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THE BERLIN COLLECTION

BEING A HISTORY AND EXHIBITION OF THE BOOKS AND MANUSCRIPTS PURCHASED IN BERLIN IN 1891 FOR THE UNIVERSITY OF CHICAGO BY WILLIAM RAINEY HARPER WITH THE SUPPORT OF NINE CITIZENS OF

· CHICAGO ·

THE JOSEPH REGENSTEIN LIBRARY. APRIL–OCTOBER, 1979

The publication of this catalogue
was made possible in part with funds given by
The University of Chicago Library Society.

Cover illustration:
Joachim von Sandrart
Des Alten und Neuen Roms Grosser Schau-Platz
(item number 60)

Library of Congress Catalog Card Number 79–84896
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Design by Lynn Martin

PREFACE

This volume celebrates an early event in the history of the University of Chicago. The event is described in a short narrative which tells as much about the atmosphere surrounding the founding of the University as it does about a number of books which moved across the Atlantic from Berlin to Chicago. But it is the books which are our primary concern. They were at the core of the Library's collections and have had an abiding influence on the course of scholarly investigation at the University as well as on the growth of the Library.

The books selected for exhibition were the result of a long process. There is no complete or partially complete list of books in the Berlin Collection, so the books had to be rediscovered, and it soon became a matter of reducing many worthy examples to a manageable number. While we wished to present some of the outstanding individual works and those which have a visual charm, we also hoped to select representative works which give the collection its underlying strength. These latter works are rarely on exhibit, and when seen they are usually in the hands of the solitary scholar in the reading room.

The books in this collection are formidable ones, and it is impossible to take them lightly. Their vast range also challenged the succinct requirements of this catalogue. The difficult task of selecting, researching, and writing the descriptions for the books represented here went to Glen A. Hayes, a graduate student in the Department of History of Religions, who probably received a part of his education he never envisioned. We hope his contact with Reuchlin, Valla, Lipsius, Heinsius, Montfaucon, Wolff, Buffon, Humboldt, and all the others will stand him in good stead. Ann Koopman delved into the University Archives to establish many of the facts regarding the purchase. Edith Brinkel, the Library's Exhibition Coordinator, guided the exhibition and this catalogue to fruition keenly aware of her responsibilities both to the books themselves and their audience. Lynn Martin's design of this catalogue captured the spirit of the whole with artistic appropriateness. They were all very patient with the writer of these words.

Even though they are now part of history, we also have to thank William Rainey Harper for his entrepreneurial zeal and the nine donors who made the purchase possible. They provided the genius and the means to allow a great library to begin its course.

Robert Rosenthal
Curator
Special Collections

April, 1979

THE BERLIN COLLECTION
A HISTORY

ON July 30, 1891, William Rainey Harper completed his first month as president of the University of Chicago, an institution which had yet to construct a building on its newly acquired campus on the city's south side. The University was not to open for another fifteen months. There was faith that there would be time to raise the money, build buildings, and recruit faculty and students, but in the meanwhile Harper, his wife, their three children, and a small group of Yale students set out for Berlin.

This voyage was not unlike the only other Atlantic crossing Harper had made three years earlier. Both trips were urged on Harper as a way of preserving his health and renewing energy which he recklessly expended. Besides completing his teaching at Yale, Harper had been maintaining a preposterously heavy schedule of public lectures. Ever since his nomination for Chicago's presidency he had been forced to defend himself from criticism by orthodox Baptists while attempting to move John D. Rockefeller and the University's Board of Trustees to create a full-fledged university rather than a modest college. At the time Harper submitted his resignation to President Timothy Dwight of Yale in February, Frederick T. Gates advised John D. Rockefeller that "Dr. Harper is overworked, worn out, physically sensitive and weak in proportion." When Harper accepted the Chicago presidency shortly thereafter, Rockefeller himself admonished him to "have a rest at the earliest moment possible."

As Harper readied himself for the trip, Gates' misgivings increased, and he poured out his frustrations to Rockefeller:

> I cannot persuade myself that Dr. Harper's methods of employing his time have been or promise to be for the highest good of the University. I believe he should abandon his lectures, decline Chautauqua, throw off every outside engagement, and concentrate every energy on the direct upbuilding of the University. . . . I urged him strongly to drop the European trip for the present. He yielded far enough to curtail it.

Harper agreed to return to Chicago by October 15, but only after Gates had exhausted "every reserve and [strained] my personal relations with him." Within hours of embarking, Harper fired the final shot in this skirmish:

> Meanwhile, as indicated to you in my last words, I have accepted the proposition

> subject to the condition named, which is that, should the condition of my health or the character of the presidential duties seem to demand it, at the end of one year I shall be free to resign my position.

If Harper left New York harbor feeling chastised by Gates' insistence on an early return, he remained eager to visit the German universities and to meet with their leaders. There was also the possibility of seeking out recruits for his new faculty. Finally, he had his Yale students, especially James Harvey Breasted, who had been engaged to tutor Harper and his family in German. Although gifted in reading written language, Harper, by his own account, "hadn't the slightest ear for spoken language."

He was not unmindful that the new University would require books and that Berlin would be an excellent place to look for them. There were forty-thousand volumes on hand in Chicago, the legacy of the defunct "Old Chicago University," and collections which would come from the Baptist Union Theological Seminary in Morgan Park, soon to be transformed into the University's Divinity School. An assistant librarian, Mrs. Zella Allen Dixson, had already been engaged to operate the library and to implement Harper's scheme for departmental libraries. Some donations of local collections were in the offing, but it was obvious that these would hardly satisfy the demands of the research faculty which Harper was assembling. A large number of books at the University would be one way of forcing the issue of providing a building to house them. Harper was not unaware that books would legitimatize the University's broad commitment to education as well as cast an aura of scholarly respectability over the whole enterprise.

Upon their arrival in Berlin toward the middle of August, the Harpers settled in an apartment on Lützowstrasse, below the Tiergarten and perhaps a mile or a mile and a half from the Unter den Linden. Not far off was the American Church at Motzstrasse 6, a likely place for the Harpers to worship. Its minister was John Henry Stuckenberg, a liberal, evangelical Lutheran, and like Harper a native of Ohio and an erudite churchman. It was the Reverend Dr. Stuckenberg who, perhaps after learning of Harper's ambitious plans for the University, called Harper's attention to the large body of books which were available for sale at Unter den Linden 17, the address of the venerable bookselling firm of S. Calvary and Company.

S. Calvary and Company was owned by a seventy-five year old bookseller, G. Heinrich Simon, who had been hoping to sell the firm following the death of his brother and partner in 1885. The brothers had taken over the firm from Dr. Frederick Spiro who had founded it in 1852 with Dr. S. Calvary. Calvary died a year after its establishment, and Spiro sold out to G. Heinrich Simon in 1863. Simon and his brother continued the scholarly tradition of the firm, combining publishing with the sale of antiquarian and second-hand books. The firm supplied scholarly collections in Europe and North America, making its reputation in the fields of classical philology, archaeology, and the natural sciences. Its antiquarian book catalogues covered many subjects, including oriental literature, linguistics, zoology, and botany. The firm's wide reputation was also based on "Calvary's Philologische und Archaeologische Bibliothek," known more popularly as "Calvary's Library." From 1872 until 1894 this series grew to 114 inexpensively priced volumes, including specialized works by Niebuhr, Humboldt, and others, as well as editions of the classics. It also published the proceedings of the Berlin Royal Academy of Sciences and those of the Historical-Philological Society of Breslau. Simon was known for his collection of German doctoral dissertations, it being said that he had something like 150,000 of them. But the firm's reputation had declined with Simon's advanced age. It was time to sell, and an *en bloc* sale would be an ideal solution.

Within two weeks of his arrival in Berlin, Harper received from Simon an offer for the entire contents of the Calvary stock, which was stated as containing 300,000 volumes and 150,000 pamphlets. The large scale no doubt appealed to Harper's sense of enterprise, for never before had an American university acquired so many books at one stroke. He could also see the Calvary books as part of the strategy that would be necessary once he returned home. He would not only have to confront the unrelenting eye of Frederick Gates and the high expectations of the denomination, but he would also have to enter immediately into a fund-raising drive that would literally create a campus and get the University started within a year. Harper saw beyond the books to the attention which they would draw to the University. If a splash were needed, here was an opportunity to make one.

Simon's offer of August 23 was not perfunctory. It smacked of a teutonic

thoroughness and bookselling hyperbole, although it was far from detailed considering the number of books apparently involved. The proposal categorically states that the stock of S. Calvary and Company contained 300,000 volumes and 150,000 pamphlets with strong holdings in philology and the philosophical sciences. For "certain branches of classical philology and principally in classical archaeology the stock forms the richest existing library in the library world so that it is superior to the British Museum and the Royal Library in Berlin." Thereafter, the nine-page account divides the stock into fourteen subject categories, and for each of these are listed the number of volumes, the estimated value, and the "value of our inventure," or inventory. Simon began his description with two hundred manuscripts having an estimated market value of 50,000 marks and an inventory value of 10,000 marks. He noted that the greater part of the manuscripts came from the library of Pope Pius VII and included such "treasures" as three autograph letters of Raphael, the original manuscript of Abbé Rancé's work against Mabillon, an unpublished work of Friedrich von Schlegel, and a fourteenth-century Book of Hours "with unknown French poems illustrated by an artist of the early Burgundian school." There was enough here to whet the interest as well as to raise questions.

Simon's methodical description proceeded through palaeography (2,000 volumes), periodicals (25,000), Greek and Roman archaeology (80,000), Greek and Latin classics (80,000), Greek and Latin authors of modern times (3,000), Greek and Roman philology (2,000), general linguistics and Orientalia (2,500), modern languages (4,000), history, the "auxiliary" sciences, and varia (3,000), art, including a collection of illustrated works (1,000), philosophical sciences (6,000), natural history (6,000), and, in the end, 150,000 dissertations and programs. Interspersed with these figures were lists of bookish information: "Middleton's book on Cyclopean walls in Italy which Professor Norton has found only one copy of in the United States—no copy in the British Museum"; "a unique set of Lafreri's *Speculum Romanae magnificentiae*"; "perhaps one of the richest libraries in existence of Greek and Latin classics . . . embracing all the best editions of all the classics," and so on through the fourteen categories. The letter was heavily laced with inducements which were sure to snare the imagination: "one of the four known copies of Goethe's dissertation," "an unknown

poem of Schiller," "the important *Denkmahl aus Aegypten* in twelve folio volumes in a subscription copy," "a rich collection of Petrarch, even several works missed in J. Fiske's celebrated collection," "a copy of the astronomies by Aldus with hand notes by Aldus himself," and on and on.

The canny Simon began his letter with the price:

> The market value of the stock after catalogue prices is between two and three million marks, we have fixed the price to 230,000 marks, the approximate price of our last inventory which gives the prices paid by us for the books with deduction of ten per cent for all the books which have passed once the inventory, the price paid by us is over 245,000 marks.

He concluded his letter by referring to the sale price of the dissertations as "calculated nearly as waste paper."

It was Harper's turn to act, and this he did by attempting to confirm both the content and the value of the books at Unter den Linden 17. He also had to look ahead to securing purchase funds. A potential donor and the University trustees would require confirmation, and for this he turned to two librarians at the Royal Library in Berlin.

The testimony of the two librarians, Dr. M. Blumenthal and Dr. R. Münzel, was given in a document written by James Breasted with a single emendation by Harper. Harper used this document, dated September 9, 1891, in his later representations:

> The statement herein contained is made by the undersigned after careful examination [last three words in Harper's hand] for recommending in the following particulars the collection of books known as the S. Calvary Buchhandlung:
>
> 1. It is such a collection of books as would require many years, incalculable pains, and many thousands of dollars to bring together again, and therefore;
>
> 2. Is one not to be found for sale once in a century.
>
> 3. It contains one of the largest and most complete collections of periodicals to be found anywhere in Europe.
>
> 4. It contains a file of Academy Journals unsurpassed by any in Europe and possesses some complete sets not found elsewhere.
>
> 5. It contains an extraordinary rich and valuable collection in classical philology including *some very rare copies*.
>
> 6. It contains one of the richest collections in classical archaeology to be found

anywhere, including some works *not found even in the Royal Library of Berlin* and *the British Museum.*

7. It contains one of the largest collections of dissertations and pamphlets in Europe which would be *entirely unique in America.*

8. It contains in general many rare and unique works many of them *not to be found elsewhere.*

9. Finally, we regard this library at the price named (180,000 marks) as an exceedingly rare and valuable opportunity to place in America such a collection of books as has never gone there before and will be to the University of Chicago an acquisition of inestimable value.

There is no account of the procedures followed by the two librarians but their role appears to have been perfunctory. Their document was in part based on Simon's proposal of August 23, embellished by Harper. The new price of 180,000 marks was apparently the result of further bargaining.

Confirmation of the collection's value was also secured from Hugo Bloch, the manager of a branch of Koehler's Antiquarium, also on Unter den Linden. Harper turned to Bloch as an expert from within the antiquarian book trade, receiving from him a four-page document extolling the virtues of the collection for Chicago. Bloch began by stating that "the library offered to Prof. Harper from Dr. Simon is one of the best and richest I ever have seen." Thereafter, he enumerated highlights and special features. "The monetary value of the palaeographical collection," he wrote, "can scarcely be estimated;

> I never have seen a similar one and the largest libraries of Europe or America might envy the Chicago University Library if this precious treasury gets into its hands; if I only take out a few works, such as the Bastard, Lafreri's *Speculum* (the most complete copy perhaps in existence) and about 3 or 4 others, the monetary value of them alone would amount to at least 30,000 M, if I altogether suppose that such fine copies as the mentioned works really are, can be estimated at all: But in this perhaps richest of all departments are so many works of the highest value that it would be a vain attempt to appoint even only the most important ones; I estimate the selling value of this department alone at at least 180,000 M.

In effect, Bloch was suggesting that the market value for this segment of the collection equalled the price for which the whole was being offered. He thought that

the "real value of the whole collection will surely attain one and a half million marks" and concluded his account with the following:

> I could only congratulate Prof. Harper and the Chicago University Library for this very fine and most profitable purchase and if they would spend still another $15,000 for filling up the few deficiencies they would surely possess a library which would not fail to attract the students from every quarter.

Harper also sought the assistance of Richard Mead Atwater, an alumnus of Brown, studying the technology of the German glass industry.Atwater, whom Harper may have met at the American Church, was the source of suggestions for possible appointments at the University, especially in chemistry. This interest, combined with his personal interest in books, led to his involvement. On September 9, Harper wrote him:

> I am sorry not to have seen you again. The fact is that my time, day and night, has been taken up with the Calvary Library. The matter is finally settled. I shall see you before leaving Berlin for good and tell you the details. I may say that the price is less than 180,000 marks without duplicates. The royal librarians say that the contract is unique and most advantageous. Will you not write me a letter emphasizing the opportunity, and the value in general, the desirability of having such a library in America.

Within two days Atwater responded, taking some credit for bringing the collection to Harper's attention as well as praising G. Heinrich Simon:

> I have your note of the 9th and am very glad to learn that you have settled satisfactorily the terms for the Calvary Library. I am glad that this noble collection of books will go to America, and with a little twinge that it did not occur to me to get it for Brown. I am glad that it goes to Chicago, and that I had a little hand in the matter in bringing it to your notice. It was a pleasant return for the very satisfactory way in which Herr Simon has done my book business. He is an ideal merchant, of the highest standard of honor and of personal interest in the specialties of his customers. You will find him a valuable correspondent in the future and he will act for you in his special lines in the future development of your library. I take it for granted that the Library is yours, assured that your friends in the Corporation will not hesitate in the matter. It would I think be a great mistake to lose the Library for your University.

Within a week of this exchange with Atwater, Harper received the formal offer from Simon. Although the document, dated September 14, had been the result of discussions between Simon and Harper, many crucial issues were left poorly defined. This carelessness would cause grief for the firm as well as for the University in the immediate months and years to come. It is not known what passed between Simon and Harper in their direct discussions, but the first of the contractual terms stated that the price of the collection or stock was 230,000 marks with duplicates, or 180,000 without duplicates. Unfortunately, duplication was not defined and eventually there would be dispute between them over the word's precise meaning. The second stipulation was equally vague. It stated the number of volumes in the collection to be 350,000 or 280,000 without duplicates, while the number of dissertations and programs was 150,000, or 120,000 without duplicates. These round numbers were without trustworthy supporting documentation. In anticipation of possible adjustment it was stated that "should the number fall short of this number, deduct a proportional sum of 20 pfennig a volume for books and 5 pfennig for dissertations and programs." The conflict which developed out of this vagueness was the method of counting and what in effect would constitute a "volume."

The proposal makes fourteen additional stipulations. Harper had until November 1 to accept the offer, which would give him two weeks to find funding upon his return to Chicago. Payment was to be made in three parts, one half on January 1, 1892, and one-quarter portions each on January 1 of 1893 and 1894, with an interest charge of five per cent after the first payment. If the offer were accepted, the University would have storage space rent-free until February 1892, when a charge would be made at the rate of 500 marks a month. There were provisions for securing additional scholarly periodicals and for the packing and binding of the books, as well as for the compilation of a list of all the books purchased. There was also the vague stipulation that Calvary would "sell no books belonging to the collection between this date and Nov. 1, 1891, except duplicates, and keep an account of such sales, the sums of which shall be deducted in case the duplicates are purchased."

While en route to England and Chicago, Harper received word in Paris on September 23 that all was not as it should have been at Unter den Linden 17. Atwater

apparently informed him of activity around the Calvary book stock which was supposed to have been suspended pending the University's decision. Harper immediately wired Atwater:

> Please visit Doctor Simon or his clerk. Say I have received word that the library is being tampered with. Obtain evidence that this is incorrect. In any case telegraph facts immediately to Hotel Binda. Perhaps will sail Saturday.

Atwater responded the same day: "Am investigating. Hope to report facts tomorrow."

On the next day Atwater, along with the Reverend Dr. Stuckenberg, wired Harper that their investigation did not confirm his suspicions. As a precaution against loss they recommended that the librarian Blumenthal be asked to compile a list of 3,000 random titles from the stock without Simon's knowledge. But Harper had made other plans for safeguarding the University's interests.

Harper now engaged Hugo Bloch to act formally as the University's agent in the matter. He also recruited James H. Breasted and Charles Chandler, both of whom were to join the University faculty. Breasted had remained in Berlin to take classes at the University of Berlin while Chandler had already been hired as a professor of Latin. The two would become Harper's most reliable informants about the status of the Calvary stock.

Soon after his departure from Berlin, Chandler wrote a detailed letter which described the chaotic state of the Calvary stock and his attempt to make some sense of it. A Mr. Noltenius, apparently the principal clerk, had begun to make lists but said "that no one can say just what is on hand." The partial catalogues which existed were inadequate, and "Mr. Simon's additions are in a hand so minute and irregular that neither Noltenius nor myself can make out all the words." The stock was in great disarray, and he noted that "someone must have been outrageously careless with some of the finest works." But Chandler continued that it was "a great pleasure to dig around such a collection, though the work is awfully dusty and tiring; once in I am obliged to stay until evening, for I am too black to go upon the street by daylight."

