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HUNTIA



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# An introduction to bibliography for botanists

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BOTANISTS AND ZOOLOGISTS, and taxonomists especially, are much concerned with the precise dating and ordering of works in their field. In establishing the correct dates of natural history publications they rely on evidence such as references in contemporary correspondence, diaries, invoices, periodicals, booksellers' catalogues, publishers' records, library registers and the like, all perfectly admissible though not always infallible.

Literary critics, too, are concerned with problems of dating and ordering, though for different reasons, and in the last half-century they have made increasing and effective use of the techniques of bibliography to solve their problems.

Let us consider an example from English literature. In the year 1669 Dryden's *Wild gallant* appeared in two editions, designated by literary critics as A and B. One was a reprint of the other, though there were, inevitably, different readings of some words in the text. The question that faces an editor is which edition was printed from which, or, in other words, which is the original and therefore more correct text? The fact that an edition is original does not guarantee its being the most correct text. Later editions may have been overseen and corrections made by the author himself, but in this case that did not happen.

On critical grounds alone such a great English authority as Saintsbury believed that A was the first edition and others followed him. The well-known American bibliographer, Fredson Bowers, of the University of Virginia, then examined the two editions and found conclusive proof on strictly bibliographical grounds that edition B was in fact the prior, and that edition A had been reprinted from it with consequent corruptions of the text in places.

English literature abounds in such examples and it might be thought that natural history also would readily provide similar instances. A search of the volumes of the *Journal of the Society for the Bibliography of Natural History* reveals only three or four papers at most in which strictly bibliographical evidence plays any part at all. A notable example is: "The dates of publica-

tion of the several portions of Doubleday, (E), *Genera of Diurnal Lepidoptera . . .* " by Francis Hemming, 1: 335-411. 1941.

We may conclude that either that journal is misnamed or that the word "bibliography" is being used in two different senses. The latter conclusion is the correct one; there is an unfortunate ambiguity in the word. As used in the above-mentioned journal it signifies, quite legitimately, the study of the literature of the field of natural history and this is the more familiar sense of the word. It is the contention of this paper that bibliography in its other sense also deserves the attention of the biologist.

It would be completely false to assert that the tool of bibliography, so fruitful in textual criticism, can resolve all problems of dating or ordering in natural history but it can unquestionably resolve some. The fact that it has not been used to any great extent for this purpose as yet can only be because specialists in the fields of natural history are in the main uninformed concerning its methods and aims, and bibliographers are naturally attracted to the literary studies out of which their subject arose. Also Stevenson has said, "For bibliography is no longer a simple thing that one may readily add to one's other techniques" (Hunt Botanical Catalogue 2: cxciii. 1961).

What then is bibliography, as this paper discusses it? It is a science, using the methods of empirical observation, of classification and comparison of data, the formulation of hypotheses, and the deduction of valid conclusions. It studies the book as a material object. The subject-matter of the book is entirely subordinate, even irrelevant. A bibliographer looks at a book as an assemblage of sheets of paper folded in a certain way, gathered in a certain order, printed with inked impressions of certain wood or metal surfaces, sewn or cased in covers of a certain material. He measures what is measurable, the size of the leaf, the size of the sheet, the area covered by type, the size of the type; he counts the number of pages, the number of gatherings, the number of lines on a page. He studies subjects which have bearing on the material aspects of the book—paper-making, type founding, binding, methods of illustration, and the history of publishing, to name a few.

Two specific pitfalls may be mentioned in determining questions of publication and in both cases bibliography can offer assistance.

1. The year on the title-page of a work cannot always be taken as the year of publication of that work. If a work was published in parts or fascicles, as were so many botanical works (color-plate books, especially) in the 18th and 19th centuries, the year on the title-page may be either that in which the whole work was completed (the more usual practice) or even (as in the

work by Titford discussed later in this journal) the year in which publication began. A great many papers in the *Journal of the Society for the Bibliography of Natural History* are devoted to elucidating the dates of fascicles. The methods of analytical bibliography are highly relevant to such elucidation.
2. When the year of publication is correct, there may arise the problem of distinguishing two editions of the same work published in the same year or of determining the relative priority of two different works published in the same year. This latter problem is probably one of the most frequently encountered in taxonomic studies and assumes great importance in literature of the late 18th and early 19th centuries, when large numbers of new names for plants were appearing in contemporaneous publications all over Europe.

