Chapter 5

The Encyclopedia

1. We have seen that the characteristic was inseparable in Leibniz's mind from the encyclopedia. The former presupposed the latter to some extent, or at least had to be established at the same time and developed in parallel with it. Conversely, once established, the characteristic would be the instrument of the encyclopedia and the key to all the sciences.[1] This encyclopedia was to be a compendium of all human knowledge, both historical and scientific, arranged in a logical order according to a demonstrative method, beginning with definitions of all the simple and primitive terms (which form the alphabet of human thoughts). This project occupied Leibniz throughout his life and was to be his great philosophical and scientific work. Thus the history of this enterprise—its origins, transformations, and final failure—are mixed with the history of the thought and mind of the philosopher.

Without a doubt, no one was better prepared than Leibniz to conceive and undertake such a work. While still a child, he had gathered from his reading, done at random and with an insatiable curiosity, an extremely broad and varied erudition, of which he gave proof, not without some ostentation, in the essays of his youth,[2] and of which the works of his maturity are but the fulfillment. Trained at first in the history and literature of the ancients, he later immersed himself in reading scholastic authors with an ardor that put his masters in fear of his going any further.[3] He next studied law and theology and made a brilliant debut as a lawyer, which was to remain his official position for life.[4] Soon he applied his philosophical and critical mind to the science of law. His first essays as a jurist are marked by the preoccupations of the logician.[5] In them, he deals with difficulties of a logical nature and strives to resolve them by rigorous demonstrations. The spirit of these works can be characterized by the thought Leibniz expressed some years later, namely that jurisprudence is nothing but logic applied to moral questions; likewise, just as there is a theological logic, a medical logic, and a mathematical logic (that is, algebra), there is also a juridical logic, so that jurisprudence is a true dialectic of the law.[6]

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[1] See the end of Chap. 3; Leibniz to Oldenburg (*Phil*., VII, 13; *Brief*., I, 101); and *Judgment on the Writings of Comenius* (Note XIII).

[2] The dissertation *On the Principle of Individuation*, *On the Art of Combinations*, the *Preface to Nizolius*, etc.

[3] *The Life of Leibniz Briefly Sketched by Himself* (Klopp, I, Foreword, xxvi).

[4] See Leibniz to Jacob Bernoulli, April 1703: "In what I would now call an almost arrogant ignorance of mathematics, I surveyed histories and laws, for I had devoted myself to these studies" (*Math*., III, 72).

[5] *An Example of Difficulties in the Law, or the More Interesting Philosophical Questions Gathered From the Law* (2 December 1664). *An Example of Certainty, or of Demonstrations in the Law, Displayed in the Doctrine of Conditions* (1665) (see Note V below). *On Difficult Cases in the Law* (5 November 1666).

[6] Leibniz to Conring, 9/19 April 1670 (*Phil*., I, 168). Leibniz later wrote to Bierling: "We have excellent juridical logics, that is, applications of logic to jurisprudence" (7 July 1711; *Phil*., VII, 498).

2. From legal casuistry and the interpretation of positive laws, Leibniz advanced gradually to the philosophy of law. He discovered first a "new method for learning and teaching jurisprudence," in which he was naturally led back to the logical principles of the didactic art and to note the imperfections of contemporary legal studies.[7] He then conceived a project for reformulating civil law on the one hand and Roman law on the other, according to a systematic plan;[8] he also began to collaborate with Lasser, tribunal councilor to the Elector of Mainz, on some "elements of Roman law."[9] From there he was led to investigate the principles of natural law, in order to found on them the set of positive laws, and he articulated these principles already in his *New Method*, as he would 26 years later in the preface to *Diplomatic Code of the Law of Nations*.[10] Around this time he planned to compose a work on the elements of natural law, about which he wrote to Arnauld and the duke of Hanover,[11] and which his trip to Paris must have forced him to abandon. He later returned to this plan (though without much success[12]) and until the last year of his life he dreamed of correcting the civil code according to the principles of natural law.[13] From all of these plans, we are left with numerous essays and drafts, most notably a fragment entitled *Definition of Universal Justice*.[14] It contains the seeds of several original theories, both in logic and in morality, that are connected with the idea of the encyclopedia and which are met again in the philosopher's later writings.

3. At the same time, Leibniz was preoccupied with introducing mathematical rigor into practical questions of morality and politics by means of formal reasoning. It is in this spirit that he composed *A Specimen of Political Demonstrations for Choosing the King of Poland* in 1669[15] and *A Specimen of a Political Demonstration* in 1671,[16] intended to recommend to Louis XIV the conquest of Egypt as a means of diverting his armies from

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[7] *A New Method for Learning and Teaching Jurisprudence*, 1667 (see Note VII below).

[8] *A Method for Repairing the Body of Law*, Mainz, 1668 (Dutens, III, 235). Cf. *Letter to a Friend on the Faults and Improvement of Roman Law*, in *Acta Eruditorum*, XXIII (Dutens, III, 230); Leibniz to Lambeck, late 1668 (Klopp, I, 34); Boineburg to Conring, April 1670 (Klopp, I, Foreword, xxii); Leibniz to Conring, 1670 (*Phil*., I, 162); Leibniz to Arnauld, 1671 (*Phil*., I, 73).

[9] See Leibniz to Hobbes, 13/22 July 1670, in which he says that for the past four years, he has entertained the plan of reducing Roman law to a small number of general principles, adding that a good half of Roman law is natural law (*Phil*., I, 83). Cf. Leibniz to Arnauld, 14 July 1686 (*Phil*., II, 60).

[10] See Note VII below. Cf. *Observations on the Principle of Law*, 1670 (Dutens, III, 270).

[11] Leibniz to Arnauld, 1671 (*Phil*., I, 73); Leibniz to Duke Johann Friedrich (*Phil*., I, 60).

[12] Leibniz to Johann Bernoulli, 28 December 1696 (*Math*., III, 347-8).

[13] Leibniz to Kestner, 1 July 1716 (see Note XX below). In a sketch of the encyclopedia dated May 1681, Leibniz again speaks of a new book on repairing the body of law (*Phil*., VII, 72). Leibniz's manuscripts contain numerous drafts relating to these different plans, only a portion of which appear in Georg Mollat's *Rechtphilosophisches aus Leibniz' ungedruckten Schriften* (Leipzig, 1885). A new edition of this work was published under the title *Mitteilungen aus Leibnizens ungedruckten Schriften* (Leipzig, 1893). See the enumeration of these pieces in Bodemann, 31ff.

[14] Published by Trendelenburg (see Note IX below).

[15] See Note VIII below.

[16] The complete title is *A Specimen of a Political Demonstration Concerning What Now May Be of Interest to France, or the Best Plan that Can Be Given to the Most Powerful King. An Expedition into Holland is Rerouted to the East or Egypt* (Klopp, II, 100-7). The same volume contains all of the documents relating to the plan for the Egyptian expedition, notably the *Egyptian Plan* and *Dissertation on a Just Egyptian Expedition Proposed to the King of France*, incompletely published in Foucher de Careil, V.

Holland.[17] The same preoccupation with logical rigor, this time applied to the justification of theological dogmas, is manifest in *Confession of Nature Against the Atheists* (1668) and *Defense of the Trinity Through a Newly Discovered Logic* (1669).

In sum, Leibniz's first essays show, on one hand, that he was interested in all types of knowledge with a truly universal curiosity, and on the other, that he endeavored in all these fields, even the moral and practical, to give priority to the logical clarity and demonstrative force already convincingly observed in mathematics, although he was only very imperfectly acquainted with the latter and had not yet been charmed, as he says, by the sirens.[18]

4. It is in this period that the idea of an encyclopedia first surfaces. It appears in connection with a plan for "repairing the body of the law," which would culminate in a true encyclopedia of the law.[19] Leibniz had conceived the project of a bibliographical review that would give an account of all new books and would serve to summarize and classify scientific works of every kind.[20] This project was for him, however, only the indispensable preparation for the encyclopedia.[21] Already he complained of the accumulation of bad or useless books, the mass of which smothered good books; already he feared that the confusion of studies produced disgust and a return to barbarism.[22] The *Semiannual Literary Review* would not only give a concise analysis (without criticism) of worthwhile new books (the others would be passed over in silence), but it would also print unpublished works, both ancient and contemporary; it would give an account of inventions and discoveries; and finally, it would describe and explain arts and crafts and provide all the scientific and historical information not found in books. Periodically, there would be a complete catalog of its contents, which would serve as a bibliographical index. In the end, the materials methodically compiled and classified in this way would form a complete encyclopedia.[23]

This encyclopedia was initially conceived as a simple summary of acquired knowledge, a portable library[24] or *Photian work*—that is, an extract or essence of books, after the example of the work that Photius, patriarch of Constantinople, had ordered for

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[17] We know that this plan was the occasion of Leibniz's journey to Paris, where he accompanied his patron Baron Boineburg on a diplomatic mission. Moreover, it was at the instigation of the latter that he composed the two abovementioned essays, as well as *Defense of the Trinity* (1669) and *Preface to Nizolius* (1670).

[18] *Phil*., VII, 323. He later said of his *New Physical Hypothesis*, composed in the same period (1671), "It was the essay of a young man who had not yet thoroughly penetrated mathematics." Leibniz to Foucher, 1693 (*Phil*., I, 415). Cf. Leibniz to Tschirnhaus, late 1679 (*Brief*., I, 406); Leibniz to Jacob Bernoulli, April 1703 (*Math*., III, 71); *Phil*., VII, 186.

[19] See Leibniz's letter to Lambeck, late 1668, and Boineburg to Lambeck, 18 November 1669 (Klopp, I, 34, 100).

[20] See the two plans for the *Semiannual Literary Review* (1668) in Foucher de Careil (VII, 164, 155), only the second of which is found in Klopp (I, 39), and *The Usefulness, and Indeed Necessity, of a Semiannual Summary of Books*, 1669 (Klopp, I, 86).

[21] See, from the same period, *Plan for the Renewal of Letters and the Founding of an Encyclopedia*: "the goal of a universal labor: the development of an encyclopedia" (Klopp, I, 48).

[22] Klopp, I, 40, 45, 48, 53. Cf. *Phil*., VII, 160; Foucher de Careil, A, 286.

[23] *Plan for the Renewal of Letters and the Founding of an Encyclopedia* (for more details, see Appendix IV below).

[24] "It may be contained in several portable volumes of a library" (*ibid*.). Cf. *Semiannual Literary Review*: "a compact universal library" (Klopp, I, 40; Foucher de Careil, VII, 157).

the books gathered in the Basilica of St. Sophia, later destroyed by the Turks.[25] However, it would be composed in a more logical order, according to the didactic method that Leibniz had invented and applied to the study of the law in his *New Method* (1667).[26] This method would constitute, according to a metaphor dear to Leibniz, the thread of Ariadne in the labyrinth of literature.[27] The encyclopedia would thus comprise not only the "public treasury of learning"[28] but a logical and didactic system of knowledge.

From here the original plan was developed and expanded. Leibniz conceived the plan of founding a society of learned men in order to carry out the work, which would surpass the efforts of a single man.[29] The final product would include, first, a "compact library," which would be a summary of the knowledge contained in the books; second, a "universal atlas," which would assemble all the figures, tables and diagrams needed for illustrating and completing the encyclopedia;[30] third, a "corpus of literary treasures," that is, a collection of rare or unpublished documents; fourth, a "treasury of experiences," a compendium of observations and experiments of all sorts (physical, medical, and industrial); and fifth and finally, the "true method of invention and judgment," which would include analysis and the combinatory—that is, logic as Leibniz conceived it—and which would serve to organize all the enumerated material according to the logical succession of truths and to complete them by deducing all their necessary consequences.[31]

5. The oldest extant plan for the encyclopedia undoubtedly dates from this period: *An Encyclopedia Drawn From Successive Authors and Their Particular Views*.[32] As the title indicates, and even more the list of authors whose names appear in the different headings, this would be a compilation rather than an original and systematic work, and this is why we believe it can be related to the project of the *Semiannual Literary Review*. The plan gives a prominent place to theology, law, history, and the moral and political sciences; by contrast, mathematics and medicine occupy only a subordinate position, which shows that this document dates from the period in which Leibniz, *doctor utriusque juris*, had not yet studied the sciences.

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[25] *The Usefulness, and Indeed Necessity, of a Semiannual Summary of Books* (Klopp, I, 86).

[26] "Didactics or the method of teaching and learning" (Klopp, I, 47). There exist some unpublished fragments relating to this "new didactic method" (LH IV 6 Bl. 11).

[27] Klopp, I, 46, 47.

[28] "The public treasury of learning" (Klopp, I, 41; Foucher de Careil, VII, 160; cf. *ibid*., 166). "The complete treasury of public learning" (Klopp, I, 142; Foucher de Careil, VII, 80). "The encyclopedia or common treasury" (Klopp, I, 45). "*The great work... on behalf of the public treasury of all human knowledge and experience*" (Klopp, I, 54).

[29] See Appendix IV, §3

[30] Klopp, I, 42, 52, 54. Cf. Foucher de Careil, VII, 140, 163, 592; *New Essays*, III.x.25. Leibniz says that he has elsewhere drawn up the plan for this atlas. It is found in the unpublished fragment LH IV 7A Bl. 30.

[31] Klopp, I, 54-55.

[32] *Phil*., VII, 37-38. Gerhardt published only the headings of this plan, but each is followed by a large number of names of authors, from whom the material for the corresponding chapter was to be borrowed. This fragment is classified as LH IV 7A Bl. 16 (see Bodemann, 93).

To this plan we can join a project for correcting and completing the encyclopedia of Alsted, which appears to date from around 1671.[33] This too would be a compilation of works by different authors, but Leibniz reserved the right to modify their doctrines and perhaps reconcile them. The physics was borrowed primarily from Hobbes, supplemented by Galileo, Huygens, and even Aristotle and Digby. The geometry was taken entirely from Euclid. The logic was that of Jungius, with additions from Clauberg, the *Port-Royal Logic* and *On the Art of Combinations*. The philosophy of soul was extracted from Descartes, Digby, and Thomas Barton.[34] The most personal part was the jurisprudence, politics, and theology; and this confirms our conjecture concerning the date of this plan, which appears to be contemporary with the *New Physical Hypothesis* (1671) as well as the projected *Elements of Natural Law* and *Elements of Mind*,[35] and which certainly predates the journey to Paris in March 1672. In any case, Leibniz appears to have begun the work and to have undertaken to extract lists of definitions from Alsted's encyclopedia[36] and Zwinger's *Theatrum vitæ humanæ.*[37]

6. Leibniz's journey to and sojourn in Paris (March 1672-October 1676) naturally interrupted his projects, or at least delayed their practical realization. However, he did not renounce them, as we see in a piece dated May 1676 and entitled *Physical Method. Characteristic. Improvements. Society or Order*.[38] This small memorandum, clearly intended for an illustrious figure to whom Leibniz promises glory in its final phrase, marks a new stage in his great project: the characteristic is presented as the true method of reasoning, as the universal logic. Moreover, there is evident in it an entirely new regard for the physical sciences and the experimental method (to which the characteristic is also applicable, as we shall see in the next chapter[39]). The memorandum concludes with the foundation of a learned society that would have for its aim not only the recording of acquired knowledge but research and discovery and the promotion of all the sciences, both theoretical and experimental.[40]

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[33] *Some Thoughts on the Method of Completing and Improving the Encyclopedia of Alsted* (Note XII below). Cf. *Judgment on the Writings of Comenius* (Note XIII below).

[34] See Note I below.

[35] Leibniz to Arnauld, 1671 (*Phil*., I, 73); Leibniz to Duke Johann Friedrich, 26 March 1673 (*Phil*., I, 67).

