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# Bibliography and Science

by

G. THOMAS TANSALLE

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**A** REVIEWER FOR THE *Times Literary Supplement*, COMMENTING in 1972 on two bibliographical annuals, remarked, "To argue about the scientific nature of bibliography now is surely to pursue a red herring."<sup>1</sup> I could not agree more. When I observed a few years ago, "All that 'scientific' can mean when applied to bibliographical analysis and textual study is 'systematic,' 'methodical,' and 'scholarly,'" <sup>2</sup> I was only repeating what a number of others have said and what many more must believe. It seems obvious that the word "scientific," when used to describe bibliography—as it has been off and on for more than a century—does not mean the same thing as when it is applied to physics, say, or chemistry. Apparently the issue cannot be dismissed so easily, however, for there have been several recent essays—notably those by D. F. McKenzie, James Thorpe, Peter Davison, and Morse Peckham<sup>3</sup>—which take up fundamental questions regarding the connections between science and bibliography. In a sense one must agree with the *TLS* that "it is perhaps a pity that he [McKenzie] revived the old argument about the scientific nature of bibliography"; at the same time, the existence of this group of essays suggests that the issue is not a dead one, and the *TLS* admits that the matter is "currently very much in the air."

Actually, of course, what is in the air is an attempt to clarify the nature of bibliography as a discipline, and what is a pity is that the focus on science may only serve to confuse the central question. Both "science" and "bibliography" have many different meanings, and, when

1. *TLS*, 2 June 1972, p. 640.

2. "Textual Study and Literary Judgment," *PBSA*, 65 (1971), 111.

3. McKenzie, "Printers of the Mind: Some Notes on Bibliographical Theories and

Printing-House Practices," *SB*, 22 (1969), 1-75; Thorpe, "The Ideal of Textual Criticism," in *The Task of the Editor* (1969), pp. 1-32; Davison, "Science, Method, and the Textual Critic," *SB*, 25 (1972), 1-28; Peckham, "Reflections on the Foundations of Modern Textual Editing," *Proof*, 1 (1971), 122-55.

the two words are joined, the possibilities for confusion are multiplied. It is in this sense that the issue may be regarded as nonexistent, for "scientific bibliography" can mean almost anything, and arguments about it may amount to no more than knocking down straw men. Self-examination, though, is presumably a healthy thing, and bibliography will no doubt profit, as it has in the past, from soul-searching. It may be that bibliographers, at one stage, needed to overemphasize the scientific aspect of their work as a means of calling attention to, and insisting upon, its rigorous and scholarly nature, and that they have now reached a stage where they feel an urge to redress the balance. Bibliography—like many of the so-called "social sciences" (and I am not at this point claiming that it is a social science)—has been somewhat uneasy about its own identity, and it would not be surprising to find that attempts to define it have followed a pendulum-like course. Current discussion which questions in various ways the notion that bibliography is "scientific" may eventually lead—if a debate about "science" itself does not get in the way—to more fruitful analysis of the relations between one kind of bibliographical inquiry and another and of the procedures appropriate to each. In supposing that there is little to be gained by further discussion of how "scientific" bibliography is, I am not complaining about the general direction in which these recent articles are moving but about their circuitous path.

It is easy to understand why bibliographers have had a tendency to proclaim the scientific nature of what they were doing. For one thing, they have wanted, especially during the late nineteenth and early twentieth centuries, to demonstrate that bibliography is a scholarly pursuit, to be distinguished from a merely dilettante concern for book collecting. In their zeal to show the respectability of their relatively new discipline, bibliographers were naturally tempted to play up the aspects of their work that could be compared to science, for the spectacular accomplishments of the physical sciences made "science" glamorous and gave particular advertising value to the word. This temptation has been intensified by the fact that bibliography has been associated most closely with the study of literature and that bibliographers are frequently members of English departments who assume that, since much of their work seems more objective than literary criticism, it is somehow scientific. The misunderstanding which occasionally exists between bibliographers and other members of English departments seems to turn on the matter of "science": the bibliographer often makes extravagant claims for the definiteness of his conclusions and may feel flattered to think that he is a scientist of sorts;

certain literary scholars, on the other hand, believe that imagination and insight are unnecessary in the search for scientific facts and assume that bibliographical work is on a lower intellectual plane than literary criticism. Both are wrong in their understanding of science;<sup>4</sup> but the fact remains that it has become a cliché, in the context of literary studies, to regard bibliography as scientific in some way.

Any such tradition has a grain of truth at its center: obviously there is something more "factual" about bibliography than about literary criticism. But the usefulness of science *as an analogy* has led some people to take the claims for the scientific status of bibliography more literally or in a more precisely detailed sense than was originally intended. I think that a glance at the ways in which science has been linked with bibliography ("the scientific analogy")<sup>5</sup> over the years will reveal the shifting meanings of the two terms, the repetitiveness of the discussions, and the growing tendency to be critical of the comparison itself. And perhaps this kind of survey can provide a perspective from which to view the current situation.<sup>6</sup>

## I

During much of the nineteenth century "bibliography" was understood to mean what we would now regard as "reference bibliography"<sup>7</sup> (or "enumerative bibliography")—that is, it was concerned with the intellectual content of books, with preparing lists of books on particular subjects, with the classification of knowledge and the arrangement of libraries.<sup>8</sup> Thomas Hartwell Horne, in *An Introduction to the*

4. F. H. Ludlam has commented, in another connection, on the failure of some scholars to recognize that "the aim of both artists and scientists is to communicate a new and valuable way of regarding the phenomena, an enterprise in which there can be no absolute and permanent correctness" ("The Meteorology of Shelley's Ode," *TLS*, 1 September 1972, p. 1015). Cf. A. E. Housman's classification of scholars as scientists (and his distinction between literary critics and scholars) in *The Confines of Criticism*, ed. John Carter (1969), pp. 26-34.

5. I shall use the term "scientific analogy" as a convenient shorthand to refer to any linking of "bibliography" (in any sense) with "science" (in any sense).

6. I have not attempted to provide an exhaustive history of the scientific analogy but rather a sketch which incorporates a representative sampling of relevant pronouncements over the years.

7. I am using the terms suggested by Lloyd Hibberd in "Physical and Reference Bibliography," *Library*, 5th ser., 20 (1965), 124-34.

8. The history of the word "bibliography" has been studied in great detail: one thorough survey is the opening section of David Murray's "Bibliography: Its Scope and Methods," *Records of the Glasgow Bibliographical Society*, 1 (1912-13), 1-105 (reprinted separately in 1917), which refers to bibliography as "one of the oldest, and yet one of the most modern of the sciences"

*Study of Bibliography* (1814), went somewhat further and included discussion of the materials of books and the history of printing; but when he referred, in his preface, to "the infant science of Bibliography," he obviously meant nothing more than "the classification of books as a field of knowledge."<sup>9</sup> The use of "science" in the general sense of "systematic knowledge" recurs in most of the nineteenth-century discussions. It is explicit, for example, in Reuben A. Guild's *The Librarian's Manual* (1858), which defined "bibliography" as "the Science or Knowledge of Books" (p. 3). That he equated this science primarily with checklists is evident when he went on to say, "In Great Britain Bibliography as a Science has received less Attention than upon the Continent, although valuable Works have been produced by HORNE and LOWNDES, DIBDIN and WATT" (p. 5). His view of bibliography as a "practical Science" (p. 5) was still essentially the same two decades later when he wrote an article entitled "Bibliography as a Science," in which "bibliography" really means "librarianship."<sup>10</sup> Similarly, E. Fairfax Taylor, in the ninth edition of the *Encyclopaedia Britannica* (1875), though he included some account of printing history under "Bibliography," defined his subject as "the science of books, having regard to their description and proper classification"—using "description," in the sense standard at the time, to mean a recording of the basic facts considered necessary to identify a book (those we would now think appropriate for a checklist).<sup>11</sup>

(p. 2); an even more extensive survey is Rudolf Blum's "Bibliographia: Eine wort- und begriffsgeschichtliche Untersuchung," *Archiv für Geschichte des Buchwesens*, 10 (1970), cols. 1010-1246. A convenient collection of quotations of definitions of bibliography appears in Percy Freer's *Bibliography and Modern Book Production* (1954), pp. 1-13.

9. Even at this early stage, however, the word "science" in this context did not go without criticism. Macvey Napier, writing the first full article on "Bibliography" for the *Encyclopaedia Britannica* (in the *Supplement* of 1816), complained about Horne's remark: "He seems to have allowed himself to be imposed upon, by the vague *verbiage* of those French Writers, who claim for this branch of knowledge a character of vastness which does not belong to it." In another criticism of the French view, he says that "some of her Biblio-

graphers have lately fallen into a very extravagant mode of describing the nature and rank of this branch of Learning. They go so far as to represent it as a Universal Science, in whose ample range all other sciences, and all other kinds of knowledge, are comprehended."

10. *Library Journal*, 1 (1876-77), 67-69. It is worth noting, however, that his inclusion among the bibliographer's concerns of "the materials of which books are composed" and the "external peculiarities or distinctions of an edition" foreshadows the later emphasis of physical bibliography.

11. He also referred to the development of "material" (or physical) bibliography as "due to the gradual formation of a technical science of books" and ended by saying that bibliographers should "recognise the chief value of their science as the handmaid of literature." Taylor's article

It is generally recognized that a new meaning for "bibliography" developed in the last third of the century from the work of William Blades, Henry Bradshaw, and Robert Proctor on incunabula. Blades's *The Life and Typography of William Caxton*, published in 1861-63, attempted to classify and date Caxton's books on the basis of a close examination of their typography; according to T. B. Reed, writing in 1891, this book "marked a new epoch in bibliography, and disposed finally of the lax methods of the old school."<sup>12</sup> Blades himself had commented a few years earlier on the achievement of Bradshaw, whose important classified indexes of incunabula began with his work on the de Meyer collection in 1869:

From an early period he perceived that to understand and master the internal evidences contained in every old book, the special peculiarities of their workmanship must be studied and classified, much in the same way as a botanist treats plants, or an entomologist insects. This he called "the natural-history system." . . . To make his work more effectual and scientific, he did that which many a bibliographer has to his great loss omitted to do—he made acquaintance with the technicalities of book-making.<sup>13</sup>

In remarks of this kind, both "bibliography" and "science" are obviously used in a different sense from the way in which Horne or Guild had understood them. "Bibliography" here means what we would now call "analytical bibliography," with the emphasis on physical evidence, and "science" refers not to systematic knowledge in general but to the examination of empirical data. The movement initiated by these men is what lies behind Henry Stevens's statement in 1877 that bibliography "is fast becoming an exact science, and not a whit too soon. It is high time to separate it from mere catalogue-making"<sup>14</sup>—a statement which was echoed in remarkably similar language by W. A. Copinger in his "Inaugural Address" before the newly formed Bibliographical Society fifteen years later.<sup>15</sup>

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followed the same plan as Napier's 1816 article but was largely rewritten.