Bibliographical description precedes bibliographical analysis and, to the best of my knowledge, the Hunt Botanical Catalogue represents the first detailed bibliographical catalogue in the field of natural history although such catalogues have long been common in literary studies (*e.g.*, the Rothschild and Pforzheimer catalogues). There have been, of course, excellent bibliographies of the works of individual scientists, such as Ray, which go into bibliographical detail but I know of no comparable subject catalogue.[1]

What follows is a brief explanation of the principles of bibliographical description. The paper following this, on Titford's *Sketches,* is an illustration of the application of these principles and should be read in conjunction with this one.

The most important page in any book is the title-page and it is worth while paying some attention to it. The information that generally appears on a title-page is first, the title of the work and regardless of what other form the title may take in other parts of the book or on the wrapper or binding, the version on the title-page is always taken as the correct form. The name of the author or authors follows and sometimes the name of an illustrator, editor, or translator, and this may be the only place where these names are found. If the work is illustrated there may be information about the number and form of illustrations. Finally, at the foot of the page is found the imprint, generally in the form of place of publication, printer or publisher, and date of publication.

In a bibliographical catalogue it is important to reproduce the title-page in some form and in some detail. The ideal way to do this, of course, is to reproduce a photograph of it, but more conventionally, bibliographers have devised a form of description called quasifacsimile, in which the text

[1] There is of course the excellent *Tobacco: its history illustrated by the books, manuscripts and engravings in the library of George Arents, Jr.* 5 vols. New York, 1937-1952, but this is confined to one particular plant.

of the title-page is given exactly as it reads, using vertical bars to indicate line-endings. Bibliographers differ in the amount of distinction they make of the various classes of type font that may be found on the title-page but, generally speaking, it is good practice to differentiate the three main classes of roman, italic, and black-letter or Gothic (not to be confused with the American application of the term Gothic to certain sans-serif faces). Capitals should appear as capitals, and lower-case letters as lower-case.

In volume two of the Hunt Botanical Catalogue, Allan Stevenson distinguishes small caps from large caps, but it is common practice to do so only when they both fall in the same line (*e.g.*, in the publisher's imprint of Titford's *Sketches*). Stevenson also uses a visual form of indicating rules on a title-page, but this has its limitations and most bibliographers prefer to describe the rule as "short rule," "thick-thin rule," "decorative rule," etc. This form of description is placed within square brackets, a convention for anything that does not appear as such on the title-page, or for anything added by the describer, such as the Latin word *"sic"* after a misprinted word.[2]

It is ideal to reproduce red printing in that color, as was done in volume two of the Hunt Botanical Catalogue, but it can also be indicated by adding the word "red" in square brackets after each word or each line in that color. Ornaments of various kinds, vignettes, printer's or publisher's devices, and the like are sometimes found on title-pages and these are described concisely and measurements generally given.

Although all of the information that appears on a title-page has a prima facie validity, all or almost all of it should be treated with circumspection.

The name of the author may be a pseudonym, and the situation is not unknown for a completely false ascription to appear on a title-page. Ghost-writing is a common practice in the production of some modern autobiographies, and is not unknown in earlier periods. The French botanist, Richard, is said to have ghosted several published works under the names of other botanists. The title-page of the first issue in an English translation of F.-A. Michaux's *North American sylva,* 1819, claims 150 illustrations, whereas there are in fact 156. Krauss' *Afeeldingen der fraaiste boomen en heesters,* Amsterdam, 1802, names the publishers J. C. Sepp en Zoon in the imprint; the Hunt copy names as the publisher, Johannes Allart. These examples indicate that the title-page of a work, in spite of its ostensible authority, may contain false information or, in different copies of the same work, contradictory information. As a general rule, mistakes on a title-page

[2] My preference to indicate that misprints or other errors (*e.g.*, letters of wrong font) are on the title-page and are not the compiler's error, is to repeat the word or words at the end of the description, preceded by the proofreader's conventional "stet," meaning, let it stand.