[36] Johann Friedrich Alsted of Herborn (1588-1638) published his *Encyclopedia* (4 vols. in folio) in 1620. See the notes taken by Leibniz on this work in the unpublished fragment LH IV 7C Bl. 11-12, and the following fragment (LH IV 7C Bl. 13-16), *Notes on Distinctions or the Principles of Divisions*, which begins: "I do not think that it would be bad if, just as I once did with Zwinger's *Theatrum*, I should extract the principles of divisions or oppositions from Alsted's encyclopedia. For the art of division (which is a part of logic) has, as I have noted elsewhere, an important use for invention, although it seems to me always less suitable for knowledge" (sentence quoted in Trendelenberg, III, 42, which mistakenly prints *propositiones* in place of *oppositiones*). We know that the division of concepts (into genera and species) goes hand in hand with definitions.

[37] Theodore Zwinger of Basel (1533-1588) published his *Theatrum* in Basel in 1565. It appears to be a sort of "practical ethics," according to what Leibniz says of it (*Phil*., VII, 181, and *New Essays*, IV.xvi.11; IV.xxi.4). He cites Zwinger and Alsted together in a piece from May 1681 (*Phil*., VII, 67).

[38] LH IV 5, 6c Bl. 9-10. Published by Klopp (III, 308) and by Foucher de Careil (VII, 101-5) under the title *On Establishing the Foundation for Advancing Knowledge*.

[39] The unity of the deductive and inductive methods is already affirmed in a fragment *On the Art of Discovering Theorems*, dated Paris, 7 September 1674 (LH IV 6, 12d). See Chap. 6, §37.

[40] See Appendix IV, §6 below.

This project is developed and refined in another, lengthier memorandum,[41] which Leibniz must have drafted shortly after his return to Germany, at the instigation of certain great personages, whom he says have sustained him.[42] He proposes founding an Imperial German Society, which would always have the same aim: the advancement of the natural sciences.[43] The result of its efforts would be the encyclopedia, whose rules and composition Leibniz describes: every proposition must be either postulated or proved. The postulates will be definitions, axioms, and hypotheses. Propositions will be proved by demonstration or by experiment; in the absence of certainty, the most probable conclusions will be sought, for probability itself is susceptible to demonstration.[44]

7. This project, to be carried out under the auspices of the emperor, undoubtedly met with no more favor at the Viennese court than had the *Semiannual Literary Review*. In any case, Leibniz appears to have set aside invocations to the great and instead made a direct appeal to the good will of learned men. This new attitude is revealed in several French fragments[45] and in a Latin memorandum in which he develops the plan for the future encyclopedia.[46] The first science is rational grammar, which is, we know, the indispensable preface to logic.[47] The second is logic, of which Aristotelian syllogistics is only the most elementary part. The third is mnemonics.[48] The fourth is topics or the art of invention. The fifth is the "art of formulas," that is, the combinatory. The sixth is "logistics" or universal mathematics, that is, the logic of quantity. The seventh is arithmetic; the eighth, geometry (with its technical applications); and the ninth, mechanics. The tenth is "poeography," the science of the physical qualities of bodies; the eleventh, "homeography," which organizes bodies into different species (rather like chemistry).[49] All of these sciences are somewhat abstract; there follow the concrete sciences. The twelfth discipline is cosmography, which includes astronomy, physical geography, and meteorology. The thirteenth is "idography," the science of organic bodies (of animal and vegetable species). The fourteenth is moral science, or what we call

[41] *A Consideration of the Knowledge of Nature, for the Sake of Advancing the Enjoyment of Life, and Establishing to This End a German Society That Will Describe in Our Language the Arts and Sciences Most Useful for Life and Assert the Honor of the Fatherland* (Klopp, III, 312; Foucher de Careil, VII, 105-126).

[42] Foucher de Careil, VII, 105.

[43] "The expressed desire of improving physics" (Foucher de Careil, VII, 120). See Appendix IV, §6 below.

[44] "For probability too can be demonstrated" (Foucher de Careil, VII, 125). Cf. Klopp, I, 42; Foucher de Careil, VII, 161.

[45] *Memoir for Enlightened Persons of Good Intention* (Foucher de Careil, A, 274-292; Klopp, X, 7-21). *Discourse on a New Plan for a Certain Science, in Order to Seek Advice and Assistance From the Most Intelligent* (LH IV 6, 12f Bl. 29, published in Bodemann, 90). *Essay on a New Plan for a Certain Science, Concerning Which the Advice of the Most Intelligent is Sought* (LH IV 7B, 6 Bl. 1-2; see Bodemann, 99).

[46] *Plan for a New Encyclopedia, to be Composed Methodically by its Inventor*, 15/25 June 1679 (LH IV 5 Bl. 7). Cf. the fragments LH IV 7C Bl. 87-8, 156-7; LH IV 6 Bl. 18.

[47] See Chap. 3, §15. We may recall that it is in 1678 that Leibniz was chiefly occupied with the idea of a rational language.

[48] See the beginning of Chap. 6 for the role Leibniz assigned to mnemonics in logic.

[49] Leibniz distinguishes these two sciences by regarding them respectively as the *science of attributes* and the *science of subjects* (cf. LH IV 8 Bl. 56 verso; Klopp, I, 51).

psychology.[50] The fifteenth is geopolitics, the science of the relation of man to the earth, which includes political geography and history. The sixteenth is natural theology, the science of incorporeal substances—in short, metaphysics.

To the theoretical encyclopedia there would have to be added a practical one, containing those scientific applications most useful for human life and happiness.[51] We note that the project acquires an increasingly rationalist character: theology and law, which initially occupied the position of honor, have disappeared from it, and the mathematical and physical sciences enter the first rank after logic, to which they are related. We can measure the progress of Leibniz's thought by comparing this plan to the one sketched at the end of *The Analysis of Languages* of 11 September 1678.[52] There, too, grammar serves as an introduction to logic, but immediately after logic comes metaphysics as the most general science, then ethics, the science of human actions and passions, and only then mathematics, physics, and finally history and custom.[53]

8. These unpublished fragments furnish chronological facts that allow us to date very roughly the two plans for an encyclopedia published by Gerhardt. He wrongly regarded them as contemporary, for they display a great difference in their order of subjects. The oldest, and the shortest, initially bore the title *Dialogues on the Secrets of Things*; later, Leibniz crossed out *Dialogues* and wrote above it *Guilielmus Pacidius's*.[54] It was in 1676, after he had read Plato and summarized the *Phaedo* and *Theaetetus*,[55] that Leibniz too began to compose dialogues, such as *Pacidius Philalethi*.[56] He seems, therefore, to have rejected the idea of composing this work in the form of a dialogue, and this in the

[50] Leibniz was acquainted with the word "psychology" (he may have invented it), but he applies it to the theoretical and metaphysical knowledge of souls and spirits (see LH IV 8 Bl. 56 verso).

[51] In *Plan for the Renewal of Letters*, Leibniz already distinguished these two parts and assigned to them two opposing methods: "The universal encyclopedia ... will consist of two parts, the theoretical and the practical. The theoretical will proceed in a synthetic order, the practical in an analytic order" (Klopp, I, 49). He distinguished them again in a fragment sometime after 1696 (LH IV 8 Bl. 56-7), in which he reassigns to the practical side "normative" sciences like logic, ethics, politics, medicine, and gymnastics.

[52] LH IV 7C Bl. 9-10.

[53] This is precisely the order assigned to these different sciences in the fragment *A Rational Language*, which must date from 1678 (*Phil*., VII, 29). It is worth comparing with *The Analysis of Languages*, "the *monitor*... of the art of peculiar words and phrases and of accepted formulas and opinions," the subject of *A Consideration of the Knowledge of Nature* (Foucher de Careil, VII, 111).

[54] *Phil*., VII, 51, note.

[55] See the abridgements of the *Phaedo* (March 1676) and *Theaetetus* (Foucher de Careil, B, 44, 98).

[56] Dated October 1676 (see *Archiv für Geschichte der Philosophie*, vol. 1, 1888). In Leibniz's unpublished manuscripts (LH XXXV 1 Bl. 29), we find a dialogue on teaching arithmetic, modeled on the *Meno*, in which there appears a character initially named *Pacidius*, and then *Charinus* (these are the names of two characters in *Pacidius Philalethi*), and in which Leibniz shows a lively admiration for Plato (cf. the preface to *Plus Ultra*, *Phil*., VII, 147-8); *Dialogue of Charinus and Theophilus on Wisdom and Happiness* (LH IV 4, 4k); two dialogues on theology: *Dialogue Between Theophilus and Polidorus* and *Dialogue Between Polyander and Theophilus*, the first of which was composed "before the death of the late Duke Johann Friedrich," i.e. before 1680 (LH I 20 Bl. 61-7, 68-71; Bodemann, 22); and finally, *Dialogue on Peasant Religion*, dated Paris, November 1673 (LH I 3, 8e; Bodemann, 7). Cf. *Conversation of Philarete and Eugene on the Recent Question Debated at Nijmegen on the Right of an Ambassador of the Electors and Princes of the Empire*, 1677 (Foucher de Careil, VI), and *Conversation of Philarete and Ariste, Following an Earlier Conversation of Ariste and Theodore* (*Phil*., VI, 579). This last dialogue, composed after 1706, is modeled on Malebranche's *Dialogues on Metaphysics and Religion* (1688), of which it is a continuation, as its title indicates.

period in which he used the pseudonym Pacidius, under which he planned to publish the *Plus Ultra*. In this plan we find, inserted between algebra and geometry, the whole of metaphysics, including the issues of the existence of God (no. 4) and the immortality of the soul (no. 5), and the two famous *labyrinths* (that of freedom and that of infinity and the continuum) (nos. 6 and 7).[57] Already there is mention of the rational language, associated with the characteristic and the combinatorial art, and a new analysis that is undoubtedly the infinitesimal calculus[58] (nos. 2 and 3). But the positive sciences still occupy a minor place in it,[59] compared with the moral, political, and religious sciences.[60] On the other hand, there is a chapter devoted to alchemy,[61] and in the last two chapters there are traces of a utopian, mystic imagination,[62] whose absence is notable in the plan for *Plus Ultra*. All these comparisons indicate that the plan for *On the Secrets of Things* dates from 1678 at the latest.

9. The second plan is more developed and more exact, and marks an obvious progress in the classification of the sciences.[63] After some introductory chapters to which we shall return, we find first rational grammar, then logic, with the logical calculus and the dual methods of synthesis (combinatory) and analysis; then follow universal mathematics, arithmetic, algebra, geometry, the physical sciences (optics, kinematics, dynamics and mechanics, astronomy, geophysics, and meteorology), the natural sciences (mineralogy, botany, and zoology), medicine, psychology, politics, and economics; and finally, jurisprudence and theology, which now come last. Notable is the absence of ethics, properly speaking. The work would end with a proof of the truth of Christianity, a plan for the reconciliation of the churches,[64] and a plan for a society of the friends of God,

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[57] The word *labyrinth* had been suggested to Leibniz by Libert Fromondus (1587-1653), author of *Labyrinthus, sive de compositione continui* (see *New Essays*, II, xxiii, §31). Leibniz employed it from 1671: see his letter to Oldenburg, 11 March 1671 (*Brief.*, I, 53). Cf. *Discourse on Metaphysics*, 1686 (*Phil*., IV, 435; cf. 491); Leibniz to Arnauld, 1687 (*Phil*., II, 119); and finally, *Theodicy* (1710), Preface and Preliminary Discourse, §24.

[58] From 1675, Leibniz spoke of the imperfection of algebra. See his letter to Oldenburg of 28 December 1675 (*Phil*., VII, 10; *Brief.*, I, 145). He invented his infinitesimal calculus to make up for the inadequacy of Cartesian analysis (see Chap. 7, §5).

[59] The title of no. 11 recalls the *New Physical Hypothesis* of 1671.

[60] No. 16, "On Justice and a New Code," recalls the project of *Repairing the Body of Law*.

[61] No. 13: "On the Secrets of Nature, and the Refinement and Dyeing of Bodies"; cf. no. 12: "On the Hidden Causes of Things," and the title of the work itself: *On the Secrets of Things*. We know that in 1666 Leibniz was affiliated in Nuremburg with the secret society of the Rosicrucians (Guhrauer, I, 46).

[62] No. 25: "Prayer, or a Fable on the General Improvement of Things, and the Story of a Subsequent Age." No. 26: "Hope, or a Poem on a Future Life." No. 21, "On Holy War," alludes to the plan for a crusade against the Turks. These poetic titles (also no. 14, "On the Light of the Mind") recall that of *Aurora*.

[63] *Phil*., VII, 49-51.

[64] Leibniz, undoubtedly under the influence of Baron von Boineburg, who was a Lutheran convert to Catholicism, early on conceived the plan for reuniting Protestants and Catholics, to which he actively applied himself, though without success, on repeated occasions (1679, 1683, 1691-1694), as well as the reunion of the Protestant churches (Lutheran and Reformed) (see the irenic writings of 1697-1706). We find a plan for reconciliation (in Latin) following a plan for a learned society (in German) that dates, according to Klopp, from the years 1669-1672: *Outline of a Plan for the Formation of a Society in Germany for the Advancement of the Arts and Sciences* (Klopp, I, 130; Foucher de Careil, VII, 60). See §22 of this chapter.

which figured already in *On the Secrets of Things* (no. 24).[65] In its arrangement of subjects, this plan closely resembles that of June 1679, and it must be contemporary with it or slightly later.

An examination of its form confirms the conclusion drawn from the study of its contents. First, the author's pseudonym, Guilielmus Pacidius, is the same as the one Leibniz added as an afterthought to the title of *On the Secrets of Things*. This pseudonym has a transparent meaning that reveals the intentions of the author: he is presented as the conciliator or "pacifier" of minds; he aims to end disputes and controversies, abolish philosophical sects, and unite all learned men in a common labor. If he adopts a pseudonym, it is precisely in order to save the pride of his future collaborators, to give to his enterprise an impersonal character, and to extol more freely its advantages and benefits.[66] This does not prevent him, however, from providing on this occasion valuable autobiographical details of his youthful studies and projects.[67] Next we notice the title *Plus Ultra*, borrowed from Glanvill,[68] and the subtitle *Foundations and Specimens of the General Science, or on the Renewal and Advancement of Learning* [recalling Bacon[69]] *and on the Perfection of the Mind and the Discovery of Things for the Public Happiness*.[70] There appears in it a new idea: that of the general science, which, at first confounded with that of the encyclopedia,[71] is refined and specialized so as to designate the general method of the sciences, the arts of invention and demonstration, and in short the true logic, which must serve as the form of the encyclopedia.[72] A fragment of a preface, intended precisely to define this method, carries another title: *Guilielmus Pacidius Lubentianus's Aurora*,[73] *or Foundations of the General Science Drawn from the Divine Light for the Sake of Human Happiness*. This poetically styled piece, throughout which Leibniz employs the metaphor of light or fire to describe his method, appears to be prior to *Plus Ultra*,[74] but the two are related. Finally, other fragments carry neither the

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[65] Leibniz's manuscripts contain two pages relating to this plan for "A Charitable Society or Order of Conciliators": *A Society of Theophilists, for the Purpose of Celebrating the Praise of God and Opposing the Spread of Atheism throughout the World* (LH I 20 Bl. 99-100; Bodemann, 22). We know that Leibniz was disturbed by the progress of atheism (see his letter to Thomasius, 20/30 April 1699, *Phil*., I, 26). Cf. *Plan for a German Benevolent Society*, §4 (Foucher de Careil, VII, 384), and Appendix IV, §8.

[66] *Phil*., VII, 124. Cf. LH IV 8 Bl. 3, and *A Consideration of the Knowledge of Nature* (Foucher de Careil, VII, 105).

[67] *Phil*., VII, 51-3; cf. 126.

[68] See Chap. 3, n. 20.

[69] *The Advancement of Learning* is cited (*Phil*., VII, 52-3).