12. "Memoir of the Late William Blades," in Blades, *The Pentateuch of Printing* (1891), p. xii.

13. Quoted (from the *Printer's Register*, 6 March 1886) in G. W. Prothero, *A Memoir of Henry Bradshaw* (1888), p. 363. Reed called Bradshaw "the keenest of the new scientific school of bibliographers" (Blades, *Pentateuch*, p. xiii).

14. "Photo-Bibliography," *Library Journal*, 2 (1877-78), 172.

15. "There can be no doubt," Copinger said, "that Bibliography is now in process of development, and is fast becoming an exact science. It is high time, therefore, that it should be recognized as something very different from mere cataloguing." See *Transactions of the Bibliographical Society*, 1 (1892-93), 33. Henry Guppy, a few years later, said that "bibliography has, properly speaking, assumed the form of a science";

However inexact the term "exact science" might be, it served the rhetorical purpose these writers had in mind: an effort to contrast the methodical inspection of evidence found in books with the dilettante interest in old books merely as antiquarian objects. It is important to note that the putative inexactness which the new "exact science" would replace did not lie in the pursuit of enumerative bibliography but rather in the casual attitude of book collectors who—like the "new" bibliographers themselves—regarded books as physical objects. Since Stevens and Copinger both made a point of saying that bibliography—in their sense—was distinct from "mere" cataloguing, they may have given the impression that cataloguing was inexact work and that analytical bibliography was the exact work that had developed from it. But such an interpretation is actually an illogical mixture of two concepts which lie behind their statements: first, that "bibliography" in the sense of listing or cataloguing is a separate activity from "bibliography" in the sense of attention to books as physical objects; and, second, that the "exact" pursuit of the second kind of bibliography (examination of physical evidence) is replacing the "inexact" (vague dilettante interest). The first concept concerns definition of the field of activity; the second concerns the degree of seriousness with which the field is pursued. When the definition of an activity shifts in the middle of a discussion of a particular attribute of that activity, only confusion can result, and this kind of confusion could be regarded as the motif running through the whole history of attempts to link the words "science" and "bibliography." It is no wonder that Olphar Hamst, as early as 1880, felt that the word "bibliography" had so many meanings as to be useless for "any scientific purpose."<sup>16</sup> One further point may be noted about these early descriptions of analytical bibliography: the use of the phrase "natural-history method," like that of "exact science," was meant to be suggestive, not precise. Obviously Blades knew that books, being man-made objects, could not be studied in exactly the same way as plants or insects, but there was no reason for him to make that point, since he was concerned only with a general analogy between two examples of the use of empirical observation, in order to contrast that method with one which did not involve systematic observation at all.

In the years which followed, the Bibliographical Society and several younger bibliographical societies continued to advertise the "scientific"

see "The Science of Bibliography and What It Embraces," *Library Association Record*, 2 (1900), 173.

16. *Aggravating Ladies* (1880), p. 10.



nature of physical bibliography. The title of Falconer Madan's "On Method in Bibliography," read before the Bibliographical Society in 1893, is characteristic of the concern of these groups that their field should be systematic.<sup>17</sup> Speaking before the Edinburgh Bibliographical Society in 1899, John Ferguson said that bibliography "has nothing to do, in the first instance at least, with the contents. They may be good, bad, or indifferent, but they do not concern the bibliographer. If one may so say, he is not a book-ethicist, but a book-ethnologist."<sup>18</sup> Ferguson's choice of ethnology as his scientific analogy skillfully suggests that bibliography has both an objectivity of method and a concern with the human; even more revealingly he called bibliography "the biography of books" (p. 9). He did not develop the point, but his recognition that physical bibliography is a form of history probably accounts for his unwillingness to label bibliography flatly as a science; it is, he said, "the science or the art, or both, of book description" (p. 3). Although he went on to concern himself principally with the enumeration of books, his few comments on physical bibliography constitute an intelligent revision of the scientific analogy. Another speaker (J. Christian Bay) before another bibliographical society (the Bibliographical Society of America) observed in 1905, "Bibliography, as taught and practiced in the circle to which I address myself, ranks now equal to, if not among, the exact sciences"—phraseology which makes plain the metaphorical nature of the statement.<sup>19</sup> And Victor H. Paltsits at about the same time compared bibliography to anatomy in its concern with analyzing the "component parts" of a book.<sup>20</sup> Both writers, however, went on to confuse the issue somewhat by making the inevitable contrast with "library routine" and the compilation of lists. The whole tendency of this period to glorify the "scientific" aspects of bibliography, in contrast to what went before, is well summed up in James Duff Brown's *Manual of Practical Bibliography* (1906):

If once it is recognized that bibliography is really the index and guide to all past and existing knowledge, . . . then there will be some hope of the science being set in its proper place as a key to the knowledge stored, and

17. *Transactions of the Bibliographical Society*, 1 (1892-93), 91-106. 1900.

18. "Some Aspects of Bibliography," *Publications of the Edinburgh Bibliographical Society*, 4 (1899-1901), 2-3. Ferguson's monograph (amounting to 102 pages with its book list) was also issued separately in

19. "Contributions to the Theory and History of Botanical Bibliography," *PBSA*, 1 (1904-7), 75.

20. "A Plea for an Anatomical Method in Bibliography," *PBSA*, 1 (1904-7), 123-24.



too often hidden, in books. At present we cannot hope for this recognition. It has become crystallized in the public mind—if it ever considers the matter at all—as a dull, repulsive game for snuffy and cantankerous old men who spend most of their time buying books from ignorant booksellers at one twentieth part of their market value, in order to stow them away on musty bookshelves, there to accumulate a further value in the course of time. Book-hunting, indeed, has almost become synonymous with bibliography in the minds of a great many persons. But, luckily, a more advanced, more reasonable, and more scientific spirit is awakening, and many modern practical exponents of the new bibliography have completely repudiated the traditional view of the limits of the science. (pp. 19-20)

Brown's chief interest is obviously in reference bibliography, but his contrast of the scientific present with the dilettante past<sup>21</sup> is characteristic of the viewpoint lying behind the insistence on science in analytical bibliography as well.

By 1912 the tradition of comparing bibliography with science was well established, and W. W. Greg had given enough thought to the matter that he was ready to make what would be the first of an important series of statements on it. He recognized that a general analogy with science could be drawn, for bibliographers "are gradually evolving a rigorous method for the investigation and interpretation of fresh evidence."<sup>22</sup> But what distinguished his remarks from previous ones is that he turned the scientific analogy into a criticism, saying that bibliography was not yet a "satisfactory science":

In a sense every science is descriptive. But in so far as a science is merely descriptive it is sterile. You may dissect and you may describe, but until your anatomy becomes comparative you will never arrive at the principle of evolution. You may name and classify the colours of your sweet peas and produce nothing but a florist's catalogue; it is only when you begin grouping them according to their genetic origin that you will arrive at Mendel's formula. (pp. 40-41)

Like the writers before him, Greg contrasted enumerative and analytical approaches but, unlike them, did not feel that the analytical had developed far enough to provide cause for celebration; the scientific analogy, if it was useful at all, apparently could serve to stimulate bibliographers to greater activity. Still, Greg used the word "science"

21. Brown makes similar statements on pp. 8-9, 16-17; and the words "science" and "scientific" turn up repeatedly—e.g., see pp. 1, 3, 4, 15, 18, 157.

22. "What Is Bibliography?" *Transactions of the Bibliographical Society*, 12 (1911-13), 39.

in his own definition, which at the same time gave currency to another element that would complicate the issue. His chief interest in analytical bibliography, in contrast to that of Blades or Bradshaw, was the effect which its discoveries might have on the establishment of texts, and he defined bibliography (he called it "critical bibliography") as "the science of the material transmission of literary texts" (p. 48). In effect, his definition tended to make analytical bibliography the servant of literary study; and, while he did not say that the editorial process—choosing among variant readings and correcting mistakes—was a science, his statement did use the word "science" and did mention "literary texts." He had entered a fertile ground for misunderstanding, and it is not surprising that debates about the scientific nature of editing would occur, especially after others began to pronounce similar definitions.

Of course, one of the principal accomplishments of the Bibliographical Society in its early years—reflected in the emphasis of R. B. McKerrow's "Notes on Bibliographical Evidence for Literary Students and Editors . . ." <sup>23</sup>—was to demonstrate the bearing of analytical bibliography on literary matters; and it is understandable that A. W. Pollard, as he surveyed in 1913 the Society's first twenty-one years, should have defined bibliography as dealing with "the material mediums . . . through which the thoughts of authors reach those who will take the trouble to gain a knowledge of them." <sup>24</sup> George Watson Cole followed in 1916 with another statement stressing textual transmission—the "perpetuation of thought . . . by means of the printing-

23. *Transactions of the Bibliographical Society*, 12 (1911-13), 211-318. McKerrow recognized, however, that editing requires more than analytical bibliography by itself can provide: "The knowledge and literary training of a scholar like Dyce could and often did enable him better to represent his author's intention, than more 'scientific' methods in the hands of men unskilled to use them" (p. 219). In another comment in the "Notes" he expressed both the relative objectivity of analytical bibliography and its historical nature: analytical bibliography is "one of the most absorbing of all forms of historical enquiry," he said, in part because "such discoveries as we may make are real discoveries, not mere matters of opinion, but provable things that no amount of after-investigation can shake" (p. 221). His optimism about the possibility

of conclusive proof in analytical bibliography had not altered by the time he converted the "Notes" into *An Introduction to Bibliography for Literary Students* (1927), for this statement remains (p. 5).