(or elsewhere in the book) tend to be corrected in later editions or issues, or even sometimes in the actual course of printing. This is of interest to the botanical bibliographer because it is evidence of priority of one edition or issue over another, and it is not difficult to imagine the taxonomic implications. All that applies to other information on the title-page applies particularly to the year of publication and it is hardly too sweeping to say that, in the absence of corroborative evidence, the year given on the title-page of a work should always be regarded with suspicion. L'Héritier de Brutelle's practice of antedating his publications because he believed they should bear the date on which they were ready for the press, is an example. Titford's *Sketches* bears the title-page date 1811, but publication was not in fact complete until late in 1812.

Generally the title-page and other preliminary matter were printed after the text of the work and frequently on a separate sheet, so that it is quite conceivable for the title-page to be on paper that bears a later watermark than the first leaf of text. Any change in typography or arrangement of a title-page in different copies of the same work, or different editions, can be bibliographically significant; and thus it is important to reproduce the title-page in detail.

Another function of a bibliographical description is the authenticating or identifying of other copies of the work. Armed with a bibliographical description, the examiner may compare it with the copy in his hand to see whether it is the same edition or issue and whether it is complete or not. For this purpose the title-page is paramount though not conclusive, and more to the purpose is the next part of the bibliographical description, the collation.

Every book is made up of sheets of paper folded a certain number of times and arranged in groups. This folding takes place after the sheet has been printed.

The entire sheet of paper is put in the press, printed on one side and later turned over and printed on the other side (perfected). Sheets of paper are made in various sizes and the final size of the book will depend on the original size of the sheet and on the number of times it is folded. Both of these factors must be known in order to indicate the size of a book. (A simple linear measurement will give the size, but will tell nothing of the book's makeup.) The names that commonly appear in the descriptions of books in library or book-dealers' catalogues, such as folio, quarto, octavo, and so on are simply indications of the number of times the original sheet has been folded and, by themselves, are only rough guides to the dimensional size. If it is decided that the page dimensions are to be half those

of the original sheet then two pages will be printed on each side and the sheet folded once across the long axis to produce two conjugate[3] leaves, or four pages. To assure that these pages will be in the correct order (supposing them to be the first text pages of the book), page 1 and page 4 will be printed on one side of the sheet and, after turning the sheet end to end, page 2 and page 3 will be printed on the back.

When the sheet is folded once, the size is known as folio (conventionally designated F, or 2°) and is a common book size for botanical colorplate works. Quarto (4°) is a sheet folded twice, each time across the long axis, and produces four leaves, or eight pages. It will be appreciated that the arrangement for printed pages on each side of the sheet (the imposition, in printers' terms) becomes more complicated every time the sheet is folded. In octavo (8°) the sheet is folded three times, in sextodecimo or sixteenmo (16°) four times, and so on until we reach the rather uncommon folding of 32°, which produces very small books.

Each folded sheet bears at the foot of its first leaf (and sometimes later ones) a signature, that is, a letter of the alphabet as a guide to the binder when he arranges the folded sheets for binding. It is these signatures that the collation reports because they serve to indicate the makeup of the book. André Michaux's *Travels to the westward of the Allegany Mountains,* London, 1805, is an example of a straightforward collation. It is in octavo, that is, it is composed of sheets each folded three times to give eight leaves (sixteen pages), and each sheet bears in sequence a letter of the alphabet from A to Z. For purposes of signing the sheet (or gathering,[4] as it is called when folded) only one letter is used from the group I and J, and one from the group U, V, and W (to avoid the possibility of confusion). This means that Michaux's *Travels* contains twenty-three gatherings of eight leaves each. In bibliographical description this is written concisely as:

$8°: A\text{-}Z^{8}$

Very few collations are as simple as this. As a rule the prelims, that is, the leaves containing the preliminary matter (title-page, contents, preface, etc.) are unsigned. If the text leaves begin with A then by convention the gathering containing the prelims is indicated (by the bibliographer, never by the printer) as $\pi$. The Greek letter $\pi$ (pi) in a collation, therefore, signifies an unsigned preliminary gathering. A title-page is never signed but the second leaf of the gathering in which it occurs may bear a signature and

[3] Conjugate leaves are leaves which are continuous at their hinges. In a quarto work, the first and fourth, and the second and third leaves are conjugate.

