page xi it is stated that "these illustrations constitute a pictorial history of American mathematics through 1850 on a scale that has not before been attempted with any similar group of American imprints." While mathematical history and mathematical bibliography have much in common their fundamental objectives usually differ widely, and the present work is a bibliography as its title clearly indicates.

A difference between the objectives of a mathematical history and a mathematical bibliography was stated emphatically by the well-known former writer on the history of mathematics, Moritz Cantor (1829–1920), at the International Congress of Mathematicians held at Paris, France, in 1900 and reported in the *Bulletin of the American Mathematics Society,* volume 7, by Charlotte A. Scott (1858–1931), then at Bryn Mawr College. In passing over many minor writers on the subject he remarked "tous aussi morts que leurs livres; gardons—nous de les ressusciter." Probably most historians of mathematics would not be in full accord with this dictum, notwithstanding the great reputation of its author. On account of the vastness of the material with which the modern mathematical historian has to deal it frequently becomes necessary to confine the attention at first to what appears to be most important, and in doing this the first thousand mathematical works printed in America would usually not receive much attention.

While the work under consideration lists only about one thousand different publications without counting different editions of the same work, when these are counted the number of the listed publications is nearly three thousand. As might be expected most of them are text-books which were usually based on more extensive and in most cases better foreign publications. It is interesting to note that the early Spanish publications usually deviated more from their source material than those which appeared in the English language. The earliest work noted is the "Sumario" by Juan Diez Freyle, which was printed in Mexico in 1556 but is much inferior to the well-known "Ars Magna" published by the Italian mathematician, H. Cardan, about eleven years earlier. Various other earlier European mathematical publications are also superior to this earliest known mathematical work printed in America.

In an appendix the author deviates from the title of the work under consideration by treating briefly native American mathematical developments (pp. 607–611). These native developments are much inferior to those made by the Babylonians more than three thousand years before Columbus discovered America. In particular, the Babylonians solved at that early date certain quadratic equations in the sense that they found at least one root of such an equation by methods which are still being used by our high-school students. Much has been written about the ancient Mayan and the ancient Peruvian mathematics, but most of this relates to their methods of representing numbers and exhibits very little mathematical insight in comparison with much older developments in Babylon and in Egypt.

While this volume revives many authors who were as dead as their books it will doubtless be welcomed by the librarians and also by many others who are interested in the early development of mathematics in our country even if the destruction of all these books would not diminish materially our mathematical knowledge. Many will find pleasure in verifying for themselves the lack of originality in the material of nearly all these works and will thus be more impressed by the very slow growth of our modern mathematical knowledge. The abstract form of this knowledge has become so widely useful in our age as a result of the great scientific advances which have demanded continually greater brevity in our statements as regards exact situations.

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PRACTICAL SUGGESTIONS FOR REDUCING THE LABOR OF INDEXING A TEXT-BOOK

INDEXING is an individualistic task which varies with the type of book concerned. While there are no fixed rules, the general principles outlined in this article may be found of assistance to medical and other authors who wish to index their own texts.

Indexing technique must be flexible and allow expansion and rearrangement of entries in order to allow re-use of original drafts of entries when preparing the index of a revised edition. Since each entry must be separable, either individual slips of paper or file cards are customarily used for each entry. The use of letter size sheets of paper each ruled horizontally into four sections—one section for each entry—reduces the number of insertions required in typing.

The selection of subjects and of index entry words requires judgment based on knowledge of the subject, and is improved by some knowledge of indexing. Words which are to be used as leading words of index entries should first be checked *by the author* on the printer's page proof of the text. When the desired leading word does not occcur in the text, it should be written in the margin of the page proof at the proper place.

In deciding upon subjects to be indexed and wording of entries, the author must take into consideration whether the book and index are for the general reader or for the expert. He must also decide whether to

make descriptive entries or whether to compile simply a skeleton type index. The subject of the text itself should not be used as an index entry heading. Capitals should be used sparingly. The page number should be preceded by a comma and should follow the last word of each entry without intervening spaces.

After entry words have been checked by the author on the page proof of the text, an assistant may complete the task of indexing.

Subheadings in a group of entries having the same entry word must be arranged alphabetically. It is difficult to alphabetize subheadings which inadequately describe the entry word. When impossible to alphabetize such subheadings, they may be arranged in progressive order of page numbers.

The complete entries drafted from the entry words checked on the printer's page proof of the text are typed in consecutive order on the quarter-ruled letter size sheets. Each sheet of four entry slips should be numbered consecutively in the upper right-hand corner. A carbon copy of each sheet is preserved intact in original consecutive order. These carbon copies obviate the necessity for rearrangement of the original entry slips from alphabetic back into consecutive order in making a revised edition of the text and index.

On a photographer's cutting board several quarter-ruled sheets at a time are cut into their four separate slips each bearing a single entry.

The cut slips are then sorted into alphabetic order, first according to the leading letter and later according to the second and third letters of the first word of each entry. Alphabetic arrangement is based only on the leading word of each entry. The word which follows the leading word does not form an entity with the latter for purposes of alphabetizing. A compound word is, however, treated as an entity.

The individual slips are then edited and revised. Whenever several entry slips bear identical entries, the page numbers of these are entered in consecutive order upon a single entry slip and the superfluous original slips discarded. Groups of entries having the same entry word are then arranged alphabetically in indented setting, eliminating repetition of their entry word. Cross references are made on blank entry slips and inserted wherever necessary. Errors in alphabetizing are then corrected.

Individual entry slips, arranged in the order in which they are to appear in the index, may be numbered consecutively in the upper left-hand corner of each and sent in slip form to the printer. It is not necessary that they first be pasted upon sheets of paper in their consecutive order, or that they be typed again into a regular manuscript of the index.

Each entry in the printer's galley proof of the index must be checked against the page proof of the text. There is no short cut or substitute for this final recheck.

Index page proof should first be read through for verification of alphabetical order of entries. On the original entry slips ditto marks were used for groups of entries having the same entry word. A second reading is necessary to make sure that none of these ditto marks have been retained as column headings in the page proof of the index. When division of such groups is carried over from one column to the next, the entry word (without page number) should be repeated at the head of the new column.

Insertions in the text of revised editions will render incorrect the page numbers of many of the subsequent index entries. The carbon copies of each sheet of four entries preserved intact in original consecutive order of page numbers are compared with the page proof of the revised text. Where necessary, new page numbers are then assigned to the previously drafted entries. From this point on, the indexing of the revised edition is similar to that of the original.

The method described in this article makes re-drafting the bulk of the index entries in a revision of the index unnecessary. It also avoids the necessity of taking all the previously alphabetized entry slips out of alphabetic order and rearranging into their original consecutive order to permit these drafted entries to be used again in the index of the revised edition of the text.

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THE INCIDENCE OF HYDROGEN SULFIDE AT KILAUEA SOLFATARA PRECEDING THE 1940 MAUNA LOA VOLCANIC ACTIVITY

PERIODIC analyses of the solfataric gases at Kilauea have been carried out by the writers over a period of two years, with the purpose of determining whether there is a correlation between the constitution of these gases and volcanic activity in Kilauea. Since the lavas of this volcano and of near-by Mauna Loa volcano are known to have the same origin, it was felt that there might also be found a relationship to periods of Mauna Loa activity.

Aside from steam, which is the predominant gas, Kilauea solfataric gases were found to be composed of 85 to 98 per cent. carbon dioxide, 1 to 15 per cent. sulfur dioxide and approximately 1 per cent. air. There have been irregular variations in the sulfur dioxide-carbon dioxide ratio during the two-year period, and no eruption of either volcano has occurred.

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