24. "Our Twenty-First Birthday," *Transactions of the Bibliographical Society*, 13 (1913-15), 24. A few years earlier, in his article for the eleventh edition of the *Encyclopaedia Britannica* (1910), Pollard did not call bibliography the science but rather the "art of the examination, collation and description of books." Though he did not discuss the issue in *Shakespeare Folios and Quartos* (1909), one of the early monuments of the "new" bibliography, he did talk about establishing a "scientific hypothesis" to account for the 1619 quartos (p. 99).

press"—as the domain of bibliographical study.<sup>25</sup> And Falconer Madan, in his Presidential Address to the Bibliographical Society in 1920, saw bibliography as "the groundwork to which every literary researcher and writer will instinctively turn"; like Greg, but more elaborately, he had recourse to "science" in expressing the connection between bibliography and literary study: "It is not too much to say that our work bears, or ought to bear, the same sort of relation to literary subjects of research as mathematics bear to natural science."<sup>26</sup> By a curious shift, the natural-history analogy was now more indirect; bibliography was not compared to science directly but instead to mathematics, as a tool employed in the sciences, thus making bibliography a tool of literary study—a rather narrow view of both mathematics and bibliography. Whether this statement was intended as a summary of the current situation or as a recommendation for the future is not clear, but in any case its hint of some sort of exactness in bibliographical work is unusually vague. This tendency to increase the distance between analytical bibliography and science was furthered in Pollard's Presidential Address to the Edinburgh Bibliographical Society in 1923. Entitled "The Human Factor in Bibliography," it pointed out that, unlike botany and geology, bibliography deals with human productions, and any analogy between bibliography and science was therefore somewhat limited.<sup>27</sup> Pollard expressed a point of view which has been heard often since then, but one cannot help feeling that its target is a nonexistent argument, since surely no one who had called bibliography scientific had believed that its materials of study were of precisely the same order as those in the physical sciences. It was bibliographers like Greg and Pollard, interested in the literary application of analytical bibliography, who were finding increasing reason to suggest qualifications of the scientific analogy; but ironically their association of bibliography and literature helped give rise to the misconception that bibliographers were attempting to put literary criticism on a scientific footing.<sup>28</sup>

25. "Bibliographical Problems, with a Few Solutions," *PBSA*, 10 (1916), 124. In this essay he also described bibliography as "the comparative anatomy of the book" (p. 127). Four years later in "Bibliography—A Forecast," Cole asserted that bibliography could be regarded as a science in the light of the *Century Dictionary's* general definition of "science" and again likened it to anatomy in its minute examination of books "to discover the relations

that each part bears to the whole" (*PBSA*, 14 [1920], 10-11).

26. "Some Experiences of a Bibliographer," *Library*, 4th ser., 1 (1920-21), 139-40.

27. *Publications of the Edinburgh Bibliographical Society*, 12 (1921-25), 69-77.

28. One essay from the 1930s may be taken to show some of the problems that arise.

During the 1930s two bibliographers in particular—Greg and McKerrow—made comments about science which go to the heart of the matter. In each case they attempted to rectify certain fallacies which they believed the comparison with science had led to, and one begins to feel that they found the analogy more distracting than helpful. Greg, in his Presidential Address of 1930, recognized that bibliography is essentially a historical study; whether or not it is scientific thus turns into the question of whether historiography is a science, and Greg answered in the affirmative: “The knowledge of human events, and the methods by which that knowledge is pursued, have just as good a claim to be called a science as have any other body of facts and any other instruments of research.”<sup>29</sup> Whereas he had believed earlier that bibliography was an immature science, he thought that it had now moved to a new stage, and he pointed out the meaninglessness of the often-used phrase “exact science”:

Is not exactitude the aim of every science, which it approaches as it gains in mastery over its material? . . . I think that the real distinction is not between an exact science and any other, but between a mature science and one that is still groping after its foundations, or else merely between science and bunkum. (p. 256)

Although Greg was still calling bibliography a science, the implications were now different, since it had been equated with history. And as history it was an independent discipline, not “the slave of other

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Hereward T. Price, in “Towards a Scientific Method of Textual Criticism for the Elizabethan Drama,” *JEGP*, 36 (1937), 151-67, complained about what he called the “bibliographical school” of editing because he found its adherents guilty of “hasty generalization on insufficient data”; yet one of his chief examples was Dover Wilson, whose work would not be regarded by most analytical bibliographers as illustrating the way their discipline operates. (His criticism, however, is understandable, since Wilson himself spoke of bibliography as forming “the only secure and scientific basis for textual investigations”—see, e.g., *Library*, 3rd ser., 9 [1918], 153.) Price concluded by urging greater scientific rigor for “textual criticism”: “Scholars think too much of an explanation which may be true and

not at all of an explanation which *must* be true. It rarely occurs to scholars that their business is not so much to find explanations for special cases, as to discover the explanation which fits all the cases of the same sort. This is a truism in the natural sciences; let us hope we can make it a truism in the science of textual criticism” (p. 167). It is not clear whether “textual criticism” here means the same as “analytical bibliography” or whether it includes editing as well; the statement would be more effective if it clearly distinguished between the two and recognized the possibility that different procedures might be appropriate to each.

29. “The Present Position of Bibliography,” *Library*, 4th ser., 11 (1930-31), 258.

sciences" (p. 259).<sup>30</sup> If from the beginning analytical bibliography's subject had been described as (in Greg's words) "human events"—as opposed to "natural events"—there would perhaps have been less misunderstanding about it. By the end of the decade McKerrow seemed even more exasperated with the scientific analogy. In his *Prolegomena for the Oxford Shakespeare* (1939) he observed that the popular reputation of "science" caused people to wish "to bring within its scope, at least in name, many subjects which cannot properly be said to belong there" (p. vi). He admitted that science could be defined so as to include bibliography: "Truth is truth and logic is logic . . . and in a sense any honestly conducted enquiry may be termed scientific." But science as "usually understood," he asserted, involves demonstration by controlled experiment; in this sense the "textual critic"<sup>31</sup> cannot be scientific:

. . . for scientific proof of his theories he must substitute arguments based on what seems to him, from his "knowledge of human nature" and from what he can learn of the procedure and habits of early copyists, printers, and theatrical producers, most likely to have occurred, and which can seldom or never be more than *probably* correct, even though the probability may in some cases be of a high degree. (p. vii)

30. Greg apparently found it compatible to speak of bibliography as an independent subject and at the same time to define it in terms of literary study or as the "grammar of literary investigation." Of course, one of his reasons for stressing its independence was to oppose the notion of bibliography as a list-compiling service for other disciplines. In another address, a year and a half later, he emphatically stated that the "bibliography" he was talking about was "in no way particularly or primarily concerned with the enumeration or description of books—a belief which has done much in the past to reduce it to futility and retard the recognition of its real nature and importance." This kind of argument is merely an attempt to segregate analytical bibliography from what is regarded as "bibliography" in the popular mind; but he went on to explain once again that his kind of bibliography dealt with the "formal aspect," not the subject matter, of books, thus implicitly linking it with "exact" or "objective" studies. Indeed, he continued to define bibliography as "the science of the transmission of literary

texts." See "Bibliography—An Apologia," *Library*, 4th ser., 13 (1932-33), 113-43. The same ideas also appeared in his address "The Function of Bibliography in Literary Criticism Illustrated in a Study of the Text of *King Lear*," *Neophilologus*, 18 (1933), 241-62: he praised critical insight but felt that the critic should accept bibliographical facts not with antagonism but "with the welcome accorded by the true scientific spirit, the spirit of intellectual integrity" (p. 244).

31. By "textual critic" McKerrow really meant "analytical bibliographer," since his (and Greg's) conception of bibliography stressed its relation to texts. But the possibility of interpreting "textual critic" to mean something roughly equivalent to "editor" may distract some readers from the main point of the argument. The issue McKerrow is discussing is not the scientific nature of the editorial process but rather—what had been repeatedly claimed—the scientific nature of the processes of analysis which form a foundation for the editorial process.

Taken together, these statements of Greg and McKerrow cover the crucial points: analytical bibliography is a form of historical investigation; its conclusions are on a lower plane of probability than the inductive generalizations of many sciences because of the impossibility in bibliography of repeating past events as experiments; it can be thought of as scientific only if "science" is taken in an extremely general sense. One wonders what more needed to be said on the subject.

The scientific analogy, however, having become established, continued to turn up. G. F. Barwick, sketching the history of the formation of the main bibliographical societies, used "scientific bibliography" to mean the examination of a book "as an entity" (as opposed to list-making) and commented on various societies in terms of their attention to "scientific bibliography."<sup>32</sup> Arundell Esdaile considered bibliography to consist both of enumeration and analysis, the first of these being an "art" and the second a "science."<sup>33</sup> And Stephen Gaselee, agreeing that both are legitimate aspects of bibliography, went farther than previous writers in finding that both could be called scientific in the same sense—"both are a part of science, at any rate of that natural science to which bibliography is ordinarily and reasonably compared."<sup>34</sup> In addition to comments of this kind, there was one event in the 1930s which gave new force to the scientific analogy: the publication of John Carter and Graham Pollard's *An Enquiry into the Nature of Certain Nineteenth Century Pamphlets* (1934). A spectacular instance of answering a bibliographical question by recourse to the laboratory was bound to become a classic illustration of "scientific bibliography." Yet no one would be likely to argue that the laboratory analysis of paper is a peculiarly bibliographical technique; it would be more accurate to say that it is a technique from a field other than bibliography which proved to be helpful in investigating a bibliographical problem. Microscopic analysis fits the popular conception of "science," but bibliography does not achieve scientific status merely through association with it. The way in which the *Enquiry* could legitimately be said to represent a "scientific" approach to bibliography

32. "Bibliographical Societies and Bibliography," *Library*, 4th ser., 11 (1930-31), 151-59.

33. *A Student's Manual of Bibliography* (1931), p. 13. His discussion of analytical bibliography begins, "In all sciences laboratory work on the specimen precedes classification" (p. 18); under "Historical Bibliography" he speaks of "anatomy" and the

"natural history method"—which he calls "Darwinism applied by analogy to a human activity" (pp. 20-21).

34. "The Aims of Bibliography," *Library*, 4th ser., 13 (1932-33), 228. Gaselee continued to use the analogy in describing Bradshaw's contribution as "a change of direction almost comparable to the work of Darwin or Mendel."



is in the frame of mind of its authors, whose objectivity in assessing physical evidence led them to see the necessity for turning to another discipline for assistance.<sup>35</sup> A carefully worded statement on the dust-jacket of their book clearly reflects this distinction, saying that the book "introduces scientific methods which have never before been applied to bibliographical problems of this period." But probably most people, when they call Carter and Pollard's work "scientific bibliography," are thinking of the microscope and do not reflect on the fact that they are thereby attaching an additional meaning to an already overburdened term.