[4] The term "signature" is sometimes extended to mean all the leaves signed with a particular letter, but it is better to avoid possible ambiguity and to use the term "gathering" for this.

in that case $\pi$ would not be used. If the text leaves begin with B and the prelim leaves consist of one unsigned gathering then, by inference, it will be A and the fact of inference is indicated in a collation either by enclosing the A within square brackets, or by italicizing it.

The question may suggest itself, what happens if the number of gatherings in a book exceeds the available letters of the signing alphabet? Two practices are used by printers. The more common is to run a second alphabet with double letters (Aa), a third with triple letters (Aaa), and so on as needed. This is indicated concisely in a collation by prefixing an arabic figure to the letter of the alphabet.

The collation of the 4th edition of Willdenow's *Grundriss der Kräuterkunde,* Berlin, 1805, runs:

$\pi 1$ A-2S$^8$

This means that $\pi$ is a single leaf, followed by 41 gatherings of eight leaves each.

The second practice is to begin the single-letter alphabet over again, and this is indicated in a collation by prefixing succeeding alphabets with a superscript arabic numeral to distinguish them thus: $^2$A, $^3$A, etc. Prelims sometimes extend to more than one gathering and in that case succeeding gatherings are indicated as $^2\pi$, $^3\pi$, etc. It should be noted that the prelims are sometimes signed by the printer with lower-case letters. The signatures of the main text are generally set with capital letters.

Sometimes, especially in American books, gatherings are signed with numerals instead of letters and here again if any gathering is inferred it is italicized. Occasionally books are met with in which there are no signatures and the simplest way to treat them is to infer numerical signatures, prefixing the whole collation with the word "unsigned."

Generally speaking, books are composed of successive single gatherings. That is to say, a quarto will be made up of successive gatherings of four leaves (*i.e.,* eight pages), an octavo of successive gatherings of eight leaves (sixteen pages), and so on, but this is by no means always so. Folios are hardly ever gathered in single sheets and it is common practice to assemble them in gatherings of three sheets at a time, one inside the other, to make six leaves. If they are intended to be gathered in this way the three sheets will all be signed with the same letter of the alphabet.

There are two further complications which must be noted before leaving the subject of collations. On occasions, gatherings or single leaves will be found which manifestly do not belong in the main sequence. Sometimes these are obvious, sometimes it takes experience to detect them. Where they occur they are designated by the Greek letter $\chi$ (Chi) as signature,

and the number of leaves that they cover is indicated in the usual way. Examples of such irregularities are cited in the study of Titford's *Sketches* that follows.

The second complication concerns what are known as *cancels*. This is a subject too large to be treated here in detail, but it has great bibliographical importance. A cancel is a leaf that is substituted for another leaf after the work has been printed. Strictly speaking, the English word "cancel" can be applied to both the leaf that is to be replaced and to the replacing leaf. It is more convenient therefore to distinguish one from the other by Latin names—*cancellandum,* the cancelled leaf, and *cancellans,* the cancelling leaf. The detection of cancels requires knowledge and experience. Wherever they occur they are indicated in descriptive bibliography by the plus-and-minus sign (±) of mathematical texts, indicating that something has been taken away and something has been put in. A good example is to be found in the collation of Michaux's *Voyage à l'ouest des monts Alléganys,* Paris, 1804. It runs:

$8°: \pi^2$ $a^4$ (-a3) $A^8$ (±A7) B-$E^8$ $F^8$ (±F1, F5) $R^8$ (±R7) G-$Q^8$ S-$T^8$ $V_4$.