While calling attention to some of the important individual works he came upon, Chandler also commented that he was not finding the large, illustrated publications of

museum collections that he expected to locate. Yet he was still stunned by the "bewildering richness" of a place "full of treasures and surprises."

He was quick to identify the problem of the duplicates which had been so lightly passed over in the proposal for the sale. This issue probably confused Harper further as he made his way back to America. "By the way," Chandler asked

> are you sure that you and Mr. Simon are at one in your understanding of the word duplicate? In the strict sense of that word there are few duplicates,—very few I think—among the rare and valuable books; but in the ordinary sense of the term, there are many duplicates and triplicates of valuable works, and it would be the greatest pity not to have duplicates and triplicates. Do you understand to the certainty what Mr. Simon's idea in the matter is?

Further news of the collection came while Harper was attending the meetings of the Baptist Union of Great Britain in Manchester. Breasted informed Harper of Bloch's astonishment when he had received Harper's letter raising the question of possible tampering with the collection by Simon. Bloch and Simon were not friendly, Breasted reported, and he doubted that they were in collusion. Bloch had demanded the installation of a telephone on the Calvary premises so that he could be in closer contact with the collection.

In the meanwhile, Harper, in partial justification for all this activity, wrote Gates that "I shall be able to show you that my time has been given almost exclusively to University matters. You can't understand how I have grown. I am almost ready to pledge myself to spend six weeks abroad every year."

On the day Harper embarked from Southampton, Chandler wrote an encouraging letter which would reach Harper in Chicago. He said that while the treasures of the Calvary stock are apt to be overestimated by librarians and collectors, the "substantial value of the collection lies in its astonishing richness in standard editions of all degrees of rarity." In a burst of enthusiasm he wrote that "here is a glorious opportunity for Chicago, the likes of which is extremely unlikely to occur again in our times, if ever. . . . To get them all at once would be a brilliant thing for the new University, and would give great éclat to its library, as soon as the value of the acquisition becomes known." As further encouragement for Harper he added that the price without the duplicates was regarded as "very low."

While still in New York, Harper made his first move to secure the purchase price of $45,000 (or 180,000 marks) for the Calvary books. It would have been tactless to approach John D. Rockefeller but why not his younger brother William? William was wealthy in his own right, although not known for his philanthropic impulses. The plan was to approach William with the help of President Faunce of Brown, an old friend and ally of Harper. A request for a meeting received an immediate rebuff—Rockefeller would be happy to see Faunce and Harper if the call was to be of a "social nature," but if it were for a "business chat," Rockefeller asked to be excused.

But Harper showed no reticence in the letter he sent to William Rockefeller. He gave a recent history of the collection and the opinions of the various experts he had enlisted, closing his remarks with "a few important facts:"

1. The purchase of the library would be one of the greatest book-deals ever made, and would produce a profound impression in the literary world.

2. Its possession would place 200,000 valuable books in the West which cannot be found there now, many of which cannot be found anywhere in America.

3. Its possession would give the University of Chicago, *at once,* a library which would stand favorable comparison with the best in the land.

4. Another such opportunity will not come in a century.

5. It would take 20 years, and the cost of this collection in salaries alone, to obtain it.

6. The price is undoubtedly a small one, and the terms of payment easy. 10,000 volumes might be selected worth the amount named.

7. Its possession will compel at once the erection of a building to house it.

8. Since leaving Berlin, I have been informed that a Mr. Loeb (of a Jewish banking house) has offered the sum named to be paid November 2 if we cannot make the necessary arrangements.

9. I am to make an effort the coming winter to raise $500,000 to $1,000,000 in Chicago for buildings. This is all we can reasonably hope to do in Chicago, and it is felt that nothing should be allowed to interfere with this effort.

10. The collection, one feels, ought to be the purchase of one man, bear his name, or such a name as he may designate.

11. In addition to the $45,000 for purchase, the sum of $5,000 will be needed for completing to date certain portions of the library; $5,000 to $10,000 for binding and $5,000 for packing and shipping.

Harper's plea fell flat. Rockefeller's telegram simply stated: "It will be impossible for me to do anything as indicated in your letter of the 19th."

Undismayed, Harper headed for Chicago while Gates wrote John D. Rockefeller about "Dr. Harper's great library scheme, and the apparent promise. Dr. Harper is making manful attempts to carry it without appealing to you, and I am inclined to think he will succeed."

On October 27, five days after returning to Chicago, Harper placed the whole matter before the Committee on Organization and Faculties of the Board of Trustees. The Committee recommended "that the Board purchase the Berlin Collection in accordance with the terms proposed by Dr. Simon, in case the purchase money, $45,000, is subscribed and that Koehler's Antiquarium be made the agent of the University in making the purchase, and packing and shipping the books." This text of the resolution contained the first use of the name "The Berlin Collection" for the Calvary books.

The resolution was accepted by the Board of Trustees on the same day that they appointed Harper "to conduct further negotiations and conclude the business." To Harper's jubilation, the money was quickly secured from members of the Board. Always hoping for Gates' approbation, Harper immediately wired him in New York: "Rust, Ryerson, Hutchinson, Kohlsaat, and others subscribe the necessary money, Hallelujah." Goodspeed waited a day to give Gates further details. "I have only a moment to write. Rust began the subscription with $12,000. Kohlsaat followed with $6,000, and Ryerson and Hutchinson assured the rest. Walker said, 'No. I want to secure a scientific building.' And if we can get the Academy of Science Collection, he is pledged to see a $50,000 wing of the Collections building go up. He will give or get the money."

Beyond Goodspeed's account of the event there is only one piece of unsubstantiated evidence concerning the subscriptions for the library, and that is an undated document titled "Calvary Library" which is divided into paid and unpaid subscriptions. The paid subscriptions were listed as Martin A. Ryerson, $11,250; H.H. Kohlsaat, $5,988.28; C.L. Hutchinson, $1,000; Byron L. Smith, $1,000; A.A. Sprague, $1,000; C.H. McCormick, $1,000; and C.R. Crane, $1,000 for a total of $22,238.28.

The unpaid subscriptions were listed as H.A. Rust, $11,250; W.R. Harper, $5,625; and C.J. Singer, $1,000 for a total of $17,875. All the above names with the exception of Harper's are listed as donors on the collection bookplate and elsewhere.

The next day, Goodspeed described the excitement at the Board meeting including Edward Ayer's declaration to give his Indian collection to the University. "All this," he explained to Gates, "has come directly out of the library effort. I feel even more satisfaction in this because it is the consummation of the movement you and I inaugurated two years ago. As Harper says, the work was really all done. It only needed the library incident to bring everything to a point and a conclusion." Harper had correctly perceived the effect of the Calvary books. The purchase and its consequence did not fail to move Frederick Gates, who wrote to Goodspeed: "I have written Mr. Rockefeller the details, and added some hopeful words about the entire situation. Things are moving, and now the momentum gained will make the triumphs easier . . . I am serenely happy over the whole situation. . . ."

With the money pledged, Harper immediately wired Simon that his offer was accepted and that Hugo Bloch was to act as the University's agent. The deadline had been met. There was also a full measure of publicity.

The day after the Board's action *The New York Times* had it as a first-page story under the headline, "A Valuable Library Bought, the Treasures Secured by the University of Chicago." Calling it "one of the largest book deals ever consummated in America," the story contained the long run of figures covering the collection's contents. "The price paid for the library is not made public. The catalogue price is between $600,000 and $700,000, and the estimated bookseller's price $300,000. Those who profess to know say that there are 15,000 volumes in the library worth the purchase price." This information would have come directly from Harper. The news quickly spread across the country.

Two days after the Board's vote, Harper had a letter from William G. Gale, whom he was attempting to lure from Cornell as professor of Latin:

> The newspaper announced the purchase of the library mentioned in your letter. You have accomplished the incredible. And the manner of the doing of it is a most hopeful omen; for you have touched the heart and opened the purse of Chicago.

> From another aspect the purchase is most happy. The library has been collected from a standpoint wholly nonutilitarian. You have interested businessmen in precisely those things which the atmosphere of Chicago would seem unfavorable to. Whoever may go to you in Latin, I am glad your start has been precisely of this kind.
>
> Now you will need a library building. You, and your architect, should see ours at Cornell, just completed. It has some grave faults, architectural and otherwise. And yet it is the best building of its kind in the country and wonderfully cheering and inspiring. In itself alone, it is one of the strongest inducements to hold a professor here.

A dour view of the acquisition came from E. Nelson Blake, president of the Board of Trustees, who wrote from his home in Arlington, Massachusetts:

> I saw the Associated Press account of the library purchase, also the "Inter Ocean" account of the library in Wednesday's paper. I am *very* sorry that some outsider could not have been induced to aid you to *that* extent on *that* exclusively, for *all* taken from such friends as those four, lessen the am't from *them* for buildings, which are so essential just now. I know and fully appreciate all that can be said in favor of the purchase, I know it was a chance of a life-time, but you can not have everything at once, and you must have the buildings. The great reason in favor of the purchase after all is the reputation it will give us everywhere, in connection with our other puffs, and the important lever of success may make you invincible in your soliciting for buildings, but the coming of the new library makes the library building almost a necessity.

Writing a few days later, Blake noted that the purchase had created a great stir on the Pacific coast, but he was still concerned that it might dry up sources by "causing people to think that we are sufficient for all our needs."

John D. Rockefeller congratulated Harper. In the happy glow of success, Harper wrote to Gates that "the sentiment of the city is thoroughly aroused by the library business. Everybody is pleased about it. The testimonies concerning the value of the library are coming in every day; e.g. Gunsaulus, who knew its contents perhaps better than I myself did, from men all over the West and South who know the collection. The editorial in the *Boston Herald* Monday morning sets us up at great rate. I think the moral effect of the library is worth very much more than the cost of it."

While Harper basked in public acclaim, the problem of physically securing the collection quickly became complicated. The arrival of Harper's wire accepting the Calvary offer caused an immediate retreat by Herr Simon. "It seems," he wrote Harper, "that there will be no more than 120,000 volumes of books and 80,000 dissertations" instead of the contracted 280,000 volumes and 150,000 dissertations. Heinrich Simon beseeched Harper for understanding, but Harper not only had his obligations to his donors, who were looking over his shoulder as his trustees, he also had seen to it that the larger figures were known across the country. Despite the awkwardness of the situation, neither side wished to withdraw. Harper needed the books and could not repudiate his own publicity, and Simon was ready to retire from business. Simon also had further cause for panic because provision for a rebate was included in the contract for all undelivered volumes—20 pfennig per book and 5 pfennig per dissertation. This provision as well as the definition of the term "volume" would be at issue for years to come.

Harper had little patience with such arcane matters as the definition of a "volume." He had less than a year to prepare the University for its opening and was carrying "a load that is fairly crushing him to earth." So Gates commented to Rockefeller as he reported on another crucial library matter that could not escape notice: "There is no provision, except students' fees, for modern books in any of the departments. The graduate students can do very little without them. The head professors are much worried on this point. The income of at least $200,000 should be temporarily set apart for this until someone endows the library."

Although both parties were apprehensive, one half of the purchase price was dispatched to agent Bloch on December 29, 1891. The remaining amount fell due in two equal parts on January 1 of 1893 and 1894. To protect the University until the questions of numbers and rebate were settled, Bloch withheld a third of the 94,100 marks from Simon. Even with this precaution, Harper remained uneasy and asked Chandler and Breasted for reassurance. Despite the exaggerated numbers, Chandler advised Harper that "it would have been a matter of unceasing regret if the opportunity had been lost" and not to walk away now from a "first-rate bargain." Thus Chandler had not only to contend with Harper's doubts, but he was also caught

between Simon, who was "very tricky—not dishonest, but capable of pretending to misunderstand orders," and the obsequious Bloch, who was "very fond of being authorized."

In early February, Bloch deflated the Calvary stock to fifty or sixty thousand volumes. Chandler reported to Harper:

> I do not feel at all certain that Simon has any consciousness of having misrepresented anything or of having any very considerable overestimate, he would simply and with considerable plausibility say that the astounding discrepancy was due to Mr. Bloch's way of counting. . . . In fact, without having agreed upon a definition of the word "volume," I do not see how . . . we can hope for an agreement about the number.

The controversy over the numbers was temporarily put aside as Simon and Bloch prepared the books for shipment. On May 31, 1892, Bloch wrote Harper that 242 boxes containing 57,630 volumes and 39,020 dissertations were en route via Hamburg insured for 500,000 marks. Bloch implored Harper "not [to] refuse me your perfect satisfaction" by this effort. Shortly after the books arrived in late June and were placed in storage on 55th Street, just off the campus, Simon died, leaving S. Calvary and Company without direction.

By January, 1893, a temporary building for the library and gymnasium had been erected on the present site of Hutchinson Court. Its construction was one of the many expenses which put the University's budget in a precarious state, a chronic condition which persisted throughout Harper's presidency. The financial panic which struck the country in 1893 further depressed the University's finances. With deficits piling up, it took two dunning notes from Calvary to get 17,961 marks from the University in late February, 1893, less than half the amount due. To compound the confusion, Hugo Bloch decided to shift allegiance from the University and to become manager of Calvary. Although payment was in arrears, Calvary continued to complete and bind journals for the University.

The next dun would come on October 21 from Bloch, who demanded that $5,000 be sent within four weeks or Calvary would "be forced by yourself to take other steps." Pleading with Harper, Bloch asked, "but what can we do, if not only you do not pay,

but you do not even answer our letters?" On December 7, 1893, Calvary received 23,000 marks which was to be the University's last payment.

Then, after a year of no apparent exchange regarding the books, the final round began with a warning that Calvary expected $6,000 early in 1895. Henry A. Rust had now become the University Comptroller, and a drastic change would take place in the University's dealings with Calvary. On Rust's own account: "I looked into the matter, and with such a wide difference as regards the number of books that seemed to be originally contemplated and the number actually received, that I was bewildered and unable to understand the basis upon which payments before had been made." Rust requested that Bloch submit "copies of agreements and a statement of deliveries, giving numbers and values of books, etc." because of his ignorance of the transaction.

Bloch was shocked. He wondered why Rust had asked him "all those questions" about the original transaction "whereas President Harper himself can give you the best information you would ever desire, having himself made and concluded the whole matter here in Berlin!" While submitting a statement covering the University's account, Bloch asked that the balance of 40,645 marks be paid immediately. Perturbed that it had been necessary to write Harper fifteen times, Bloch was now prepared to take legal action. Worse, he could not resist reminding Rust to "please take care that your letters are sufficiently stamped; we had nearly regularly to pay for insufficient stamping."

Rust's response at the end of February was swift and pointed. He told Bloch that the University was withholding payment but that Bloch would be advised promptly after study of the account, and that settlement would be made "of any balance that may be found to be due."

By late May, 1895, Rust's evaluation of the account and the events surrounding it was completed. He concluded that the University had overpaid Calvary 74,000 marks! Rust's accounting was simple. He looked at the original 1891 agreement calling for the delivery of 280,000 volumes and 120,000 dissertations and found that there was a shortage of 81.4 per cent for volumes and 67.5 per cent for dissertations. It was time for the lawyers. In response to a notice from Calvary's attorney that he would be compelled to "use further means," the University's attorney responded that "the com-

mencement of legal proceedings by Messrs. Calvary & Co. will furnish the University with the desired opportunity to bring forward its large counter claim."

Harper returned to Europe in 1898 and saw Bloch. This resulted in a long, heavily underscored letter from Bloch once again summarizing the events of the past seven years. Rust sent the letter to Noble B. Judah, the University's attorney, who commented:

> I feel very much complimented with your suggestion that I could possibly successfully cope with the poetry and idiom of the communication. Being only an ordinary individual much held down to the grinding unpoetic side of things, I beg leave to submit to you herewith a form of letter for Dr. Harper. I do not pretend that it is at all equal to the occasion, though I am sure it in substance represents what will be in your mind as a proper answer to the business part of the communication.

The transaction was brought to a conclusion with this exchange. Harper's *Presidential Report* for 1897–98 stated in its Library statistics that the Berlin Collection contained "175,000" volumes. The next year's *Report* modified this figure by adding "not entirely delivered." But there would be no further books from Calvary. How "175,000" was contrived is beyond recall.

As a final note to this episode, Zella Allen Dixson received a letter in 1901 from A. B. Meyer, Director of the Königliches Zoologisches und Anthropologisch-Ethnographisches Museum of Dresden. He asked how much the University had paid for the Calvary books. The question was referred to Harper, who responded by saying: "There have been some questions in dispute and I do not think it is possible at present to make a definite statement."

DURING the next half century the books from Unter den Linden 17 were slowly absorbed into the Library's collections. Most were identified by a simple, unadorned bookplate naming the nine donors, which remains the sole identification of the books to this day. Notice was given early that books "not yet distributed are held in trust for the advantage of all divisions of the Library without individual preference of one over the other." The temporary library-gymnasium bulged with shelves doing double duty and the accumulation of "unclassified masses." The assistant librarian reminded anyone who would listen that "there is much accessioning of books in special collections urgently needing to be done." The books from Calvary had not produced the library building Harper had hoped for, and it was only with his death in 1906, in his fiftieth year, that plans began to construct a library that would be his memorial.

But the collection did yield other results. The University Library became the largest in the city, and by 1896 it was the second-largest university collection in the United States with 340,000 volumes, the Berlin Collection contributing its uncertain but dominant share. This rapidly achieved status was used by Harper to lure faculty and also to give a sense of stability to the University. It was another reminder that the University was beginning on a monumental scale, and that it had assumed monumental commitments to the future. In the meanwhile, the Berlin books overwhelmed a struggling library staff that had to contend with a research faculty which the books themselves had helped create. It also cooled any urge to make similar *en bloc* acquisitions for two decades, until the opening of the Harper Memorial Library gave impetus as well as space for the growth of the collections.

A single, officially sanctioned number was never assigned to the Berlin Collection. The numbers varied depending on the occasion and the audience for whom they were intended. "One of the largest book deals ever made" was soon part of library mythology, and it became convenient to round off the numbers at a quarter of a million books and manuscripts, and occasionally more. But the books which arrived in Chicago during the summer of 1892 were the only ones which the University received under the contract signed by Harper and Heinrich Simon, and these were carefully recorded as being 57,630 volumes and 39,020 dissertations. By the time both parties

had become completely estranged, the University had paid Calvary 106,000 marks, or approximately $28,382 including shipment and other incidental costs.

The books themselves have outlasted the foibles of the participants, becoming the foundation for the grander aspirations of the Library and the University. The combination of great treasures and row upon row of standard texts of the sixteenth and seventeenth centuries placed the University Library in the noble company of the great seats of European learning. The rigor with which the University pursued the past made it an immediate part of the working "apparatus" of the institution. Ironically, many of the collections' greatest treasures, the Lafreri *Speculum* and Buffon's *Histoire naturelle des oiseaux,* for example, were part of the Library's general collections until recently. Decades later, when Harper's purchase was dimly remembered, these, and multitudes of other books, were being rediscovered.