Bibliography continued to be referred to as vaguely "scientific" through the 1940s,<sup>36</sup> though two important essays did appear—Madeleine Doran's "An Evaluation of Evidence in Shakespearean Textual Criticism" and R. C. Bald's "Evidence and Inference in Bibliography," both in the *English Institute Annual* of 1941. These essays constitute the most serious and extended treatment that had appeared of the implications of the scientific analogy, following the lines of Greg's and McKerrow's comments; more than that, they provided a direct examination of the nature of bibliographical reasoning and demonstration. Bald, agreeing with Greg, classified bibliography as history—or, more precisely, said that it belongs among those "organized human activities . . . loosely known as 'history and the social sciences'" (p. 162). Just as history studies "monuments" (material objects which survive) and "documents" (accounts of events, liable to human error), so bibliography, he reasoned, examines both books themselves, as physical objects, and external evidence bearing on their production and dis-

35. The same could be said of Allan Stevenson's use of beta-radiography for reproducing watermarks, as illustrated by *The Problem of the "Missale speciale"* (1967). Even if this technique becomes standard in bibliographical investigation of paper—as there is reason to believe it should—it is still a technique from outside the field of bibliography which has become useful in bibliographical work.

36. For example, Randolph G. Adams, in some "Remarks" before the Bibliographical Society of America in 1942, used the scientific analogy in recognizing the intrinsic interest of analytical bibliography, whether or not applied to a literary problem: "I often think of bibliography as akin to, or analogous to, pure science. The

findings of pure scientists are not always applied in the lifetime of the discoverer" (*PBSA*, 36 [1942], 59). In the same year Rollo Silver, reviewing G. L. McKay's directory of the New York book-trade to 1820, declared, "In approach and method, bibliography is one more science," and compared McKay's accomplishment to that of "a chemist listing the components of a single compound" (*PBSA*, 36 [1942], 78-79). F. C. Francis, after surveying "Recent Bibliographical Work," concluded that it was characterized by the "careful amassing of all possible data before attempting to draw conclusions"; he had demonstrated, he believed, "that there is really scientific bibliographical work being done at the present time" (*Library*, 4th ser., 23 [1942-43], 126).



tribution. Because historical study involves human actions and because laboratory experiments cannot recreate the past, the method of "proving" a case in bibliography could be likened more appropriately to that followed in a court of law than to that employed in a scientific investigation.<sup>37</sup> "Bibliography," he summarized, "cannot claim for its conclusions the same universal validity as belongs to those of the exact sciences" (p. 162). Miss Doran, in her essay, provided a concise expression of this point of view:

It should be clear that we are in a realm where demonstration, in the strict sense of the term, is impossible. For our method cannot be solely deductive; nor do our problems admit of controlled laboratory experiment. . . . The textual problem is always a historical one—an attempt at recovery of what actually did happen; demonstration, therefore, is always a matter of the establishment of probability. This is so great in some cases as to amount almost to certainty; in others, so slight as to be questionable.<sup>38</sup> (pp. 98-99)

It would be hard to find a more compact and penetrating statement of the case. Four years later the Bibliographical Society's commemorative volume, *Studies in Retrospect, 1892-1942* (1945), naturally gave some attention to the development of bibliography as a "scientific" pursuit,<sup>39</sup> but it included no comment which brings together all the central issues as this one does.

From this point forward the most prolific commentator on bibliographical theory has been Fredson Bowers, and his writings, as one would expect, repeatedly touch on the "scientific" question.<sup>40</sup> How-

37. A similar analogy was drawn by Henry Thomas, who maintained that "bibliography on its physical side is (or should be) at least as scientific as Scotland Yard" ("Watermarks," *Edinburgh Bibliographical Society Transactions*, 2 [1940-46], 450). This analogy has reappeared a number of times since then, as in Stevenson's *The Problem of the "Missale speciale,"* p. 69.

38. Her use of the word "textual" here as a virtual synonym for "bibliographical" shows that she (like Greg) was thinking of analytical bibliography in terms of its application to textual matters.

39. Greg, in his essay "Bibliography—A Retrospect," noted the movement of bibliography "from the dilettante stage to the technical. And it was the work of the incu-

nabulists," he continued, "and of those who followed their lead, that transformed bibliography from a study the main interest of which was artistic to one governed by the methods of scientific inquiry" (p. 27). Victor Scholderer said that the study of incunabula was put on "a truly scientific basis" (p. 32) during the early years of the Society and that Robert Proctor "found the history of early printing guesswork and left it a science" (p. 34). F. P. Wilson, in his remarkable chapter on "Shakespeare and the 'New Bibliography,'" wrote of Greg, "As do men of science, he has worked by analysis and synthesis" (p. 135). And Michael Sadleir referred to "the science of bibliography" (p. 146).

40. A glance at the writings of others during the 1950s and 1960s shows that the same variety of uses of the word "science"

ever, he uses the word "science" infrequently, and it is clear that he follows in the line of those writers who find the scientific analogy somewhat facile. His position, as set forth in "Some Relations of Bibliography to Editorial Problems,"<sup>41</sup> is that, although there has often been an "inferential identification of bibliography with textual criticism," the two are separate, and analytical bibliography can be pursued independently of any possible application to textual matters. Since analytical bibliography deals with physical evidence, it lends itself to logical, systematic procedures; "strictly bibliographical evidence," Bowers says, "crosses the line of probability into something close to the field which in science would be regarded as controlled experiment capable of being reproduced" (p. 58).<sup>42</sup> Textual criticism and editing,

continues. Stanley Morison called bibliography "essentially the same discipline as Palaeography," which he defined, in turn, as a "science . . . pursued primarily for the benefit of the efficient criticism of the physical means of the transmission of thought" ("The Bibliography of Newspapers and the Writing of History," *Library*, 5th ser., 9 [1954], 154). James G. McManaway asserted, "Pure bibliographical research may be defended in the same terms as pure scientific research. In fact, Bibliography is sometimes referred to as a science. Certainly its methods are scientific, and its purposes" ("Bibliography," in *Literature and Science* [1955], p. 27). F. N. L. Poynter believed that bibliography "is neither an art nor a science but may contain both," though the analytical methods developed by Pollard, McKerrow, and Greg "may justly be called 'scientific'" (*Bibliography: Some Achievements and Prospects* [1961], pp. 5, 6). Allan Stevenson considered bibliography "an art and a science, mixing the critical and creative with cool precision and method" (*Hunt Library Catalogue*, 2 [1961], cxlii) and later asked that watermarks be studied "as scientifically as we have studied types" (*The Problem of the "Missale speciale,"* p. 69). William A. Jackson, on the other hand, avoided "science" in defining bibliography as "the art of looking at a book objectively, as a physical object" (*Bibliography and Literary Studies* [1962], p. 1); and Charlton Hinman did not use the word in distinguishing analytical bibliography from editing: "Bib-

liographical analysis can establish many facts about the printing-house history of a book. . . . It can provide all manner of general enlightenment. . . . Yet the final resolution of particular textual problems is ordinarily an editorial responsibility" (*The Printing and Proof-Reading of the First Folio of Shakespeare* [1963], 1: vii).

41. *SB*, 3 (1950-51), 37-62. An earlier remark on the "scientific" nature of descriptive bibliography occurs in *Principles of Bibliographical Description* (1949): "I do not see how one can escape the conviction that the 'scientific' is basic in true descriptive bibliography, and that no amount of other inquiry, no matter how valuable, can itself substitute for the analytical description of the book as a material object" (p. 34). But he adds that descriptive bibliographies need not be limited to "scientific description only": "I feel that strictly scientific bibliographers often unduly limit the more general value of their work to too few classes of readers."

42. He goes on to say that what this produces, rather than "high probability," is "practical demonstration on physical evidence of a mechanical nature, demonstrable by a mechanical process." Actually, of course, such "demonstration" is simply a higher level of probability, resulting from agreements within a body of inductive evidence which common sense tells one cannot be explained as mere coincidence.

on the other hand, require critical insight: "the great emendations have been inspired art and not systematic science" (p. 45);<sup>43</sup> evidence in this area "can seldom if ever afford more than a high degree of probability, and this is essentially different from positive demonstration" (p. 57). Bowers makes clear, both here and in succeeding essays, a point which some of the later writers on "science" in bibliography do not seem to recognize—that analytical bibliography, while it may at times invalidate a literary argument through a factual demonstration, cannot (and does not claim to) eliminate the need for judgment and critical acumen in editing. Indeed, Bowers repeatedly defends the authority of informed critical insight, when coupled with an understanding of the extent to which analytical bibliography can contribute to the solution of a given problem:

The scientific method should have its valued place in humane studies, but as a servant, not the master. The current exaltation of the scientist in other fields should not lead to his domination of the humanities. Yet the processes of logical and material demonstration which the more scientific bibliographical methods bring to literary studies cannot be idly surveyed from an ivory tower or they will eat away its foundations and topple it.<sup>44</sup>

In a concise statement of the point he says, "Bibliography endeavors to take as much guesswork as possible out of textual criticism, and the literary method endeavors to inform bibliography with value judgments as a check on mechanical probability."<sup>45</sup> Although Bowers does occasionally apply the word "scientific" to analytical bibliography,<sup>46</sup> therefore, he is careful not to use it to describe editing; and he has done more than any other bibliographer to give substance to the word, by examining at length—in his 1959 Lyell Lectures<sup>47</sup>—the nature of

43. Cf. his later comment, "I should prefer the taste and judgement of a Kittredge (wrong as he sometimes was), and of an Alexander, to the unskilled and therefore unscientific operation of a scientific method as if it were the whole answer"—in *Textual and Literary Criticism* (1959), p. 116. (And note the similarity to McKerrrow's remark quoted in footnote 23 above.)

44. "Bibliography, Pure Bibliography, and Literary Studies," *PBSA*, 46 (1952), 208.

45. *On Editing Shakespeare and the Elizabethan Dramatists* (1955), p. 35.

46. For example, in *The Bibliographical Way* (1959), he calls it the "scientific

analysis of the physical evidence of the books themselves" (p. 8). Generally, however, he speaks of "laws of evidence" (p. 10) or "a logical method of analysis" (p. 34) without direct reference to science. Describing analytical bibliography in "The Function of Bibliography," he said, "The evidence utilized is circumstantial and physical, and the method, it may be said, is inductive" (*Library Trends*, 7 [1959], 498). And in the current *Encyclopaedia Britannica* article his analogy is not with science but with law: "The evidence utilized is circumstantial and physical, and would often be legally valid."