This means that the work is made up of sheets of paper folded three times. The first gathering is an unsigned quarter-sheet of two leaves only. Then follows a prelim gathering signed "a," a half-sheet of four leaves originally, of which the third leaf has been removed; then a series of gatherings of full sheets A-T of which A7, F1, F5, and R7 are all cancels. The last gathering is a half-sheet. The pagination is unbroken throughout. Why was a3 cut out? Why were the quoted leaves cancelled? Such questions are always bibliographically interesting and can obviously have textual or taxonomic importance.

The pagination is reported in the collation after the signatures. All pages that do not belong to any sequence are reported in square brackets. All inferred pages are reported in italic. The page numbers of prelim pages are generally in lower-case roman numerals. When the pages of a book are wholly unnumbered the bibliographer counts the leaves and usually gives this information either by prefixing the total with the abbreviation "ff." (folios) or by using the word "leaves" instead.

The description of the contents of the work follows the collation. It is given in a brief form indicating the range of the different sections of the work. It is more satisfactory for this purpose to use the signatures as reference rather than the pagination. There are two reasons for this. First, the signatures (especially when the devices $\pi$ and $\chi$ are used) cover the whole range of the work, whereas the pagination may not do so. Second, when there are significant anomalies, such as single leaves, odd-numbered gath-

erings, or cancels, it is important to be able to check readily what is on such leaves or gatherings. This can be checked more easily by reference to the signature than to a page. Signatures represent the way in which the work is made up; pagination is simply a sign-post to the reader. Each leaf of a gathering is numbered in sequence. Sometimes the leaves of a gathering are numbered by the printer to as much as one leaf beyond the middle of the gathering. That is to say, a gathering of four leaves would be signed A1, A2, A3, but the fourth leaf would be unsigned. But practice varies, and in time it became commoner to sign fewer and fewer leaves of a gathering. Whether signed or not, the leaves are referred to by the bibliographer as if they had been signed by the printer. The front of a leaf (that on the right side of an opened book) is called the *recto* (conventionally designated r) and the back (that on the left side of an opening) is called the verso (conventionally designated v) and, where precision requires it, these letters are added to the signature reference.

Blank pages or leaves are important bibliographically in establishing the status of editions and they are cited either in words as "C3v blank" or, more neatly, by the convenient device □ representing a blank page (devised by Nijhoff and adopted by Stevenson), thus "C3v □." It should be mentioned here that it is important to establish whether blank leaves at the beginning or end of a work are part of the sheets on which the main body is printed (in which case they should be included in the collation and contents) or leaves added by the binder (in which case they should be omitted from the collation). What goes into a contents note, and in what detail, rests with the judgment of the bibliographer. Generally speaking, it is important to transcribe, more or less fully, all half-titles (a title on a leaf preceding the title-page), dedications, copyright notices, and the like. Dates, wherever they occur, as for example at the end of a preface, are transcribed in quotation marks.

The description of plates is the next part of the description. Here it must be recognized that the majority of full-page plates that occur in a work (at least, of the 19th century and earlier) are on different paper from that used for the text or, if not different paper, on paper that is not part of the text-sheets. Such plates therefore are not included in the text collation but have their own separate collation. When collating plates, the numbers that generally appear on them are used. If they have no numbers, inferred numbers are assigned to them. The method by which the plate is made is stated. The importance of plates to a taxonomist needs no emphasis, and the reasons for quoting exactly the plate names and any dates that appear on the plate are self-evident. In Great Britain, after 1734, dates were required

to be entered on plates for copyright, but a perusal of the study of Titford's *Sketches* that follows should suffice to convince the unwary that the date on a plate is no more authoritative than the date on a title-page. Any information which may serve to distinguish a plate in one copy of a work from the same plate in another copy or a later edition of the same work is important in establishing relative priorities of the works in which they appear. For this reason the height and width of the plate-mark (the impression left by the metal plate used in engraving[5]) is given, preferably in millimeters.

The forms of artist's and engraver's signatures as given on the plates are quoted and, finally, for botanical works, a list of the plates with plate-names as given should be appended, especially if they have not been indexed or only partly indexed by Stapf in *Index londinensis*.