[70] This is the exact title (with a second *or* linking the title and subtitle) that Leibniz himself inscribed on a separate sheet (LH IV 7A Bl. 1; see Bodemann, 92). There is another incomplete and unpublished plan, bearing the title *Guilielmus Pacidius's Plus Ultra, or Introduction and Specimens of a Secret Method for the Renewal and Advancement of Learning for the Sake of the Common Happiness* (LH IV 8 Bl. 3). We note that the phrase *general science* is replaced by the words *secret method*, which recalls the "secret encyclopedia" (LH IV 8 Bl. 1-2).

[71] Cf. the title: *Preliminaries to the Encyclopedia or General Science* (*Phil*., VII, 43).

[72] "I mean the general science, which teaches all the other sciences the method of invention and demonstration from sufficient givens" (*Phil*., VII, 60).

[73] This title seems to have been inspired by another work by Glanvill, *Lux orientalis*, 1662 (*Phil*., VII, 6, note).

[74] The same metaphor is found in the plan for *On the Secrets of Things*: "No. 14: On the Light of Minds" (*Phil*., VII, 51, note).

title *Plus Ultra* nor the title *Aurora*, but only the simple and prosaic subtitle, which seems to indicate that they are later than the other two.[75]

10. Let us now return to the plan of *Plus Ultra*, in order to try to classify the various fragments associated with it. The first chapter would give the reasons the author has undertaken the work, and why he has concealed his name. We are already acquainted with the latter;[76] as to the former, we find them indicated at the beginning of a long preface evidently destined for *Plus Ultra*.[77] Leibniz perceives more and more that his great project would surpass the powers of a single individual, and he communicates it to the public, on the one hand, in order to find helpful collaborators, and on the other, in order to prevent the idea of the general science from being lost if he should perish before the completion of the work.[78] In the same chapter, he seems to boast of his familiarity with princes and of their approbation;[79] he clearly alludes to his position at the court of the duke of Hanover,[80] and he counts on his patronage and protection.

The second chapter, entitled "The History of Letters," is contained in the long preface already cited,[81] in which Leibniz reviews the entire history of letters, the sciences, and philosophy. The third chapter, entitled "On the Present State of Learning, or the Republic of Letters,"[82] would depict the actual state of knowledge, after the historical picture of its origin and progress.[83] This picture is sketched in the fragment that begins with the words "On the Republic of Letters," dated May 1681.[84] The following chapters would deal with the evils humanity suffers through its own fault, with discoveries useful for human life

[75] *Guilielmus Pacidius's Foundations and Specimens of the General Science, or on the Renewal and Advancement of Learning, for the Public Happiness* (*Phil*., VII, 124-6), *Synopsis of a Book Whose Title Will Be: Foundations and Specimens of a New General Science for the Renewal and Advancement of Learning, for the Public Happiness* (*Phil*., VII, 64-5), and an unpublished fragment entitled *Introduction to a Secret Encyclopedia, or Foundations and Specimens of a General Science for the Renewal and Advancement of Learning, and Thereafter for the Perfection of the Mind and the Discovery of Things, for the Public Happiness* (LH IV 8 Bl. 1-2), in which Leibniz asks himself, "Should the author be anonymous?"

[76] *Phil*., VII, 124.

[77] *Phil*., VII, 127-56.

[78] "For he fears lest it be lost and he be unable to complete it" (*Phil*., VII, 128). Cf. LH IV 8 Bl. 3.

[79] "The familiarity of great princes and their friendly opinions" (*Phil*., VII, 49).

[80] He had known Duke Johann Friedrich since 1669 and had kept him informed of his studies and plans from 1671 (see his letter to the duke, *Phil*., I, 43). He was appointed librarian at Hanover in 1676 and tribunal councilor in 1678 (see Leibniz to Galloys, 1677-78, *Math*., I, 179, 183, and Leibniz to Conring, 1678, *Phil*., I, 203).

[81] *Phil*., VII, 145-6, starting with "On the Taste of the Ancients."

[82] Cf. *Synopsis of a Book*: "We will also have to speak of the present state of learning" (*Phil*., VII, 64).

[83] "On the Origin and Progress of the Sciences, or the History of Letters. On the Present State of the Republic of Letters. The History of Discoveries" (LH IV 7A Bl. 26). Cf. the unpublished plan for *Plus Ultra*: "The division of the work: Chapter 1. On the History of Letters. Displayed is the state of human knowledge from the earliest times right up to our own day.... Chapter 2. On the Present State of Learning, and of all human knowledge. This according to the order of subjects, in the preceding according to chronological order" (LH IV 8 Bl. 3).

[84] *Phil*., VII, 66. It carries in addition this note: "There is in French a small satire on the republic of letters," which probably refers to the piece entitled by Erdmann *Precepts for Advancing the Sciences* (*Phil*., VII, 157-73; the beginning up to "When I consider..." [p. 160], is missing in Erdmann's edition).

and the means of assuring human happiness.[85] We can gather their contents from various drafts. First, the philanthropic intention of the work, already marked in all the titles we have quoted,[86] is strongly and eloquently affirmed in a plan for a preface,[87] in which Leibniz declares that he intends to work for the happiness of humanity, and that nothing can contribute more to the public good than the composition of the encyclopedia.[88] It is not easy to see at first what relation there is between this completely utilitarian moral end and Leibniz's wholly speculative and scientific project. Yet in fact, for him, the ultimate end of mankind is knowledge of the universe, so that politics has no other aim, after virtue, than the progress of the sciences.[89] This progress, moreover, is the condition of happiness for humans, not only because the sciences increase material well-being, allow the satisfaction of needs, and remedy the evils of physical life,[90] but because science is the principle of all civilization and virtue. Knowledge of the universe leads to knowledge of God, and consequently to the love of God, who is the provider and source of all the virtues.[91] It causes us, therefore, to recognize our duties and at the same time disposes us to fulfill them. Even better, it reveals to us the identity of justice and prudence, and of the honorable and the useful—in short, of self-interest and the general interest,[92] which is clearly the best and surest means of making us love and practice virtue willingly.[93]

In sum, justice is the charity of the wise,[94] wisdom is the science of happiness,[95] and it presupposes genuine erudition—in short, knowledge of all the sciences. Thus, nothing

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[85] "4. On the evils human beings suffer through their own fault. On those useful things that have been discovered for sustaining human life. 5. On the management of human happiness" (*Phil*., VII, 49). Regarding the negligence of human beings, see Foucher de Careil, VII, 101.

[86] *Phil*., VII, 49, 54, 57, 64, 124; cf. *Foundations of the General Science... for Increasing Human Happiness* (Erdmann, 85); LH IV Bl., 18; 8 Bl. 1, 3.

[87] *Phil*., VII, 125; cf. 45: "From this it follows that it is of importance for human happiness that a certain encyclopedia or ordered collection of truths be founded," and LH IV 7A Bl. 26: "An idea of the happiness of which the human species is capable."

[88] General welfare was truly Leibniz's constant motive and the supreme end of his ethics. See, for example, his curious letter to Burnett (1699), in which, apropos of Newton, who did not want to publish "his work on colors," he said, "You know, Sir, my principles, which are to prefer the public good to all other considerations, even to glory and to money." Later, he remarked that he had "assumed the role of the soliciter general of the public good" (*Phil*., III, 261, 262). Cf. *Phil*., VII, 53; Leibniz to Basnage, 1696 (*Phil*., III, 125); and Klopp, IX, 265.

[89] Leibniz to Burnett, 1699 (*Phil*., III, 261).

[90] *Phil*., VII, 45, 63.

[91] *Phil*., VII, 125.

[92] *Phil*., VII, 47, 55, 62, 125.

[93] Leibniz gave a social foundation to justice and defined it in terms of public utility: "The just and the unjust is anything publicly useful or injurious" (*New Method*, 1667; see Note VII). Cf. *On Generosity*: "The principle of justice is the good of society, or rather the general good, for we are all part of the universal republic whose monarch is God.... We are not, therefore, born for ourselves, but for the good of society, as the parts are for the whole" (*Phil*., VII, 106-7). Consequently, he saw no other means of rendering it obligatory than by establishing the identity of the just and the useful, which presupposed the existence of a rewarding God and the immortality of the soul: "In order truly to show by a universal demonstration that everything honorable is useful and everything evil injurious, we must assume the immortality of the soul and God as master of the universe" (Preface to *Diplomatic Code of the Law of Nations*, 1693, *Phil*., III, 389). Cf. Leibniz to Conring, 1670 (*Phil*., I, 160); *Introduction to the Principles of Eternal Law* (Mollat, 1); *On the Highest Rules of Law* (Mollat, 85); *On the Principles of Justice* (Mollat, 88); *Axioms or Principles of Law* (Mollat, 95).

[94] *Phil*., VII, 47, 73, 75, etc.; LH IV 8 Bl. 4-5. See *Definition of Universal Justice* (Note IX).

can better serve to render men virtuous and happy than the encyclopedia and the general science that is its method and its key.[96]

Elsewhere, these utilitarian and humanitarian motives seem to give way to religious ones, but it is easy to show that these two levels of motive concur and at bottom even coincide. The encyclopedia appears to have for its aim and crowning moment the demonstration of the truth of religion.[97] The "true use of meditation" is the study of questions relating to God, the soul, and true happiness.[98] We cannot be assured of finding happiness in virtue, however, unless we acquire certainty of the existence of God and of the immortality of the soul, and this is precisely what natural theology provides by demonstrating the truth of religion. This demonstration can come only after study of all the sciences, including mathematics and physics,[99] so it presupposes the entire encyclopedia. The latter appears to have for its aim, over and above the happiness of mankind, the glory of God,[100] but we soon discover that these two ends are in reality the same.[101] The best way of knowing and honoring God is to study the universe and ameliorate the condition of mankind. The most beautiful hymn that can be sung to God is the discovery of a law of nature or an invention useful for humanity.[102]

Thus, the apparently conflicting tendencies of Leibniz's mind—his nearly mystical religiosity and his positive and businesslike philanthropy—are reconciled, just like the

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[95] *Phil*., VII, 43, 45, 47, 73, etc. Leibniz was in possession of these ideas from 1671, when he contemplated his *Elements of Natural Law* (letter to Arnauld, 1671, *Phil*., I, 73). Cf. Leibniz to the Electress Sophie, 1697? (*Phil*., VII, 549).

[96] *Phil*., VII, 43, 45, 46-7. Science also serves as the foundation for friendship, which is only solid and lasting if it rests on reason (*Phil*., VII, 47). But friendship is also a source of happiness, for nothing is more useful or precious to a human being than another human being (*Phil*., VII, 62). We note the odd mixture of rationalist and utilitarian ideas, borrowed from Aristotle and Hobbes.

[97] One of the last chapters of *Plus Ultra* is entitled "On the Truth of the Christian Religion" (*Phil*., VII, 51). "But the greatest usefulness of learning in all matters consists in the fact that it serves true religion" (*Phil*., VII, 70).

[98] *Phil*., VII, 79.

[99] *Phil*., VII, 79-80, note.

[100] *Phil*., VII, 53.

[101] "In the common good, or what amounts to the same thing, the glory of God" (Mollat, 8). Cf. *Memoir for Enlightened Persons of Good Intention*, in which Leibniz speaks of "contributing to the glory of God, or, what is the same thing, to the common good" (Foucher de Careil, A, 227). He says elsewhere, "To love the public good and to comprehend the universal harmony, or what is the same, the glory of God and how much is in it, is to do the greatest thing." *Outline of a Plan*, §9 (Klopp, I, 114; Foucher de Careil, VII, 34; cf. Klopp, X, 42). There is more: The universal harmony is not only the glory of God, it is God himself. In the same essay (§8), God is called *the ultimate reason of things* and *the greatest harmony of things,* and in a letter to Duke Johann Friedrich (September 1671?), we read, "The ultimate reason of things or the universal harmony, that is God" (*Phil*., I, 60). We note that these texts are much earlier than the system of preestablished harmony, and they serve to explain its genesis.

[102] This idea, borrowed from Galen (*Phil*., VII, 71), is found expressed in several essays: *A Proposal* (Klopp, I, 54); *The Method of Physics,* May 1676 (Foucher de Careil, VII, 104); *A Consideration of the Knowledge of Nature* (Foucher de Careil, VII, 107). Leibniz did not even shy away from regarding scientific discoveries and technical inventions as pious works far superior to the prayers and ceremonies of priests, insofar as deeds are preferable to words, or from saying that one of them is worth more than a thousand speeches, poems, or sermons (*Outline of a Plan*, §§13-19, Klopp, I, 116-9; Foucher de Careil, VII, 38-44). Cf. a memorandum to the Elector of Brandenburg (Klopp, X, 23).

utilitarianism and intellectualism of his ethics. Indeed, his religion is at bottom essentially rationalistic, naturalistic, and almost pagan, as is his ethics itself.[103]

11. As the plan for the encyclopedia was extended and completed, Leibniz came to realize better the immensity of the work and the need for collaborators. In order to attract the latter and provide them with an example, he restricted himself to presenting his logic (the general science) and to publishing, by way of examples, some isolated chapters of the encyclopedia. The title *Foundations and Specimens of the General Science*, which comes to take the place of the more ambitious title *Plus Ultra*, corresponds to this more limited project. The work thus conceived would contain two parts: first, *Foundations of the General Science*, that is, the principles of the general method that serves to elaborate the encyclopedia, and second, *Specimens of the General Science*, that is, the abbreviated encyclopedia of no more than two or three sciences, designed to show the application of the method and thereby to prove its usefulness and fruitfulness.[104] Several drafts of this new plan have survived. The first part (*Foundations*) is almost the same in all of them. It would include, first, the "elements of eternal truth," that is, the foundations of logic reduced to a type of algebra rivaling the rigor of mathematics.[105] Next would come the art of invention, which was the logic of research and discovery, just as the elements of eternal truth would be the logic of judgment and demonstration.[106] Thereafter, Leibniz

[103] We may add that he counts on the encyclopedia, as on the characteristic, to aid in the propagation of the faith by demonstrating in an obvious and irrefutable manner the fundamental truths of natural theology and rendering them intelligible to all peoples (*Phil*., VII, 70, 175, 180). See his surviving plan for "the propagation of the faith through knowledge" (Foucher de Careil, VII, 247, 280, 288; Klopp, X, 353, 366). As to Leibniz's rationalism in religion, it is sufficiently proved by his "Discourse on the Conformity of Faith With Reason," which forms part of the *Theodicy*. Cf. this curious passage from *Meditation on the Common Concept of Justice*: "...to the eyes of our reason or faith, which I here take to be the same thing, for true faith is founded on reason" (Mollat, 52); Leibniz to Duke Johann Friedrich, 1679: "The true religion is always the most reasonable" (Klopp, IV, 445); and Leibniz to the Electress Sophie, 1709, 1713 (Klopp, IX, 300, 395-6).

[104] "Since most people believe experiences of an event rather than reasons, and do not think they see anything that they see only with the mind's eye, they also will not value even the finest method unless they see its use in examples" (*Phil*., VII, 58). Cf. *Phil*., VII, 128: "For I grant that in all matters, experience must so far as possible be joined to reason.... Thus, I venture to say that to the *foundations* of this most general science I thought should be added *examples*."

[105] In *Plus Ultra*: "8. Elements of eternal truth, and of the art of demonstrating in all disciplines as in mathematics" (*Phil*., VII, 49). In *Synopsis of a Book*: "There follow the very elements of eternal truth, where there is explained the manner of giving completely rigorous demonstrations in all subjects equal to those of mathematics" (*Phil*., VII, 64). Cf. the unpublished plan for *Plus Ultra*: "Chap. 3. The elements of truth..." (LH IV 8 Bl. 3) and *Phil*., VII, 296. It is indeed a matter of the logical calculus, for we read soon afterwards in *Plus Ultra*: "9. On a certain new general calculus, with the help of which all the disputes among those who agree in its use will be settled"; and in *Synopsis of a Book*: "And so a certain new and wonderful calculus is here revealed, which may be applied in all our reasoning and which proceeds no less accurately than arithmetic or algebra" (Cf. *Phil*., VII, 125). Leibniz developed his first system of the logical calculus in April 1679 (LH IV 5, 8a-f). We learn in an unpublished draft that in the preface to *Elements of Eternal Truth* he was going to review all the authors who had attempted to reason mathematically in philosophy (LH IV 6, 12f Bl. 27).