47. Published in 1964 as *Bibliography and Textual Criticism*.

the evidence which analytical bibliography produces and the soundness of the conclusions drawn from that evidence.

We shall have occasion shortly to return to those lectures. But, first, it is worth noting that the use of the word "science" in connection with analytical bibliography—as a brief historical sketch of this kind reveals—has developed in two phases. First came the enthusiastic phase, in which bibliographers found science a useful analogy to help them advertise the fact that their field was a serious and systematic study, not a dilettante pursuit. Exaggeration was probably inevitable;<sup>48</sup> but however strongly they claimed bibliography to be science, these bibliographers generally did not examine in detail the implications of such a comparison but instead used it in a vaguer way for its suggestive value.<sup>49</sup> The second—or critical—phase began when bibliographers, taking these scientific claims more literally, recognized that a comparison of bibliography with "science" (that is, in the usual sense of "physical science") involved pointing out many differences, perhaps as many differences as similarities. Leading bibliographers of the past fifty or sixty years have taken this second position and have stated over and over various distinctions between bibliography and "science." At the same time, through both phases, the issue has been complicated by shifting terms, with one person talking about a different kind of "bibliography" from another, or using "science" in a different sense. One begins to wonder whether the whole matter was not a red herring from the start. Presumably the point of the analogy is to define biblio-

48. The situation is not unlike that in which McKerrow found himself when he wished to counteract what he regarded as overly subjective and eclectic procedures in the editing of Shakespeare: in order to make his point, he went farther in the direction of rigidity than he would probably have gone if he had not been reacting against what seemed to him a lack of discipline. As Bowers sums up the matter, "it often appears that in his general editorial theory McKerrow's thinking was affected more by reaction to that of others than by positive theory of his own"; see "McKerrow's Editorial Principles for Shakespeare Reconsidered," *SQ*, 6 (1955), 309-24, which stresses McKerrow's reaction against Dover Wilson's use of supposedly "scientific" bibliographical methods. In this context Bowers sees a "pettishness" in McKerrow's comments on scientific method (quoted above)—though what "pettishness" there is may also reflect a more general

impatience with the scientific analogy.

49. It is not surprising that recent efforts to introduce French-speaking scholars to analytical and descriptive bibliography should utilize the scientific analogy. See, for example, Roger Laufer, "Pour une description scientifique du livre en tant qu'objet matériel," *Australian Journal of French Studies*, 3 (1966), 252-72, and "La bibliographie matérielle dans ses rapports avec la critique textuelle, l'histoire littéraire et la formalisation," *Revue d'histoire littéraire de la France*, 70 (1970), 776-83—which speaks of analytical bibliography as "une discipline archéologique annexe de l'histoire" (p. 781), with problems similar to those posed by "la description des objets archéologiques" (p. 782). See also Wallace Kirsop's articles, such as "Vers une collaboration de la bibliographie matérielle et de la critique textuelle," *Australian Journal of French Studies*, 3 (1966), 227-51.

graphy, and definition by analogy can sometimes be illuminating, even when the supposed analogy serves as something to be reacted against. But when the comparison involves a concept as complex as "science," it may do more to confuse than to clarify. Whether bibliography can be defined as a "science" or as something else is of less importance than understanding, in a direct way, what in fact it does, what its methods of procedure are, what its strengths and weaknesses may be. More direct discussions of such matters might have promoted greater understanding than that which has resulted from the perennial concern with the "scientific" quality of bibliography. The course of these "scientific" comments over the years is not an inspiring one and appears to be leading nowhere; the last word on the subject would seem to have been said, and said repeatedly. But apparently Bradshaw's concept of a "natural-history method"—and all that follows from it—is so intriguing to bibliographers that they cannot let go of the analogy, for it remains a matter of discussion.

## II

The recent essays on this subject continue the historical trend toward the criticism of the scientific analogy: they find fault, in one way or another, with the supposedly scientific pretensions of bibliography. Insofar as they touch on the nature of bibliographical evidence or the historical aspect of the field and fail to make distinctions between one kind of bibliography or one aspect of science and another, they repeat past history. In this sense the *TLS* is right in saying that they have "revived the old argument about the scientific nature of bibliography" (though apparently it was never dead). But in another sense they are pitched on a different level, for they offer extended discourses on the philosophic background, the methodology, and the logic of bibliographical demonstration. It does not matter if, for purposes of argument, they assume greater claims for the scientific rigor of bibliography than have normally been advanced; but they do little to alter one's feeling that the question of science in bibliography, initiated as a metaphor to help elucidate the nature of the subject, has developed into a verbal smog which threatens to hide it.

McKenzie's "Printers of the Mind"—the starting point for the current debate—is essentially a statement of the weaknesses of the inductive method.<sup>50</sup> Many of the conclusions reached through analytical bibliography, McKenzie shows, are unsound or less certain than

50. See footnote 3 above. McKenzie had made some of the same points earlier in

the introductory remarks to *An Early Printing House at Work: Some Notes for Bibliographers* (1965).

they were thought to be, because in each case a generalization was based on an insufficient body of inductive evidence. The question which obviously follows is whether any body of inductive evidence can ever be large enough to support more than a reasonable guess. Although McKenzie is ostensibly criticizing bibliography for not being sufficiently "scientific," his discussion demonstrates that bibliography is like "science" in proceeding by empirical observation and that the problem of induction is therefore basic to both. Philosophers have never proposed a satisfactory solution to the problem of induction. Indeed, in the form in which it is often posed, there can be no solution: for if induction is by definition not a form of deduction, and if valid conclusions can result only from a deductive argument, then induction must be ruled out as a legitimate process of logical demonstration.

McKenzie's way of dealing with this dilemma is a standard one: to advocate the insertion of qualifications in any inductive generalization and thus the conversion of such generalizations into hypotheses to be tested deductively. In his words, "A franker acceptance of deductive procedures would bring a healthy critical spirit into the subject by insisting on the rigorous testing of hypotheses, and the prime method of falsification—adducing contrary particulars—would impose a sound curb on premature generalizations" (p. 61). This line of reasoning—given its classic statement in Karl Popper's *The Logic of Scientific Discovery* (trans. 1959)—rejects inductive generalizations in favor of unfalsified hypotheses; but it does not confront squarely the logical objection to inductive evidence, since any finite body of evidence which fails to provide falsification for a hypothesis would be open to the same kind of objection. There would seem to be little difference between a generalization held provisionally to be true on the basis of examined evidence and a hypothesis for which no falsifying evidence has yet been located. In either case, further investigation may overturn present judgments. This sort of argument, in other words, appears to make little distinction between induction and deduction, except for the supposed greater caution of the latter. But if the goal of observation is to find some kind of regularity that will be useful in making further observations, excessive qualification may almost negate the process. As Max Black says, "In converting a purportedly inductive argument into a valid deductive one, the very point of the original argument—that is, to risk a prediction concerning the yet unknown—seems to be destroyed."<sup>51</sup> One could perhaps restate McKenzie's observation, with-

51. "Induction," in *The Encyclopedia of Philosophy*, ed. Paul Edwards (1967), 4: 176.



out recourse to induction or deduction, simply by saying that bibliographers should be more careful in framing general statements and more thorough in surveying the relevant evidence. Clearly this is sound advice, and the most impressive part of McKenzie's essay is his effective account of instances in which bibliographers have jumped to conclusions that must be modified in the light of further evidence. McKenzie's article is important and timely: his work on the Cambridge University Press records has put him in a position to understand the value of knowing in detail the various jobs in progress in a printing shop at any one time, and one of the weaknesses of much bibliographical analysis in the past has been that the production of a single book was looked at in isolation, without sufficient regard for the total activity of a shop. The great value of McKenzie's essay, in other words, seems to me to lie in its challenge to widely held generalizations rather than in its theoretical discussions about the logic of bibliographical investigation.

Nevertheless, the objections to induction which McKenzie summarizes ought to be faced by bibliographers—anyone whose work involves argument from empirical observation should give some thought to the logical validity of what he is doing. The inconclusiveness of inductive reasoning cannot be denied, but it seems shortsighted to limit "scientific" argument to the deductive. Philosophers of science recognize that there is no such thing as "the" scientific method, except perhaps in the broadest characteristics.<sup>52</sup> One can say that "science" or "scientific method" involves scrupulous fidelity to evidence obtained empirically and a systematic means of handling that evidence. But the details of the procedure will vary from one kind of situation to another or from one area of endeavor to another. Inductive investigations can be "scientific" in this sense, and to deny their legitimacy is greatly to restrict the range of research. In justifying induction one must finally turn to the pragmatic or common-sense argument of common experience. Everyone, from birth, learns to get along through an inductive process. From time to time one's generalizations are proved incorrect, when the expected does not occur, and one makes adjustments in the generalizations; but the whole concept of "rationality" or "rational behavior" depends on expectations of regularity based on past experience. Perhaps there is no ultimate regularity in the universe; the point, however, is that the projection into the future of a seeming regularity from the past appears to be the only way of proceeding in

52. A convenient summary of points of "Scientific Method" in *The Encyclopedia of Philosophy*, 7: 339-43. view appears in Peter Caws's article on



the short run. If induction is denied, all human concepts would seem to be destroyed with it.<sup>53</sup> Furthermore, a deductive argument is conclusive only in terms of its premises, which may themselves be unrelated to the "real" world (that is to say, logical validity and truth are separate concepts). Therefore, to establish "truth"—that contact with the "real" or "objective" which is the aim of research—involves the testing of those premises by what amounts to an inductive procedure, even if it is expressed in terms of Popper's theory of falsification. In other words, one is driven to induction on pragmatic grounds, despite the unassailability of logical objections to it. I am making this amateurish summary of a familiar philosophical debate in order to suggest two points: first, bibliographers—though they should understand the implications of inductive reasoning—need not hesitate to proceed inductively, so long as they do so with care and responsibility; second, to collect and examine evidence with care and responsibility is by definition to be scientific, and discussions about whether or not bibliography resembles one particular scientific pursuit or another seem somewhat fruitless exercises (except perhaps to demonstrate the multiplicity of individual paths which scientific endeavor takes).