The bibliographical description of typography and paper offers scope for great variety of treatment. The form adopted for volume three of the Hunt Botanical Catalogue (as used in the description of Titford's *Sketches*) may best be understood by looking at a normal printed page, preferably one bearing a signature. This page will consist of a block of text (referred to as the type-page) of a stated number of lines and of a particular width or set.

Above the text there is another line of type, known as the headline (hdl.). This is generally made up of the title of the work or perhaps of the section or chapter, and the page number. The title that appears here is called the running title (RT) since it runs through the whole work, section, or chapter and therefore, in contrast to the text, which changes on every page, represents a relative typographical constant. Indeed, compositors, when building up pages of type, would leave the type of the running title standing from page to page. At the foot of the page, below the text, is the line containing the signature when that is given. This is generally referred to as the direction-line (drl.) and besides the signature it may include the volume number (in multi-volume works) and, though this is a late development, the publisher's identification number or abbreviation of the title of the work. The text itself consists of lines of type of a particular size each set apart at a particular distance and these measurements may or may not be constant throughout the book. All these features of the type-page are amenable to measurement, and differences in the measurement from copy to copy, from edition to edition, are bibliographically significant. The note on typography, therefore, is based on a particular page (or pages) of the work and gives the number of lines, followed by the measurement in

[5] Engraving was by far the most common form of botanical illustration until the 19th century.

millimeters of the height of the type-page, first without and then with the headline and direction-line, the width of the type-page (a most significant measure in establishing reprinting), followed by the measurement of twenty lines of type in millimeters, and, in parentheses, the point-size measurement of the type. These last two measures constitute respectively the bibliographer's way and the printer's way, of indicating type-size; the suggestion that they be combined in a typographic formula was first made by John C. Tarr in *The Library,* ser. 5, 1: 248-249. 1946-47. There is one difficulty here. Type may be set in lines so close together that the descender of a letter (the lower stroke of such letters as p and y) in one line may touch the ascender of a letter (the upper stroke of such letters as h and l) in the line below. Where the two letters do not fall in the same vertical it is possible to determine this by means of a straight-edge. Such type is said to be set solid. It is more common to find type in which a space is added between the lines. This is accomplished by adding thin strips of metal called leads between the lines, and such type is said to be leaded. When the type is leaded the resultant measurement of twenty lines will not give the actual size of the type-face, and it becomes necessary to estimate the size from the measurement of the height of a single line, measuring from the top of an ascender to the bottom of a descender in the same line. This minute measurement is not likely to be very accurate, but an approximation of the size will be obtained by multiplying its measurement by twenty.

To adapt Tarr's formula, these two sizes as expressed by the measurement of twenty lines are separated by a slant stroke, the smaller (type-size) first followed by the larger (leaded). The same applies to the point-size of the type. The point-size can be calculated from the measurements of lines of text, but it is more convenient to use the table provided by Tarr. The formula concludes with a description of the class of type-face. At some point in the note on typography it is convenient and advisable to provide a statement of signing, that is, a description of the actual leaves that bear signatures. Since signed leaves in a gathering will normally be the same ones throughout, a convenient symbol to indicate any or every gathering is the dollar sign ($). Thus the statement "$1, 2 signed" means that the first and second leaf of every gathering has been signed by the printer. The position of the signature in the direction-line should be indicated, and so also the position of the pagination in the headline. Finally, running titles should be quoted and aberrant versions noted.