The broad pattern of the collection's content was reasonably presented in the early outlines. The manuscripts were relatively small in number but they were the foundation of the University's later collection. Many came from the library of the marquis of Taccone and not from Pope Pius VII's library as touted; the autograph letters of Raphael turned out to be spurious. The Library's collection of incunabula also had its beginning with the Berlin Collection, but the real impact came from books printed during the later Renaissance and into the eighteenth century. In one stroke, as it were, the Library had books on many subjects, some of which were not to become academically favored for decades to come. The history of science and technology is an example. In more traditional subjects such as palaeography and classical philology, there was not only an immediate scholarly audience at the founding of the University, but both subjects became deeply rooted in the University and part of the Library's holdings. The topography and physical remains of ancient monuments of Rome was another theme that ran through the collection and that, in turn, stimulated further development by the Library. The richness of the journals and proceedings of the European academies placed the University in immediate touch with the tradition of European erudition and research.

There is a certain profundity to the books in the Berlin Collection. Many are weighty tomes, dense with learning and fact. Such books permit discoveries only by

those who are disciplined and well prepared. An eighteenth-century edition of *Reineke de Vos* is a charming and occasional reminder of the lighter side of the collection. For those not prepared to make such discoveries or whose interests are elsewhere, the books are a reminder of a civilized tradition of learning and intellectual curiosity which is one of our glories and obligations.

Robert Rosenthal
April, 1979

THE BERLIN COLLECTION
A SELECTION

MEDIEVAL TRADITIONS

1

Boethius

Opera

Venice: Joannes and Gregorius de Gregoriis, 1498–99

Three volumes

The writings of Boethius (*ca.* 480–524), Roman philosopher and statesman, constituted the major source from which scholars of the early Middle Ages derived their knowledge of Aristotle. Highly learned and industrious, Boethius hoped to make the works of Plato and Aristotle available to the Latin West and to interpret and reconcile their philosophical views with Christian doctrine. Charged with treason by Theodoric the Ostrogoth, he was executed without trial in 524, never completing his project. In prison he wrote his most popular work, *De consolatione philosophiae*. Boethius had a profound influence on medieval Scholasticism; his Latin translations of Aristotle's *Categoriae* and *De anima* provided the Schoolmen with Aristotelian ideas, methods of examining faith, and classification of the divisions of knowledge.

2

Isidore of Seville

Etymologiae

Venice: Peter Löslein, 1483

Isidore (*ca.* 562–636), archbishop of Seville, compiled numerous works which were instrumental in the transmission of the learning of classical antiquity to the Middle Ages. Among the most important productions of the "Great Schoolmaster of the Middle Ages" is the *Etymologiae,* also called the *Origines,* assembled by Isidore between 622–633. An encyclopedic work, unsystematic and largely uncritical, it covers a wide range of topics, including geography, law, foodstuffs, grammar, mineralogy, and, as illustrated here, genealogy. The title "Etymologiae" refers to the often fanciful etymological explanations of the terms introducing each article. The work became immensely popular and largely supplanted the study of classical authors themselves.

3

Eusebius Pamphili

Historia ecclesiastica

Italy, fifteenth century

The reputation of Eusebius Pamphili (*ca.* 260–340), bishop of Caesarea, as the "Father of Church History" rests mainly on his *Historia ecclesiastica,* issued in its final Greek form in 325.

For over a millennium it has served as the major source for the history of the early Church. At the urging of Chromatius (d. 406), bishop of Aquileia, a Latin translation was produced in the late fourth century by Rufinus, presbyter and theologian. Rufinus made numerous changes in Eusebius' account which reflected his own theological stance and historical viewpoint, and introduced additions from original sources which are now lost. The present manuscript dates from the fifteenth century and once belonged to the marquis of Taccone, treasurer to the king of Naples late in the eighteenth century.

4

Basil the Great

De legendis gentilium libris

Bound with

Athanasius

Vita Sancti Antonii Eremitae

Italy? *ca.* 1480?

The writings of Basil (329–379) and Athanasius (293–373) exercised great influence upon the development of the ascetic life within the Church. Both men sought to regulate monasticism and to integrate it into the religious life of the cities. *De legendis gentilium libris* does not deal specifically with monasticism, but is instead a short treatise addressed to the young concerning the place of pagan books in education. The work displays a wealth of literary illustration, citing the virtuous examples of classical figures such as Hercules, Pythagoras, Solon, and others. Moral exhortations are also found in Athanasius' *Vita Sancti Antonii Eremitae,* a hagiography which awoke in Augustine the resolution to renounce the world and which served to kindle the flame of monastic aspirations in the West. This manuscript edition of the two works, probably originating from fifteenth-century Sicily, was written by Gregorius Florellius, an unidentified monk or friar.

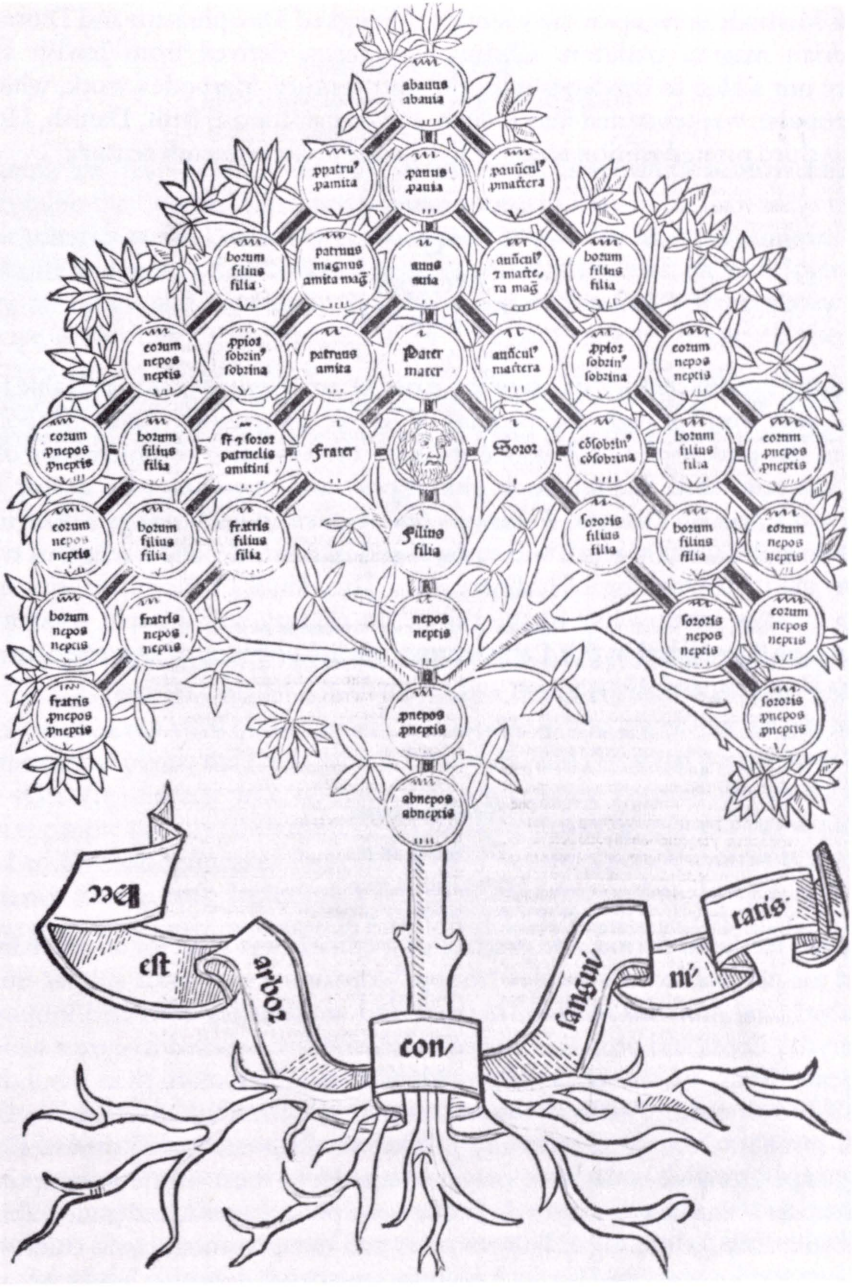
5

Marbode

De lapidibus pretiosis enchiridion

Freiburg, 1531

Precious stones and minerals have long been prized for their supposedly magical and medicinal properties. During the Middle Ages these popular beliefs were gathered under the form of lapidaries, works which listed numerous gems, stones, and minerals, as well as the many powers attributed to them. Marbode (1035–1123), bishop of Rennes, composed the earliest and most influential of these medieval lapidaries, describing the attributes of sixty precious stones.



2. Isidore. *Etymologiae*. 1483.

For his work Marbode drew upon the scientific writings of Theophrastus and Dioscorides and the Alexandrian magical tradition. Christian elements, derived from Jewish apocalyptic sources, were not added to lapidaries until the next century. Marbode's work, which became immensely popular, was translated into French, Provençal, Italian, Irish, Danish, Hebrew, and Spanish. This third printed edition is one of five issued in the sixteenth century.

6

Averroes
Notabilia dicta

Italy, *ca.* 1430–1450

Beginning in the twelfth century, much of the Aristotelian corpus became available for the first time to the Latin West through the medium of Arabic translations. Many Schoolmen were introduced to the philosophy of Aristotle through the extensive commentaries of Averroes (1126–1198), the renowned Spanish-Arab philosopher and physician who deeply influenced later Jewish and Christian thought. Followers saw implicit in his writings a doctrine of "two truths": a philosophical truth which was to be found in Aristotle, and a religious truth which is adapted to the understanding of ordinary men. This denial of the superiority of religious truth led to a major controversy in the thirteenth century and a papal condemnation of Averroism in 1277. Contained in this Latin manuscript are portions of Averroes' commentaries on Aristotle's *De anima* and *Metaphysica,* and his medical tract *Al-Kulliyyat.*

7

Receptarium de medicinis

Naples, Italy, *ca.* 1500,
with sixteenth-century additions

Throughout the medieval period, the practice of medicine was more of an art than a science and required the preparation of complex "recipes" containing numerous animal, mineral, and vegetable substances. *Materiae medicae,* herbals, and antidotaries described innumerable recipes for everyday needs and proposed remedies which were believed to cure a wide range of human ailments. Many of the medieval prescriptions combine more than a hundred ingredients. This fifteenth-century *materia medica* contains prescriptions attributed to Galen (131–200), Mesuë (776–857), Avicenna (980–1037), Averroes (1126–1198), and others. Condiments and spices (pepper, ginger, cardamom, oregano) appear in most of the prescriptions, along with such favorites as camomile, mandrake, honey, camphor, aniseed, and gum arabic. Recipes are given for ink, soap, white sugar, hair-restorers and dyes, cosmetics, and colors—to name but a few. Remedies are suggested for such ubiquitous woes as dog-bite, headache, and gout.

8

Blasius of Parma

Questiones super libro methaurorum

Italy, fifteenth century

Blasius of Parma (*ca.* 1345–1416), a versatile, eminent, and sometimes controversial scholar, was instrumental in the dissemination and popularization in Italy of the new ideas then being debated by Scholastics at the University of Paris. Best known for his commentaries upon the works of Aristotle and more recent authors, he wrote on mathematics, physics, logic, psychology, theology, astrology, and astronomy. His discussion of Aristotle's *Meteorologica* found in this manuscript is distinctly anti-Aristotelian in tone and may be traced to the Platonist reaction fostered by the Medici. Blasius, also known as Biagio Pelacani, taught at Pavia, Bologna, and Padua and spent some time at the University of Paris. His wide range of interests anticipates the breed of scholar who would make Italy the center of the early Renaissance.

9

Book of Hours

(Use of Chalôns-sur-Marne)

Northeastern France, *ca.* 1400–1410

This Book of Hours is a noteworthy example of fifteenth-century *Horae* displaying a mixture of Parisian, Flemish, and provincial styles. The pages, adorned with elaborate borders and illuminations, contain ten miniatures depicting episodes in the life of the Virgin Mary. The elegant and mannered poses, the wave-form robe motifs, and the aerial perspectives based on graded blue skies are characteristic of early fifteenth-century Parisian illuminations. They contrast with the more provincial elements such as short, stocky figures and rustic faces which can be traced to Flemish influence. Prescribing daily worship periods, these texts served as concise breviaries for the laity. Including a liturgical calendar, psalms, hymns, anthems, and prayers, *Horae* were frequently produced in fifteenth-century France and Flanders.

10

Book of Devotions

Germany, fifteenth century

Books of Devotions, such as the example here, express the growth of a new religious consciousness and independence among the lower clerical orders and laity during the fourteenth and fifteenth centuries. The text, probably gathered and copied in or around Mainz between 1450–1475, is a collection of allegorical and devotional meditations, rules, stories, and exhortations. Of note is an allegory concerning Christ and the loving soul, using the metaphor of the human body as a castle, Christ as the master, and the soul as the mistress. Scattered through-

out the final leaves are personal notes made by various lay owners of later periods. These include pious phrases in Latin and German; lists of debts and interest paid; the memoranda of one Ernst Lorentz Pauly (d. 1718) concerning his marriage, children, several baptisms, and a murder which occurred in 1669.

11

Altvaterbuch

Strassburg: Johann Grüninger, 1507

Lay piety found new forms of expression with the rise of printing in the late fifteenth and early sixteenth centuries. Sources for this *Altvaterbuch,* a collection of lives of the saints, may be traced to late antique Byzantine hagiographies of the desert Fathers, such as Anthony, Gregory, and Hilary. The exemplary figures described in such traditional works provided personal and immediate sources of inspiration for devoted laity. The Latin *Vitae patrum* were subsequently translated into vernacular tongues, along with other popular devotional literature. The editions produced by the celebrated printer Johann Grüninger were known for their fine illustrations, usually produced from metal plates instead of the more frequent woodcuts. In order to facilitate the identification of pious readers with the holy figures, the illustrator depicted the Fathers in contemporary garb and placed them at work among the common people.

RENAISSANCE HUMANISM

12

Francesco Petrarca

Epistolae familiares

Venice: Joannes and Gregorius de Gregoriis, 1492

The *Epistolae familiares* of Petrarch (1304–1374) reflects the author's emphasis on concrete human experience and his love of classical antiquity—attitudes which became characteristic of the revival of classical learning which he helped set in motion. By composing letters to ancient Greek and Roman personalities as if they were still alive, Petrarch hoped to revive the individuality, beauty, and purity which he perceived in the classical works. He felt that the lessons of the ancients could serve to invigorate the moral life of Christendom and to lighten a world beset by disease, famine, and other woes. This incunable edition of the *Epistolae familiares* includes the first eight of the twenty-four books comprising the collection.

13

Giovanni Boccaccio

Il Filocolo

Gualdo, Italy, 1456

Much of the genius of the early Renaissance humanists lay in their ability to reinterpret and embellish a variety of classical and medieval texts and traditions. Among the earliest writings of Giovanni Boccaccio (1313–1375), a close friend of Petrarch, was *Il Filocolo,* a romance in prose based upon the popular medieval French tale, *Fleur et Blanchefleur.* Interweaving elements of classical mythology and enriching the plot with his own acute observations on human nature, Boccaccio described the loves and adventures of the Spanish prince Florio and the Roman girl Biancofiore. Written at the request of his mistress Fiammetta, *Il Filocolo* is notable for its innovative use of Italian prose and for the ways in which it presages Boccaccio's later masterpiece, the *Decameron.*

14

Leone Battista Alberti

De re aedificatoria

Italy, *ca.* 1485

Leone Battista Alberti (1404–1472) was the prototype of the Renaissance "universal man," combining the vocations of humanist, athlete, engineer, architect, courtier, musician, and mathematician. A clear synthesis of so many skills is to be found in *De re aedificatoria* (1452), a work which became the basic text of Renaissance architecture. Alberti blends insights gained from long study of classical sources and models, such as Vitruvius, with an innovative architectural technique based upon mathematical principles and musical harmonies. Alberti brought his theories to fruition by designing churches in Rimini and Milan, and the Rucallai palace in Florence. This manuscript of *De re aedificatoria* was probably produced in a Sicilian center or in a Neapolitan scriptorium.

15

Leonardo Bruni

De primo bello Punico

Italy, *ca.* 1450–1470

The political history of early fifteenth-century Italy, especially the attacks of Milan on Florence, fostered a heightened consciousness of Italy's past among Florentine humanists. In their discussions over the fate of ancient republics and monarchies, they found a flexible medium for articulating the problems of contemporary governments. Thus the original work by Leonardo Bruni (1369–1444) on the first Punic war, which is found in this fifteenth-century manuscript, represents a critical moment in the development of Florentine civic humanism.

Through his application of the skills of a classicist to more immediate problems, Bruni had a great influence upon the growth of modern historiography.

16

Aristotle

Opera [Greek]

Venice: Aldus Manutius, 1495–98

Five volumes

The invasion of Greece in the fifteenth century by the Turkish armies caused great alarm amongst nascent humanist circles in Europe. Fearing the destruction of Greek literature, Aldus Manutius (1450–1515), a noted scholar, procured from his student Alberto Pio, prince of Carpi, the funds required to establish a printing house at Venice and, in 1489, began the editing of classical texts. Aldus later issued a remarkable five-volume series containing the works of Aristotle and others, executed in a superb Greek type which surpassed in quality any previous attempts. Volume 1 contains the *Organon,* while other works by Aristotle, as well as those of Galen, Philo Judaeus, Theophrastus, and Alexander Aphrodisaeus, are found in the other four volumes.

17

Scriptores astronomici veteres

Venice: Aldus Manutius, 1499

Edited by Franciscus Niger

Although the great advances in astronomy were not made until the first half of the sixteenth century, *Scriptores astronomici veteres,* a collection of Greek and Roman astronomical texts, was published with great foresight by Aldus Manutius in 1499. The volume includes previously unpublished works by Aratus of Soli and Proclus, whose writings became influential during the Renaissance. The work of Aratus continued the tradition of the astronomical writings of Eudoxos of Cnidos, a pupil of Plato. Proclus, known as the great exponent of later Neoplatonism, was one of the first writers to discuss the precession of the equinoxes and the annual eclipses of the sun. Thomas Linacre, the renowned English humanist, provided a translation of Proclus' *De sphaera;* other humanists such as William Grocinus contributed letters and introductions to this remarkable collection.

18

Diogenes Laërtius

De vita et moribus philosophorum

Italy? fifteenth century?

The fifteenth-century interest in Diogenes Laërtius (fl. 222–235) represents a significant chapter in the transmission of classical Greek learning to the Latin West. *De vita et moribus*

philosophorum was not generally available in Latin until Ambrosius Traversarius made a complete translation for Cosimo de Medici in 1435. Laërtius, with his lively, anecdotal style, provided an entertaining alternative to standard literary biographies such as St. Jerome's *De viris illustribus* (*ca.* 390). This manuscript is one of many which were eagerly passed from hand to hand before printing made another form of distribution possible with the first Latin incunable edition at Rome *ca.* 1472.