The more direct and positive approach to scientific method in bibliography is to accept induction openly and to set about examining what constitutes responsible handling of inductive evidence in this particular field, given the nature of the problems which bibliographers wish to solve. Fredson Bowers did exactly that fifteen years ago in his Lyell Lectures. After distinguishing analytical bibliography (con-

53. Something along these lines is what is sometimes known as the "linguistic" approach to the problem of induction; I quote again from Max Black, an advocate of this point of view: "The inductive concepts that we acquire by example and formal education and modify through our own experiences are not exempt even from drastic revision. . . . What is clearly impossible, however, is the sort of wholesale revolution that would be involved in wiping the inductive slate clean and trying to revert to the condition of some hypothetical Adam setting out to learn from experience without previous indoctrination in relevant rules of inductive procedure. This would be tantamount to attempting to destroy the language we now use to talk about the world and about ourselves and thereby to destroy the concepts embodied in that language. The idea of ceasing to be

an inductive reasoner is a monstrosity. The task is not impossibly difficult; rather, its very formulation fails to make sense" (*Encyclopedia*, p. 179). The common-sense defense of induction does not of course answer the philosophical objections. As Black, in "The *Raison d'Être* of Inductive Argument"—included in his *Margins of Precision* (1970)—says, "There is no way to cope with the 'problem' that, in my opinion, offers any prospect of satisfying those to whom its solution seems necessary except by patiently exposing the underlying confusions until the alleged problem withers away" (p. 177). He sees "no stultifying circularity" in holding that "there is indeed good inductive evidence for thinking that our universe is of such a character that continued trust in the inductive practice is reasonable."

cerned with books as “tangible objects”) from textual bibliography (in which analytical bibliography is applied to “internal form, or contents” of books) and suggesting in general the relations of bibliographical research to editing, Bowers examines the nature of bibliographical evidence and states that one of the “laws” of bibliographical procedure “requires us to reason inductively from specific, concrete evidence in the text” rather than deductively from “our general ideas about printing practice” (p. 36). Of course, if “our general ideas” were adequately buttressed with evidence, there would be no problem, but finding that evidence returns us to an inductive search—thus the inductive process is basic, whatever it is called, and Bowers is not interested in debating the terminology.<sup>54</sup> Instead, he proceeds to—what is the heart of the matter—the question of the interpretation of inductive evidence, and he sets up “three orders of certainty”: the demonstrable, the probable, and the possible. Now to say that inductive evidence can ever lead to a “demonstrable” case (one in which physical evidence “leaves no loophole for opinion”) entails certain assumptions—that all relevant evidence is known and has been examined<sup>55</sup> or that extreme coincidences do not in fact take place. In other words, one has to begin with some notion of the range of occurrences which it is reasonable to expect. Bowers calls this notion the “postulate of normality,” which “depends on the working hypothesis that all we know at any given time must be the truth, and therefore the details of the printing process and their handling that have been recovered (when tolerably full) must represent ‘normality’ unless we have stubbornly inexplicable evidence to the contrary” (p. 72). The phrase “when tolerably full” underscores the central problem, since one must have surveyed a certain quantity of evidence in order to interpret a new piece of evidence, and yet without that new evidence itself the inter-

54. “I am not happy,” he says, “about my need to use these terms [‘inductive’ and ‘deductive’], and I hope they will be accepted in just the rough-and-ready, practical sense intended by Bacon” (p. 36). Bowers has made some comments on McKenzie’s article in “Seven or More Years?”, *Shakespeare 1971*, ed. C. Leech and J. M. R. Margeson (1972), pp. 50-51.

55. Elsewhere Bowers describes the search for extant copies of a book in such a way as to emphasize the open-ended quality of inductive procedure: “. . . although no

way exists to protect oneself against the unique copy of a variant in a private collection, or in some out-of-the-way small library which one would not ordinarily consult, one’s coverage should be so wide as materially to reduce the odds that an unknown variant will turn up later to dim one’s hopes for completeness. (The number of variants I have already seen in unique copies does not give me any great confidence, however, that an equal number still does not lie in wait, unknown and unsung, waiting for my book to be printed.)” See “Bibliography and Restoration Drama,” in *Bibliography* (Clark Library, 1966), p. 4.

pretation may be faulty. Nevertheless, some assumption of normality is unavoidable:

This hypothesis is necessary in some part because a confirmation of the validity of inductive bibliographical reasoning is that it leads us, by a series of tests of the evidence, to an explanation consistent with our knowledge of normality. (A different matter, incidentally, from deducing an explanation of evidence from this knowledge of normality.) Also, since certainty about every small detail in the operation is difficult to attain, it is essential whenever we can to assume that we know the general process of printing, for otherwise conjecture from evidence would be paralysed for lack of some standard for confirmation, or would have no bounds set to mere guesswork. (p. 72)

At this point McKenzie would say that we do not have a large enough body of evidence to define satisfactorily any kind of "normality."<sup>56</sup> Still, his description of a deductive process based on a recognition of "the partial and theoretic nature of bibliographical knowledge" is not, in practical terms, very different from Bowers's picture of an inductive procedure in which explanations "based on imperfect evidence" are modified or corrected by new evidence. Obviously we never know enough; but if we are to proceed, we have to assume that we know enough to get on with. Bowers's discussion, by providing numerous examples of what he regards as demonstrable, probable, and possible interpretations of bibliographical evidence, shifts the focus from the theoretical to the practical. He is not principally concerned with arguing the philosophical question of inductive versus deductive reasoning; the assumption lying behind his analysis seems to be that, since the demonstration of a "truth" finally rests on empirical observation, one might as well accept induction and proceed to confront and examine the evidence that turns up. As a result, his book is a more direct investigation of the "scientific" nature of bibliography than any other discussion, for, instead of concentrating on how well bibliography conforms to certain abstract qualities of "science," he looks at concrete examples of what bibliography in fact consists of, in order to see what particular brand of "scientific method" emerges as most appropriate for dealing with bibliographical evidence.

In the same year in which McKenzie's essay was published, James Thorpe delivered a paper entitled "The Ideal of Textual Criticism" at a Clark Library Seminar.<sup>57</sup> One section of this paper collects quota-

56. Indeed, he doubts that the concept of "normality" is meaningful "in any serious and extended sense" (see pp. 4-6).

57. See footnote 3 above; the essay is republished, in revised form, as a chapter in his book *Principles of Textual Criticism*

tions from several bibliographers—especially Greg and Bowers—which seem to assert the scientific nature of “textual criticism,” and it cites a few instances of quantitative and mechanized approaches to textual problems. Thorpe then proceeds to conclude, “I can see nothing in the present or future of textual criticism, however it is carried on, which will make it answerable to the term ‘science’ or ‘scientific’ ” (p. 68). Of course, if “science” is taken to mean “the physical sciences,” it is easy to agree with him; but, since no analysis of the term or of the nature of textual criticism accompanies the statement, it has the effect of being simply an assertion, placed in opposition to a series of other assertions. The scientific analogy is worth analyzing if some illumination of the nature of the subject emerges, but little is gained by asserting its inadequacy or inappropriateness, particularly since leading bibliographers over the years have repeatedly made the same point. Although the bibliographers cited by Thorpe did make the comments he quotes, I hope that my earlier historical survey has shown the general drift of the major statements of the last half-century to be in the direction of finding fault with the scientific analogy and recognizing the important place which critical judgment occupies. The difficulty here—as in so many similar discussions in the past—is one of definition. Does “science” mean the same thing throughout all of Thorpe’s quotations and in his own remarks as well? More to the point, does “bibliography” mean the same thing, and the same thing as “textual criticism”? Although Thorpe elsewhere discusses at length the relation of bibliography and textual criticism,<sup>58</sup> he does not at this point raise the issue of shifting definitions. His subject is specifically

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(1972), pp. 50-79. The sentence from this paper quoted below is the same in both versions, and the citation is to the 1972 publication.

58. In the third chapter of *Principles of Textual Criticism*, pp. 80-104. It is his thesis in this chapter that bibliographers have attempted to “make textual criticism a branch of bibliography” (p. 101), and he provides a historical survey to exhibit “the process by which bibliography has taken over textual criticism” (p. 89). Although he says, “This development very closely parallels the twentieth-century association of science and bibliography,” the survey of the scientific analogy which I presented earlier suggests that his view is somewhat

overstated. He concludes that “textual criticism cannot properly have a single methodology” (p. 104), but it does not seem that the leading bibliographers ever suggested that it should. The issue is really whether or not the “bibliographical orientation” of textual criticism is excessive—a matter which cannot be decided on theoretical grounds. If analytical bibliographers can accept being plumbers rather than scientists, they would no doubt agree with Thorpe’s final assessment: “The tools of one trade will not repair every breakdown, and the special expertise that the textual critic ought to possess is that of a skilled and knowledgeable handyman. He is not a plumber or an electrician, but he must know how to deal with pipes and wiring” (p. 104).

"textual criticism," yet the word "bibliography" is what appears in a number of his quotations; and it should be clear by now that the two terms have not normally been regarded as synonymous. (Even when "text" or "textual criticism" appears, it is by no means certain that the writer is asserting the "scientific" nature of every step of the editorial process.) The trend in recent decades, as shown above, is to think of the techniques of analytical bibliography (analysis of physical evidence) as perhaps having certain "scientific" qualities but to regard textual criticism (often defined to include editing) as being—true to its name—*critical*. Thorpe may be concerned about the increasing amount of attention which an editor is expected to give to bibliographical information, but that is a different matter from suggesting that the editorial process itself is claimed to be mechanical (which is what "scientific" often means in this context). If Thorpe's conclusion is that editing involves critical judgment (or literary criticism), most people would undoubtedly agree, including those from whom he quotes. One can concur, in other words, with what Thorpe appears to be saying at the end and yet not see how he is led to that statement by quoting comments on "scientific" bibliography and textual criticism from various periods—especially without analyzing the sense in which each writer was using the key terms.

A similar problem emerges in Peter Davison's incisive discussion<sup>59</sup> of McKenzie's position, for Davison is chiefly interested in textual criticism, while McKenzie is concerned with analytical bibliography. In what is surely one of the most penetrating analyses of the nature of bibliography yet written, Davison argues persuasively that McKenzie's view of scientific method is oversimplified and that his view of bibliography as amenable to the "hypothetico-deductive method" is unrealistic. Nevertheless, Davison's examples are editorial problems, and he shows the shortcomings of the deductive method in terms of editing. He points out, for example, that editors "have to provide answers even if evidence is insufficient or contradictory" (p. 13); and he goes on to explain that the deductive method

cannot be more than a useful tool which may help us avoid the avoidable. Thus, in practice, one often has to choose between various courses, none wholly satisfactory, and the hypothetico-deductive method is a convenient means of testing the choices open to an editor, helping him to decide to which choice he should give preference. (pp. 13-14)

59. See footnote 3 above; Davison also offers in this essay a criticism of Thorpe's method of selecting quotations (pp. 5-6). He had presented some of the same points

about McKenzie's paper earlier in "Marry, Sweet Wag," in *The Elizabethan Theatre II*, ed. David Galloway (1970), pp. 134-43.

