

### **Types of Abstracts**

Abstracts often are classified on the basis of content, purpose, and structure as well as their authorship. Abstracts of articles in primary

journals are usually called *author abstracts*, although some are written by subject specialists or members of the editorial staff of the publishing house. Abstracts written for secondary publications and services typically are composed by subject or information specialists. Since these secondary publications and services have now become better known as access publications and services, the abstracts prepared for them will be referred to as *access abstracts* in this text.

Author and access abstracts may be further classified according to purpose, structure, content, and method of preparation. Within this classification scheme, the two most common types are *informative* and *indicative* abstracts, which will be discussed shortly. Other types include *modular*, *critical*, and *computer-based* abstracts. All of these abstract types are described in the Glossary at the end of this book.

## Content of Abstracts

Abstracts generally contain up to four, usually sequential, information elements that describe or extract information from the basic document. As described in the *American National Standard for Writing Abstracts*, these elements state the “purpose, methodology, results, and conclusions presented in the original document.”<sup>(2)</sup> Methods for preparing this type of abstract are those that generally will be discussed in this book. A *findings-oriented* abstract, in which the most important results or conclusions are placed first, followed by supporting details, other findings, and methodology, is also mentioned in the *American National Standard for Writing Abstracts*. Once authors or access abstractors acquire a good understanding of the procedures for writing the more conventional types of abstracts, they should have no difficulty in writing findings-oriented abstracts or other types that use variations in format. When examples of abstracts are discussed in the following pages of this book, the four information elements are referred to by slightly different terms. These are (1) primary annotative element (information on purpose, scope, and methodology comprising the first sentence); (2) secondary annotative element (those sentences, if any, containing additional information on purpose, scope, and methodology); (3) results; and (4) conclusions and recommendations.

## Indicative and Informative Abstracts

Indicative and informative abstracts are variously defined in the literature. Many definitions suggest that an informative abstract should be a miniature version of the full paper, whereas an indicative abstract should resemble a table of contents. In practice, the differences between the two types often become blurred. The *American National Standard* accordingly recognizes the existence of mixed “informative-indicative” abstracts.

For ease of instruction in this text, I consider indicative abstracts to be those which contain information on the purpose, scope, or methodology, but not on results, conclusions, or recommendations. An example of this type of abstract is given in Figure 1. Each of the five parts of this book is introduced with an indicative abstract.

The preferred definition for an informative abstract in this text is that, although it may contain information on purpose, scope, and methods, it must also contain results, conclusions, or recommendations. Figure 2 shows an informative abstract that contains all four information elements. In Figure 3, the indicative abstract given in Figure 1 has been expanded into an informative abstract by the addition of a conclusion.

Progress in modeling human cognitive processes is reviewed, emphasizing the use of computer programming languages as a formalism for modeling and computer simulation of the behavior of the systems modeled. Elementary and higher processes are examined, and neural models are briefly described.

FIG. 1. *Indicative abstract. Adapted from the abstract in Simon.*<sup>(27)</sup>

The embryotoxicity of hexachlorocyclopentadiene was studied in mice and rabbits. Pregnant animals were given 5, 25, or 75 mg/kg per day by gavage on days 6 to 15 (mice) or days 6 to 18 (rabbits) of gestation. Food and water consumption and weight were recorded daily. Mice and rabbit dams were killed on days 18 and 29 of gestation, respectively. Fetuses were removed and examined for malformations. Fertility of the treated mice and rabbits was not significantly different from that of control animals. The dose of 75 mg/kg per day was toxic to rabbit dams; no toxic effects were seen in mice at any dose. No significant effects on the average number of implantations, live fetuses, or resorptions were observed in either species.

FIG. 2. *Informative abstract. Not published previously.*

Progress in modeling human cognitive processes is reviewed, emphasizing the use of computer programming languages as a formalism for modeling and computer simulation of the behavior of the systems modeled. Elementary and higher processes are examined, and neural models are briefly described. Theories of human cognitive processes can be attempted at the levels of neural, elementary information (retrieval from memory, scanning down lists in memory, comparing simple symbols), or higher information processes (problem solving, concept attainment).

FIG. 3. *Informative version of the Figure 1 indicative abstract.*

## Chapter 2

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# Informative Words for Authors of Abstracts

*There are four things that make this world go round:  
love, energy, materials, and information. We see about us  
a critical shortage of the first commodity, a near-critical  
shortage of the second, increasing shortage of the third,  
but an absolute glut of the fourth.*

—ROBERT A. DAY

---

In the preface to his book *How to Write and Publish a Scientific Paper*,<sup>(12)</sup> Day uses the four words love, energy, materials, and information to underscore his general advice to authors of scientific papers before he presents more specific advice, not only on the writing of a scientific paper but also on writing review papers, conference reports, and theses. Continuing his preface, Day advises authors on how to alleviate the problem of the glut of information:

We in science, of necessity, must contribute to the glut. But let us do it with love, especially love of the English language, which is the cornerstone of our intellectual heritage; let us do it with energy, the energy we need to put into the scientific paper so that the reader will not need to use much energy to get the information out of the paper; and let us husband our materials, especially our words, so that we do not waste inordinate quantities of paper and ink in trying to tell the world more than we know.

That which is appropriate for the writing of all other components of a scientific or scholarly paper is also appropriate for the writing of the abstract.

### Second-Wind Love and Energy

Everyone knows what it is to start a piece of work, either intellectual or muscular, feeling stale—or *oold*, as an Adirondack guide once put



it to me. And everybody knows what it is to “warm up” to his job. The process of warming up gets particularly striking in the phenomenon known as “second wind.”

—WILLIAM JAMES

The original or revised version of the author's paper is almost completed. He (or she) has invested far more love, energy, and time in thinking through his ideas, researching them, testing them, and writing them into manuscript form than he ever imagined he would when he first decided to share them through publication. The paper now has unity and coherence, and the ideas flow well from the introduction to the conclusions and recommendations; footnotes are numbered and verified, and are in proper sequence; and references are in agreement with the specifications of the publisher to whom the manuscript is being submitted. One of the final steps remaining before submission of the full manuscript for refereeing, review, or acceptance is to prepare or revise the abstract.

This seems simple enough. Besides a few minor “style conventions” on verb usage, symbols, and abbreviations, the instructions for the particular abstract might ask only for an “informative abstract” of about 150 words. This appears to pose no major problem, even though the author now may be feeling intellectually “stale—or *oold*,” as William James put it in his 1906 essay on “The Energies of Men.”<sup>(15)</sup> But if he or she does not have a firm grasp of the fundamentals of preparing an informative abstract, this request definitely could pose a major problem—one which could well require a substantial burst of “second-wind” love and energy to ensure that the completed abstract achieves the same degree of unity as the full text of the paper that follows it.

## Information Reductionism

Science gets most of its information by the process of reductionism, exploring the details, then the details of the details, until all the smallest bits of the structure, or the smallest parts of the mechanism, are laid out for counting and scrutiny.

The above definition of the scientific process created by Lewis Thomas,<sup>(29)</sup> a contemporary essayist and biology watcher, may be paraphrased to define the abstracting process:

Abstracts derive most of their substantive information by a process of reductionism, the analytical reading of the full text of a paper, monograph, or thesis, until all of the relevant parts of the structure and the essence of the findings and conclusions are laid out for writing and editing.