19

Domizio Calderini

Commentaria in Martialem

Italy? fifteenth century

The compactness and variety of the epigrams of Martial (40–*ca.* 104) made him one of the most popular authors during his own and later times. A skilled observer, he used his wit and penetrating insight to render all aspects of Roman society into sharply condensed statements. His critical view of a cosmopolitan society proved most attractive to humanists such as Domizio Calderini (*ca.* 1444–1478), who produced his *Commentaria in Martialem* at Venice in 1474. By the age of twenty-four, Calderini had received great praise for his study of letters and was summoned to a professorship in Rome by Pope Paul II. He was later designated Apostolic Secretary by Pope Sixtus IV. Calderini, best known for his commentaries on classical authors, was also versed in mathematics, jurisprudence, and philosophy. In this contemporary manuscript, written in a Neapolitan hand, the quoted words from the epigrams appear in red. The text is adorned with over 700 decorated initials.

20

Plato

Opera

Basel: Johann Froben, 1532,

Translated by Marsilio Ficino

Marsilio Ficino (1433–1499) was the most influential representative of Renaissance Platonism. Together with Alberti, Pico della Mirandola, Cosimo de Medici, Politian, and Landino, he founded the Platonic Academy in Florence. Although several works of Plato had been available in Latin translations prior to the fifteenth century, Ficino made the first complete translation of the Platonic corpus into a Western language (1484). This publication marks a major point in the intellectual history of Europe. The work was of such high quality that it remained in general use until the eighteenth century. The sixth edition, emended by Simon Grynaeus (1493–1541), was issued by Johann Froben (1460–1527), one of the greatest printers and publishers of the period, who employed the renowned Erasmus as literary advisor and proofreader.

26. Sachs. *Nachred das grewlich laster.* 1535.

21

Lupold von Bebenburg

Germanorum veterum principium zelus et fervor in Christianam religionem deique ministros

Basel: Johann Bergmann, 1497

Edited by Sebastian Brant

A great deal of the early success of the German humanists was due to their articulation of a national spirit. Their convictions about Germany's ancient culture and role as successor to the Roman Empire helped secure for them badly needed patronage. Thus they revived not only ancient authors on Germany such as Tacitus, but also medieval writers who had exalted the Holy Roman Empire and had discussed the relationship between German kingship and imperial dignity. Sebastian Brant (1457–1521), the Strassburg humanist and author of *Das Narrenschiff* (1494), edited a treatise by the canon lawyer and political theorist Lupold von Bebenburg (*ca.* 1297–1363) which emphasizes the prominence of Germany and the Empire in Christendom and their venerable and close connection with the Christian faith. In delineating the roles of the spiritual and secular powers in Christian society, Lupold had sought to provide a *modus vivendi* between the papacy and the Empire.

22

Konrad Celtes

Panegyris ad duces Bavariae

[Augsburg: Erhard Ratdolt, 1492]

While less scholarly than Brant's edition of Lupold, *Panegyris ad duces Bavariae,* composed by Konrad Celtes (1459–1508), represents those acts of homage to rulers which often won humanists the patronage they sought in vain from universities. Celtes, a student of Rudolph Agricola (1443–1485), led the wandering life of a Renaissance scholar and was instrumental in the diffusion of the new learning north of the Alps. The dukes of Bavaria acknowledged Celtes and his program of humanistic study by adding a humanist faculty to their university at Ingolstadt, just as the Habsburg emperor Maximilian had done at the University of Vienna. Celtes' poetic achievements also won him the honor of being the first poet laureate of Germany, a distinction conferred upon him by the emperor Frederick III in imitation of ancient Roman practice.

23

Priamus Capotius

Oratio metrica in alma Lipsiensi universitate habita

[Leipzig: Martin Landsberg, 1487–88]

Following the establishment of humanist faculties at German universities by Celtes and

others, a number of Italian humanists came to aid in the instruction of the new fields of learning. When Celtes left the University of Leipzig, his associate Priamus Capotius (d. 1517) was invited to fill the vacant chair of literature, thus becoming one of the earliest exponents of classical studies in the north. Prior to his appointment, Capotius had composed *Oratio metrica,* a dithyramb in which he extolled the virtues of the founder of the University of Leipzig, Frederick of Saxony. Using a range of heroic verse, classical allusions, and Christian sentiments, the *Oratio* predicts future glory for Frederick and his lineage. Best known for his work on Lucretius, Cicero, Virgil, and Horace, Capotius promoted the systematic study of both sacred and secular texts at a critical moment in the diffusion of Renaissance learning.

24

Johann Reuchlin

De rudimentis hebraicis

Pforzheim: Thomas Anshelm, 1506

The growth of Renaissance learning in the universities and schools of Germany met with the opposition of the obscurantists, those Schoolmen who were opposed to the humanistic methods and ideas. Johann Reuchlin (1455–1522) had been central Europe's leading scholar of Greek and Latin classics but later in his life turned to the study of Hebrew and to biblical criticism. After research on medieval rabbinic grammatical and exegetical traditions, Reuchlin issued in 1506 his *De rudimentis hebraicis,* a Hebrew grammar and lexicon. Reuchlin's work soon became a major issue in a controversy which erupted between German humanists and obscurantists on the eve of the Reformation. Whereas Reuchlin hoped that *De rudimentis* would promote investigation into the texts of the Judeo-Christian tradition, especially the Vulgate, many of his contemporaries feared that it would hinder their attempts to convert the Jews. In response, the obscurantists launched a campaign to confiscate all Jewish books, particularly the Talmud. The obscurantists harassed Reuchlin for years, eventually losing the debate both in the courts and in the eye of a public now absorbed with Luther's challenges.

25

[Ulrich von Hutten *et al.*]

Epistolae obscurorum virorum

[Mainz? *ca.* 1516–17]

Reuchlin was by no means without resourceful friends during his confrontation with the obscurantists. A number of young admirers composed letters purporting to come from the casuistic philosophers and monks who opposed Reuchlin. The first volume of *Epistolae obscurorum virorum,* composed by Crotus Rubeanus and others, appeared in 1514–1515; the

second volume, issued in 1516–1517, is attributed largely to Ulrich von Hutten (1488–1523). The *Epistolae,* an enduring classic of literary satire, dealt Reuchlin's foes a crushing blow from which they could not recover. As outrageous parodies of the unsophisticated Latinity and medieval attitudes of the obscurantists, they were highly successful. Inventing names for the correspondents, von Hutten and his colleagues used latinized forms such as Franciscus Genselinus (Franz Gosling) and Lupoldus Federfusius (Lupold Featherstuffer) to belittle the stature of their opponents.

26

Hans Sachs

Nachred das grewlich laster,
sampt seinen Zwelff eygenschafften

Nuremberg: Wolfgang Formschneider, *ca.* 1535

This early edition of "Rumors Concerning Evil Slander and Her Twelve Qualities" was composed by Hans Sachs (1494–1576), the most popular German poet of the sixteenth century. Using rhymed couplets, Sachs spun an allegory depicting the woes that proceed from Evil Slander, here personified as a woman. The woodcut, probably derived from the central figure in Dürer's "Nemesis," portrays a blindfolded woman with tresses made of snakes, wings of peacock feathers, and trailing a fiery ball which symbolizes the devastation spread by slander. She offers a lidded cup with her right hand, but in her left hand she conceals a knife. Sachs was a colorful personality. After studying the Classics until the age of fifteen, he became an apprentice cobbler, taking to the roads throughout southern Germany and the Rhine country. A prolific author, he claimed to have written several thousand works including *Meisterlieder,* tales and fables in verse, and Shrovetide plays.

27

Desiderius Erasmus

De ratione studii

Leipzig: Valentin Schumann, 1521

One of the great issues confronting humanists of the sixteenth century was the nature of education. Private schools of the period followed outmoded medieval models and were often staffed by ignorant and cruel teachers. When humanists such as John Colet (*ca.* 1466–1519) sought to establish public schools for children, they discovered that the available textbooks for educating the young were inadequate for beginners because of their length and complexity. At the request of Colet, Erasmus (who was then teaching Latin and Greek to Cambridge students) composed an essay, first published in 1511, in which he set forth his views concerning the ideal schoolmaster and method of education. The teacher, notes Erasmus, "should not merely

be a master of one particular branch of study," but must have "travelled through the whole circle of knowledge." Such an instructor "might give boys a fair proficiency in both Latin and Greek in a shorter time and with less labor than the common run of pedagogues take to teach their babble." Erasmus' own textbooks would soon replace many of the antiquated medieval manuals.

28

Lorenzo Valla

De elegantiis latinae linguae

Paris: Simon Colinaeus, 1533

29

Theodore Gaza

Introductionis grammaticae libri quatuor, Graece

Basel: Valentin Curio, 1529

The educational needs of the new humanistic curricula were admirably met by two standard textbooks of the fifteenth and sixteenth centuries: Theodore Gaza's *Introductionis grammaticae* and Lorenzo Valla's *De elegantis latinae linguae*. Both of these works were highly praised by Erasmus who, in his *De ratione studii,* remarked that "amongst Greek Grammars that of Theodore Gaza stands admittedly first," and, as for Latin, there was "no better guide than Lorenzo Valla." Valla (1407–1457) applied an innovative critical examination to the forms of Latin grammar and the rules of Latin style and rhetoric—thus providing a sound basis for the analysis of language, historical documents, and ethical opinions. The Greek grammar by Theodore Gaza (*ca.* 1400–1475) was the first modern manual to include syntax, and was used by Erasmus at Cambridge and Guillaume Budé (1467–1540) at Paris. Both works were frequently reprinted, Valla's seeing fifty-nine editions between 1471 and 1536. The 1529 edition of Gaza, edited by Valentin Curio, includes Latin translations by Erasmus, Conrad Heresbach, Jacob Tusanus, and Richard Croke.

30

Dirk Schrevel

Palaemon, sive diatribe scholasticae

Leiden: Bonaventura and Abraham Elzevir, 1626

One important aspect of the development of the institutions of higher learning is its close relationship with the history of printers and booksellers. *Diatribe scholasticae,* a well-organized discourse on the goals and methods of higher education, was composed by Dirk Schrevel, rector of the University of Leiden, and published by the renowned firm of Bonaventura and Abraham Elzevir in 1626. Schrevel, a Dutch humanist born at Haarlem in 1572, served as rector from 1625 to 1642, a period during which the University underwent its greatest expansion, attracting illustrious scholars from all of Europe. The Elzevir family acted as official printers to the University for most of the seventeenth century, and many faculty members edited or wrote books for the firm during this time.

31. Tomasini. *Gymnasium Patavinum*. 1654.

31

Jacopo Filippo Tomasini

Gymnasium Patavinum

Udine: Nicolas Schiratt, 1654

Gymnasium Patavinum, compiled in 1654 by Jacopo Filippo Tomasini (1597–1654), describes the history and customs, the degree programs, library, faculty, and alumni of the University of Padua. Founded in 1222 as a result of the migration of students from Bologna, the institution soon developed into one of the foremost schools in Italy and a renowned center of scientific studies, with a long and illustrious list of professors and students. Under the Venetian Republic, of which Padua was a part, the University enjoyed its greatest prosperity: buildings were erected and the program expanded with a school of medicine (1543), a botanical garden (1545), and an anatomical theater (1594).

32

Friedrich Lucae

Europäischer Helicon

Frankfurt a. M.: Samuel Tobias Hocker, 1711

Friedrich Lucae (1644–1708), historian and theologian, wrote extensively on the development of royal and aristocratic institutions in Europe. Of noble Silesian background, Lucae travelled throughout the Continent, visiting dukes and barons, yet often supporting himself as pastor to various congregations. After his death in 1708, a manuscript of his was found and subsequently published as *Europäischer Helicon.* A comprehensive and systematic treatise on education, it outlines the foundation, charter, degree programs, faculty, physical environment, growth, and decline of numerous European colleges and universities—some of which no longer exist. Lucae's work thus represents a valuable source for research on the history of education in Europe prior to the eighteenth century.

REFORMATION

33

Desiderius Erasmus

Consilium cuiusdam ex animo cupientis esse consultum et Romano pontifici dignitati et Christiane religionis tranquillitati

[Cologne?] 1521

As a devoted Christian humanist, Erasmus realized that the growing controversy between

Luther and the Roman Catholic Church could only serve to shatter the unity of Christendom and curtail international scholarship. Characteristic of his moderate and pacifist nature, Erasmus collaborated with the Dominican theologian Johannes Faber in drawing up a plan for reconciling the two parties. In this rare copy of *Consilium cuiusdam,* published anonymously in 1521, the "prince of humanists" urges Luther and the Pope to consider moderation and arbitration, "lest enormous fruit of the Gospel's harvest perish because of a few little errors." However, Erasmus' plea was ignored. By 1521 Luther had issued his inflammatory pamphlets and burned the Papal Bull. Erasmus turned against the Wittenberg reformer, commencing a famous literary duel.

34

Ein schöner Dialogus von
Martino Luther und der geschickten
Botschaft aus der Helle
die falsche geystligkeit und das wort
Gottes belangen gantz
hübsch zu lesen

1523

If many of the reformers were at odds with the humanists, they were not above adapting some of the resources devised by the latter, especially pamphlet warfare and satire. Due to developments in printing since the late fifteenth century, pamphlets were inexpensive and could easily be reproduced—the perfect means of conveying Luther's message to the people. The new publications contained forceful illustrations and, instead of Latin, used an idiomatic German which could be read by merchant or soldier. In this example, produced by an anonymous follower in 1523, Luther is shown conversing with a Dominican monk whose claws and hooves belie his true identity as Satan.

35

Jean Calvin
Institutio Christianae religionis

Strassburg: Wendelin Rihel, 1539

Although the exact date of Calvin's conversion to Protestantism is uncertain (sometime between 1529 and 1532), he was forced to leave Paris in 1534 and subsequently settled in Basel, Switzerland, then a Protestant center. While in Basel he undertook an exhaustive study of theology, drawing mainly on the Bible, the works of the early Church Fathers, and the writings of contemporaries such as Martin Luther and Martin Bucer. As a result of this effort,

Wie man die falschen Propheten erkennen ia greiffen mag/ Ein predig/zu Mynden jnn Westphalen gethan/durch D. Vrbanum Rhegium.

Canonicus: Monachus:

Jeremie 10. Die Hirten sind zu narren worden/ vnd fragen nichts nach Gott/Darumb können sie auch nichts rechts leren/ sondern zerstrewen die Herd.

37. Rhegius. *Wie man die falschen Propheten erkennen mag*. 1539.

and given further impetus by an outbreak of persecutions in Catholic France, he issued, in 1536, his epoch-making *Institutio Christianae religionis*. Conceived originally as a basic manual of doctrine, the *Institutio* took the form of a systematic and comprehensive treatise on dogmatic theology. It became immensely popular throughout Europe and was without doubt the most influential manual issued during the Reformation. The second edition of 1539 was enlarged almost threefold and better arranged, showing deeper study of Augustine and Chrysostom and reflecting the influence of Calvin's friend Bucer.

36

Joannes Oecolampadius

Vom Sacrament der Dancksagung

Zurich: Christopher Froschover, 1526

One of the central issues of the Reformation concerned the nature of sacraments as instruments of salvation and expressions of grace. Questions arose as to whether the Eucharist involved the metaphorical or literal presence of Christ's body. While Martin Luther favored the latter view, other reformers such as Oecolampadius (1482–1531) followed Zwingli in preferring the metaphorical interpretation. In *Vom Sacrament der Dancksagung* Oecolampadius utilizes an exegesis of Christ's words "This is my love" to support the metaphorical understanding. A trusted leader, Oecolampadius was instrumental in the adoption of Reformation principles in Basel and in Berne.

37

Urbanus Rhegius

Wie man die falschen Propheten erkennen ja greifen mag

Brunswick: Anders Goldbeck, 1539

The career of Urbanus Rhegius paralleled those of other contemporary reformers. Born in 1489 at Constance, Rhegius' education was strongly humanistic. He followed his master, Johann Eck (1486–1543), Luther's famous antagonist, from Freiburg im Breisgau to Ingolstadt where, under Eck's influence, he wrote the strictly orthodox treatise *De dignitate sacerdotum*. By 1521, however, he had become a Lutheran and was forced to resign his post as cathedral preacher in Augsburg. As a reformer, his initial efforts were directed against the Roman tradition; his later activities against what Rhegius considered the dangerous radicalism of the Anabaptists. His special concerns were pastoral and educational, of which this sermon on the recognition of false prophets is, in its anti-Catholicism, strongly indicative. Caricatures depicting a priest and monk as wolves feasting on the faithful sheep emphasize the necessity for discriminating between the true "lutter Evangelium" and the "falschen Propheten."

38

Friedrich Nausea

Evangelicae veritatis homiliarum centuriae tres

Cologne: Peter Quentell, 1532

Friedrich Nausea (1480–1552) was one of the chief Roman Catholic preachers and apologists of the Reformation period. He received his doctorate in law from Padua in 1523 and, the following year, went to Germany as secretary to Cardinal Lorenzo Campeggio. During that same year he was given the impossible task of returning Philipp Melanchthon (1497–1560) to the Roman Catholic Church. Nausea gradually rose through the Church hierarchy and succeeded to the episcopal see of Vienna in 1541. He attended the Council of Trent in 1551 as Emperor Ferdinand's orator, participating in debates on the Eucharist, penance, and extreme unction. Nausea composed many sermons, a collection of which is to be found in this rare first edition of *Evangelicae veritatis homiliarum,* published at Cologne in 1532. It is the only copy reported to be in the United States.

THE CLASSICAL HERITAGE

39

Tacitus

Ab excessu Augusti annalium libri sedecim

Basel: Ex officina Frobeniana, 1533

Edited by Beatus Rhenanus

Northern humanists such as Beatus Rhenanus (1485–1547) were attracted to the works of Cornelius Tacitus (*ca.* 55–120) for a variety of reasons: the striking presentation of the first-century Roman Empire, the delineation of character and ethical concerns, and the description of Germany found in *De Germania.* Rhenanus was born in Schlettstadt near Strassburg but spent many years in Basel where he was a close friend of Erasmus and the printer Johann Froben. This edition of Tacitus, which he compiled between 1519 and 1533, is considered one of his best works. Other accomplishments include the *editio princeps* of Velleius Paterculus (1520),

good editions of Curtius (1518, with notes by Erasmus), Seneca's *Ludus de morte Claudii* (1515), and Livy (1535), as well as a biography of Erasmus.

40

Julius Caesar Scaliger
De causis linguae latinae

[Heidelberg]: Petrus Santandreanus, 1584

Julius Caesar Scaliger (1484–1558) led a colorful and controversial life. Allegedly from the illustrious Veronese house of della Scala, Scaliger became a page to the emperor Maximilian at the age of twelve. Between adventures as a soldier of fortune, he studied art under Albrecht Dürer and was trained as a physician. It was not until his forties that he left the military for the life of a scholar, fighting later literary wars with Erasmus, Rabelais, and Cardano. *De causis linguae latinae,* first published in 1540, is a notable early attempt to subject traditional principles of Latin grammar to rigorous philological analysis. Scaliger originally composed the book as an educational aid for his son Sylvius, commenting in the preface that "it is not proper that you undertake more serious studies before knowing the reasons for the particular rules, for through them the scope of each and every important field of learning has to be revealed." Another son, Joseph Justus Scaliger (1540–1609), became the founder of modern textual criticism and one of the most influential scholars of the sixteenth century.