All this seems reasonable, but it does not meet McKenzie on his own grounds, since McKenzie is talking about analytical bibliography. What starts out as a criticism of McKenzie's position—the advocacy of the deductive method for a particular purpose—turns into a criticism of the appropriateness of the deductive method for a different purpose. I do not believe that McKenzie would disagree with Davison's position in regard to editing: that an editor must frequently make decisions on the basis of his own interpretation and judgment (informed by whatever data are available) rather than on the basis of conclusively established facts. But McKenzie would still say that the deductive method should be followed in bibliographical analysis—in establishing, that is, the facts and hypotheses which may turn out to be of use in the process of editing. It is possible to meet this argument—as I tried to show earlier—by examining the general problem of induction; but Davison, though he makes an effective case against deduction, does not really speak directly to McKenzie's point, since he shifts the area of application to textual criticism. Once again, a debate about the scientific aspects of bibliography is rendered less clear than it might be through the failure to draw distinctions among different kinds of bibliography (or between "bibliography" and "textual criticism").

Davison's important essay takes up a still larger issue. The existence of essays like McKenzie's and Thorpe's, he believes, may suggest that bibliography is at a "moment of crisis," that it is engaged in what Thomas S. Kuhn calls "paradigm rejection"<sup>60</sup>—the replacing of one paradigm by another when the former is judged to be inadequate to handle the problems with which it is faced. He cites examples of dissatisfaction with the usual concepts of "author" and "text" and with the stemmatic approach to textual criticism. He then argues—in the most intriguing part of his discussion—that, just as a creative writer reflects the changing world-views that result from new scientific theories, so an editor (who responds to "the needs, general and scholarly, of his own society") should perhaps "take note of these changes in the physical explanation of our world and the response of creative writers thereto" (p. 27). The rise of the "new bibliography" is placed in this context:

It was the new awareness of science and man which developed in the nineteenth century (and which can be seen in the great creative writers as well as the scientists of the time) which came to be applied to textual

60. In *The Structure of Scientific Revolutions* (1962). Davison is aware of, and com-

ments on, the fact that he is introducing another scientific analogy by referring to this concept.



studies in English literature from the time McKerrow and Greg met at Cambridge in the 1890s. (p. 26)

One illustration is the study of the history of textual transmission:

The response to the spirit motivating the understanding of man in society which influences the creative writing of, say, a Zola or a Shaw, or even a Lawrence or a Joyce, influences also that aspect of textual studies which seeks to discover what happened to texts in the societies which produced and transmitted them. (p. 26)

Insofar as this argument says that a man inevitably reflects the characteristic interests and approaches of his intellectual milieu, it is making a generalization about all men and not about bibliographers in particular. But in applying this observation to bibliographers, it has the merit of stressing the humanistic aspects of the field, of saying that bibliographers are like "creative writers," historians, and others who meditate on human behavior, in their reaction to scientific theories about the physical universe. By proposing a pervasive influence of science on bibliography, Davison is paradoxically setting the two apart, for he associates that influence not with specific methodological changes but with an altered outlook that bibliographers share with other thinking human beings. The result is to provide a strong affirmation of the creative in bibliography and to reject the idea that bibliography is like "science" (although the rejection is on a deeper level than is usually implied by the comparison).

The affirmation is salutary, and it gains weight from the thoughtful analysis lying behind it. But one is surprised to find the conclusion couched in language which seems to reopen the troublesome issue of "scientific bibliography." Davison is urging bibliographers to a renewed faith in intuition and subjective judgment:

What we *could* find is that the more precise techniques developed by "the school of Bowers and Hinman" (if I may use such an expression) are to us not unlike what Newtonian physics is to scientists, but that outside the usefulness of these methods (which are, after all, rather extensive) we ought not to be afraid of irrationality and infinite coincidence. Or, to put it more conventionally, imagination and taste. (pp. 27-28)

Here is the most sophisticated use yet made of the scientific analogy. But to claim that the recognition and acceptance of creativity in bibliography somehow involve modification of the bibliographical paradigm is to suggest that bibliography has been more rigidly mechanical than would appear to be the case, judging from the statements, and the work, of its practitioners. Even in the limited area of analytical



bibliography—or in Newtonian physics—imagination plays its role (in recognizing significant evidence, in devising ways of arranging it, in making connections between related occurrences). Furthermore, if the bibliographical methods springing from McKerrow and Greg are regarded as the reflection, in the bibliographical area, of the nineteenth-century scientific revolution, it is hard to see the aptness of comparing a further development of those methods with Newtonian science. In any case, the emergence of ways of looking at the universe which go beyond Newtonian physics can indeed be said to require modification of a paradigm, since the Newtonian laws were thought to be universal; but the rules of procedure in analytical bibliography were never claimed to have the same kind of universal application throughout the whole realm of bibliographical pursuits. (Newtonian laws might be thought of as operating in all areas of one horizontal plane—which serves well enough to provide a perspective for everyday purposes—though we recognize the existence of other planes; in contrast, rules of analytical bibliography might be thought of as operating in the limited areas of several planes forming one vertical segment of the bibliographical whole, though we recognize that other segments—editing, for example—border on it.) Besides, to compare “Newtonian physics” and the “precise techniques” of analytical bibliography is seemingly to mix explanations with approaches, though both are called “methods.” If the methods of the two areas are compared, it is true that both require care and accuracy, but so do all scholarly pursuits; if the discoveries of the two are compared, both share the ultimate inconclusiveness of all inductive generalizations, though one offers in support an incalculably greater body of evidence than the other. That bibliography and science can be compared in certain carefully defined respects and contrasted in others is not at issue. But Davison’s closing comparison, like so many similar ones in the past, diverts attention from, rather than clarifies, his main point and therefore does less than justice to what he has to say.

Another essay which stresses the humanistic nature of bibliography appeared at about the same time as Davison’s. Morse Peckham, in “Reflections on the Foundations of Modern Textual Editing,” is chiefly concerned with examining the concepts of “text” and “author,”<sup>61</sup> but he begins by questioning the appropriateness of the words “mechanical” and “scientific” as descriptive of bibliography. To

61. See footnote 3 above. I do not propose here to go into this part of Peckham’s

paper; I believe it does no injustice to his argument to consider the first section (pp. 127-36) separately from the rest.

think of book production as a mechanical process in which the "human factor" must be adduced to explain anomalies is, he says, an inversion of the truth, since book production is essentially a form of human behavior, and its study is therefore a branch of historiography:

What the analytical bibliographer does, then, whether he realizes it or not, is, on the basis of certain artifacts which are the consequence or deposit of various behaviors, to make a theoretical reconstruction or construct of the behaviors responsible for the historical emergence of those artifacts. This is so obvious that it would scarcely need saying were it not for the constant appearance of the term "human factor" in both the theoretical and problem-directed discourse of analytical bibliography. The "human factor" is not something that occasionally enters into the bibliographer's thinking when he finds himself in a spot; it is almost exclusively all that he is concerned with. The analytical bibliographer is a historian, and he should not forget it for a moment. The object of his inquiry is not printed artifacts as physical objects but human behavior in the past, human behavior that no longer exists and cannot now be examined. (p. 131)

That bibliography is a historical study has been expressed before, by Greg and others, in less elaborate language, and Peckham is right in saying that it does not need to be repeated—except in the hope that one more repetition may convert those who apparently do not yet understand. But are there really any bibliographers who do not understand that they are dealing with human productions and human behavior? It seems unlikely, and yet the kind of terminology Peckham objects to undoubtedly persists. The problem, of course, is one of rhetoric. The old scientific analogy has become so entrenched as a cliché that it continually turns up in one form or another. While its history shows that it is productive of enough confusion that it might better be avoided, it obviously still serves a purpose for some writers. I do not believe that most bibliographers who use the term "human factor" would disagree with Peckham's statement that the term "actually explains nothing" and "only admits that the explanation has broken down." One impulse to use the scientific analogy comes from the need to explain just what approach the analytical bibliographer is taking toward human behavior; since he is dealing with an area which involves the use of mechanical instruments—pens, presses, type-formes, type matrices, paper moulds, and so on—his approach is to see how much can be explained by factoring out the "human" element and concentrating on those instruments. Obviously what he is trying to describe ultimately is a human action, but he wants to see how far he can go in that direction by examining the products of mechanical

instruments. He can never go all the way, and sometimes he can hardly get started; when he resorts to a term like "human factor," he is admitting that his explanation can go no farther. Certainly the suggestion that his work is a "scientific" treatment of "mechanical" operations is an overstatement and a cliché, but the motivation for it is clear enough. The difficulty comes—as it has repeatedly—when people react to the rhetoric on a different level from the one intended, and Peckham's complaint about "human factor" is another instance.

Nevertheless, he usefully redirects our attention to the basically historical nature of bibliography and recognizes where that leaves the scientific question: "The scientific status of analytical bibliography is the scientific status of any historiographical construct" (p. 132). This, too, has of course been said before, but what Peckham adds that is new is his approach to the definition of historiography. Since statements about past events cannot be verified by empirical observation, he argues, their interior logic has no relation to any "truth" outside the historical account unless the historian, like the scientist, makes predictions about currently existing artifacts, which are thus subject to repeated direct observation. As he puts it in another essay, historical statements "cannot tell us how to locate the phenomenally perceptible, but only how to construct other statements that may, or may not, successfully instruct us how to locate something in the world before us."<sup>62</sup> In other words, the historian "predicts about where he is going to find documents and artifacts and what their attributes are going to be" (p. 133); and "like any scientist," Peckham says, the historian, after checking his prediction, may have to adjust the thinking that led to it. The question whether history is a science has been more widely debated than the question of bibliography's scientific status,<sup>63</sup> and what Peckham has done is to offer another explanation of the sense in which history does resemble science. His argument, though expressed in different terms, arrives at essentially the same point as McKenzie's: that analytical bibliography—or history—is scientific insofar as it continually

62. "Aestheticism to Modernism: Fulfillment or Revolution?" in *The Triumph of Romanticism* (1970), p. 204; the essay was originally published in 1967.