[106] "Part I. *Elements of the General Science*: Book I. *Elements of Eternal Truth*, or on the form of argumentation through which, by means of a calculus, all controversies can be demonstratively settled.... Book II. *On the Art of Invention*, or a sensible thread for guiding inquiry, and on the species of this art, combinatory and analysis" (*Phil*., VII, 57). Cf. an unpublished fragment: "*Elements of the General Science*,

proposed his project for an encyclopedia and invited the learned to collaborate with him by using the general science just revealed.[107]

There is more variation among the different plans in the choice of the examples. In the briefest, which is probably also the oldest, these include *mathesis generalis*, mechanics, physics, as well as a provisional medicine; elements of moral and political science; then metaphysics and rational theology; and finally literary history, which was to serve as a basis for the demonstration of revealed theology.[108] This still overly ambitious plan was limited in subsequent versions. In one, the examples are four in number: general mathematics,[109] geometry,[110] mechanics, and a "physical essay."[111] Another, more detailed plan contains no more than three test cases: a geometry and mechanics, whose contents seem to be the same as in the preceding plan, and the elements of universal jurisprudence, in which Leibniz intended to explicate the nature of justice, define the pure law, and give a method for resolving questions of law with geometrical certainty.[112] Finally, there is an unpublished fragment closely connected with the earlier plan, for it mentions as examples geometry (including the transcendental geometry invented by Leibniz), mechanics (founded on geometry), and "civil logic" or "the logic of life," that is, the logic of probabilities, applicable to all practical questions (particularly questions of

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wherein is treated the renewal and advancement of the sciences, or the sensible mark of truth and a certain thread for the art of invention" (LH IV 7A Bl. 24).

[107] "Book III. *Plan for Founding an Encyclopedia*, as an inventory of human knowledge" (*Phil*., VII, 58). The plan for this book constitutes a sort of summary of *Precepts for Advancing the Sciences* (*Phil*., VII, 157-73). We can relate it to the unpublished fragment LH IV 6 Bl. 18, entitled by Raspe: "Leibniz's elegant meditation on the confused knowledge of man, and the ways in which this could be made better and more perfect," and an unpublished plan in which we read, "The author's plan consists of two parts: first, in treating of the *general science*..., second in establishing the *treasury of human knowledge*" (LH IV 7A Bl. 26). It is worth noting that *Synopsis of a Book* contains a new feature, namely a comparison of Leibniz's method with that of Descartes, and a discussion of objections made to the *Meditations*, to which Descartes had not sufficiently responded. We can get an idea of the crux of this debate from Leibniz's correspondence with Eckhard and Molanus (1677-79), his letters to Malebranche (1679) in *Phil*., I, and his letters to Molanus (1677), to Philipp (1679-80), and to the Duchess Sophie in *Phil*., IV. This connection with Leibniz's first attacks on Cartesianism determines the approximate date of *Synopsis of a Book*.

[108] *Synopsis of a Book* (*Phil*., VII, 65). A note inscribed by Leibniz on the back of the plan of *Plus Ultra* marks the transition between the project of the complete encyclopedia and the more circumscribed project of the *Specimens*: "We could divide it into general principles and applications of these principles to special cases, of which the former are elements, the latter examples. The examples are: the mathematical-technical, the physical-medical, the political-juridical, the metaphysical-theological" (Bodemann, 93, note).

[109] For the conception of this science, see Chap. 7.

[110] Leibniz promised the elements of a transcendental geometry, which are obviously those of the infinitesimal calculus (*Phil*., VII, 59; cf. 58), but at the same time he announced a new geometrical calculus, which he had not yet established. This is a reference to the *geometrical characteristic*, on which he composed an essay dated 10 August 1679 (see Chap. 9). We may compare this with what he says concerning the insufficiency of Cartesian algebra in letters to Molanus, 1677 (*Phil*., IV, 277, 280, 301); to Philipp, January 1680 (*ibid*., 286); to the Duchess Sophie, (*ibid*., 291); to Tschirnhaus, May 1678 and the end of 1679 (*Math*., IV, 460, 481; *Brief.*, I, 379, 405); to Galloys, December 1678 (*Math*., I, 183); to Malebranche, 13 January, 22 June 1679 (*Phil*., I, 328, 336); and to Huygens, 8 September 1679 (*Math*., II, 17-18; *Brief.*, I, 567-8).

[111] *Phil*., VII, 59-60.

[112] *Phil*., VII, 58-9.

law).[113] This last science would later be incorporated into the general science itself and would no longer belong to its applications.[114]

12. In the period at which we have now arrived, Leibniz appears to have renounced founding a new society of collaborators for his encyclopedia. Instead, he undertook (undoubtedly believing that this was the easier way) to convert to his design one of the learned societies that had recently been established for the purpose of organizing and centralizing the labors of researchers.[115] He made appeals to the Royal Society of London and to the Académie des Sciences in Paris that they adopt his great project and make it their own.[116] He addressed himself first to the Royal Society, to which he had been elected a member on 9 April 1673.[117] We have already seen him recommend his characteristic to his compatriot Oldenburg, secretary of the Royal Society, in a letter that is actually a memorandum intended for the Society.[118] It ended with a precise and highly significant declaration, constituting a barely disguised invitation, namely that ten learned and willing men would be enough to make great progress in the sciences in a short time.[119]

Oldenburg died in 1677, and Leibniz lost his main support in the Royal Society. He turned then to the Académie des Sciences, whose principal members he had known since his stay in Paris, and to which he would have been admitted in this period had he not been a Lutheran.[120] He had remained in correspondence with Huygens and with the Abbé

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[113] LH IV 7A Bl. 24. We will see that the idea of a logic of probabilities had been suggested to Leibniz by his legal studies (Chap. 6, §28).

[114] Cf. *Elements of the General Science, or on a New Method of Renewing and Advancing the Sciences, so That With the Smallest Amount of Time and Effort, if Only Men Should Desire to Do so, Great Things Could Be Done for Increasing Human Happiness* (Erdmann, 85-6), in which the "elements of truth" demonstrate not only how to verify certain (necessary) propositions but also how to evaluate the probability of those for which the givens do not suffice to prove them. This fragment is consequently later than all the others that carry a similar title.

[115] We may recall that the Royal Society was founded in 1660 and the *Académie des Sciences* in 1666

[116] We know that he had dedicated to them, respectively, the two parts of his *New Physical Hypothesis* (1671).

[117] See his letters to the Royal Society (*Brief.*, I, 80, 99).

[118] He had discussed it with Boyle and Oldenburg during his first journey to London (January-March 1673) and they had requested a memorandum from him on the subject, while promising to speak of it to the Society. Leibniz to Haak (*Phil.*, VII, 17). Cf. *Phil.*, VII, 7, reproduced in Note III.

[119] "I thus conclude that ten men who are learned, willing, and versed in the necessary sciences would do more in a few years than the entire human race could do in the scattered and disorderly creations of many centuries" (*Phil.*, VII, 15; *Brief.*, I, 104). Elsewhere, it is not the number of collaborators but the number of years that Leibniz fixes: "I venture to say that they would accomplish more in a decade than the entire human race could otherwise do in the disorderly and scattered labors of many centuries." *The Method of Physics*, May 1676 (Foucher de Careil, VII, 105). The similarity between these two passages serves to date the preceding letter to Oldenburg. Cf. *Memoir for Enlightened Persons of Good Intention* (Foucher de Careil, A, 275) and *Plan for a German Benevolent Society* (Foucher de Careil, VII, 388). Later, Leibniz shows himself more cautious: "...within a few years by a few intelligent men..." (*Phil.*, VII, 199; text after 1684).

[120] He was elected a corresponding member of the Académie in 1699 (at the time of its division into classes). See the letter from L'Hospital and Leibniz's reply of 13/23 March 1699 (*Math.*, II, 332f). Cf. Gerhardt (*Math.*, I, 175).

Galloys.[121] To the latter he submitted his plan for the characteristic, hinting that he needed collaborators: "But if I had capable persons to work with me, I believe I have said nothing that we would not carry out, and maybe even something more, for there is usually a connection among discoveries."[122] This "something more" of which Leibniz did not want to speak, undoubtedly for fear of frightening Galloys, is obviously the encyclopedia, which is inseparable from the characteristic. Indeed, Leibniz asked Galloys to make excerpts of definititions for him from the *Dictionnaire de l'Académie*.[123] We know that the initial preparatory work of the encyclopedia was the formulation of good definitions, and we will see that Leibniz occupied himself with collecting them from a wide range of earlier works (§23).

13. Leibniz does not appear to have succeeded in interesting Galloys, a superficial and frivolous man, in his great project, nor consequently the Académie des Sciences. Thus, he soon turned back to the Royal Society, where he must have had more influence as a member. Robert Hooke had succeeded Oldenburg as secretary, and Leibniz tried to engage his interest through the agency of his compatriot Theodore Haak, who lived in London.[124] He recommended himself by way of the memory and example of Wilkins, and presented his characteristic as the development and perfection of the idea of a universal language, suggesting that its application to all the sciences could not be the work of a single man.[125]

To these overtures, Hooke responded through the same intermediary, approving in principle Leibniz's project and recognizing that Wilkins's work could, and must, be simplified and perfected. He went so far as to declare that the method used in algebra was equally valuable for the other sciences.[126] Leibniz responded by expressing some much more precise and profound ideas that he had had for some time,[127] namely that algebra was not the true art of invention and that it was not even the general method of mathematics; that he had formulated an entirely new and truly universal analysis, which he had applied to algebra and which could be applied even to objects not dependent on the imagination (that is, to abstract ideas such as those of metaphysics, morals, and law).

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[121] The Abbé Jean Galloys (1632-1707), professor of Greek at the Collège Royal, editor of the *Journal des Savants* from 1666 to 1675, member and secretary of the Académie des Sciences since 1668, enjoyed the favor of Colbert. He later attacked Leibniz's infinitesimal calculus, and had it attacked through Rolle (see Leibniz to Johann Bernoulli, 15 April 1706, *Math*., III, 789). Leibniz painted a sharp and hardly flattering picture of him in a funeral oration, depicting him as a court jester (Leibniz to Johann Bernoulli, 24 June 1707, *Math*., III, 816).

[122] Leibniz to Galloys, December 1678 (*Math*., I, 187-8).

[123] Leibniz to Galloys, 1677-78 (*Phil*., VII, 21, 23; *Math*., I, 180, 187).

[124] *Phil*., VII, 16, note.

[125] "But this takes precedence over personal honor; it is certain that this is not a matter for one man. Nevertheless, I wanted Hooke to know this idea of mine, for by virtue of his excellent mind, he would be able to form a judgment concerning these things—all the more as he seems more engaged in these matters, having had experience of Wilkins's work." Leibniz to Haak, February 1679/80, obviously intended to be communicated to Hooke (*Phil*., VII, 17).

[126] *Phil*., VII, 19-20.

[127] See Leibniz to Tschirnhaus, 1678 and 1679 (*Math*., IV, 459, 481; *Brief*., I, 523). Cf. Chap. 7, §5.

He ended by addressing an explicit appeal to the Royal Society, while expressing fear that the political state in England was hardly favorable to such undertakings.[128]

We do not know how Hooke responded to this formal invitation, but it is probable that he did not comprehend the magnitude and the scope of the method conceived by Leibniz. The praises that the latter bestowed in advance on his invention continued to appear to Hooke mere bragging and boasting and instead inspired mistrust and aversion toward the project. This is all the more excusable as Huygens, to whom Leibniz had at least communicated a sample of his geometrical characteristic, had formed no more favorable an opinion of it than Hooke.[129] In any case, the Royal Society of London failed to carry out the project proposed by Leibniz.

14. Rebuffed by the learned societies, Leibniz resolved to appeal once more to the great, to princes and kings; he hoped that it would be easier to convince a single man than an entire society.[130] He naturally thought of Louis XIV, who was then at the height of his glory and power and who had assumed the role of protector of the arts and sciences, not only in France but in Europe as a whole. He reasoned that the king could impose on the Académie des Sciences the great project that Galloys had undoubtedly failed to bring before him. It was with this intention that Leibniz composed his *Discourse Concerning the Method of Certainty and the Art of Invention* and the essay Erdmann entitled *Precepts for Advancing the Sciences*.[131] These two memoranda, drafted in French in an elegant and careful style, were clearly designed to be presented to the great king to commend to him the project of the encyclopedia and to persuade him to have it executed by a learned society. Leibniz recalls the illustrious examples (chosen to evoke in Louis XIV a sense of honor and rivalry) of Alexander the Great, the "Emperors of Constantinople—Justinian, Basil of Macedonia, Leon the Philosopher, and Constantine Porphyrogenitus," and finally "Almansor or Miramolin, great prince of the Arabs," all of whom had ordered collected the knowledge of their day. He begins by imagining the existence, in an indeterminate future, of "a great prince, unconstrained and curious, or a lover of glory, or even enlightened himself (and one can be enlightened without having attended school[132]),"
who "will have the essence of the best books extracted and will have joined to it the best observations..., which would represent the greatest and most lasting tribute to his glory and an incomparable duty that would be owed to him by the entire human race."[133]

After this suggestive preface, Leibniz reveals his intentions by means of a rhetorical device: "But what need have I of fiction? Why look back to some distant past for what

[128] "But I am not one who will promise such a thing, this being a matter of greater importance than can be brought about by any one man. Indeed, I think this business is worthy of the entire Society, nor will you find scarcely anywhere else such an abundance of the most profound minds as I recognize in England." Leibniz to Haak, 6 January 1680/81 (*Phil*., VII, 20).

[129] Leibniz to Huygens, 8 September 1679 and Huygens's replies (*Math*., II, 17ff, 27, 35). See Chap. 9, §2.

[130] An unpublished plan for the encyclopedia carries this amusing note: "Dedicated to the monarch who wants it" (LH IV 7A Bl. 26; see Bodemann, 94).

[131] Erdmann, selections LIII, LIV; *Phil.,* VII, 157, 174.

[132] This flattery recalls the proverb that summarizes the pretension of nobles and courtesans at this time: "The great know everything without ever having learned anything."

[133] Leibniz added a wish that has since been fulfilled by so many generous benefactors: "Maybe this great prince I imagine will even offer prizes to those who make discoveries or who uncover important knowledge that has been hidden in the confusion of men or authors" (*Phil*., VII, 163).

would be incomparably easier in our time?... What century would be better suited for it than our own, which we will perhaps one day designate as the century of inventions and marvels. The greatest marvel that we will be able to observe may be this great prince in whom our century glories, and whom those coming after him will wish for in vain." This pompous praise suffices to indicate, as Leibniz himself says, the sovereign to whom the memorandum is indirectly addressed.[134]

Erdmann was mistaken on this point and saw in this great prince the king of Prussia![135] This error would be of no great importance if it did not force us as a consequence to push forward the date of this piece and the relateded pieces until after 1701, which disrupts the chronology of Leibniz's writings and renders their succession unintelligible.[136] Erdmann's conjecture, however, does not stand up to a reading of certain noteworthy passages from the two memoranda in question, which make reference to the peace of Nijmegen (1678): "All that we must hope is... that the heavens continue to favor him, that without external problems he can make Europe enjoy this happy peace by which he has crowned his marvelous exploits." Likewise, in *Discourse Concerning the Method of Certainty*, Leibniz says: "Finally, I count as one of the greatest advantages of our century that there is a monarch who, by a rare and amazing combination of merit and fortune, after having triumphed on all fronts and reestablished peace and prosperity in his kingdom, is placed in a state not only to fear nothing, but also to be able to carry out at home everything he desires for the happiness of his people." He adds that "this great monarch, who will be recognized easily from what I have just said about him" is the arbiter of his fate and of that of his neighbors,"[137] which could never be said of the king of Prussia during Leibniz's lifetime, even with the obligatory hyperbole of these courtly compliments.[138] Later, there is an allusion that can only refer to France: "What Alexander had done by Aristotle cannot compare, and already the *Mémoires* of the Académie and

[134] See the sentences that follow: "I do not touch here on his praises concerning the state and war, which do not belong in this place or to this pen; what he has done for the sciences will suffice by itself to immortalize him. There is no need for more details—he is too unique and too recognizable in every quarter" (*Phil*., VII, 163).