41

Justus Lipsius
Opera omnia

Leiden: Ex officina Plantiniana, 1596

Justus Lipsius (1547–1606), one of the most celebrated European scholars of the sixteenth century, was rivalled as a classicist only by the two Scaligers. He obtained his early education at the Jesuit college in Cologne and later attended the Catholic university at Louvain. The *Opera omnia,* first issued in 1585, contains several of his important early works, one of which, *Variarum lectionum libri tres,* procured Lipsius an appointment as Latin secretary to Cardinal Gravella in Rome (1567). In 1579 Lipsius was called, as honorary professor of history, to the University of Leiden where he remained for eleven years, the period of his greatest productivity. During this time he perfected his superb editions of Tacitus and Seneca and brought out a series of texts covering many classical authors and topics. Although his main strength lay in textual criticism and exegesis, Lipsius also had a profound and accurate knowledge of Roman history and antiquities and was instrumental in the revival of Stoicism.

42

Isaac Casaubon

Animadversionum in Athenaei Dipnosophistas libri quindecim

Lyons: Apud Viduam A. de Harsy and Petrum Rauaud, 1621

Isaac Casaubon (1559–1614) began the study of Greek with his Huguenot father when still a child but later found his way to the University of Geneva where he became professor of Greek in 1582. In 1590 he commenced work on the *Deipnosophistae* of the Greek rhetorician and grammarian Athenaeus (fl. A.D. 200). The *Deipnosophistae* is a valuable compendium of information on Greek banquets, music, songs, dances, games, and courtesans, quoting many authors whose works are otherwise lost. The critical edition of Athenaeus was finally published in 1597 but did not include preface, dedication, or commentary. This lacuna was remedied by the publication of *Animadversionum in Athenaei Dipnosophistas* (1600), a supplementary work requiring over three laborious years to complete. Among other achievements, Casaubon demonstrated on purely philological grounds that the Hermetic Corpus—esteemed in the Renaissance for its remote antiquity—was no older than the second century of the Christian Era.

43

Joannes Drusius

Observationum sacrarum libri XVI

Franeker: Aegidius Radaeus, 1594

At the age of twenty-two, Joannes Drusius (1550–1616) was appointed professor of Hebrew at Oxford, from which position he moved to Leiden in 1577, finally settling at the newly founded University of Franeker in 1585. Highly reputed as a teacher, Drusius drew students from all the Protestant countries in Europe. The *Observationes,* like many of his other works, sought to provide a sound philological foundation for theologians to build upon. This combination of textual criticism with exegetical excursions proved to be very influential at a time when Dutch Protestant churches were addressing the issue of a vernacular Bible.

44

Hugo Grotius

Poemata collecta

Leiden: A. Clouquius, 1637

45

Daniel Heinsius

Poemata graeca

Leiden: Franciscus Heger, 1640

Although the major activity of classical scholars was the editing and study of Latin and Greek texts, they frequently turned to the composition of original poetry along classical lines. Such

51. Montfaucon. *Palaeographia graeca*. 1708.

was the case with the renowned Hugo Grotius (1583–1645) and Daniel Heinsius (1580–1655). Grotius, the noted statesman, theologian, diplomat, and scholar, successfully reproduced in *Poemata collecta* the spirit of classical Latin verse, clothing modern thoughts in ancient forms. Heinsius, like Grotius a student of Joseph Scaliger, was honored for his learning both in his native Holland and abroad. *Poemata graeca,* edited by his son Nikolaes, contains original Greek and Latin poems composed by the elder Heinsius. Heinsius and Grotius were associates for many years, although they were later estranged because of Grotius' liberal religious convictions.

46

Johann Buxtorf

Lexicon hebraicum et chaldaicum

Basel: In officina Episcopiana, 1735

Prompted by the contemporary rejection of an infallible Church and the growing emphasis on scriptural studies, many German scholars such as Johann Buxtorf (1564–1629) turned to Hebrew and rabbinic materials in order to justify their faith. Buxtorf assisted Piscator (1546–1625) in a Latin translation of the Old Testament (1602–1603), but he is chiefly remembered for the several lexicons and concordances which he produced. *Lexicon hebraicum et chaldaicum,* first published in 1607, proved to be of great use to scholars and was subsequently issued in many editions. Buxtorf was aided in his research by the many learned Jews whom he befriended at a time when legislation, especially in his residence of Basel, restricted the freedom of Jews. Thoroughly acquainted with Hebrew traditions, he was often consulted by members of the Jewish community concerning matters of ceremonial law.

47

Aristoxenus. Nicomachus. Alypius

Leiden: Ex officina Ludovici Elzeviri, 1616

Edited by Johannes van Meurs

Johannes van Meurs (1579–1639) wrote extensively on Greek antiquity, including festivals, games, dances, music, and the mysteries of Eleusis. At the age of sixteen, he produced a commentary on the *Cassandra* of Lycophron and in 1610 was appointed professor of Greek and history at the University of Leiden. Van Meurs issued the *editio princeps* of Aristoxenus' *Elementa harmonica,* along with works of Nicomachus and Alypius, in this Elzevir edition of 1616. Aristoxenus (fourth century B.C.), whose father was a pupil of Socrates, studied with Aristotle at Athens and also was influenced by the Pythagoreans. In the *Elementa,* his only surviving work, he argues that the soul is related to the body as harmony is to the parts of a musical instrument.

48

Gerhardus Joannes Vossius

De arte grammatica libri septem

Amsterdam: Willem Blaeuw, 1635

Gerhardus Joannes Vossius (1577–1649) belonged to a community of scholars whose presence at Leiden made that institution a major center of classical scholarship in the seventeenth century. A lifelong friend of Hugo Grotius, he was versed in the Classics, Hebrew, Church history, theology, rhetoric, and grammar. Despite Vossius' moderate views and his great reputation throughout the Netherlands, France, and England, he was falsely accused of heresy in 1619 and forced to resign his post at Leiden. After a period of three years, however, he was returned to the University as professor of rhetoric and chronology. Ten years later Vossius left Leiden for the newly founded Athenaeum at Amsterdam, where he remained until his death in 1649. Among his many works was a textbook on grammar (1607) which was printed repeatedly in the Netherlands and in Germany. Increased public demand for his knowledge of grammar led in 1635 to the production of *De arte grammatica,* a collection treating many additional aspects of the subject.

49

Bar Hebraeus

Specimen historiae arabum

Oxford: Henry Hall, 1650

Edited and translated by Edward Pococke

Edward Pococke (1604–1691), English Orientalist and biblical scholar, had already gained the attention of Vossius for his edition of the four New Testament epistles not contained in European editions of the old Syriac canon, when he sailed for Aleppo as chaplain to an English commercial settlement. While in Aleppo, he developed his knowledge of Arabic language and culture and collected many valuable manuscripts. At the request of William Laud, then chancellor of the University of Oxford, Pococke returned to England in 1636 to fill the first chair of Arabic. In 1648 he also was given the chair of Hebrew. This first edition of *Specimen historiae arabum,* a short account of the history and customs of the Arabs, is based on the chronicle of Bar Hebraeus, also known as Abu'l-Faraj, a versatile thirteenth-century Jewish scholar from Syria. In compiling his work, Pococke utilized innumerable manuscript sources which are still of value to the scholar.

50

Joannes Fredericus Gronovius

Ad L. et M. Annaeus Senecas notae

Leiden: Ex officina Elzeviriana, 1649

Gronovius (1611–1671) entered the University of Leiden in 1634 and completed his academic

studies at Groningen. Upon matriculation he travelled throughout Italy, France, and England. During this period, he undertook extensive manuscript research which supplied him with abundant material for later editions of the Latin classics. While at Leiden he had studied with luminaries such as Daniel Heinsius, Vossius, and Grotius. Like many of his contemporaries, Gronovius had a preference for first-century Latin prose, and his editions of Livy, both Senecas, Tacitus, and Gellius met with much acclaim. *Ad L. et M. Annaeus Senecas notae* (1649) contains his commentary upon the Elzevir Seneca, issued in 1639–40, in the recension of Kaspar Schott, with emendations by Lipsius.

51

Bernard de Montfaucon

Palaeographia graeca

Paris: Ludovicus Guerin [etc.], 1708

Belonging to a noble and ancient line, Bernard de Montfaucon (1655–1741) was destined for a military career but spent most of his youth in the family library at the castle of Roquetaillade. Ill-health and the death of his parents caused him to choose the life of a monk. Taking his vows in 1676, Montfaucon subsequently lived at various abbeys in France and Italy. His unlimited access to the manuscripts of numerous monastic libraries led to his important work *Palaeographia graeca,* first published in 1708. Besides establishing the foundations of Greek palaeography, the book contains a remarkable list of 11,630 manuscripts which the author consulted for its preparation. Illustrating the history of Greek writing and the variation of its characters, *Palaeographia graeca* is still a mine of valuable information for the classical scholar.

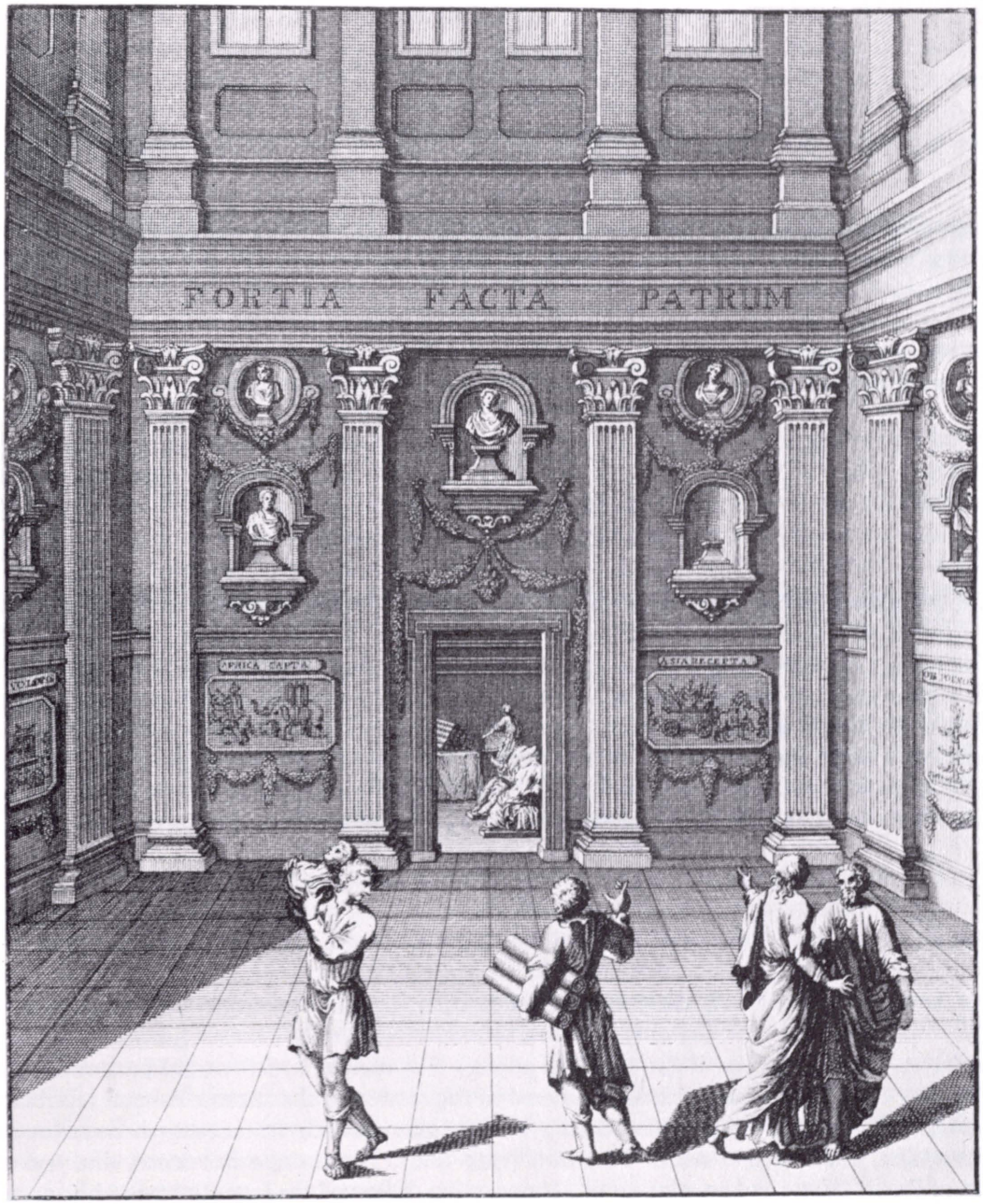
52

Barnabé Brisson

De formulis et solennibus populi Romani verbis

Frankfurt and Leipzig: In officina Weidmanniana, 1754

The study of jurisprudence in eighteenth-century Germany, stimulated by research on ancient Roman law, developed along two distinct lines: that of the philosophical jurists, such as Heineccius, and that of historical jurists, exemplified by Franz Carl Conrad (1701–1748) and Johann August Bach (1721–1758). Bach revised Conrad's edition of the famous treatise by Barnabé Brisson (1531–1591) on ancient Roman legal terms and phrases, hoping to counter the proposals made by the philosophical jurists with a sound legal history that appealed to national sentiment. Brisson, a member of the court of Henry III at Paris, remained the unquestioned authority on ancient Roman legal terminology until the discovery of the *Institutiones* of Gaius in 1816.



54. Chladni. *De gentilitate veterum Romanorum*. 1742.

53

Johann Gottlieb Heineccius

Antiquitatum Romanarum iurisprudentiam illustrantium syntagma

Strassburg: Johannes Reinhold Dulssecker, 1730

Johann Gottlieb Heineccius (1681–1741), an important teacher of law, belonged to the school of philosophical jurists. In the present work, he treated law as a rational science by grounding jurisprudence in first principles. In this way, Heineccius developed legal doctrines into a system of philosophy which appealed to the educated public of the time. As the major text from which the eighteenth century learned Roman law, the work proved to be very influential in the refinement of continental legal canons based upon Roman precedents.

54

Ernst Martin Chladni

De gentilitate veterum Romanorum

Leipzig: In officina Langenhemiana, 1742

A son and grandson of noted theologians, Ernst Martin Chladni was born at Wittenberg in 1715. Later a professor of law, he attained an early mastery of philosophy and jurisprudence at the University of Wittenberg. He was also skilled in archaeology, epigraphy, and numismatics. Such a wide range of interests combined with a tendency towards systematization led to the writing of *De gentilitate,* an influential eighteenth-century work on historical methodology. A revision of a much shorter and less comprehensive work issued in 1738, *De gentilitate* argues that the most accurate historical investigation must proceed not only from works of literature, but also from coins, marble inscriptions, monuments, and other archaeological evidence.

55

Adam Ferguson

Geschichte des Fortgangs und Untergangs der Römischen Republik

Leipzig: M. G. Weidmanns Erben und Reich, 1784

In order to develop general theories about politics and society which would be universally valid, many eighteenth-century thinkers turned to the history of the ancient Roman republic. "Rise and fall" literature thus constituted a distinct genre which attracted such notables as Montesquieu, Gibbon, and Adam Ferguson (1723–1816). Ferguson, a Scotsman who was a friend of David Hume and an admirer of Montesquieu, followed the latter in basing his moral

philosophy upon history and observation instead of upon abstract theory. The original English edition of *History of the Progress and Termination of the Roman Republic* appeared in 1783. Extremely popular, Ferguson's work went through many editions, including this translation into German of 1784. The book resulted from Ferguson's conviction that the history of the Roman republic served as a practical illustration of contemporary ethical and political doctrines.

56

Louis de Beaufort
La république romaine,
ou plan général
de l'ancien gouvernement de Rome
The Hague: Nicolas van Daalen, 1766

Amidst eighteenth-century discussions concerning republican government, traditional historical methodology, especially that relating to the Roman republic, came under increased scrutiny. Louis de Beaufort (1703–1795) was a bold critic who questioned the credibility of early Roman history. In *La république romaine* and other works he showed that even historians of the highest repute, such as Livy and Dionysius of Halicarnassus, were unreliable guides for the period of the Roman republic. Pleading against standard histories such as Charles Rollin (1661–1741) was then writing, Beaufort indicated those methods and documents by which a sound basis might be provided for Roman history.

57

Antonio Lafreri *et al.*
Speculum Romanae magnificentiae
[Rome, etc., mid-sixteenth to eighteenth century]

The city of Rome had served as a cultural and religious magnet for many centuries before the advent of printing and engraving techniques made possible the mass reproduction of pictorial representations of the Eternal City. Undying in their quest to reach Rome, countless pilgrims and tourists flocked to the center of Catholicism—and sought visual mementos for future times at home. The engravings contained in *Speculum* are indeed exquisite mirrors which have hung in the sitting rooms and halls of cultured Europeans since their production in the later half of the sixteenth century. Those acquired in the Berlin Purchase, some 994 in all, comprise one of the largest-known collections of *Speculum*. Issued as a series of prints over the years rather than in volumes, visitors in Rome were able to stop by Lafreri's shop and select those prints which suited their own tastes, eventually mounting them in scrapbooks or having them bound into volumes.

58

Giovanni Battista Piranesi

Alcune vedute di archi trionfali ed altri monumenti

[Rome, 1778–1792]

The adroit transformations which Giovanni Battista Piranesi (1720–1778) effected upon the ruins of Rome lent to his engravings a romantic unrestraint which made them so very popular during the eighteenth century. Piranesi, a celebrated Italian architect, designer, and engraver, continually fed the imagination of a tumultuous and war-torn Europe with idealized *vedute* that tantalized the viewer with glimpses of the stability and security of ancient Rome. *Alcune vedute di archi trionfali,* the majority of which were issued in 1748, reflects the influence of the architects Palladio, Bibiena, and Fischer von Erlach upon the young Piranesi. A grasp of perspective, mastery of chiaroscuro, and appreciation of archaeology merge in these vistas of ruined splendor.

59

Guiseppe Agostino Vasi

Prospetto dell' alma citta' di Roma

[Rome?], 1765

The immense panoramic view of Rome engraved in the eighteenth century by the Sicilian artist, Giuseppe Agostino Vasi, is as spectacular today as it was two centuries ago. Produced during the 1750s and 1760s by Vasi with the assistance of Piranesi and others, the work is invaluable not only for its artistic and technical excellence, but also for its accurate depiction of a Rome long since changed. Due to the painstaking efforts of Vasi and his staff, even minute details of vanished buildings and alleys can be discerned. To have the vast splendor of Rome unfold into a single breathtaking panorama was Vasi's idea of a fitting climax to his *Magnificenze di Roma,* a series of ten volumes, which took him fourteen years to complete.

