The Sanctuary of Truth, an allegory of the arts and sciences from the frontispiece of the *Encyclopédie*

PHILOSOPHERS TRIM THE TREE OF KNOWLEDGE: THE EPISTEMOLOGICAL STRATEGY OF THE *ENCYCLOPÉDIE*

THE NEED TO SORT AND classify phenomena extended far beyond the files of the police who tried to keep track of men like Diderot; it lay at the heart of Diderot's greatest enterprise, the *Encyclopédie*. But when it expressed itself in print, it assumed a form that may escape the attention of the modern reader. In fact, the supreme text of the Enlightenment can look surprisingly disappointing to anyone who consults it with the expectation of finding the ideological roots of modernity. For every remark undercutting traditional orthodoxies, it contains thousands of words about grinding grain, manufacturing pins, and declining verbs. Its seventeen folio volumes of text include such a jumble of information on everything

from *A* to *Z* that one cannot help wondering why it raised such a storm in the eighteenth century. What set it apart from all the learned compendia that preceded it—from the imposing *Dictionnaire de Trévoux*, for example, or the much vaster *Grosses vollständiges* Universal-Lexicon alter *Wissenschaften und Künste* published in sixty-four folio volumes by Johann Heinrich Zedler? Was it, in the words of one authority, a "reference work or *machine de guerre*"?[1]

One could answer that it was both and dismiss the problem as a question *mal posée.* But the relation between information and ideology in the *Encyclopédie* raises some general issues about the connection between knowledge and power. Consider, for example, a totally different kind of learned book, the Chinese encyclopedia imagined by Jorge Luis Borges and discussed by Michel Foucault in The Order of Things. It divided animals into: "(a) belonging to the Emperor, (b) embalmed, (c) tame, (d) sucking pigs, (e) sirens, (f) fabulous, (g) stray dogs, (h) included in the present classification, (i) frenzied, (j) innumerable, (k) drawn with a very fine camelhair brush, (l) et cetera, (m) having just broken the water pitcher, (n) that from a long way off look like flies."[2] This classification system is significant, Foucault argues, because of the sheer impossibility of thinking it. By bringing us up short against an inconceivable set of categories, it exposes the arbitrariness of the way we sort things out. We order the world according to categories that we take for granted simply because they are given. They occupy an epistemological space that is prior to thought, and so they have extraordinary staying power. When confronted with an alien way of organizing experience, however, we sense the frailty of our own categories, and everything threatens to come undone. Things hold together only because they can be slotted into a classificatory scheme that remains unquestioned. We classify a Pekinese and a Great Dane together as dogs without hesitating, even though the Pekinese might seem to have more in common with a cat and the Great Dane with a pony. If we stopped to reflect on definitions of "dogness" or on the other categories for sorting out life, we could never get on with the business of living.

Pigeon-holing is therefore an exercise in power. A subject relegated to the trivium rather than the quadrivium, or to the "soft" rather than the "hard" sciences, may wither on the vine. A mis-

shelved book may disappear forever. An enemy defined as less than human may be annihilated. All social action flows through boundaries determined by classification schemes, whether or not they are elaborated as explicitly as library catalogues, organization charts, and university departments. All animal life fits into the grid of an unconscious ontology. Monsters like the "elephant man" and the "wolf boy" horrify and fascinate us because they violate our conceptual boundaries,[3] and certain creatures make our skin crawl because they slip in between categories: "slimy" reptiles that swim in the sea and creep on the land, "nasty" rodents that live in houses yet remain outside the bounds of domestication. We insult someone by calling him a rat rather than a squirrel. "Squirrel" can be a term of endearment, as in Helmer's epithet for Nora in *A Doll's House.* Yet squirrels are rodents, as dangerous and disease-ridden as rats. They seem less threatening because they belong unambiguously to the out-of-doors. It is the in-between animals, the neither-fish-nor-fowl, that have special powers and therefore ritual value: thus the cassowaries in the mystery cults of New Guinea and the tomcats in the witches' brews of the West. Hair, fingernail parings, and feces also go into magic potions because they represent the ambiguous border areas of the body, where the organism spills over into the surrounding material world. All borders are dangerous. If left unguarded, they could break down, our categories could collapse, and our world dissolve in chaos.[4]

Setting up categories and policing them is therefore a serious business. A philosopher who attempted to redraw the boundaries of the world of knowledge would be tampering with the taboo. Even if he steered clear of sacred subjects, he could not avoid danger; for knowledge is inherently ambiguous. Like reptiles and rats, it can slip from one category to another. It has bite. Thus Diderot and d'Alembert took enormous risks when they undid the old order of knowledge and drew new lines between the known and the unknown.