[135] Preface to his edition, xxi. This conjecture is made with respect to *Discourse Concerning the Method of Certainty*, but Erdmann considers it to be contemporary with *Precepts for Advancing the Sciences*.

[136] Thus Erdmann dated *History and Praise* (LII), *Precepts for Advancing the Sciences* (LIII) and *Discourse Concerning the Method of Certainty* (LIV) after 1700; in addition, he placed between 1684 and 1687 the fragments on the general science, the encyclopedia, and the logical calculus (XI-XXIII), and in particular *Plus Ultra* (XIV-XVII), which, we have seen, dates from around 1679. The evidence Erdmann believed he could draw from the handwriting of Leibniz's manuscripts for the purpose of determining their dates was, in his own view, ambiguous (Preface, xii, xiii), for Leibniz simultaneously employed several scripts: one (the most common in his letters and drafts) small and compressed, the other (in copies) larger and more elegant. See the letter from Foucher of 30 January 1693: "When you do me the honor of writing to me, Sir, please write in your usual manner, for I read very well your writing, which encloses much in a little space" (*Phil*., I, 417; cf. Klopp, I, Introduction, iv). Thus, whatever Erdmann may say, internal evidence (drawn from the content of the writings) is more valuable and more certain.

[137] *Phil*., VII, 176.

[138] This is the opinion of Guhrauer, who regards the memoranda in question as designed for Louis XIV (I, 335-9) and who refutes the view of Erdmann (I, Notes, 44, 49). Cf. his *Quaestiones criticae ad Leibnitii opera philosophica pertinentes* (Quaest. II).

the accomplishments of the Observatory infinitely surpass it."[139] Finally, a last passage is addressed specifically to a personage of the court who would present Leibniz's memorandum to the king: "It remains, therefore, only to inform this great prince of all he can do; this detail falls to those illustrious figures who approach him the nearest, but as they are all burdened with great affairs, it must be the duty of others to furnish them with memoranda, and if this small paper could serve them among others, it would be well enough employed."[140]

All these considerations suggest that the two French memoranda date from around 1680, or a little later than Leibniz's letters to Galloys.[141] It seems that, having failed to find a favorable reception at the Académie des Sciences, he appealed to the king to patronize his project and to impose it on the Académie. This is what is implied in the following passage: "This project, as important as it is for our well-being, demands too much cooperation for us to be able to hope for it very soon without some higher command."[142] This means, in short, that to find collaborators, Leibniz no longer counted on the good will and spontaneous understanding of his colleagues, but on a sovereign command that would oblige them to cooperate in the envisioned great work.

15. It is important to analyze these two memoranda in order to understand the state of the project around this time. Leibniz compares "our knowledge to a great shop or store or bank that lacks order and an inventory: for we do not even know ourselves what we already possess, and we cannot make use of it when required."[143] He deplores the disorder that reigns in the Republic of Letters and which makes it that "we are paupers in the midst of riches."[144] He is terrified of this horrible mass of books, which always keeps growing,[145] and he goes so far as to fear that "we are repelled by the sciences, and that out of a fatal despair, men will fall back into barbarism."[146] At the same time, he criticizes the absence of order and method in scientific research and the lack of understanding and agreement among the learned, which has the consequence that they squander their time, energy, and work almost at random. To be sure, he pays tribute to

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[139] *Phil*., VII, 177. This is obviously a reference to the Paris Académie des Sciences, founded in 1666, and to the Paris Observatory, constructed by Charles Perrault between 1667 and 1672. Dominique Cassini, summoned to France in 1669 to be the director, immediately began the famous meridian of the observatory, which would serve as the basis for Newton's calculations. It was installed at the observatory in 1671.

[140] *Phil*., VII, 177. We can only conjecture who the personage was to whom Leibniz addressed this memorandum. Perhaps it was the Duke of Chevreuse, who had been his patron in Paris and with whom he had remained in contact. (See Leibniz to Galloys, *Math*., I, 177, 178, 182, 188; Leibniz to Johann Bernoulli, 24 June 1707, *Math*., III, 816; cf. Guhrauer I, 147, 365.)

[141] It is likely that *Precepts for Advancing the Sciences* is the "small satire on the Republic of Letters" of which Leibniz spoke in 1681. On the other hand, it shows many similarities with *Plan for a New Encyclopedia* of June 1679. It was therefore probably written between these two dates.

[142] *Phil*., VII, 182. Cf. *Phil*., VII, 163-4 (quoted p. 162, n. 2).

[143] *Phil*., VII, 178; cf. 157, 158; *On Universal Synthesis and Analysis* (*Phil*., VII, 296); *Inventory of Mathematics* (*Math*., VII, 16); and the beginning of *Plan for an Encyclopedia*: "It has often occurred to me that men could be much happier than they are if those things that are within their *power* were also *enumerated*, so that they could be utilized whenever necessary" (LH IV 5 Bl. 7). We may compare with these two memoranda the unpublished fragment LH IV 6 Bl. 18.

[144] *Phil*., VII, 178, 158-9; cf. *Plan for a Renewal of Letters* (*Klopp*, I, 54).

[145] *Phil*., VII, 160; cf. *Memoir for Enlightened Persons of Good Intention* (Foucher de Careil, A, 286).

[146] *Phil*., VII, 160 (cf. the earlier texts quoted in §4). A little later, he voices some reservations concerning this fear, which he regards as fanciful (*ibid*., 162).

the marvelous progress that science has made since the Renaissance,[147] but the very abundance of discoveries engenders a confusion within which the mind has difficulty finding its bearings. This confusion is aggravated by rivalry among the learned, who all claim to invent systems and set themselves up as the heads of schools: each devotes himself to refuting his predecessors and demolishing their work in order to raise himself up on their ruins. This ambition only produces fruitless disputes, in which "one contents oneself with specious discourse," and a multitude of books in which a few good ideas and a few new truths are lost in a cumbersome and indigestible jumble. Thus Leibniz scorns above all the spirit of sects and systems, which perpetuates the discord and anarchy of the learned world.[148] In sum, the very title of *Discourse Concerning the Method of Certainty and the Art of Invention* defines perfectly the double end it advances: first, "to end disputes," to suppress the schools and sects, and to bring all the learned together to collaborate in the collective work; second, "to make great progress in a short period of time," by uniting and coordinating the efforts of researchers and by furnishing them with a rigorous and infallible method—that is, the general science. It is the encyclopedia that would, in short, constitute that "perennial philosophy" of which Leibniz dreamed all his life and which would reconcile all thinkers in a common and impersonal doctrine open to indefinite progress.[149]

16. For this, it would first be necessary to gather all the knowledge already acquired and to make an inventory or balance sheet of scientific riches, which are "the greatest treasury of the human race."[150] Leibniz believed that the time had come to draw up a catalog of the truths already possessed: "Never has a century been better suited for this great work than ours, which seems to harvest the crops sown by all the others."[151] This systematic presentation of the sciences would summarize and replace all earlier books, and it would allow one to digest their contents in a methodical and much more rapid manner. Not only would the encyclopedia dispense with the need for reading a multitude of henceforth useless books, but in the future it would even dispense with the need to write them, since each new discovery would soon be assigned its place within the encyclopedia and would come to be enclosed among the already known truths to which it is logically related. This would mean a great saving of time for readers, for they would no longer have to digest entire works in order to assimilate a few new truths. Moreover, the pride of authors (which Leibniz wanted to satisfy and feed) would still receive its due, for the name of the inventor would forever be attached to the truth he had discovered; one would be

[147] *Phil*., VII, 143, 174.

[148] "And he strongly scorns the ambition of those who initiate a sect and condemn others, as if they could by themselves carry out great things" (*Phil*., VII, 128; cf. 158, 187). We know that this was his principal complaint against Descartes: "Descartes had the vanity of wanting to be a solipsist." *Memoir for Enlightened Persons of Good Intention* (Foucher de Careil, A, 289).

[149] He borrowed this idea, or at the very least the name, from a work by Augustinus Steuchus Jugubinus. See Leibniz to Foucher, 1687 (*Phil*., II, 395); Leibniz to Burnett, 1/11 February 1697 (*Phil*., III, 191); Leibniz to Remond, 26 August 1714 (*Phil*., III, 625).

[150] *Phil*., VII, 174; cf. 158.

[151] *Phil*., VII, 174; cf. 163.

immortalized even more surely by a single discovery than by fat books, which fall, sooner or later, into oblivion.[152]

Finally, this general catalog would serve as a guide for scientific research, for since truths would be classified in it in the order of their logical dependence, one would see in a glance, as in a synoptic table, which truths are still missing, which are the most important to discover next, and how we can arrive at them.[153] Instead of searching haphazardly and tentatively, one would make discoveries methodically and with complete assurance, and this would accelerate the progress of science enormously. If one rigorously applied the method that Leibniz recommends, science would advance more in 10 years than it has done in several centuries.[154]

17. What we have just said applies above all to the rational sciences, whose method is deductive. In what concerns them, the plan of the encyclopedia is completely prescribed: propositions will be arranged in the order in which they are deduced from each other, just as in treatises of geometry.[155] Thus, Euclid's *Elements* must serve as a model for the demonstrative encyclopedia,[156] just as geometry constitutes for Leibniz the ideal of a rational science.[157] Furthermore, all the sciences must be organized in turn according to the deductive model. As we discover truths (for example, laws of nature), they are related to one another by multiple connections. In this way, their logical order is revealed and strengthened, and we gradually reduce them by deduction to a small number of principles or hypotheses.[158] Thus it is, according to a profoundly accurate observation endlessly verified by history, that "the sciences are abridged while being enlarged."[159] When a science is constituted in its rational form, all its propositions are derived logically from a few principles, with the result that one needs only to know these principles and to possess

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[152] "It is not always a question of creating great works; if each would provide only a single discovery, we would gain much in a short period of time. A single important observation or demonstration is enough to be immortalized and to develop merit with future generations. There are ancient geometers of whom we have no works, like Nicomedes and Dinostratus, whose reputation is preserved through some propositions that we connect with them" (*Phil*., VII, 161). The allusion is to the conchoid of Nicodemus (2nd century B.C.) and to the quadratrix of Dinostratus (4th century B.C.). Cf. *Phil*., IV, 312, and the end of *Plan for a New Encyclopedia* (LH IV 5, 7 Bl. 6 recto).

[153] *Phil*., VII, 158, 58.

[154] "More can be accomplished in a decade by means of a certain and fruitful method than has been done in a few centuries" (*Phil*., VII, 68). In this fragment, dated May 1681, Leibniz appears to lament that the learned societies have not appreciated or adopted his project: "It is true that the Royal Societies of France and England have brilliant members and that they have given or will give excellent things, but those things that would be of the greatest necessity and profit, for certain reasons they do not even dare to attempt." He seems to be alluding here to the lack of success of the proposals he had made to the two societies, and he adds, "And so it happens that they are driven to pursue things that are more curious and more beautiful than they are useful, at a greater loss to the human race than the insufficiently discerning would readily believe of those things." Cf. *Memoir for Enlightened Persons of Good Intention* (Foucher de Careil, A, 275), *Plan for a German Benevolent Society* (Foucher de Careil, VII, 388), and the texts quoted in n. 119.

[155] *Phil*., VII, 180.

[156] *Phil*., VII, 168.

[157] *Phil*., VII, 158.

[158] "The perfect scientific order is that in which propositions are arranged according to their simplest demonstrations, in the manner in which they arise from each other; but this order is not known initially, and it is discovered more and more as the science is perfected" (*Phil*., VII, 180).

[159] *Phil*., VII, 180.

"the true logic" in order to rediscover its truths in order and to reconstitute deductively the entire science in question.[160] These principles can be truths of reason or truths of experience or propositions borrowed from another science. In the last case, the science in question is "subordinate," and this consideration determines the natural order of subordination of the various sciences.[161]

We thus gradually arrive at a formulation of the "demonstrative elements of all human knowledge."[162] Undoubtedly, according to what has just been said, we could dispense with them if need be, for once we know the principles of invention for each science, we can derive all the rest from them by means of the general science or art of invention.[163] But the characteristic, to which Leibniz here alludes, had not yet been established, and furthermore, not everyone has the force of mind necessary to follow long chains of deductions.[164] Nevertheless, this calculus is not indispensable; it undoubtedly perfects the natural logic, but the latter can still serve provisionally to develop the encyclopedia.[165]

18. The "general inventory of all knowledge"[166] must include not only the rational and deductive sciences but also the experimental sciences, until they can be given in their turn a mathematical form and reduced deductively to a few principles. Leibniz did not hesitate to take experience into account in his formulation of the general science, and we know already that he admitted truths of experience as principles of certain deductive sciences.[167] In the sciences that are still completely empirical—for example medicine, in which "all turns on observations"—it is all the more important to gather in a methodical and orderly manner as many facts and observations as possible.[168] In these sciences it is appropriate to draw up catalogs or "books of practice," that is, collections of facts and experiences, from which would emerge by induction empirical and provisional rules—

[160] "The more a science is perfected, the less need it has of great volumes, for insofar as its elements are sufficiently established, we can discover the whole of it with the help of the general science or the art of invention" (*Phil*., VII, 180; cf. 169, 171-2).

[161] For example, perspective is subordinate to geometry and music to arithmetic (*Phil*., VII, 169-70).

[162] *Phil*., VII, 168; cf. 158, 180.

[163] "In examining each science, it is necessary to try to discover the principles of invention, which, when combined with some higher science, or rather the general science or art of invention, can suffice to deduce all the rest from them" (*Phil*., VII, 168).

[164] "It is true that if this encyclopedia were made as I wish, we could give the means for always finding the consequences of fundamental truths or given facts by a type of calculus as exact and simple as that of arithmetic and algebra, of which I can give demonstrations in advance in order to interest men in this great work. But as the most exact demonstrations do not move us sufficiently without examples, I would be happy not to disclose this considerable device until I could support it with some fairly complete essays, so as not to prostitute it inopportunely and ineffectively" (*Phil*., VII, 168-9). "It is clear that few men are in a position to develop an exact chain of demonstrations for all the truths they would be happy to learn" (*Phil*., VII, 168).

[165] "However, although we could not yet easily arrive at this general calculus, which forms the final perfection of the art of invention, nevertheless the art of invention continues to exist, and we can give excellent but little-known rules for it, of which we will say something in this discourse, and which we will verify by examples of some actual inventions that appear to be of importance" (*Phil*., VII, 169). These last words are no doubt an allusion to the infinitesimal calculus. Cf. what Leibniz says of the imperfection of the "method of reasoning" and the "art of invention" (*Phil*., VII, 172, 173).

[166] *Phil*., VII, 182.

[167] *Phil*., VII, 169.