60

Joachim von Sandrart

Des Alten und Neuen Roms Grosser Schau-Platz

Nuremberg: Christian Sigmund Froberg, 1685

Joachim von Sandrart (1606–1688) was a celebrated German artist and art historian whose *Teutsche Academie* (1675–1679) was long regarded as the most complete history of architecture, painting, and sculpture (covering Eastern as well as Western art). The work not only draws upon Vasari, Palladio, Serlio, and van Mander, but also provides biographies of artists, information about art collections, and a study of iconography. *Des Alten und Neuen Roms Grosser*

61. D'Hancarville. *Collection of Etruscan, Greek, and Roman Antiquities.* 1766–67.

Schau-Platz reproduced most of the architectural engravings contained in this earlier work and added a German translation to the Latin text. Displaying engraving skills which he had learned from Johannes Theodor de Bry, son of the noted German engraver, Sandrart also incorporated plates by Johann Meyer and Johann Franck. Of interest are the many ground plans for the buildings depicted, some of which no longer exist.

61

Pierre François Hugues d'Hancarville
Collection of Etruscan, Greek, and Roman Antiquities
Naples: François Morelli, 1766–67
Four volumes

Sir William Hamilton (1730–1803), envoy of Great Britain to the court of Naples from 1764–1800, used both his social position and skill as an archaeologist to assemble an exceptionally fine collection of Etruscan, Greek, and Roman antiquities, some of whose contents now reside in the British Museum. Pierre François Hugues d'Hancarville (1729–1805), an adventurer and antiquarian, was given access to Hamilton's cabinet and in 1766–1767 issued *Etruscan, Greek, and Roman Antiquities*. The four expensive folio volumes, including French and English texts, contain many delicate and artfully colored engravings of designs and borders which were applied in ancient times to vases, plates, and other objets d'art. The *Antiquities* thus provided an enriching visual experience for connoisseurs of fine art and expanded the range of contemporary classicism.

SCIENCE AND TECHNOLOGY

62

Diophantos of Alexandria
Arithmeticorum libri sex, et de numeris multangulis liber unus
Paris: Sebastian Cramoisy, 1621

The Greek mathematician, Diophantos of Alexandria, one of the greatest algebraists in history, composed his *Arithmetica* in the second half of the third century A.D. Only six of the original thirteen books of this earliest extant work on algebra have survived, along with his

tract on polygonal numbers. Some of the problems found in the *Arithmetica* result in various forms of determinate equations; the majority, however, lead to indeterminate equations (hence indeterminate analysis is often termed "Diophantine analysis"). While Latin translations of Diophantos had appeared as early as 1572, the Greek text was not available until Claude-Gaspar Bachet de Meziriac issued this edition in both Greek and Latin at Paris in 1621.

63

Regiomontanus
Kalendarium

Augsburg: Erhard Ratdolt, 1489

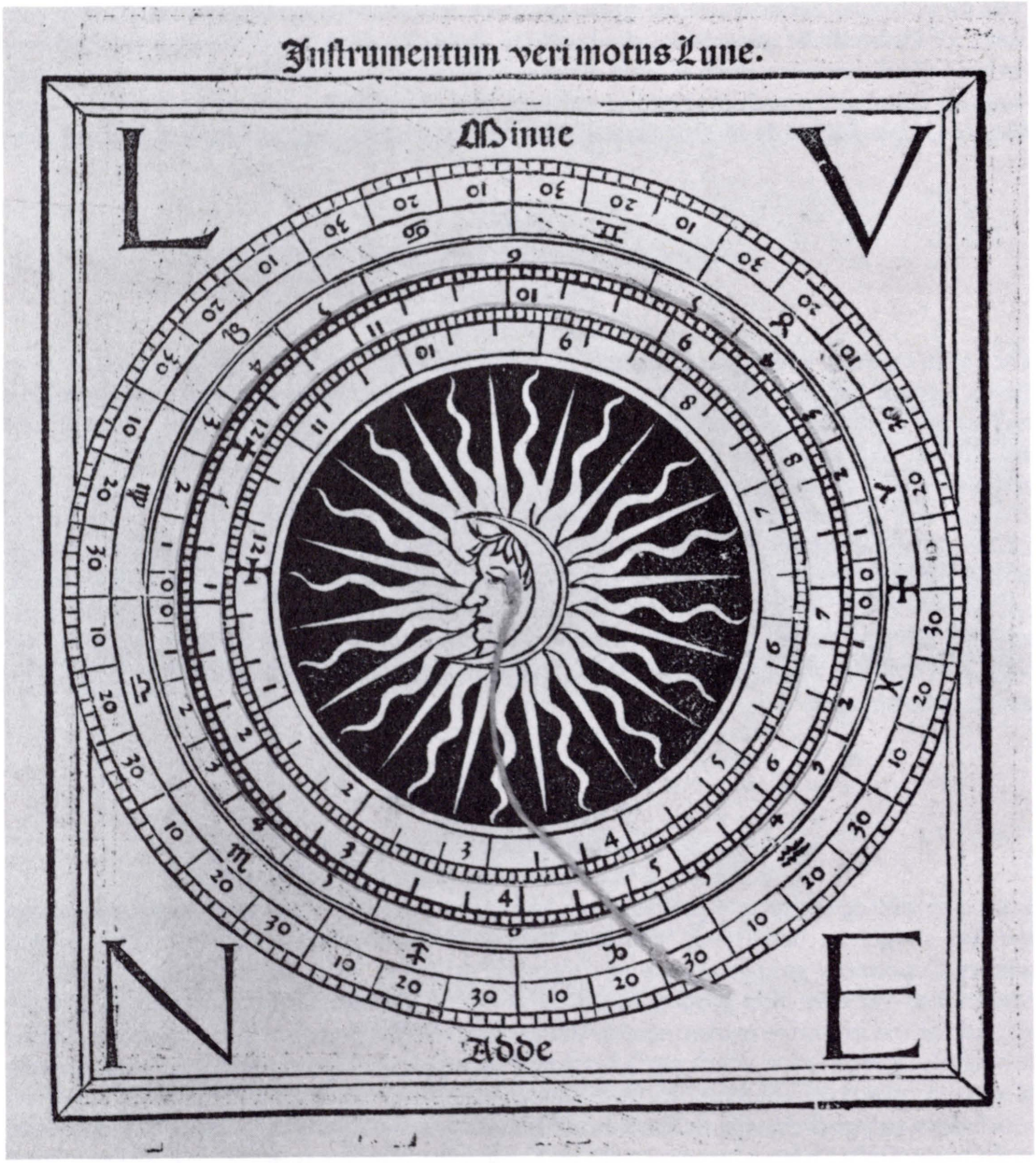
The Julian calendar which was instituted in 46 B.C. exceeded the true solar year by more than eleven seconds per year. One consequence was that, with the advance of time, natural events such as the equinoxes fell increasingly earlier in the Julian "year." By the fifteenth century the discrepancy had grown to more than a week. Pope Sixtus IV (1471–1484), realizing the inaccuracy of the Julian system, summoned Regiomontanus (1436–1476), a renowned astrologer and astronomer, to Rome in 1474 to supervise the reformulation of the official Church calendar. Although Regiomontanus' premature death in 1476 prevented completion of the project (which would occur in 1582 under Pope Gregory XIII), his *Kalendarium,* calculated for the years 1475–1532, was the first calendar printed in Europe and became the standard for later efforts. The sixth edition of this immensely popular calendar, published in 1489, also contains volvelles, astronomical and astrological tables, and brass devices for constructing horoscopes.

64

Johann Kepler
Tabulae Rudolphinae

Ulm: Jonas Saurius, 1627

Since antiquity scientists and philosophers had speculated on the motions of celestial bodies and had sought an underlying harmony and order to the cosmos. Early in the sixteenth century Copernicus grafted aspects of Ptolemaic geometry onto the heliocentric system of Aristarchus; yet even this pioneer regarded planetary motion as uniformly circular. It remained for the inventive mathematician Johann Kepler (1571–1630) to derive new descriptive laws of planetary motion which challenged traditional views. Upon inheriting a vast quantity of accurate planetary observations from his mentor Tycho Brahe, Kepler derived new laws which demonstrated the elliptical nature of planetary orbits. In 1627, after a long delay and much labor, Kepler released to the world his *Tabulae Rudolphinae* (named after his first patron Rudolph II), which charted planetary positions according to these new laws.



63. Regiomontanus. *Kalendarium*. 1489.

65

Adriaan Vlacq

Tables de sinus, tangentes, secantes, et de logarithmes

[Gouda: Pieter Rammaseyn, 1636?]

The trigonometric and logarithmic tables of Adriaan Vlacq (1600–1666), first published as *Arithmetica logarithmica* in 1628, were well received and frequently reprinted during the seventeenth century. In 1636, Vlacq, with his keen business instincts, published a smaller version in a more convenient format for the use of businessmen and scientists. Evidence suggests that this copy may have been taken to China by Jesuit missionaries who had introduced trigonometry and logarithms to the Chinese by the middle of the seventeenth century. The book also includes a note in French on Chinese paper stating that the emperor K'ang-hsi (1654–1722) made use of this book during his sessions with Jesuit tutors. Various functions are indicated by Chinese characters in red ink, while inserted before the printed text are eight handwritten pages on basic geometrical problems. The red morocco binding stamped in gold is similar to the bindings produced for the Jesuit library in China.

66

Leonhard Euler

Institutiones calculi differentialis

Pavia: Petrus Galeatus, 1787

Two volumes

Following the simultaneous invention of calculus by Newton and Leibniz, it remained for resourceful mathematicians such as Leonhard Euler (1707–1783) to perfect the new method of analysis. Euler, a brilliant and prolific man, made important advances in both differential and integral calculus. Among the many contributions found in *Institutiones calculi differentialis,* first published in 1755, are Euler's theorem on homogeneous functions; an elaboration of formulas of differentiation under substitution of variables; and the application of Taylor's series to finding extrema of f(x). To this day, Euler's name is associated with many formulas, such as that governing the relation between a sum and an integral (Euler-Maclaurin formula).

67

François d'Aguilon

Opticorum

Antwerp: Ex officina Plantiniana, 1613

As with the earlier rise of humanism, the growth of the exact sciences depended on able scholars who could marshal administrative as well as academic skills. After some years as

instructor of syntax, logic, and theology, François d'Aguilon (1546–1617) was approached by Belgian officials with a bold and important request. He was asked to develop a program for the instruction of the new scientific ideas and methods which were of great use in a variety of fields. One result was Aguilon's *magnum opus* on optics, the *Opticorum* (1613), synthesizing the works of such luminaries as Euclid, Ibn al-Haytham (Alhazen), Vitellion, Roger Bacon, Ramus, Pena, Risner, and Kepler. A vital treatise for succeeding generations, the *Opticorum* is of importance to the history of science for its clear explication of orthographic, stereographic, and scenographic projections—intended for an audience of cosmographers, astronomers, navigators, military leaders, engravers, and painters.

68

Jean François Nicéron

La perspective curieuse

Paris: Jean Du Puis, 1663

In their examination of natural phenomena, many philosophers came to realize that what was previously regarded as "magic" could be described in mathematical language. *La perspective curieuse,* first published in 1638 by Jean François Nicéron (1613–1646), a student of the noted scientist Marin Mersenne, defines the range and nature of certain problems encountered in the study of perspective and geometrical optics. In sympathy with the "natural magic" prevalent during Nicéron's time, this contemporary of Galileo viewed optics not as the science of light, but as the art of illusion. Among the many practical applications of perspective, catoptrics, and dioptrics discussed, the work addresses the problem of establishing a perspective for paintings executed on irregular or curved surfaces, such as vaults or niches. Also found is the earliest published reference to Descartes' derivation of the law of refraction (1638). This fourth edition, in Latin and French, includes Mersenne's *L'optique et la catoptrique.*

69

Claude François Milliet de Challes

Cursus seu mundus mathematicus

Lyons: Ex officina Anissoniana, 1674

Three volumes

Claude François Milliet de Challes (1621–1678) combined the talents of mathematician, teacher, and writer. *Cursus seu mundus mathematicus,* first published in 1674, is a remarkable and well-written course on mathematics and kindred subjects such as optics, magnetism, mechanics, navigation, pyrotechnics, astronomy, and music. De Challes was adept at incor-

porating the works of previous mathematicians into a coherent system and at explaining the intricacies of the mathematical sciences with ease and accuracy. Although somewhat old-fashioned for its time, being based largely on Euclid and Diophantos, the *Cursus* became a popular and widely used textbook which was instrumental in the diffusion of mathematical knowledge.

70

Johann Zahn
Oculus artificialis
teledioptricus sive telescopium
Würzburg: Quirinus Heyl, 1685–86
Three volumes in one

Soon after the invention of the telescope in the first decade of the seventeenth century, considerable numbers of the new instrument were made in Holland and from there found their way all over Europe. As the years passed, focal lengths grew, magnification increased, and the need arose for comprehensive manuals that dealt with the theory, construction, and application of telescopes and microscopes. One such text, *Oculus artificialis,* was provided by Johann Zahn (1641–1707), a German philosopher, physicist, and mathematician. An important treatise with many detailed illustrations, the work proceeds from basic theory on vision and optics through material selection and preparation of lenses to astronomical and biological applications. Included is a section on the uses of optical instruments for purposes of illusion and natural magic.

71

Sebastian Münster
Fürmalung and künstlich
Beschreibung der Horologien
Basel: Heinrich Peter, 1537

Although the sixteenth century marked the initial development of clocks and watches into instruments of precision, sun dials were still the predominant timepieces and faded from use only during the eighteenth century. Among the earliest modern writers on dialling, or gnomonics, was the geographer, mathematician, and Hebraist Sebastian Münster (1489–1552), best known for his *Cosmographia universalis* (1544), an influential work of descriptive geography. In this first German edition of Münster's *Compositio horologiorum,* issued in Latin in 1531, Münster reviewed previous literature on the ancient craft of dialling, incorporated recent innovations allowing for greater accuracy, and presented the theory, construction, and employment of both sun and (Münster's own invention) moon dials. Accompanying the text are

numerous woodcuts which illustrate, among other things, how to properly orient and mount a dial.

72

Nicolo Tartaglia

Quesiti et inventioni diverse

Venice: Nicolo de Bascarini, 1554

The rise of the exact sciences occurred in the context of the growth and consolidation of states in the sixteenth and seventeenth centuries. This relationship is evident in the extent to which scientists of the period frequently linked their services to the political and economic goals of contemporary governments. Nicolo Tartaglia (1499–1557) was an early exponent of scientific technology whose inventive efforts suggest the character of the Renaissance *condottiere*. Aware of the latest theoretical advances, Tartaglia made land- and sea-based military forces the proving ground of technology. His *Quesiti et inventioni diverse,* first published in 1546 with a dedication to King Henry VIII of England, discusses topographical surveying, the disposition of infantry, gunpowder, cannonballs, the firing of artillery, and other topics important to the security of states. Bound with this copy of the *Quesiti* is a portion of Tartaglia's first work, *Nova scientia,* treating the theory and practice of gunnery, and *Regola generale di solevare ogni affondata nave,* offering a solution to the problem of raising sunken ships, plans for a diving suit and bell, and advice for weather forecasting.

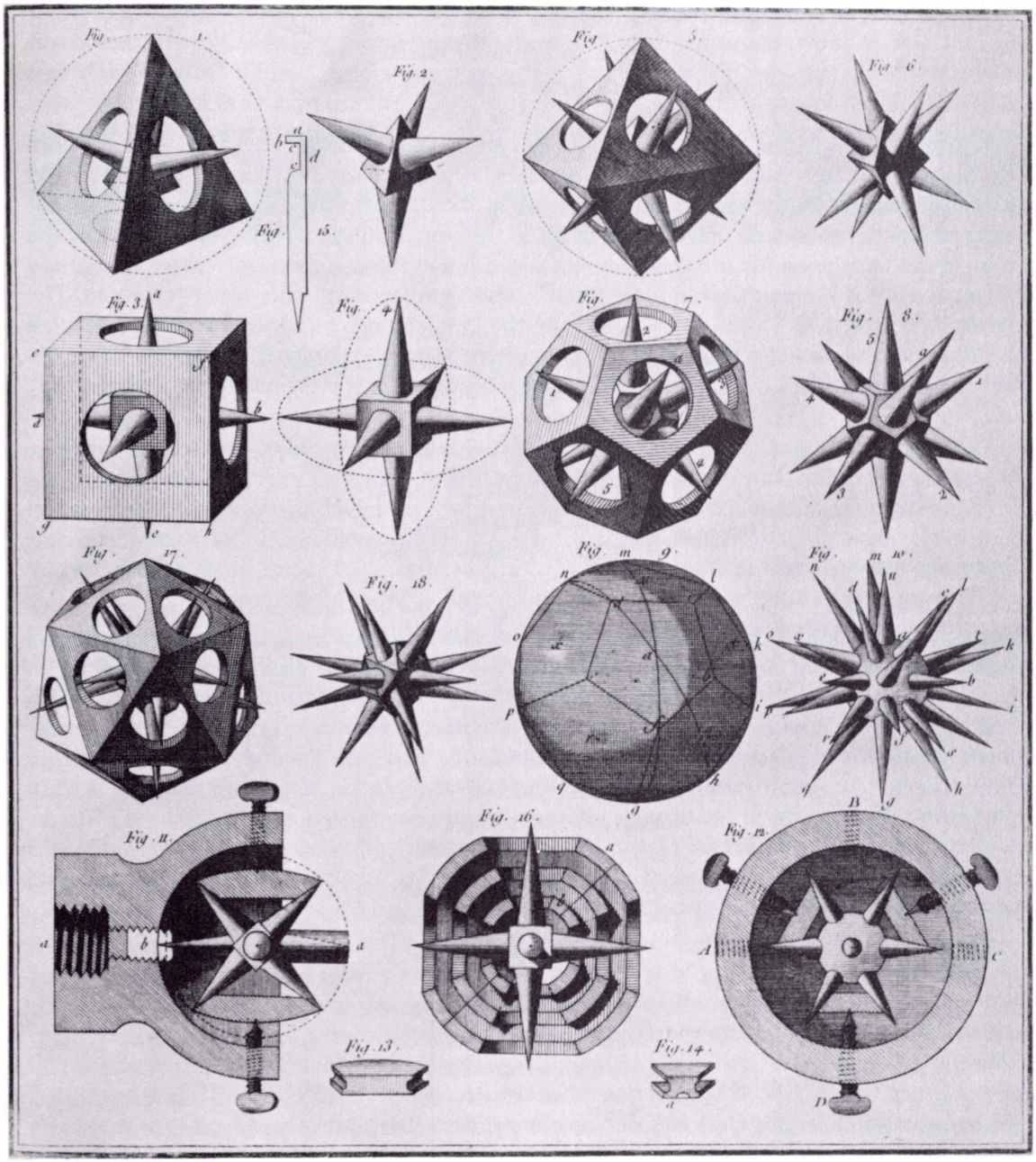
73

Francis Malthus

Traité des feux artificiels pour la guerre, et pour la recréation

Paris: Pierre Guillemot, 1632

As scientists applied themselves to the field of military technology and warfare, it became obvious that traditional methods of constructing cannons and projectiles, which resulted in an inefficient variety of sizes and poundages, were in need of standardization. Greater frequency and scale of conflict, increasingly distant fronts, and longer supply lines necessitated more efficient deployment and supply of field pieces. The French especially excelled in this direction, and the manual of Francis Malthus (fl. 1629), who held the position of "Commissaire des Feux Artificiels du Roy," is a typical handbook of the period. Dedicated to Cardinal Richelieu, the *Traité* deals with all aspects of contemporary gunnery and pyrotechnics, including cannons, gunpowder, projectiles, fortifications, siege, and fireworks. First issued in 1629, it was reissued several times during the seventeenth century.