63. For a summary of some of the arguments, with a checklist for further reading, see Patrick Gardiner's "The Philosophy of History," in *International Encyclopedia of the Social Sciences*, ed. David L. Sills

(1968), 6: 428-34, and his anthology *Theories of History* (1959); see also the chapters on the social sciences and history in Ernest Nagel, *The Structure of Science* (1961), pp. 447-606. A few theories of historiography are summarized in a bibliographical context by William H. Goetzmann in his contribution to a symposium on "The Interdependence of Rare Books and Manuscripts: The Scholar's View," published in *Serif*, 9 (Spring 1972), 10-18.

tests hypotheses against directly observable evidence, insofar as the "printers of the mind" move outside the mind.<sup>64</sup> In contrast to the natural sciences, however, with the large body of evidence which they have amassed, "analytical bibliography certainly is not a very highly developed science" (p. 134)<sup>65</sup>—a point which Greg made long ago. Peckham's analysis does not reach any new conclusions, but it goes farther than previous discussions in treating the relations of bibliography and science in the context of historiography.

The recognition that analytical bibliography is history should answer any questions about whether it is an independent pursuit or only the servant—"handmaid" is the favorite term<sup>66</sup>—of another pursuit. But the question has generated a considerable amount of heat, and recourse to the analogy of "pure" versus "applied" science has not helped to answer it.<sup>67</sup> When Copinger, and Greg after him, called bibliography the grammar of literary investigation,<sup>68</sup> they did not mean to imply that the grammar was of no interest in its own right. But the fact that analytical bibliography grew up in the hands of people who were concerned with literary texts led a number of literary scholars to believe that it existed only as an aid for establishing texts.<sup>69</sup>

64. McKenzie's point is specifically applied to history—theatrical history—by J. A. Lavin in "The Elizabethan Theatre and the Inductive Method," in *The Elizabethan Theatre II*, pp. 74-86.

65. The earlier part of this sentence reads, "Consequently the Bowers claim that analytical bibliography is a science is justifiable . . ." I hope it is clear by this point that such a statement is an oversimplification and is characteristic of the kind of statements which have caused misunderstandings throughout the history of the scientific analogy.

66. See, for example, footnote 11 above; *Library Journal*, 1 (1876-77), 69; *Library Association Record*, 2 (1900), 174—these last two in almost identical wording.

67. J. D. Cowley, in *Bibliographical Description and Cataloguing* (1939), defined historical bibliography in such a way as to bring together the questions about its scientific and its independent status: historical bibliography (as opposed to subject bibliography and textual criticism), he

said, is "a science, if that term is used to mean any field of knowledge or knowing which is worth while approaching for its own sake" (p. 7).

68. See, among other places, *Transactions of the Bibliographical Society*, 1 (1892-93), 34; *Library*, 4th ser., 13 (1932-33), 113.

69. In the "Early Americana" section of *Standards of Bibliographical Description* (1949), Lawrence Wroth says that "bibliography is not an end but a means, a process in the study of the transmission of texts" (p. 105), and that unless it is regarded in this spirit it becomes "a species of research which closely approaches sterility" (p. 107). Curt Bühler, in the same volume, calls it "an ancillary investigation to the study of the text" (p. 8). E. E. Willoughby makes a similar comment in *The Uses of Bibliography to the Students of Literature and History* (1957): "Bibliography, in my opinion, is an ancillary science. It serves its true function when it is an efficient tool to solve problems in history, literature or some like subject" (p. 17).

As a result of this way of thinking, Bowers found himself in the position of insisting on the seemingly self-evident: that bibliography is "an independent discipline of scholarship and not merely an ancillary technique to literary investigation."<sup>70</sup> The possibility of understanding the word "bibliography" in various ways is again at the root of the matter, as it is when Thorpe returns to this issue. He quotes S. L. M. Barlow as saying, "It is none of the business of the bibliographer or the pure scientist what use is made of his findings";<sup>71</sup> and he objects by replying, "In my way of looking at textual criticism, its value derives only from serving the useful purpose of helping to present the text which the author intended" (p. 68). But "bibliographer" does not necessarily mean "textual critic"; it can mean "analytical bibliographer," whose field of interest—the printing practices of a given period or a given shop as revealed by physical evidence—is surely a legitimate subject of inquiry in its own right. If it had been as popular to call bibliography "history" as it has been to call it "science," these matters would probably have aroused less controversy; and Peckham's emphasis on the historical nature of analytical bibliography is therefore welcome.

Forty years ago Georg Schneider, in his book on reference bibliography, said, "It makes little difference whether bibliography is termed a science or an art, a technique or a skill, or even all of these together."<sup>72</sup> One is particularly ready at this point to apply the state-

70. "Purposes of Descriptive Bibliography, with Some Remarks on Methods," *Library*, 5th ser., 8 (1953), 22; though his article is specifically on descriptive bibliography, the comment quoted here refers to bibliography "in its several essential forms." This is only one of several similar statements Bowers has made; another was quoted above (and referred to in footnote 41). It is true that earlier, in the opening chapter of his *Principles of Bibliographical Description* (1949), he was more concerned with presenting descriptive bibliography as the "history of an author's book," not a mere guide to "points"; and in this context he quoted Wroth's comments as support (p. 9), called bibliography a "bridge" to textual criticism (pp. 9, 11), and said that "bibliography would be a limited science indeed if collection of external facts were its sole reason for existence" (p. 8). Some later writers have persisted in expressing doubt about the independent sta-

tus of bibliography. Roy Stokes, for example, in *The Function of Bibliography* (1969), claims, "Although bibliography is concerned with the physical problems and aspects of such material, there is little to be gained, apart from purely antiquarian pleasure, in unravelling such problems for their own sake. The major interest will always lie in some relationship to the text which is being transmitted" (p. 17). And E. W. Padwick, in the opening chapter of *Bibliographical Method* (1969), reports, as if it were a novel idea, that "contemporary leading exponents such as Professor Fredson Bowers wish to see it [bibliographical scholarship] accepted as an independent discipline no longer to be regarded solely as a handmaid of literature" (p. 12).

71. See the discussion in Randolph G. Adams, *Three Americanists* (1939), p. 9.

72. *Theory and History of Bibliography*,

ment to other areas of bibliography as well. The act of classifying a subject in terms of a larger framework ought to help clarify the nature of that subject, but the history of the association of bibliography with science shows that there are exceptions. Part of the trouble, it is evident, is that bibliography is not "a subject" but a related group of subjects that happen to be commonly referred to by the same term. There should be no problem in recognizing historical bibliography (the study of printing, publishing, and associated areas at particular times in the past) as history; nor is it hard to move from there to an understanding of analytical bibliography (the examination of the physical evidence in books as a clue to the processes of their production) as history. Descriptive bibliography again is history (the history of the forms in which a given group of books has appeared), drawing on both historical and analytical bibliography. It may have occasion, depending on the nature of the problems encountered and the level of detail contemplated, to utilize instruments or methods of measurement generally regarded as "scientific,"<sup>73</sup> but that fact does not make it a "science," except in the general sense that it is striving for accuracy; it may often take as its field of investigation the books written by a particular literary figure, but that fact does not make it a "literary" study. Textual criticism and scholarly editing,<sup>74</sup> however, though they draw on these three historical kinds of bibliography and though they aim at establishing the history of particular texts, deal with questions of meaning in texts which can frequently be resolved only by literary sensitivity, and they can reasonably be thought of as part of the field of literary criticism<sup>75</sup>—but they could also be defined as a form of history, and to debate the matter would be as fruitless as to debate whether they are a form of science. To regard bibliography as principally historical is not to settle anything, since the status of history is also in question;<sup>76</sup> but it places the debate about the scientific nature

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trans. Ralph R. Shaw (1934), p. 24; other comments about science and bibliography appear on pp. 20-24.

73. I have touched on this question in more detail in "Tolerances in Bibliographical Description," *Library*, 5th ser., 23 (1968), 1-12.

74. As opposed to what may be called "creative editing"; I have made further comments on this distinction in *PBSA*, 65 (1971), 113-14.

75. The case is not altered, it seems to me, even when the text under consideration is one that would not conventionally be regarded as "literary"; obviously a knowledge of the subject matter taken up in the text is essential, but something beyond that is required.

76. The pointlessness of many of the discussions about whether one or another of the social sciences is really "scientific" is suggested by Ernest Nagel when he says that "the requirements for being a genuine



of bibliography in the context of a larger debate, about which much more has already been written, and it associates bibliography with other pursuits that concentrate on unique past events,<sup>77</sup> thus providing a more immediately acceptable analogue (if indeed it is not a tautology).

The impulse to use a scientific analogy is ultimately the natural human inclination to believe that what one is doing now is more rigorous and precise than what people were doing in the past. Speaking of textual criticism, Housman, in a well-known passage, says that "the most frivolous pretender has learnt to talk superciliously about 'the old unscientific days.'" But the truth is, he continues, "The old unscientific days are everlasting; they are here and now."<sup>78</sup> To talk about what one is doing can sometimes help one to proceed; but there are other times when it seems best to get on with the work and to define the work by doing it.<sup>79</sup>

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science tacitly assumed in most of the challenges lead to the unenlightening result that apparently none but a few branches of physical inquiry merit the honorific designation" (*The Structure of Science*, p. 449).

77. That is to say, in more elaborate terms, pursuits which are not principally nomothetic.

78. "The Application of Thought to Textual Criticism," in *Selected Prose*, ed. John Carter (1961), p. 149.

79. David Shaw, in an extremely interesting article ("A Sampling Theory for Bibliographical Research," *Library*, 5th ser., 27 [1972], 310-19) published after the present article was written, comes to a similar

conclusion. He works out a way of applying the sampling theory developed by statisticians to the bibliographical problem of determining how many copies of a book provide a significant body of evidence. At the end he recognizes that a "preoccupation with scientific method . . . is generally to be welcomed, provided that it leads to practical results and not solely to doctrinal disputes about the methodologies. My suggestion of a greater application of probability theory in fact favours a continuation of business as before, rather than a great upheaval in bibliographical method." Instead of arguing the advantages of induction or deduction, as he says earlier, his concern "is more simply cautionary. Whatever system of reasoning one uses or thinks one is using, due caution is a most scholarly virtue" (p. 316).