[168] *Phil*., VII, 179; cf. LH IV 7C Bl. 81.

more-or-less-probable laws, until that time when they could be justified rationally and established by deduction. Leibniz noted that this method is much better suited to doctors than to lawyers, who, according to him, abuse it; in fact, the law is a deductive science founded on *a priori* principles that are applied to particular cases, whereas medicine is an *a posteriori* science in which it is necessary to ascend from facts to laws.[169] Therefore, "both alphabetical and systematic general indices," would be needed, along with bibliographical catalogs and references to authors.[170] The alphabetical indices would be chiefly designed to indicate the author and the text in which a certain truth is found; the systematic indices would contain in addition "the reasons or proofs" for each truth and would thus outline their arrangement and unification in a system.[171]

19. That is not all: "There is an infinity of beautiful thoughts and useful observations found in authors, but there are still many more dispersed among men in the practice of each profession,"[172] and this "unwritten knowledge far surpasses all that is found in books, both in quantity and importance."[173] In order to show fully the value of this common and technical knowledge, Leibniz pictured (before Daniel Defoe) a Robinson Crusoe thrown onto a desert island and asked how much enlightenment we would need to obtain all the things useful for life. He imagined "that an art was lost and that it was necessary to rediscover it, something that all our libraries often could not make good."[174] He thus delighted in abasing the scholastic and arrogant science of books and in humbling it before the industry of the simple artisan. It is not the case, as with empiricists, that he subordinated theory to practice and reason to experience; rather, on the contrary, he saw in practice "another theory, one more complicated and more detailed,"[175] and in experience an implicit and immanent reason, which serves to control the deductive and discursive reason of the learned.[176] This is why Leibniz dreamed of the intimate union of science and industry, of theory and practice, which can and must assist each other.[177] Without theory, practice is blind; but without practice, theory is often insufficient, and consequently mistaken, for want of taking into account certain elements

[169] *Phil*., VII, 179; cf. *New Essays*, IV.vii.19, in which Leibniz also criticized those empirical rules that lawyers call 'adages' (*brocardia*), because "jurisprudence is founded entirely on reason," and contrasted them with the true principles of law: "The law is not derived from rules; instead, that something is a rule is founded on the law." Cf. *Meditation on the Common Concept of Justice*, after 1693 (Mollat, p. 47).

[170] *Phil*., VII, 179. We again meet here a reminder of the plan of the *Seminannual Literary Review*, with the example of Photius, the patriarch of Constantinople, and the "Journal of the Moderns."

[171] *Phil*., VII, 178-80.

[172] *Phil*., VII, 178.

[173] *Phil*., VII, 181. Leibniz was thinking especially of empirical remedies that at times succeed where the false science of doctors has failed. Thus he praised Cardan and Campanella for collecting the secrets of charlatans, and he reproached Scaliger, who criticized them for spending more time with Aristotle and Plato than with herbalists and gardeners (*Deliberation*, §§20, 21, Foucher de Careil, VII, 86-8). Leibniz also cited Galileo and Harvey in order to show what theory owes to practice and experience (*Phil*., VII, 69).

[174] *Phil*., VII, 181-2.

[175] *Phil*., VII, 182.

[176] "I hold that it is necessary to be cautious of reason all by itself and that it is important to have experience, or to consult those who do, for experience is to reason what proofs (like those based on the casting out of nines) are to arithmetical operations" (*Phil*., VII, 173).

[177] In *Sketch of a Deliberation on the Establishment of a Society in Germany* (1669-70), Leibniz already proposed to join theorists and empiricists in a happy union (Foucher de Careil, VII, 50; Klopp, I, 111-33). Cf. *Memoir for Enlightened Persons of Good Intention* (Foucher de Careil, A, 287).

(for example, abstract mechanics neglects the resistance of matter).[178] If theory enlightens routine practice and allows it to be applied to new cases and to exceptional and unproven circumstances, practice in turn completes theory, or demands that it be completed, poses problems for it, and suggests their solutions.[179] Moreover, theory and practice penetrate one another and are mixed in such a way that it is impossible in reality to separate the theorist from the practical man; in every worker, there is an unconscious theorist.[180] Thus, to be complete, the encyclopedia must record all the procedures of the arts and crafts, and collect even the techniques of craftsmen, which can be the origin or occasion of discoveries and inventions of great scientific interest.[181] In sum, the encyclopedia must be, in the words of Leibniz, "a true theater of human life drawn from the practice of men."[182]

20. That is still not all: The "general inventory of our public treasury" will only be complete when we have gathered and classified not only laws, experiments, and observations, but also historical facts of every sort, "for these are the facts that have the greatest need of collections, authorities, and inventories."[183] Leibniz conceived of history

[178] *Phil*., VII, 172-3. The question of the resistance of matter greatly occupied Leibniz. In the plan for *Plus Ultra*, we already find a chapter: "23. On the Resistance of Solids" (*Phil*., VII, 50). Cf. *New Demonstrations of the Resistance of Solids*, *Acta Eruditorum*, 1684 (*Math*., VI, 106). These studies of physical mechanics can be related to *Note on the Resistance of a Medium and on the Motion of Heavy Projectiles in a Resisting Medium*, in *Acta Eruditorum*, 1689 (*Math*., VI, 135), and to the question of cohesion, treated in the correspondence with Hartsoeker, 1706-1712 (*Phil*., III). In order to appreciate the relation of these investigations to Leibniz's metaphysics, see the end of *Specimen of Discoveries Concerning the Wonderful Secrets of Nature in General*, to which are joined some unpublished notes on "the hardness and cohesion of bodies" (*Phil*., VII, 318; Bodemann, 86), and the unpublished fragment LH IV 8 Bl. 6-7.

[179] Likewise, Descartes wanted us to anticipate deduction through experience. Practice precedes theory, guides it, summons it, and even substitutes for it provisionally.

[180] "But we are often mistaken in calling practice what is in fact theory, and vice versa. A craftsman who knows neither Latin nor Euclid, provided that he is a capable man and knows the reasons for what he does, will truly possess the theory of his art and will be able to find working solutions in every sort of situation" (*Phil*., VII, 172).

[181] "There is no mechanical art so insignificant or so contemptible that it cannot furnish some noteworthy observations or considerations; all the professions and vocations have certain ingenious skills, which are not easy to spot but which nevertheless can be useful for some rather more refined results." Later Leibniz said, "the most important observations and techniques of all sorts of crafts and professions are still not written down" (*Phil*., VII, 181, 182). Leibniz wanted a dictionary containing all "the technical terms of the sciences, arts, and professions, and he recommended to entrepreneurs "a complete dictionary of the English language," which was meant to satirize the dictionary of the Paris Académie (Leibniz to Thomas Burnett, 17/27 July 1696, *Phil*., III, 180; Leibniz to Nicaise, 1696, *Phil*., II, 557). He added: "A long time ago I preached this to the French; but they never would have resolved to do it in their Académie if the late Abbé Furetière had not appealed to their honor" (*Phil*., III, 181). Furetière had in fact composed for the *Dictionnaire de l'Academie* (comprising two volumes) a *Supplement* of two more volumes, containing technical terms. Likewise, from the time of the foundation of the Berlin Royal Society of the Sciences, Leibniz proposed a lexicon of technical terms (Leibniz to De Volder, 6 September 1700, *Phil*., II, 210; cf. Foucher de Careil, VII, 272). We see that Leibniz attached as much importance to the study of arts and crafts as the authors of the French *Encyclopédie* of the 18th century.

[182] *Phil*., VII, 181. Leibniz added that it would be "rather different from that which some learned men have left us"—an allusion to the title of the work by Theodore Zwinger already cited (§5). Elsewhere, he employed the title *Theater of Nature and Art* (Foucher de Careil, VII, 244, 473, 567).

[183] *Phil*., VII, 182.

in the most general and most philosophical sense (which is at the same time its etymological meaning) as the search for and preservation of particular facts and events, both of nature and human society.[184] Already in his project for recasting Alsted's encyclopedia, he divided history into the "history of things," including observations of the body, the soul, and man (that is, physiological, psychological, and social facts), and the "history of places and times," including geography and history properly speaking.[185] Similarly, he defined "observations and historical truths" as "the facts of sacred, civil, or natural history." Natural history is obviously the object of the physical and natural sciences.[186] Civil history serves as the object of the moral and political sciences. Finally, sacred history provides the arguments of fact that are indispensable for apologetics, which, we know, is not the least important goal of the encyclopedia.[187]

Furthermore, besides the usefulness of history for "the proof of religion," Leibniz was interested in history for its own sake. Even before becoming a professional historian, he showed a curiosity and respect for historical truths that contrasts sharply with the disdain that Cartesians displayed for history and erudition.[188] We know the sarcasm with which Malebranche in particular ridiculed archeologists and philologists, whom he regarded as wasting their time in the pursuit of trifles unworthy of a serious man and a Christian; in reponse Leibniz was forced to undertake a defense of learning and criticism.[189]

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[184] This is also the sense in which Cournot understands history (*Essai sur les fondements de nos connaissances*).

[185] See Note XII. Cf. the *Analysis of Languages*, 11 September 1678: "There should be written a book of histories, or of universal propositions derived from singular ones" (LH IV 7C Bl. 10). Here the historical truths are not singular facts, but the empirical laws derived from them by induction.

[186] *On Universal Synthesis and Analysis*: "Now that the authority of the senses and of other witnesses has been established, we must compile a history of phenomena; and if we combine these with the truths abstracted from experience, mixed sciences are formed" (*Phil*., VII, 296). We note that the history of phenomena, too, rests on the critique of testimony, in particular the testimony of the senses. Leibniz observed that factual truth consists in the agreement of phenomena and that there is no other means of distinguishing waking from dreaming. Cf. *Plan for a Renewal of Letters*: "*Universal History*, that is both natural and civil." There follows a critique of sense data and of the testimony of men (Klopp, I, 51).

[187] See his 1679 letter to Huet, in which Leibniz pays homage to history and criticism: "One use of history, and equally of the art of criticism, is that it is indispensable for securing the truth of religion" (*Phil*., III, 15). Later he wrote: "If anyone wanted to present revealed theology in a demonstrative manner... he would have need of the preestablished principles of the art of criticism, for the truth of revealed religion is founded on the facts of ancient history, which cannot be better proved than by the monuments of antiquity." Leibniz to Nicaise, 30 April/10 May 1697 (*Phil*., II, 567). Cf. Leibniz to Burnett, 17/27 July 1696, 1/11 February 1697 (*Phil*., III, 183, 193) and a letter of 23 January 1708: "History (which includes antiquities) is useful for the proof of religion" (Bodemann, 25). This letter was intended to refute Poiret who in his *De eruditione solida* discounted the value of learning.

[188] *Phil*., IV, 325. In connection with Saumaise, he said, "Men who are offended by philosophy and reasoning are accustomed to scorn investigations of antiquity, and the antiquarians in turn make fun of what they call the reveries of philosophers." Leibniz to Burnett, 1699 (*Phil*., III, 263, 270). It is unnecessary to add that he blamed both sides equally and "does justice to the merit of each of them," in keeping with his favorite maxim, which was to scorn nothing (Leibniz to Coste, 4 July 1706, *Phil*., III, 384; Leibniz to Bourguet, 3 January 1714, *Phil*., III, 562). He composed a discourse entitled *A Cleansing of Reproaches, or That No Type of True Learning Should Be Despised*, precisely in order to combat the haughty disdain of Cartesians for the historical sciences (LH IV 8, 7 Bl. 43-44).

[189] Leibniz to Gabriel Wagner, 1696 (*Phil*., VII, 515). Cf. *New Essays*, III.ix.9: "All this shows the usefulness and scope of *criticism*, which is little regarded by some philosophers, who are very capable in other respects, but who feel free to speak with disdain of *rabbinizing* and of *philology* in general." Among the applications of comparative philology, Leibniz mentions research into the origins of peoples:

Unlike the empiricists, Leibniz was not foolishly enamored of facts. To facts themselves, he attached an entirely utilitarian and practical value.[190] He was aware, however, of the connection and mutual interdependence of all facts, however scattered or trifling they might be, and he knew that there was none, however insignificant it might appear by itself, that could not serve as the proof or verification of a historical truth or even a scientific one of great importance.[191] Thus, despite his literary education and his youthful taste for poetry,[192] Leibniz set little value on works of literature and the imagination, or even on works of religion and morals. He sought instead historical books, especially first-person narratives such as memoirs and travel writing.[193] He desired that textual criticism be applied not only to classical authors, in the manner of the Renaissance humanists, but also to historical documents and monuments, as the Benedictines had done in another context.[194] Finally, he hoped that the critical method would be reduced to principles that would form a system or complete code.[195] He indicated in passing one of the fundamental rules of this "art of criticism" of which he dreamed: "The best method is that of making the most comparisons one can and the most exact, specific, and diversified indices possible."[196] It is, moreover, this comparative method that he himself employed, whether in etymological research[197] or in the

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"Languages will take the place of books, and these are the most ancient monuments of the human race... not to mention the origins of peoples that we will come to discover through the reliable etymologies best furnished by the comparison of languages." We know what use Fustel de Coulanges and his school have made of this method of *prehistorical* inquiry. Cf. Leibniz's letter to Verjus on the usefulness of the knowledge of languages for history (Dutens, VI, 227). In the *Miscellanea Berolinensia* of 1710, Leibniz published *A Brief Account of Meditations on the Origins of Peoples, Drawn Above All From the Evidence of Languages* (Dutens, IV, 186). Cf. Leibniz to Bierling, 7 July 1711: "Some judgment could be passed on the remotest origins of peoples from the agreement of languages" (*Phil*., VII, 494). Leibniz there takes on the defense of learning in general, and in particular of Saumaise, against what Bierling said of it in his *Lineamenta Methodi Studiorum*.

[190] "A knowledge of facts is almost like that of the streets of London, which is a good thing so long as one remains there." Leibniz to Burnett, 17/27 July 1696 (*Phil*., III, 182).

[191] "I do not mind that antiquities are closely examined for the least trifles, for sometimes the knowledge that critics draw from them can be useful for important things." Leibniz cited as an example the history of dress and added, "This could perhaps be useful for distinguishing genuine monuments from those that are not, not to mention a few other uses" (*New Essays*, IV.xvi.11). Cf. *Memoir for Enlightened Persons of Good Intention* (Foucher de Careil, A, 285).

[192] "I was indeed so accomplished in humanistic studies and things poetic that my friends feared, captured by the sweetness of the seductive muses, I should shun harder and more serious matters." *The Life of Leibniz Briefly Sketched by Himself* (Guhrauer, II, Notes, 54; Klopp, I, xxxii ff). Cf. *Phil*., VII, 185.

[193] Leibniz to Burnett, 1699-1700 (*Phil*., III, 254-5, 266).

[194] "The criticism of charts and documents is much more useful than that of classical Greek and Latin authors." Leibniz to Conring, 29 June 1677 (*Phil*., I, 176). See the homage that Leibniz paid to Dom Mabillon in a 1700 letter to Nicaise (*Phil*., II, 592). Cf. Leibniz to Bierling, 24 Oct. 1709 and 7 July 1711 (*Phil*., VII, 486, 494).

[195] After noting that a work on numismatics (such as M. Morel is planning) "would make a considerable contribution to the art of criticism, which consists in the examination and use of ancient artifacts," Leibniz added, "If in addition to the diplomatic science of Dom Mabillon, we were to join to it one day the science of manuscripts, of inscriptions, and of the rest of the antiquities, we would have a completed art of criticism." Leibniz to Nicaise, 1697 (*Phil*., II, 567).

[196] *Phil*., VII, 182.