75. Salivet. *Manuel du tourneur.* 1792–96.

74

Johan Sems and Johan Pietersz Dou

Von dem Gebrauch der geometrischen Instrumenten

Amsterdam: Wilhelm Jansz, [1616]

While general principles of surveying had been known to medieval scholars, it was not until the sixteenth century that cartography and instrumentation were sufficiently developed and seriously applied. By the middle of that century it became customary for textbooks on practical mathematics to include one or more chapters on how to survey a region or country. By the time of the Dutchmen Johan Sems (1572–1623) and Johan Pietersz Dou (1573–1635), specialized manuals such as *Von dem Gebrauch der geometrischen Instrumenten,* were being produced. The work, first issued in Dutch in 1600, details the employment of various recently invented instruments and provides many useful charts, tables, and illustrations. Surveying was particularly important in the Low Countries, where land reclamation was proceeding at a rapid pace.

75

Louis Georges Isaac Salivet

Manuel du tourneur

Paris: M. P. Hamelin Bergeron, 1792–96

Two volumes

The diffusion of scientific method and technology led, as Diderot hoped it would, to alternative ways of thinking. The machine became a dominant cultural metaphor and was seen as a veritable work of art and extension of the individual. Precision machinery and tooling in particular reflected the value and dignity attached to technological innovations. Lathes, which had become very popular in the sixteenth and seventeenth centuries, underwent great refinement during the eighteenth century. A contributor to Diderot's *Encyclopédie,* Louis Georges Isaac Salivet (1737–1805) summarized these latest advances in his *Manuel du tourneur,* a comprehensive guide to the art of turning, whose illustrations of machinery suggest the plates to Diderot's massive compilation. Typical of many eighteenth-century savants, Salivet was a versatile and inquisitive individual. Trained as a lawyer, he also edited classical texts and conducted experiments in physics and mechanics.

76

Johannes Goedaert

Metamorphosis naturalis

Middelburg: Jaques Fierens, [1662–1669]

Three volumes

Like many experimental "virtuosi" of the seventeenth century, Johannes Goedaert (1617–1668) began his explorations of the natural realm from the standpoint of an artist and craftsman.

Goedaert, who never attended a university, was not only a skilled naturalist and observer, but a fine watercolorist. Aided by recent advances in optics and instrumentation, he was able to train "flea-glasses" upon a great variety of insect life. Goedaert's sole work, *Metamorphosis naturalis,* written in Dutch, was the earliest study of the insect populations of the Netherlands, and it describes observations of and experiments with insects made between 1635 and 1658. Capturing "worms" (larvae) in the field and raising them to maturity, Goedaert observed and recorded the metamorphoses of a number of species. Using his expertise as a painter, he depicted the life cycles of beetles, flies, wasps, bees, butterflies, and moths.

77

Jakob Christian Schäffer

Icones insectorum circa Ratisbonam indigenorum

Ratisbon: Heinrich Gottfried Zunkel, [1766–79]

Three volumes

In their efforts to grasp the precision and beauty of nature, many eighteenth-century scientists turned to a variety of pursuits. Jakob Christian Schäffer (1718–1790) was trained as a priest and became adept in the arts and sciences. Excelling in manual arts such as sculpture, cabinet- and instrument-making, Schäffer also conducted experiments in electricity and optics. He is best known for his work in zoology, especially in entomology and botany. Among his major productions was *Icones insectorum circa Ratisbonam indigenorum,* the result of field research on several hundred insect species in the area of Ratisbon, Bavaria. Schäffer's exact descriptions and fidelity of illustration made the three-volume work a mine of information for zoologists and brought it to the attention of scientists and royalty throughout Europe.

78

Georges Louis Leclerc Buffon

Histoire naturelle des oiseaux

[Paris: Imprimerie Royale, 1770–1783]

A major feature of eighteenth-century science was the attempt to systematize the various results of research and to make that system philosophically attractive. The massive, forty-four-volume *Histoire naturelle* of the Count de Buffon (1707–1788), a basic text of Enlightenment science, was the first work to collect the diverse facts of natural history and to present them in a lucid and popular fashion. The *Histoire naturelle* moves from cosmology and anthropology to geology, geography, zoology, and many other topics. The nine monumental volumes on ornithology, published separately, contain over 1000 hand-colored plates executed by the artist and engraver François Nicolas Martinet and others. Buffon's great encyclopedia of natural history became an immensely popular work and was translated into numerous languages.

78. Buffon. *Histoire naturelle des oiseaux*. 1765–80.

79

Alexander von Humboldt

Monographie des mélastomacées

Paris: A la librairie grecque-latine-allemande
and chez Gidefils, 1816–1823
Two parts

Alexander von Humboldt (1769–1859), the celebrated naturalist, explorer, and politician, required more than twenty years to publish the encyclopedic mass of materials—scientific, archaeological, and political—gathered during his 1799–1804 expedition to equatorial regions of the Americas. Included among the sixth part of *Voyage aux régions équinoxiales du Nouveau Continent,* under which title the results of his voyage were to be known, is the *Monographie des mélastomacées.* A monograph on tropical flora, the work is illustrated with superb color engravings prepared by Aimé Bonpland (1773–1858), a botanist who accompanied Humboldt during his journey. Heir to the Enlightenment, Humboldt excelled in many fields. In addition to botany, his scientific interests included astronomy, mathematics, physics, zoology, physical geography, and meteorology.

80

Carl Linnaeus

Systema naturae

Leiden: Theodorus Haak, 1756

One of the greatest advances made in biology during the eighteenth century was the binomial taxonomy proposed by Carl Linnaeus (1707–1778). Embracing the animal, vegetable, and mineral kingdoms, the Linnean system of classification imposed order on a burgeoning mass of data that had confronted biologists since the sixteenth century. By 1600 some six thousand distinct plants had been described, and the number trebled during the next century. Traditional classification systems such as those of Aristotle, Theophrastus, Dioscorides, and the medieval herbalists were poorly equipped to organize such data. In 1735 Linnaeus published his *Systema naturae,* in which he applied the principle of plant sexuality demonstrated by Rudolf Jakob Camerarius (1694) to the material collected and initially ordered by John Ray, Joseph Tournefort, and others.

81

Jacob Theodor Klein

Summa dubiorum circa classes quadrupedum et amphibiorum

Leipzig: Johann Friedrich Gleditsch, 1743

Following the publication and success of Linnaeus' *Systema naturae,* a number of subsequent books and monographs questioned the Linnean classification and outlined the latest research.

One such text was the *Summa dubiorum,* written by zoologist Jacob Klein (1685–1759). Klein's taxonomic method, based entirely upon external characteristics such as number and position of limbs, was incompatible with those systems, including the Linnean, based on criteria not externally visible. In addition to questioning the Linnean classes of quadrupeds and amphibians, *Summa dubiorum* discusses crustaceans and ruminants and compares human longevity with that of other primates. Of additional interest are the engravings, which suggest a style of animal portraiture much closer to the fantastic and legendary creatures of old than to modern scientific illustration.

82

Marcus Elieser Bloch

Allgemeine Naturgeschichte der Fische

Berlin, 1782–1795

Twelve volumes and atlas of plates

The accomplishment of Linnean binomial taxonomy, combined with pioneering work by the Swedish naturalist Peter Artedi, led to a vigorous period of research in ichthyology. Students travelled the globe in search of new species of fish to describe. Amidst mounting reports of new discoveries from the field, ichthyologists were faced with the task of coordinating a fixed matrix of classification with an expanding range of species. Marcus Elieser Bloch (1723–1799), a Berlin physician, was fifty-six when he began writing on fish. His enthusiasm was such that he set out to describe, illustrate, and systematize virtually every known species. The result was the monumental *Naturgeschichte der Fische* whose collection of exquisitely hand-colored engraved plates makes it one of the most handsome books on fish ever produced.

83

Louis Bourguet

Traité des pétrifications

Paris: Chez Briasson, 1742

Along with the classification of new living species came the discovery of increasing numbers of fossils, evidence which suggested that many species had completely disappeared from the world. This conclusion drew the wrath of religious authorities, since it challenged the traditional Judeo-Christian notion of the fixity of species. In the face of such opposition, scholars such as Louis Bourguet (1678–1742) explored fossil sites throughout Europe and sought to systematize their findings. Professor of mathematics, skilled naturalist, and a correspondent of Leibniz, Bourguet provided in this first edition of his major work a theory of crystallization, a list of fossil sites, and a bibliography of nearly a hundred works on petrification. Countering the notion that fossils were simply "freaks" of nature, he argued for their animal and vegetable origins.

84

Jean Louis Rodolphe Agassiz
On the Principles of Classification in the Animal Kingdom; On the Structure of the Halcyonoid Polypi; On the Morphology of the Medusae
Charleston, S.C.: Walker and James, 1850

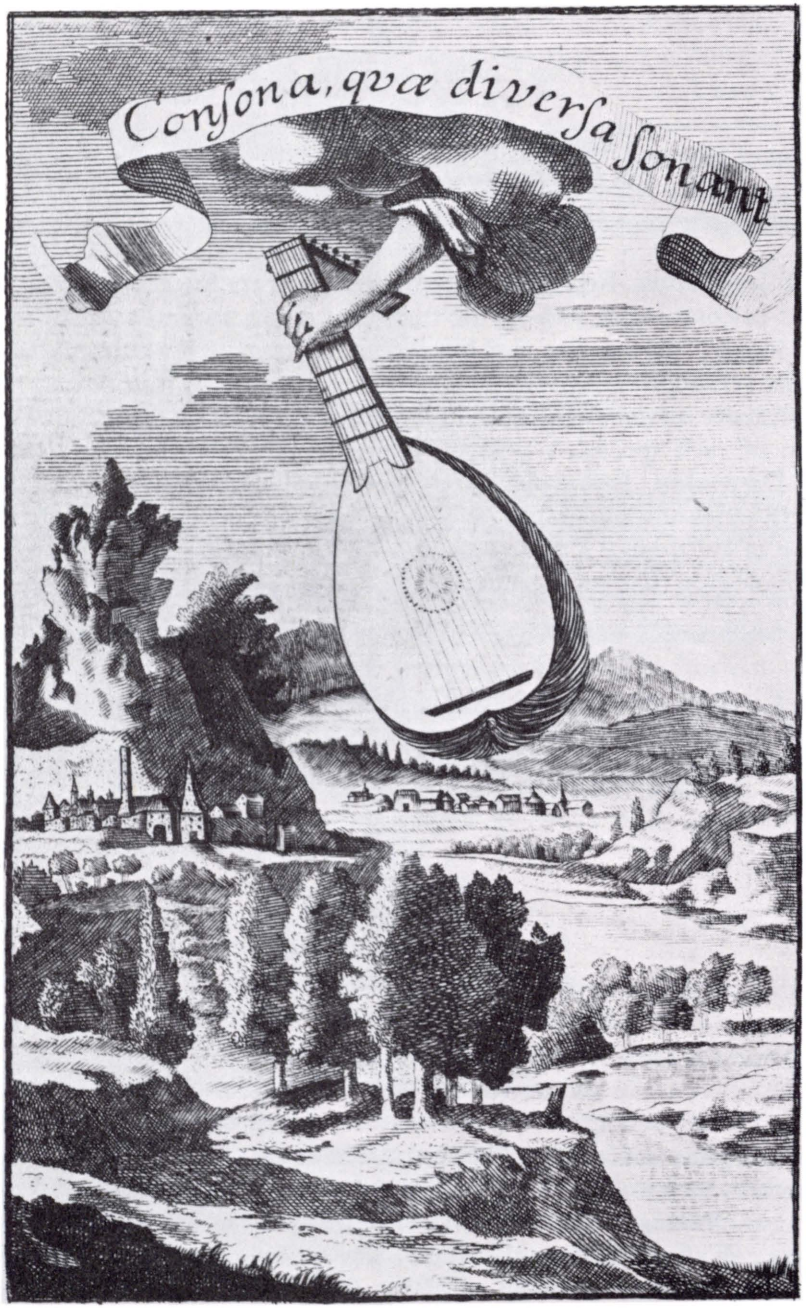
The work of Jean Louis Rodolphe Agassiz (1807–1873), Swiss zoologist, ichthyologist, geologist, and paleontologist, reflects the transition of the natural sciences from classical to evolutionary biology during the mid-nineteenth century. A student of French naturalist Georges Cuvier (1769–1832), Agassiz pursued his career both in Europe and in America. He blended an insistence on close empirical study with a metaphysical view of the Creator's role in the formation of each species, a position which would make him the leading American opponent of Darwinism. Following his acceptance of a professorship at Harvard in 1847, Agassiz issued a series of monographs on comparative embryology, including *On the Principles of Classification in the Animal Kingdom* in 1850. In this work he argued that zoologists must consider embryological changes as criteria in the classification of animal species.

GERMAN ENLIGHTENMENT

85

Christian Wolff
Vernünfftige Gedancken von dem Gebrauche der Theile in Menschen, Thieren und Pflantzen, den Liebhabern der Wahrheit
Frankfurt and Leipzig: Renger, 1730

The eighteenth-century substitution of a new faith—in reason, "science," and the future—for that of revealed religion was facilitated by the establishment of new systems of logical analysis. When philosophers such as Christian Wolff (1679–1754) changed systems of formal logic into metaphysics, they challenged the very basis of religious authority and invoked vigorous responses. In 1706, Wolff, a follower of Leibniz, was appointed professor of mathematics and natural philosophy at the University of Halle, then a center of Pietism. Wolff soon an-



85. Wolff. *Vernünfftige Gedancken*. 1730.

tagonized many colleagues by insisting that religious truths be grounded in mathematical certitude. Following years of harassment by his opponents, Wolff was ordered out of Prussia by Frederick William I and, in 1731, left for Saxony and a later post at Marburg. Among Wolff's most important writings was *Vernünfftige Gedancken von dem Gebrauche der Theile* (1724), a work on physiology which reflects his comprehensive view of philosophy as embracing all fields of knowledge.

86

Christian August Crusius
Weg zur Gewissheit
und Zuverlässigkeit
der menschlichen Erkenntnis
Leipzig: Johann Friedrich Gleditsch, 1747

Integral to the philosophies of Leibniz and Wolff was a deterministic concept of the individual and the world which challenged traditional theological viewpoints. Among those responding to these philosophies was the theologian Christian August Crusius (1715–1775). In *Weg zur Gewissheit und Zuverlässigkeit,* one of Crusius' major works, he attacked Leibniz and Wolff on the basis of the moral evils which he feared would result from their systems of determinism. Crusius was above all concerned with the implications of those systems relating to the freedom of the will. His criticisms of Wolff in particular had much influence upon the young Kant who, in his *Kritik der praktischen Vernunft,* refers to Crusius' ethical doctrines with respect.

87

Friedrich Heinrich Jacobi
Ueber die Lehre des
Spinoza in Briefen an den
Herrn Moses Mendelssohn
Breslau: Gottlieb Löwe, 1785

In this first edition of the work which brought him into prominence as a philosopher, Friedrich Heinrich Jacobi (1743–1819) criticized the system of Baruch Spinoza (1622–1677) for its suspected atheism. Jacobi also believed that the philosophies of Spinoza, Leibniz, and Wolff, being deterministic systems of metaphysics, fell prey to fatalism. Because he insisted on the importance of faith as a unifying force in philosophy, Jacobi was attacked by Moses Mendelssohn (1729–1786) and other thinkers in Berlin for his attempts to reintroduce the antiquated concept of unreasoning belief. Among the charges levelled at Jacobi were that he was an enemy of reason, a Pietist, and—worst of all—a Jesuit in disguise.

88

Gotthold Ephraim Lessing
Nathan der Weise

Berlin: Christian Friederich Voss and Son, 1779

Among the most influential works of the celebrated dramatist, critic, and philosopher Gotthold Ephraim Lessing (1729–1781) was *Nathan der Weise* (1779), a finely crafted play whose theme of religious tolerance was grounded firmly in contemporary rationalism. Lessing embodied his arguments for toleration in the famous parable of the three rings narrated by Nathan, the wise Jew. The story of the three sons—representing Judaism, Christianity, and Islam—who are potential holders of a magical ring, suggests that the absolute truth of any religious faith cannot be proven on historical grounds, and that the search for truth takes precedence over the possession of truth. *Nathan der Weise* thus argues for a nondogmatic view of religion, based on a shared humanity above the accidents of race and creed.

89

Moses Mendelssohn
Schreiben an den Herrn Diaconus Lavater zu Zürich

Berlin and Leipzig, 1770

The inspiration for the character Nathan the Wise may have been provided by Lessing's good friend, the renowned Jewish philosopher Moses Mendelssohn. One of the foremost figures of the eighteenth century, Mendelssohn drew acclaim as the "German Plato" for his discussion of the immortality of the soul in *Phädon* (1767). The *Phädon* led to a dispute with the Swiss theologian Johann Kaspar Lavater (1741–1801) concerning certain proofs of Christian dogma proposed by the Swiss philosopher Charles Bonnet (1720–1793). In his quest to convert Mendelssohn, Lavater challenged the Jewish philosopher to refute Bonnet's proofs and to defend his own tradition and faith. In response, Mendelssohn composed his *Schreiben an den Herrn Diaconus Lavater,* in which he eloquently related his philosophical views to his religious beliefs. Lavater's challenge served to strengthen Mendelssohn's commitment to Judaism, and he dedicated the remainder of his life to the emancipation of the Jews.

90

Johann Wolfgang von Goethe
Positiones juris

Strassburg: Johann Heinrich Heitz, [1771]

In his early days as a student at the University of Leipzig, the great poet, dramatist, and philosopher Johann Wolfgang von Goethe (1749–1832) spent most of his time composing

poetry and studying literature. In 1768 Goethe was stricken by a severe illness, forcing the termination of his studies at Leipzig and the return to his home in Frankfurt. After a long period of convalescence, Goethe was sent by his father to earn a degree in law at the University of Strassburg. Goethe would have preferred to resume his literary studies but agreed to his father's request, studying at Strassburg from 1770–1771. On August 6 of 1771, Goethe was awarded his degree following the successful defense of *Positiones juris,* a twelve-page dissertation containing fifty-six maxims on the nature and function of law. Goethe soon returned home to begin a career as an advocate but instead became a leader in the literary revolt then brewing against the principles of the Enlightenment.