Of course, philosophers had rearranged mental furniture since the time of Aristotle. Reordering the trivium and quadrivium, the liberal and mechanical arts, the *studia humanitatis* and all the branches of the ancient curriculum was a favorite game for schematizers and synthesizers during the Middle Ages and the Renais-

sance. The debate about "method" and correct "disposition" in the ordering of knowledge shook the entire republic of letters in the sixteenth century. Out of it emerged a tendency to compress knowledge into schemata, usually typographical diagrams, which illustrated the branches and bifurcations of disciplines according to the principles of Ramist logic. Thus a diagrammatic impulse—a tendency to map, outline, and spatialize segments of knowledge—underlay the strain of encyclopedism that stretched from Ramus to Bacon, Alsted, Comenius, Leibniz, Chambers, Diderot, and d'Alembert.[5] But the diagram at the head of Diderot's *Encyclopédie,* the famous tree of knowledge derived from Bacon and Chambers, represented something new and audacious. Instead of showing how disciplines could be shifted within an established pattern, it expressed an attempt to raise a boundary between the known and the unknowable in such a way as to eliminate most of what men held to be sacred from the world of learning. By following the *philosophes* in their elaborate attempts to trim the tree of knowledge that they had inherited from their predecessors, one can form a clearer idea of how much was at stake in the Enlightenment version of encyclopedism.

Diderot and d'Alembert alerted the reader to the fact that they were engaged in something more momentous than Ramist doodling by describing their work as an encyclopedia, or systematic account of "the order and concatenation of human knowledge,"[6] and not merely as just another dictionary, or compendium of information arranged according to the innocent order of the alphabet. The word encyclopedia, Diderot explained in the *Prospectus,* derived from the Greek term for circle, signifying "concatenation [enchaînement] of the sciences."[7] Figuratively, it expressed the notion of a world of knowledge, which the Encyclopedists could circumnavigate and map. "Mappemonde" was a crucial metaphor in their description of their work. Still more important was the metaphor of the tree of knowledge, which communicated the idea that knowledge grew into an organic whole, despite the diversity of its branches. Diderot and d'Alembert mixed the metaphors at key points. Thus in explaining the difference between an encyclopedia and a dictionary, d'Alembert described the *Encyclopédie* as:

> a kind of world map which is to show the principal countries, their position and their mutual dependence, the road that leads directly from one to the other. This road is often cut by a thousand obstacles, which are known in each country only to the inhabitants or to travelers, and which cannot be represented except in individual, highly detailed maps. These individual maps will be the different articles of the *Encyclopédie* and the Tree or Systematic Chart will be its world map.[8]

The mixing of metaphors suggested the unsettling effect of conflating categories. The very attempt to impose a new order on the world made the Encyclopedists conscious of the arbitrariness in all ordering. What one philosopher had joined another could undo. So the *Encyclopédie* might not fix knowledge more permanently than the *Summa* of Thomas Aquinas had done. Something like epistemological *Angst* showed through the language of the *Prospectus,* even when it advanced its most aggressive claims to make the older syntheses obsolete:

> This tree of human knowledge could be formed in several ways, either by relating different knowledge to the diverse faculties of our mind or by relating it to the things that it has as its object. The difficulty was greatest where it involved the most arbitrariness. But how could there not be arbitrariness? Nature presents us only with particular things, infinite in number and without firmly established divisions. Everything shades off into everything else by imperceptible nuances. And if, on this ocean of objects surrounding us, there should appear a few that seem to break through the surface and to dominate the rest like the crest of a reef, they merely owe this advantage to particular systems, to vague conventions, and to certain events that have nothing to do with the physical arrangement of beings and with the true institutions of philosophy.[9]

If the encyclopedic tree was but one of an infinite number of possible trees, if no map could fix the indeterminate typography of knowledge, how could Diderot and d'Alembert hope to establish the "true institutions of philosophy"? Essentially because they thought they could limit the domain of the knowable and pin down a modest variety of truth. True philosophy taught modesty. It demonstrated that we can know nothing beyond what comes to us from sensation and reflection. Locke made feasible what Bacon had begun, and Bacon had begun by sketching a tree of knowl-

edge. Thus a Lockean version of Bacon's tree could serve as a model for the modern *Summa* of everything known to man.