[197] See the letters to Nicaise (*Phil*., VII, 547, 564, 570-1), and the *Collectanea etymologica* (Dutens, VI). The entire correspondence with Nicaise testifies to Leibniz's interest in archeological and philological

interpretation of ancient authors. He claimed in particular that the surest and most exact method for explicating an author, especially a philosopher like Aristotle, is to comment on the author himself and to clarify obscure texts by comparing them with analogous passages.[198] This has led to his being regarded by one recent scholar as the precursor of the modern school of the history of philosophy, which employs the philological-critical method.[199]

All of this shows that Leibniz was in many respects more modern than the majority of his contemporaries. In any case, we would not have a fair and complete idea of his encyclopedic genius if we did not recognize how he was able to join a curiosity for facts, a critical spirit, and a scrupulous concern for historical truth to his taste for logical rigor and clear ideas. Still, as he himself warned, "it is not this method of carefully recording facts" that is the principal object of his logic "but rather the method of guiding reason in order to profit both from the facts given by the senses or the reports of others and from the natural light,"[200] and to derive from them general truths.

21. This is the largest and most complete plan Leibniz seems to have conceived for his encyclopedia. As he was–not without reason–doubtful of his ability to have it adopted immediately by a learned society, even with the patronage of a sovereign, he outlined at the same time a more modest project, which he could execute by himself and which would give a sample of the great collective work he envisioned. Furthermore, he took care in his various programs to distinguish clearly that aspect of his undertaking that depended on private individuals and that which required the intervention of authority.[201] He was thereby naturally led to consider the part of the work that would revert to him and which he could accomplish by himself. This included first the general science, that is, the universal method of the sciences, of which he was the inventor. He then imagined applying the latter to the purely rational sciences, namely metaphysics and morals. This project, however, already very limited, still appeared to him too ambitious, and he doubted that he would be able to realize it: "But as the human mind finds it difficult to trouble itself for a long time in a protracted and exacting labor, we will not easily find a man capable of completing at a single stretch a demonstrative handbook of the sciences that are independent of the imagination, such as I have just described."[202] He then proposed carrying out a reduction of the encyclopedia: since each science depends on certain principles from which it can be deduced in its entirety using the general science, it suffices to formulate the fundamental primitive propositions of each science to possess it virtually in its totality. These "elements" would constitute a provisional substitute for the

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research. Moreover, he published in 1693 his *Diplomatic Code of the Law of Nations*, a collection of treatises and documents designed to serve as a history of the empire.

[198] Letters to Cornelius Dietrich Koch (1701-1710), published by (see the following note) and by (*Phil*., VII, 470ff.).

[199] Ludwig Stein, "Die in Halle aufgefundenen Leibnitz-Briefe im Auszug mitgetheilt," *Archiv für Geschichte der Philosophie* I (1888), 391.

[200] *Phil*., VII, 182.

[201] *Memoir for Enlightened Persons of Good Intention* (Foucher de Careil, A, 276, 283); *A Proposal* (Klopp, I, 53); *Precepts for Advancing the Sciences*: "But let us distinguish that which is related to the union of our forces from that which depends on a superior authority, and let us say something about what depends on each of them..." (*Phil*., VII, 163-4).

[202] *Phil*., VII, 168.

encyclopedia,[203] and even when the latter is developed, they would be useful as a handbook and aide-mémoire.[204]

The same project is revealed in the fragment Raspe has entitled *History and Praise of the Universal Character Language, Which Can Simultaneously Be the Art of Invention and Judgment*.[205] In it, Leibniz begins by retracing the origin and history of the idea of his characteristic. He says at the same time that he has not yet devised a system of "characteristic numbers" but that he does not need them in order to set forth the formal rules of his logical calculus. In fact, we know that the characteristic presupposes the encyclopedia, or at the very least a "course of philosophy and mathematics."[206] It is this "course" that Leibniz wanted to have drawn up by some carefully chosen men, according to the method he discovered. He went so far as to fix the probable duration of such a work: five years for all the sciences, two years for metaphysics and morals alone.[207] Such is the form Leibniz's project took from then on: his ambition was limited to formulating the elements of philosophy in a logical order, by such a demonstrative method that they would rival in rigor Euclid's *Elements*.

22. This was, moreover, a project as old as the encyclopedia itself, and it was so fixed in Leibniz's mind that he regarded it as a "vow." Inspired by Duke Johann Friedrich, a Protestant who had converted to Catholicism,[208] Leibniz returned in this period to his earliest attempts at a reconcilation of the churches. It was in this period that his relations and correspondence began with Jacques-Bénigne Bossuet, then bishop of Condom, and Christopher Rojas de Spinola, bishop of Thina,[209] who had come to Hanover in June or July 1679.[210] Invited by the duke to draw up a profession of faith that could serve as a compromise (or at least a basis for discussion) between Protestants and Catholics,[211] and which would be a response or counterpoint to Bossuet's *Exposition de la doctrine de l'Église catholique*,[212] Leibniz planned to compose his *Catholic Demonstrations*,[213]

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[203] "It is necessary to employ provisionally a *substitute* for this great method" (*Phil*., VII, 168).

[204] "Even when we have achieved an entirely demonstrative encyclopedia, it will be necessary to have recourse to this device in order to aid the memory" (*Phil*., VII, 168).

[205] Gerhardt believed that this fragment was destined to be published in the *Acta Eruditorum* (*Phil*., VII, 39). We see it, on the contrary, as the preface to a work in which Leibniz would have presented his logical calculus.

[206] "Nothing else is needed in order for the characteristic that I am working on... to be prepared... than that there be established a course of philosophy and mathematics, as it is called, according to a certain new method, which I can prescribe" (*Phil*., VII, 187).

[207] "No more labor would be required than we see already expended on some courses or encyclopedias, as they are called. I believe that a few select men could complete the work within five years; within two years, however, they could display in a rigorous calculus the doctrines more called on in life, that is, morals and metaphysics" (*Phil*., VII, 187).

[208] In 1661. See his letter to his mother, 12 April 1662 (*Klopp*, IV, xl).

[209] Knin, Tnena, or Tnynski, in Dalmatia, on the border of Croatia.

[210] Guhrauer, I, 361. See the letters exchanged between the duke and Pope Innocent XI (20 April and 5 December 1678) and the letter from the duke to Spinola (10/20 June 1679), in Klopp, IV, xlv ff. The two prelates are named in the fragment *On the Republic of Letters*, dated May 1681 (*Phil*., VII, 72).

[211] "It is desired that I treat in essence the important question of the marks of the true church." *Some Controversies* (Klopp, IV, 429; Foucher de Careil, I, 459).

[212] Approved by Innocent XI in an encyclical of 4 January 1679 (Klopp, IV, xlviii); cf. Leibniz to Bossuet, 1 May 1679, and Leibniz to Duke Johann Friedrich (Klopp, IV, 454).

which he would submit to the pope to try to win his approval and which would be at the same time acceptable to Protestants.[214] He also put at the service of the duke his "art of controversies" and "method of disputing," which he had discussed with the Elector of Mainz and which were basically just his characteristic.[215] These *Catholic Demonstrations* were to be preceded by *Demonstrated Elements of the True Philosophy*, including logic ("for a new *logic* is needed in order to know degrees of probability"), metaphysics, morals, and politics. But it was above all as a logician that Leibniz offered his help: if he had studied mathematics in France, it was to improve his knowledge of the art of demonstration and to acquire authority as a logician. His mathematical discoveries would show that he was in complete possession of the art of invention and demonstration.[216] And he indicated how he had perfected this art by reducing it to a calculus: "Finally, in order to render my demonstrations absolutely incontestable and as certain as what can be proved by an arithmetical calculus, I will submit an example of this new writing or characteristic, or even language, if anyone wants it."[217]

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[213] Here is its plan: 1. *Natural Theology* (existence of God, immortality of the soul); 2. *Revealed Theology* (possibility of mysteries, moral and historical proofs of religion); 3. *On the Church* (theory of spiritual and temporal powers). This is the origin of the so-called *System of Theology* (1686?), to which Leibniz gave not this title but rather *An Examination of the Christian Religion* (Bodemann, 4).

[214] Klopp, IV, 441, 446. Leibniz defined with diplomatic skill the spirit in which this work would be executed: "It would be necessary to contrive a piece as though composed by a Catholic in order to convert a Protestant." Leibniz to Duke Johann Friedrich (Klopp, IV, 455). Cf. Leibniz to the Landgrave Ernst Hesse-Rheinfels, 1684 (Rommel, II, 28, 36).

[215] *On Controversies* (Klopp, IV, 429; Foucher de Careil, I, 459). Leibniz recalls there a conversation he once had with a great prince, in which he proposed to him a method for infallibly guiding and ending controversies. Cf. Leibniz to Duke Johann Friedrich (Klopp, IV, 440); *Method of Disputing All the Way to the End of the Subject* and *Defects of a Disorderly Disputation* (LH IV 7B, 6 Bl. 16; *Bodemann*, 99). See also an allusion in LH IV 7C Bl. 87-88.

[216] "I want therefore to give first to the public my discoveries in analysis, geometry, and mechanics, and I venture to say that they rival those Galileo and Descartes have given us. From these it will be determined whether I know what it is to invent and demonstrate. I have not, therefore, studied the mathematical sciences for their own sake, but in order to make good use of them one day, so as to give myself some credit while advancing piety." Leibniz to Duke Johann Friedrich, 1679 (*Klopp*, IV, 444). Cf. an extremely curious autobiographical fragment in which Leibniz portrays himself as a person whose acquaintance he had made in Paris (in connection with the *Life of Leibniz*, by *Guiliemus Pacidius*, etc.): "I surprised him one day while reading books of controversies. I expressed to him my astonishment, for he had been presented to me as being a mathematician by calling, because he had done almost nothing else in Paris. It was then that he told me this was very much a mistake, that he had many other interests, that his principal meditations concerned theology, that he applied himself to mathematics in the manner of a scholastic (that is, solely for the improvement of his spirit and in order to learn the art of invention and demonstration), and that he believed himself to have progressed in it further than anyone else at present (Klopp, IV, 454). In the same letter, he adds this very interesting note, given its date: "There is still something very important in my philosophy that will give it some entry among the Jesuits and other theologians. This is that I reestablish the substantial forms that the atomists and Cartesians claim to have banished." He states that mechanism ruins the mysteries of faith and that the identification of matter and extension excludes a real presence, etc. "Transubstantiation implies a contradiction if the philosophy of the moderns [Cartesians and Gassendists] is true." Finally, he adds that he has some metaphysical demonstrations from which the possibility of transubstantiation could be deduced. Leibniz to the Landgrave Hesse-Rheinfels, 1684 (Rommel, II, 53). Leibniz is always striving to win Catholics, and in particular the Jesuits, over to his system. See his letter to the Landgrave Hesse-Rheinfels, 1680 (Rommel, I, 281); *Phil*., IV, 343-9; and Appendix IV, §10.

[217] Leibniz to Duke Johann Friedrich, 1679 (Klopp, IV, 445).

It was this project that he recalled when he wrote to Thomas Burnett in 1697: "A clever theologian who had been a professor of mathematics asked me later whether one could write theology according to the *methodo mathematica*. I responded that one could certainly do so, and that I myself had composed some examples of the latter, but that such a work could not be completed without first providing some elements of philosophy... in a mathematical order." Leibniz went on to lay out his views "on the manner of establishing well the truth of the Christian religion."[218] Above all, it is necessary to establish some *foundations*: "I call a foundation when one determines and achieves at least certain points and places certain theses beyond dispute, in order to gain solid ground and have a basis on which to build."[219] After having outlined the theory of necessary and contingent truths, to which we must return, and having shown "that such a labor [the demonstration of the truth of religion] demands not only history and ordinary theology but also philosophy, mathematics, and jurisprudence," Leibniz concluded, "Thus, before theology can be treated by the method of foundations, as I call it, we need a metaphysics, or demonstrative natural theology, and we also need a moral dialectic and natural jurisprudence, by means of which one can learn demonstratively the way of estimating the degrees of proofs."[220] Finally, he added this piece of information valuable for the history of his thought: "It is nearly thirty years ago that I made these remarks publicly,[221] and since that time I have done much research to lay the foundations for such works; but a thousand distractions have prevented me from finalizing these philosophical, juridical and theological elements that I have projected. If God still gives me life and health, I will make it my principal business."[222] He repeated the same promise at the end of a postscript: "Finally, if God continues to give me health and life for some time, I hope he will also give me enough leisure and freedom of mind to carry out my vow, made more than thirty years ago, to contribute to piety and public instruction on the most important matter of all."[223]

In fact, Leibniz never ceased, despite his numerous "distractions,"[224] to think of this vow and to attempt to fulfill it. When, in 1710, he published his *Essays on Theodicy*, born out of discussions the works of Bayle had occasioned at the courts of Hanover and

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[218] Leibniz to Burnett, 1/11 February 1697 (*Phil*., III, 190).

[219] *Phil*., III, 192. Cf. Leibniz to Foucher, 1679? (*Phil*., I, 374). This is precisely what Leibniz understood by "perennial philosophy" (see §15, end). He added: "This is truly the method of mathematicians, who separate the certain from the uncertain, the found from the sought." He further deplored the disorder and absence of method in the works of the learned, exactly as in *Precepts for Advancing the Sciences*, and recalled the famous words of Casaubon concerning the Sorbonne (see Chap. 4, n. 57).

[220] *Phil*., III, 194. This is the logic of probabilities (see Chap. 6, §§28ff.).

[221] An allusion to the *Specimen of Political Demonstrations* of 1669, which he had recalled earlier (*Phil*., III, 190). See Note VIII.

[222] An allusion to the rumor that was current about Leibniz's death, concerning which he wrote to Thomas Burnett: "If death allows me all the time I need to complete the plans I have already formulated, I would promise it in exchange not to begin any others and to work very diligently on those that I already have, and still I would gain a great reprieve through this agreement." Leibniz to Burnett, 7/17 March 1696 (*Phil*., III, 174-5).

[223] *Phil*., III, 197. An allusion to the pious aim of the encyclopedia. (See §10.)

[224] He alluded in the same letter to the principal of these distractions: "You are right, sir, to say that works that serve to establish the truth of religion are worth more than the history of Brunswick. I would thus be very displeased if I always had to be occupied with this history" (*Phil*., III, 195). This was, however, what happened to him. (See Note XV.)

Berlin,[225] he declared that they were in his view only the preface to the metaphysical and theological elements he envisioned,[226] and which must be composed demonstratively *more geometrico*.[227] It is with this intention that he drafted in 1714 both the *Principles of Nature and of Grace*[228] (at the request of Prince Eugene of Savoy), and the collection of metaphysical theses that has come to be known as the *Monadology*.[229] These two essays take the place for us of the projected elements, but they do not replace them, for Leibniz expressed the same wish again in 1715.[230] We can therefore say that even in metaphysics, Leibniz did not succeed in realizing the limited project he had conceived as the successor to the encyclopedia.

23. Nevertheless, he did not renounce his great project, nor cease to work on it or have work done on it. We have the proof of this in the numerous lists of definitions that he drew up or had collected in various periods. We know that the preliminary work of the encyclopedia consisted in defining precisely all concepts by decomposing them into their elements; and we recall that from 1678 he requested Galloys to prepare excerpts of definitions for him from the *Dictionnaire de l'Académie* (§12). Around the same time, he himself excerpted definitions of moral concepts from the works of Descartes[231] and Spinoza.[232] One of these fragments, *On the Blessed Life*, has given rise to a curious mistake. Erdmann believed that one could infer from it that Leibniz accepted Descartes's moral philosophy in its entirety. But Trendelenburg discovered the source of this collection of definitions and propositions in Descartes's letters to Queen Christina and Princess Elizabeth and in his *Passions of the Soul*, and he showed that it was only an analytic and historical summary of the Cartesian moral philosophy.[233]

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[225] See Leibniz to Burnett, 30 October 1710 (*Phil*., III, 321).

[226] "If I were rid of my historical works, I would like to begin to develop these elements of general philosophy and natural theology.... But this present work can serve as an advance messenger" (*ibid.*).