91

Johann Gottfried von Herder

Zwei Preisschriften

Berlin: Christian Friedrich Voss and Son, 1789

Goethe had put into practice many of the ideas of the philosopher and literary critic Johann Gottfried von Herder (1744–1803). Herder was a pioneer of the *Sturm und Drang* and a critic who changed the literary tastes of a generation. Contained in *Zwei Preisschriften* is "Abhandlung über den Ursprung der Sprache" (1772), Herder's important essay on the origin of language which helped establish the foundations for the comparative study of philology, religion, and mythology. Herder argued that primitive language was an imitation in sound and imagery of natural phenomena, resulting in the personification of nature and constituting a living mythology. In contrast to the Enlightenment, he ascribed a positive role to religion in human history and praised the simplicity and spontaneity of primitive times against the complexity and rigidity of the modern world.

ACADEMIES AND LEARNED SOCIETIES

92

Accadèmia del Cimento, Florence

Saggi di naturali esperienze

Florence: Giovanni Filippo Cecchi, 1691

The establishment of learned societies was a major force in the cultivation of the new learning and the dissemination of scientific methods. The Accadèmia del Cimento, founded in 1657 by

the Grand Dukes Ferdinand II and Leopold of Florence, represented a direct challenge to the deductive methods of contemporary science. The *Saggi di naturali esperienze,* first published by the Accadèmia del Cimento in 1667, is among the earliest examples of pure experimental reporting in the history of science. Equipped with what was essentially the first physical laboratory in Europe, the Accadèmia pursued the experimental development of the scientific ideas of Galileo (1564–1642) and his students Evangelista Torricelli (1608–1647) and Vincenzo Viviani (1621–1703). The efforts of the Accadèmia del Cimento had a great influence on the growth of experimental science elsewhere and created new confidence in methods initiated by Galileo.

93

Académie Royale des Sciences, Paris
Mémoires de l'Académie Royale des Sciences, depuis 1666 jusqu'à 1699
Paris: Par la compagnie des libraires, 1729–1734
Eleven volumes

The Académie Royale des Sciences, founded in 1666 by Louis XIV, continued to develop the strong experimental emphases of earlier French scientific societies. Sustained by royal funding, the goals of the Académie were to examine the latest inventions and to conduct a wide range of experiments. With the finest observatory in Europe at their disposal, the astronomers made several important discoveries; Ole Römer (1644–1710), for example, correctly deduced the finite speed of light from his observations of the planet Jupiter. Following a brief period of decline, the Académie was reconstituted in 1699 and, subsequently, issued the *Mémoires,* or proceedings of its meetings, including unpublished records of sessions held from 1666–1699. Until its suppression in 1793, the Académie Royale des Sciences, whose members included Buffon, d'Alembert, and Lavoisier, was a major force in the growth of scientific inquiry and experimentation.

94

Preussische Akademie der Wissenschaften, Berlin
Histoire de l'Académie Royale des Sciences et Belles-Lettres
Berlin: Chez Haude et Spener, 1746–1771
Twenty-five volumes

The Preussische Akademie der Wissenschaften at Berlin began as the *Societas Regia Scientiarum*. Constituted in 1700 by Frederick I, elector of Brandenburg and first king of Prussia, the *Societas* followed the comprehensive plan of the renowned polymath Gottfried Wilhelm Leibniz (1647–1716). In his devotion to science and to Germany, Leibniz realized that a

96. Asiatic Society. *Asiatick Researches*. 1788–1839.

national scientific academy was a necessary instrument of the modern state, since through it scientific knowledge could be used for the public good. Leibniz further understood that an institution comparable to those in England and France could help restore Germany's leadership in such practical sciences as mining, chemistry, and horology. The Akademie began publication of its transactions in 1710. Over the years contributors included celebrated scholars such as Bopp, Euler, the two Humboldts, and the brothers Grimm.

95

Imperatorskaya Academiya nauk, Petrograd
Commentarii Academiae Scientiarum Imperialis Petropolitanae
St. Petersburg: Typis academiae, 1728–1751
Fourteen volumes

Shortly before his death in 1724, Peter the Great sought out the advice of Leibniz and Wolff on the formation of a scientific academy based on German and French models. His successor, Catherine I (1683?–1727), formally established the Imperatorskaya Akademiya nauk on December 21, 1725. Under Catherine II (1729–1796), the Akademiya played a major role in the advancement of national culture, as the empress dispatched teams of scholars to investigate the topography, geography, natural resources, and history of her vast domain. *Commentarii Academiae Scientiarum Imperialis Petropolitanae* was first published in 1728. Included in volume five, covering the years 1730–1731, are monographs on mechanics, mathematics, chemistry, and ancient history.

96

Asiatic Society of Bengal, Calcutta
Asiatick Researches; or, Transactions of the Society
Calcutta: Manuel Cantopher, 1788–1839
Twenty volumes

The Asiatic Society of Bengal, founded by the renowned English jurist and Orientalist Sir William Jones (1746–1794) in 1784 under the auspices of Governor-general Warren Hastings (1732–1818), served to kindle an "Oriental renaissance" in Europe during the nineteenth century. By bringing Asian languages, literature, arts, and sciences to the attention of Europeans, the members of the Asiatic Society of Bengal helped to generate a host of comparative disciplines in the areas of philology, religion, mythology, folklore, law, and anthropology. Jones, an extraordinary linguist possessing knowledge of over forty languages, was among the first European scholars to recognize the common ancestry of Sanskrit with Greek, Latin, and other European languages. Commenting on the classical language of India, he praised its

"wonderful structure; more perfect than the Greek, more copious than the Latin, and more exquisitely refined than either." Among the articles found in the premier issue of *Asiatick Researches* are "On the Orthography of Asiatick Words," "An Interview with the Young Lama," "On the Gods of Greece, Italy, and India," and "On Extracting the Essential Oil of Roses."

TRAVEL AND EXPLORATION

97

Idrisi

Geographia Nubiensis

Paris: Hieronymus Blageart, 1619

Prior to the early fifteenth century, one of the few works available to Europeans which described distant lands such as Africa and the Atlantic islands was the treatise compiled by the noted Arab geographer Idrisi (*ca.* 1099–1154). Employed by Roger II of Sicily (1101–1154) as court geographer, Idrisi sent emissaries to observe and describe various countries and regions, including Scandinavia, Germany, France, Italy, Syria, and Egypt. Idrisi organized this material into his geography which he entitled *Al Rojari* (1154) in memory of his patron. The title *Geographia Nubiensis* comes from a misreading of a passage relating to Nubia and the river Nile by the two Maronite scholars who issued this first Latin edition in 1619. In composing his treatise, Idrisi relied heavily upon Arabic versions of Ptolemy's *Geography,* not generally available in Europe until Greek and Latin manuscript versions began to circulate in the fifteenth century.

98

Collectiones peregrinationum in Indiam Orientalem et Indiam Occidentalem

Frankfurt a. M.: 1590–1634. Twenty-five volumes

Collected and engraved by Theodor de Bry *et al.*

The fifteenth and sixteenth centuries were a period of unprecedented European expansion. The story of this adventure was recorded in a wealth of literary accounts describing the many new and exciting discoveries. By the latter half of the sixteenth century there was a great demand for anthologies which brought this information together. One of the most influential

98. De Bry. *Collectiones peregrinationum*. 1590–1634.

of these works was that of the renowned German engraver Theodor de Bry (1528–1598), whose collection was a major, if not the major, source of visual representations of exotic peoples in the sixteenth and seventeenth centuries. Drawing upon prior voyage collections such as Richard Hakluyt's, de Bry and his sons created intriguing glimpses into distant lands and societies which fueled the growing fascination with the New World and Asia.

99

Chinese Rites

Italy, *ca.* 1710

As European travellers found their way over the globe, they were frequently accompanied by missionaries who sought the conversion of newly discovered peoples. The Jesuits were especially successful in establishing the Church in Asia by adapting Christianity to the customs of local communities. In China, where they had begun active mission work in the late sixteenth century, the Jesuits adopted native dress and customs, allowing their converts to continue rituals of respect to Confucius and to their ancestors, and to express the Christian concepts of Heaven and God in Chinese terms. The "Chinese Rites" controversy, which began in the mid-seventeenth century, stemmed from the vigorous condemnation of this policy of accommodation by other clergy who feared that Christian doctrine was being perverted. The issues were debated well into the next century, when this hand-written copy of pamphlets describing the controversy was made. Bitterly disputed in Europe, the matter finally led to the expulsion of all missionaries from China in 1724 and to the decline of Jesuit influence in Europe.

100

Adam Olearius
Moscowitische und Persianische Reisebeschreibung

Hamburg: Zacharias Herteln and Thomas von Wiering, 1696

During the early seventeenth century, northern European merchants saw Russia as a land through which secure trade routes might be opened to Persia and points east—without danger from or taxation by the Turks, and unknown to Italy, Spain, and Portugal. In 1633, Adam Olearius (1600–1671) was appointed secretary to an embassy from the Duke of Holstein to Muscovy and Persia which sought to make that Duchy an entrepôt for overland silk trade. Due to serious miscalculations concerning the proposed route along the Volga and other factors, the commercial goals of the five-year (1634–1639) mission were never realized. Yet Olearius' account of his travels, first published in 1647, became one of the major early descriptions of "Russia" by a European and was a popular success. With his sharp wit and anecdotal style, Olearius described the everyday life of nobility and peasant alike. He consid-

ered the Russians, with some reservations, as a Christian people, yet saw Russian institutions as so different from their Western counterparts as to constitute a distinct civilization.

101

Peter Simon Pallas

Reise durch verschiedene Provinzen des Russischen Reichs in einem ausführlichen Auszuge

Frankfurt and Leipzig: Johann Georg Fleischer, 1776–78

Three volumes and atlas of plates

During the long reign of Catherine II, Russia became increasingly receptive to Western science, technology, and culture. The German-born empress invited scores of foreign scholars to take up residence in Russia in the hope of developing the material resources and intellectual life of her empire. In 1767 she called the celebrated naturalist Peter Simon Pallas (1741–1811) to a professorship in natural history at the St. Petersburg Academy of Sciences. The following year Pallas participated in a research expedition through little-studied regions of the empire. This fruitful journey resulted in his monumental *Reise,* first issued 1771–1776. Pallas' work provided great amounts of data on a variety of subjects, including botany, zoology, geology, geography, ethnography, philology, and medicine. Employing the comparative method, he laid the foundations of a new natural history that excluded metaphysics and was influential in the development of evolutionary theory.

102

Pierre Sonnerat

Voyage à la Nouvelle-Guinée

Paris: Chez Ruault, 1776

In the latter half of the eighteenth century, France made serious attempts to break the monopoly in the spice trade which the Dutch had long enjoyed. Having annexed the Seychelles islands in the Indian Ocean (1743), they built permanent settlements (1768) and spice plantations, later dispatching expeditions to India, the Malay archipelago, and elsewhere. A naturalist accompanying one such voyage was Pierre Sonnerat (1745–1814). During a journey to the Moluccas, Philippines, and neighboring islands taken in 1771–1772, Sonnerat made extensive observations of primitive societies and exotic wildlife, which he subsequently reported in *Voyage à la Nouvelle-Guinée.* Although the title of his work refers to New Guinea, Sonnerat did not actually land there but rather on nearby islands. The many specimens and curiosities which he brought to the king's cabinet further stimulated the growing interest in the "noble savage," a popular romantic image which persisted well into the nineteenth century.

103

Pierre Trémaux

Voyage au Soudan orientale et dans l'Afrique septentrionale

Paris: Chez Borani, [1852–62]

Prior to the early nineteenth century, vast interior regions of Muslim-dominated North Africa were closed to European travellers. But a combination of events led to the journey of French archaeologist Pierre Trémaux (b. 1818) and several European scientists through previously unexplored areas of eastern Sudan and Ethiopia from 1847–1854. Bonaparte's occupation of Egypt (1798–1799), Champollion's decipherment of the Rosetta Stone (1822), and the growth of "Orientalism" in Europe created a great interest in Egyptian and North African monuments and culture. An opportunity to advance far up the Nile valleys beyond Nubia was provided by the conquest of the Sudan by Pasha Mehemet Ali in 1820–1822. Desirous of exploiting the new mineral resources, the Egyptian ruler dispatched a European research team into the territory. Through a series of fortuitous circumstances, Trémaux was able to join the team and record the many ancient monuments and contemporary societies encountered along the way. *Voyage au Soudan* contains many examples of early photography, only then being introduced to field research.

POPULAR CULTURE

104

Reineke de Vos mit dem Koker

Wolfenbüttel: Frytag, 1711

Edited by Friedrich August Hackmann

One of the most enduring fables of European folklore has been the cycle of stories concerning knavish Reynard the Fox and his ability to outwit Isengrim the Wolf, Bruin the Bear, King Noble the Lion, and other animal characters. *Le Roman du Rénard* probably originated in the French-Flemish border region during the eleventh or twelfth century. Over succeeding centuries, the fable served not only as a means for literary expression, but also as a vehicle for satirical comment on human vices and weaknesses and on the corruptions of feudal institutions. The oldest known German version was composed in 1180 by an Alsatian monk, Heinrich der Glichezaere, but the major source for later German adaptations is to be found in the

104. *Reineke de Vos*. 1711.

Flemish *Reinaert de Vos,* written by one Willem around 1250. Willem's version served as the basis for a Low Saxon incunable edition, *Reynke de Vos,* produced at Lübeck in 1498, which in turn was edited by the German scholar Friedrich August Hackmann (fl. 1709–1734) in 1711. Along with the tales of Reynard, Hackmann introduced *De Koker,* a poem of uncertain authorship consisting mainly of old proverbs.

105

Ernst Christoph Homburg
Geistliche Lieder

Jena: Georg Sengenwalden, 1659

Two volumes in one

Following the example of Martin Luther, many sixteenth-century German hymnists sought to express the new religious consciousness in vernacular songs. In the aftermath of the Thirty Years War (1618–1648), poets, song-writers, and musicians turned to the composition of such traditional songs as a means of comfort and solace during difficult times. Ernst Christoph Homburg (1605–1681), a legal counsel and court clerk at Naumberg who had gained a reputation as a poet, was brought by personal tragedy to create 150 moving spiritual songs. His *Geistliche Lieder* appeared in two volumes: in 1658 at Naumberg with music by Werner Fabricius, and in 1659 at Jena based on the melodies of Paul Becker. Homburg's compositions, dealing especially with penitence, passion, consolation, and death, are vigorous and eloquent. Several, including "Jesu, meines Lebens Leben," are still in use.

106

Wolfgang Helmhard Hohberg
Georgica curiosa

Nuremberg: Martin Endters, 1701–1715

Three volumes in two

Following the devastation brought to Germany by the Thirty Years War, the local nobility and landed gentry faced the ruin of their properties and the loss of their life-styles. A work which rekindled enthusiasm for domestic life among the propertied class was *Georgica curiosa* (1682), written by the agricultural writer Wolfgang Helmhard Hohberg (1612–1688). The text, which became extremely popular, is essentially a manual for the landed gentry, discussing agriculture, technology, economics, and political history. The first part treats the establishment of a manor, administration and finances, horticulture, vineyards, and the production of wine. The second part addresses field cultivation, care of meadows, animal husbandry, beekeeping, fishing, hunting, social gatherings, and the historical events which led up to the Thirty Years War.

107

Carl Friedrich Wilhelm Jeppe

Herbarium vivum

Rostock: A. F. Achilles, 1826

Little is known about the life of Carl Friedrich Wilhelm Jeppe except that he was a merchant at Rostock when he published his *Herbarium vivum,* an early seed catalogue, in 1826. The work contains pressed mounted specimens of fifty species of fodder, grasses, and noxious weeds, a knowledge of which Jeppe considered essential for local merchants and agriculturalists. For the weeds, he suggested means of control and eradication. Yet the majority of the plants presented in the *Herbarium vivum* are beneficial grasses, and Jeppe gave their distinguishing characteristics, soil preferences, and practical uses. Each description is provided with a carefully prepared specimen of the plant, including flowers and seed-clusters. Jeppe's catalogue served, no doubt, as a useful source of information for his customers, who, according to an enclosed subscription list, included pastors, military leaders, nobility, and landed gentry.

PRINTING AND TYPOGRAPHY

108

Gerard Meerman

Origines typographicae

The Hague [etc.]: Nicolaus van Daalen [etc.], 1765

Origines typographicae, written by the Dutch jurist and bibliophile Gerard Meerman (1722–1771), examines the problem of the earliest forms of movable printing type. Marked irregularities in the types used in the first printed books led some later scholars to conclude that movable wooden type was used prior to cast metal type. While Meerman agreed that the very earliest printed works could not have been produced using movable cast metal type, he argued instead that the first movable types were fashioned from type shanks cast in four-sided molds. After these shanks had cooled, the "faces" (the letters or characters) were then carved by hand. As ingenious as Meerman's theory may be, later scholarship has all but proven that the first known printing shops such as those of Laurens Coster (fl. 1440) in Haarlem and Johann Gutenberg (*ca.* 1400–*ca.* 1467) in Mainz did employ movable cast metal type made with letter punch, matrix, and mold.

109. Fournier. *Les caractères de l'imprimerie*. 1764.

109

Pierre Simon Fournier

Les caractères de l'imprimerie

Paris, 1764

Pierre Simon Fournier (1712–1768), a member of the famous family of French printers, was one of the finest engravers and type-founders of the eighteenth century. Fournier was a consummate craftsman and artist who designed many new styles and characters of type, made important advances in music type, and produced tasteful emblems and ornamentation. He also developed a point system for standardizing the sizes of type and published several popular works which stimulated public interest in printing and typography. *Les caractères de l'imprimerie* (1764) is a specimen book of type similar to a larger collection found in Fournier's monumental *Manuel typographique* (1764–1766). Assembled in the *Manuel* are types which Fournier designed, those inherited from his family's business, and some on loan from noted shops in Germany and France. Fournier's foundry was celebrated throughout Europe, supplying many printers with a great variety of exquisite type.

110

Jean-François-Auguste Bastard d'Estang

Peintures et ornements des manuscrits

[Paris, 1835–1848]

Efforts toward the exact reproduction of medieval illuminated manuscripts began in the seventeenth century following the developments made in printing and engraving. With the invention of lithography at the end of the eighteenth century, it soon became possible to reproduce mechanically numerous facsimiles of precious manuscripts, duplicating the colors as well as the design of the original. A skilled and industrious early exponent of this use of chromo-lithography was the Count Bastard d'Estang (1792–1883). His most extensive project, *Peintures et ornements des manuscrits,* was originally conceived as a series of 160 plates treating major schools of illumination from the fourth through sixteenth centuries. The revolution of 1848, however, deprived the Count of essential royal funding, and production of the grand and costly edition largely ceased. Published plates reproduce a variety of manuscripts, including Byzantine, Merovingian, and Gothic examples.