The subject of paper, as used in book production, has played an important role in several major bibliographical investigations and is an essential part of any thorough description. A few fundamentals of paper study

require explanation. Hand-made paper (and all paper was hand-made until the 19th century) is made by a process of shredding, beating, and boiling linen or cotton rags, and drawing off the resulting pulp in a mould with a wire frame in it. By shaking this mould, excess water is removed and the remaining pulpy deposit is turned off on pieces of felt and dried. The wire frame in the mould is composed of strands of single wire at intervals of about an inch across the long axis, and strands of finer wire at very close intervals across the short axis. Since the pulp in contact with these wires is thinner than elsewhere, the pattern of wires shows up translucently in the paper. The lines across the short axis are known as chain-lines and the lines across the long axis as wire-lines. In an unfolded sheet of paper they appear just as they do in the actual wire frame, but when the sheet is folded, their direction in relation to the long or short axis of the resulting leaves will change in accordance with the number of times the sheet is folded. Thus, in a folio the chain-lines run parallel to the long axis or vertically, in a quarto horizontally, in an octavo vertically, and so on. This characteristic of paper is invaluable in identifying the format of books. All paper, until the mid-18th century, was made on a wire frame as described above, but thereafter a new kind of frame composed of a tight wire mesh came into use. Paper made on such a frame is called wove paper (as opposed to the other kind, which is called laid paper) and, since there are no chain-lines it is more difficult to identify the format of books made with wove paper.

The size of the sheet is that of the size of the mould. From an early period the variety of paper sizes was large, but was fixed within narrow limits and the sizes were given names that are still used. One of the smaller French sizes, for example, *Cloche* (predominantly a writing rather than a printing paper) measured 300×400 mm. The largest size, *Grand Aigle,* measured 700×1040 mm. and was seldom used in printing. The common printing sizes, *Royal, Carré, Raisin,* are between these extremes. These sizes have been tabulated in works such as Labarre's *Dictionary and encyclopaedia of paper and paper-making,* ed. 2, London, 1952. The size of the original sheet is determined by measuring the leaf dimensions and by multiplying that of each side by the appropriate factor, depending on the folding. In arriving at the final result, allowance must be made for trimming of the edges by the binder.

The subject of watermarks is pertinent to any bibliographical investigation. The practice of watermarking paper is ancient. Originally the mark consisted of some simple symbol or heraldic device, such as the crude representation of a bull's head (found in the paper of the Gutenberg Bible), a pot, a crown, and so on. In the course of time more elaborate marks

were developed, such as complete coats-of-arms, but the more simple marks continued to be used as well. The translucent watermark that appears in paper is the product of a twisted piece of wire "sewn" to the wires of the frame by finer wires. The position of this mark originally was normally in the center of half of the sheet, and apparently was so-placed to produce the watermark in the center of a folio leaf. This position was not invariable, however, and depending on locality and period, marks are found in the center of the whole sheet, at one end of the sheet, along an edge, or even in the corner. In time, a second mark, called the countermark, was added and, in normal position, is placed in the center of the half-sheet unoccupied by the main mark. The countermark generally consists of the maker's name, initials, and/or year of manufacture. In France by decree after 1741, and in England by custom after 1794, the year appeared in the watermark. Such dates can give only limited aid when resolving questions of dating a work in which they appear. They provide only an anterior date before which the book or a specific part of it cannot have been printed; but even this information can often be of great value. The example of Titford's *Sketches,* in the paper that follows, provides an instance of the use of watermarks to establish printing priorities.

The binding of a book is usually of much less importance in bibliographical studies, but, in the absence of other evidence, it can sometimes throw light on the date of printing. The note on binding should provide, in addition to a description of the material used in the binding, a note on the decoration or lettering of the sides and spine, information about the state of the edges (whether cut or uncut, gilt or colored, etc.). The endpapers should be described, together with any other leaves inserted by the binder that do not belong to the printed sheets. Inscriptions of ownership or presentation, bookplates, manuscript notes, and the like should be quoted or described, and be identified if possible.

SUPPLEMENTAL REFERENCES:

BOWERS, FREDSON——*Principles of bibliographical description.* Princeton, 1949.

DUNKIN, PAUL S.——*How to catalog a rare book.* Chicago, 1951.

MCKERROW, R. B.——*An introduction to bibliography for literary students.* Oxford, 1927.

STEVENSON, ALLAN——"A bibliographical method for the description of botanical books." In, *Catalogue of botanical books in the collection of Rachel McMasters Miller Hunt,* 2 (1): cxl-ccxliv. Pittsburgh, 1961.