[227] He said in connection with his system of preestablished harmony, "Would that it were possible to reduce all these things to Euclidean demonstrations, as I see could be done." Leibniz to Tolomei, 17 December 1705 (*Phil*., VII, 468).

[228] Published in 1718 in the *Europe Savante*.

[229] Published in German by Kohler in 1720 in Frankfurt. The original French text was published for the first time by Erdmann (1840).

[230] Leibniz to Des Bosses, June 30, 1715: "I wish I had the freedom to reduce my whole metaphysics to a scholarly form, in the way I developed the *Theodicy* methodically at the end in a short Latin tract, since it is certainly the accustomed thing to do and since it is possible to display the complete form of the treatment for inspection in a table" (*Phil*., II, 499). The allusion is to the *Causa Dei*, published as an appendix to the *Theodicy*, and to the two synoptic tables that summarize it by depicting the logical division of the subject in a sort of genealogical tree. Cf. Leibniz to Remond, 26 August 1714 (*Phil*., III, 624) and 9 January 1715 (*Phil*., III, 630-4). Remond had urged Leibniz to bring out a companion volume to his *Theodicy* comprising his various metaphysical essays, notably the *Principles of Nature and of Grace*, which Leibniz had communicated to him.

[231] *On the Blessed Life* (Erdmann, 71). Cf. *On the Happy Life* (*Phil*., VII, 81); *On the Blessed Life*: *On Happiness* (*Phil*., VII, 90).

[232] *On Affects*, 10 April 1679 (see Bodemann, 99). Erdmann and Guhrauer (I, Notes, 15) date this fragment, and thus *On the Blessed Life*, 12 April 1669, but this date is clearly false, since Spinoza's *Ethics*, from which the contents are borrowed, was not published until 1677.

[233] *Leibnizens Schrift* de vita beata, *und sein angeblicher Spinozismus oder Cartesianismus* (*Trendelenburg*, II, 192-232; and *Monatsberichte der k. preuss. Akademie der Wissenschaft zu Berlin*, October 1847). Cf. *Phil*., VII, 38, note, and Stein, *Leibniz und Spinoza*, 12-13.

All his life, Leibniz was occupied with finding or collecting definitions in all the sciences he studied,[234] and we will soon see the logical importance he attributed to definitions and the value he attached to good ones. He prepared, as he said, "a supply of definitions," notably in logic, metaphysics, and morals.[235] Although he lost many of them, there remain in his manuscripts numerous long tables of them, which, moreover, are repeated often, although this takes nothing away from the perseverance with which he devoted himself to this labor—the indispensable prelude to his great plan. Some of these tables have been published by Gerhardt, among the fragments relating to the characteristic,[236] and they are indeed connected to the projects of the encyclopedia and the general science. However, there remain many others unpublished. Some of these are related specifically to the logical calculus or the characteristic;[237] others contain lists of logico-metaphysical categories;[238] finally, some longer and more numerous tables contain concepts belonging to the different sciences, generally arranged in a logical order (or more rarely in alphabetical order).[239]

24. The most important and complete of these studies, however, are five tables of definitions. The first is entirely in the hand of Leibniz,[240] and the second is a copy of the first by Hodann,[241] which allows us to affirm that this table (as well as the others) dates from between 1702 and 1704.[242] It is remarkable in that the definitions are arranged exactly in the order adopted by Dalgarno in his *Ars signorum* and *Lexicon Grammatico-Philosophicum*,[243] which demonstrates the enduring influence he exercised on Leibniz's thought. This classification rests on the scholastic distinction of substances (things or beings) and accidents (attributes or qualities). It includes several divisions whose titles, borrowed from the text of Dalgarno, are as follows: RES: *Concretum mathematicum*,

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[234] "A concern for establishing definitions has been of great importance to me since my youth. I wish he had gathered them into one collection, which often I have tried to do in this matter; but many have been lost." Leibniz to Pape, 9 August 1694 (Klopp, I, Introduction, xxiv).

[235] "As I have studied with care not only history and mathematics, but also natural theology, jurisprudence, and philosophy, I have strongly advanced this plan [the characteristic], and I have prepared a supply of definitions." Leibniz to the Duke Ernst August, 1690? (*Phil*., VII, 27). Cf. Leibniz to Bourguet, 22 March 1714 (*Phil*., III, 569).

[236] *Principles of the Encyclopedia or Universal Science* (*Phil*., VII, 43-5); VI, B, on justice (ibid., 73-7); VI, H, on freedom (ibid., 108-11), XIII (ibid., 195-7). We can add to these the studies in Latin, French, and German on the happy life, on wisdom, which is the science of happiness (ibid., 81, 82, 86, 90ff.); and on generosity and justice (ibid., 104ff.). Moral and legal definitions are found in the Preface to *Diplomatic Code of the Law of Nations* of 1693 (extract in Erdmann, 118 and *Phil*., III, 386-9; complete version in Dutens, IV.3, 287ff., 309ff., and in Klopp, VI, 457-92).

[237] These are similar to the *Logical Definitions* (*Phil*., VII, 208-10) and related passages (ibid., 223, 226-7). They include, for example, the (unpublished) end of *Specimen of the Universal Calculus* (LH IV 7B, 2 Bl. 17, 10-11) and the following: LH IV 7B, 2 Bl. 34-35, 36, 43, 44, 47-48, 49-50, 73, 74; 7C Bl. 73-74.

[238] LH IV 7B, 3 Bl. 17-18, 19-20; 7C Bl. 33-34, 59, 70. Some of these fragments contain a table of categories that would form the alphabet of human thoughts: such is, notably, *Catalog of Primitive Notions from Which All the Many Others Are Composed* (LH IV 7C Bl. 52). Cf. LH IV 8 Bl. 2 verso.

[239] LH IV 7C Bl. 32, 35-46, 47, 48-49, 71-72, 75-78; 8 Bl. 4-5; 8 Bl. 101 (Bodemann, 123).

[240] LH IV 7D, 2 Bl. 1 (38 folio pp.).

[241] Johann Friedrich Hodann, born 1 March 1674, was Leibniz's secretary from 1702 to 1704; his first letter to Leibniz is dated 10 July 1702 (Trendelenburg, III, 1-30).

[242] LH IV 7D, 2 Bl. 2 (51 folio pp.).

[243] LH IV 7D, 1 Bl. 1. (See Note III.)

Concretum physicum, *Concretum artefactum*, *Concretum spirituale*; ACCIDENTIA: *Accidens commune*, *Accidens mathematicum*, *Accidens physicum generale*, *Qualitas sensibilis*, *Accidentia sensitiva*, *Accidens rationale*, *Accidens oeconomicum*, *Accidens politicum*. As we see from these headings, it is a small encyclopedia in which the principal concepts or objects of all the sciences, from mathematics to morals and politics, and even domestic utensils and instruments of human manufacture, are defined and logically classified.[244]

The third table carries the title (in Leibniz's hand): *Extended* [*and Full*] *Table*.[245] The rest is in the hand of Hodann. This has been published by Trendelenburg.[246] It includes 993 definitions, analogous to those of the preceding table and arranged according to the classification of Dalgarno. A certain number of these are accompanied by initials that indicate their source and which will presently be explained.

The fourth, again in the hand of Hodann, is the shortest and least complete.[247] Finally, the fifth, also by Hodann, is the most extensive.[248] It is a lexicon in which the words are arranged in alphabetical order. The origin of the definitions is again noted by initials, whose explanation Hodann gives in an (unpublished) note at the top[249] and later in a final note published by Trendelenburg,[250] who gives the date of the completion of this work as 28 May 1704. Thus Leibniz, having reached a mature age and having fully developed his system, did not renounce the project of the encyclopedia and did not hesitate to draw on the help of earlier lexicographers in preparing his great work.

25. We have another contemporary and very remarkable proof of this preoccupation in the last chapter of the *New Essays* (1704), devoted to the "division of the sciences." There Leibniz distinguishes two orders in which general truths can be arranged: one is the synthetic and theoretical order, in which propositions are organized in their deductive

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[244] Leibniz specifically blamed Wilkins for having excluded artificial objects (such as all human institutions) from his real characteristic and maintained that they are as susceptible to logical definition as natural objects (LH IV 7B, 3 Bl. 10; cf. LH IV 7C Bl. 33).

[245] LH IV 7D, 2 Bl. 3 (36 folio pp.).

[246] In *Monatsberichte der k. preuss. Akademie der Wissenschaft zu Berlin*, 1861, pp. 170-219. Cf. Trendelenburg, *Ueber das Element der Definition in Leibnizens Philosophie* (III, 48-62).

[247] LH IV 7D, 2 Bl. 4 (12 folio pp.).

[248] LH IV 7D, 2 Bl. 5 (89 folio pp.).

[249] "N.B. By the letter P, I understand Ausonius Popma on the differentia of words; by B or T.L., the Thesaurus of the Roman Language, or as it is commonly called, the Roman Forum; by M, the Philological Lexicon of Martinius; by L.P., the Philosophical Lexicon of Micraelius; by D, the Latino-Philosophical Lexicon of Dalgarno. We may add that the letter H designates the definitions composed by Hodann himself (see the following note).

[250] "These definitions or, as I prefer, descriptions, are entered from the philological lexicon of Matthias Martinius, the thesaurus of the Latin language, which is commonly called the Roman Forum and sometimes ascribed to Burerus, perhaps since he was its editor, likewise from the philosophical lexicon of Micraelius, from Auson. Popma on the differentia of words, and from others, according to the guidance of the Latino-Philosophical Lexicon that Dalgarno presents in his *Ars signorum*, commonly known as the universal character and philosophical language, gathered at the order of the illustrious and most excellent G. W. Leibniz and supplemented with his own contributions by Joh. Fredr. Hodann, Candidate in Holy Theology. The work was brought to an end on 28 May 1704. SOLI DEO GLORIA" (Trendelenburg, III, 41-2; *Monatsberichte*, p. 171; *Phil*., VII, 30. The last three words are not published). Gerhardt is mistaken in claiming that this is the table of definitions that Trendelenburg published in 1861 (*Phil*., VII, 30, note). The latter had even indicated explicitly that this was "another" (*Monatsberichte*, p. 171).

sequence like theorems; the other is the analytic or practical order, in which they are organized in reverse like problems—that is, by proceeding backwards from ends to means, from effects to causes, or from consequences to principles.[251] This is, in short, the plan for an encyclopedia, as Leibniz himself states.[252] It would be completed by a catalog of terms, either systematic (by classifying terms in their logical order) or alphabetical.[253] Leibniz ends this chapter, and the work as a whole, by expressing the wish that he might finally see his dream realized by some great prince, for the good of mankind.[254] Thus he remained faithful to his great plan and always preserved the hope of seeing it executed.

26. And so, when he had entered into relations with Tsar Peter the Great, Leibniz was eager to suggest to him the foundation of a learned society whose principal aim would be the development of an encyclopedia.[255] In an admirable memorandum on the means of making progress in the arts and sciences in the Russian empire, Leibniz sketched, among other projects, the plan of the encyclopedia as he envisioned it at the end of his life. It would consist of three parts: a large, medium, and small encyclopedia. The large encyclopedia would be a "universal atlas," containing all the diagrams relating to the different sciences, in the form of a true atlas (in folio).[256] The medium one would be the encyclopedia properly speaking:[257] systematic, at once demonstrative and analytic, like the work sketched in the *New Essays*. It would be accompanied by synoptic tables showing the order and logical relations of the different sciences, as well as the gaps to be filled. Finally, the small encyclopedia would be a type of manual or refresher, as is found in mathematics. One would begin by composing the medium encyclopedia, which would serve as a basis for the large and of which the small would be an extract or summary.[258]

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[251] Cf. *Plan for the Renewal of Letters* (Klopp., I, 49), quoted in n. 51, and a fragment from after 1696, in which we read: "Theoretical philosophy explains the natures of things; practical philosophy explains the uses of things for obtaining good and avoiding evil. Thus it happens that the same thing could occur twice: in the first part, by reason of its efficient cause, and in the second part, by reason of its final cause" (LH IV 8 Bl. 56). This fragment contains a classification of the sciences, that is, yet another plan for an encyclopedia.

[252] "But by composing an encyclopedia according to both these methods simultaneously, one could make cross-references so as to avoid repetitions." *New Essays*, IV.xxi.

[253] "This catalogue would be necessary in order to assemble all the propositions in which the term enters in a sufficiently significant way. Following the two preceding methods, in which truths are arranged according to their origin or according to their use, truths concerning the same term could not be found together, as is shown by an example drawn from Euclid's *Elements*." Leibniz adds that if such catalogues are useful in geometry, they would be even more so in empirical sciences like medicine (cf. §18).

[254] "And when I consider how men have advanced in knowledge since a century or two ago and how it would be easy for them to go incomparably further in order to render themselves happier, I do not despair that there may come in a more peaceful time some considerable improvement under a great prince whom God could arouse for the sake of the well-being of mankind." Cf. *Precepts for Advancing the Sciences* (analyzed in §14).

[255] See Appendix IV, §19.

[256] We rediscover here the early project of the *Atlas universalis* (LH IV 7A Bl. 30). See §4 and the texts cited there.

[257] In this context Leibniz recalls the work of Alsted and speaks of him again with a certain esteem, despite his datedness (see §5).

[258] Foucher de Careil, VII, 591-5. Leibniz cites as an example the mathematical courses of Hérigone (see Chap. 4, n. 6), of Schott, and above all of Wolff, "the best and newest" (Foucher de Careil, VII, 592). He speaks here of his most illustrious disciple, for whom he had obtained in 1706 the chair of mathematics

The practical aim of the project was always the same: to remedy the number and confusion of books and to put in order the knowledge that has been acquired. Thus the encyclopedia would be the fruit of a great preparatory labor, which would consist in extracting the essence of all previous works. To this end, Leibniz took up again his youthful project of a bibliographic and analytic review, which would yield inventories or indices—some alphabetical, others systematic. He preferred the latter as more useful and more instructive, for the alphabetical index would serve merely to rediscover a concept in the systematic index.[259] Thus in this memorandum which constitutes, in the words of Foucher de Careil,[260] his philosophical testament, Leibniz was more than ever convinced of the usefulness of the demonstrative encyclopedia on which he had meditated all his life. Until the end of his life, he remained hopeful of seeing it composed; he spoke of it to all those whom he thought capable of undertaking it or aiding him in it.[261] It is the same with his characteristic, which he preferred to discuss with his new correspondents, as though sounding them out—an indication that it was the project closest to his heart.[262] It is thus that he spoke of it again, in a melancholic tone of regret that we now understand after so many abortive attempts, in his first letter to Nicolas Remond: "I would venture to add that if I had been less distracted, or if I were younger or assisted by some well-prepared young men, I would hope to give a type of *spécieuse générale*, in which all the truths of reason would be reduced to a sort of calculus."[263]

As Leibniz himself noted, two requirements were missing for him: on the one hand, the assistance of obedient and devoted collaborators, on the other, time, which had been consumed by all his historical and political "distractions." After meditating for fifty years on the great work whose idea he had conceived in his youth, and having sketched innumerable plans of it, he died without having executed it.[264]

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at the University of Halle. See Leibniz's comments on Wolff in his letter to Hansch, 25 January 1707 (Dutens, V, 160), and in his letter to Remond, July 1714 (*Phil*., III, 618-21).

[259] Foucher de Careil, VII, 584-90.

[260] Foucher de Careil, VII, xxxvi.

[261] See Leibniz to Lange, 5 June 1716 (Note XIX).

[262] For example, Placcius in 1678, Huygens in 1679, and L'Hospital in 1693.

[263] Leibniz to Remond, 10 January 1714 (*Phil*., III, 605). Cf. his letters to Remond of 14 March 1714 (quoted Chap. 9, §§2 and 3) and to Bourguet of 22 March 1714 (*Phil*., III, 569).

[264] Cf. Kvet, §40, 40.