Diderot and d'Alembert could have picked out other trees in the forest of symbols of systematic knowledge. Porphyry and Raymond Lull had anticipated Bacon, and Hobbes had succeeded him. More to the point, a fully developed tree stood at the beginning of Ephraim Chambers's *Cyclopaedia,* which Diderot and d'Alembert took as their main source. Not only did they begin their work as a translation of his, they derived their conception of an encyclopedia from him. Diderot acknowledged their debt freely in the *Prospectus:*

> We realized, with our English author, that the first step we had to take toward the rational and fully understood execution of an encyclopedia was to form a genealogical tree of all the sciences and of all the arts, one which would show the origin of each branch of knowledge and the connections each has with the others and with their common stalk, and which would help us relate the different articles to their main rubrics.[10]

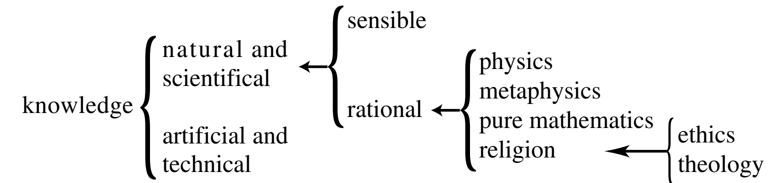
Chambers himself had insisted on the importance of presenting knowledge systematically rather than as an unordered mass of information:

> The difficulty lay in the form and economy of it, so to dispose such a multitude of materials as not to make a confused heap of incoherent parts but one consistent whole... Former lexicographers have scarce attempted anything like structure in their works, nor seem to have been aware that a dictionary was, in some measure, capable of the advantages of a continued discourse.[11]

In short, Chambers distinguished himself from his predecessors by propounding a view of knowledge as an integrated whole. He would produce not merely a "dictionary" arranged from *A* to *Z,* but a "cyclopaedia," which would encompass the entire circle of learning.

Like Bacon, Chambers represented the divisions of knowledge as branches of a tree, which he derived from the three principal faculties of the mind: memory, the source of historical knowledge; imagination, the source of poetry; and reason, the source of philoso-

phy. The faculties disappeared, however, when he depicted the tree in a diagram. The diagram merely showed how knowledge branched and twigged into a luxuriant foliage of forty-seven arts and sciences. Theology, for example, grew out of the main trunk, "knowledge," in the following manner:[12]



Was such a picture of theology likely to find favor among the Encyclopedists? If it did not quite make her the queen of the sciences, it placed theology at the crowning point of a series of bifurcations drawn out diagrammatically in the old-fashioned Ramist manner. It also allocated more articles to theology than to any other subject, as the reader could tell by consulting notes attached to every branch of the sciences. To be sure, a freethinker like Diderot might have been expected to welcome a system that seemed to derive theology from the rational and the "scientifical" branches of thought. But the bough labeled "rational" issued in four sub-branches, which accorded equal dignity to those sciences that he wanted to belittle, metaphysics and religion, and to those sciences that he wanted to elevate, mathematics and physics. Worse, the tree had no branch for philosophy as such. The sacred and the secular ran together through all its ramifications. And in the general confusion, a vital, Baconian point was lost: the arts and sciences seemed to grow out of each other, not to derive from the operations of the mind. Diderot and d'Alembert wanted to root knowledge in epistemology; so they abandoned their immediate source, Chambers, and went back to Bacon.

To return to Bacon was to leap over Locke. As d'Alembert noted in the *Discours préliminaire,* Bacon still used scholastic language, still groped for light in the depths of medieval darkness.[13] Yet much of Bacon's thought—the emphasis on induction, the distinction between perception and reflection, the turning away from

metaphysical systems and toward the investigation of the immediate world of sense experience—had an affinity with the empiricism that was later to emerge with Locke. Bacon's tree of knowledge, unlike that of Chambers, really did suggest that the arts and sciences grew from the faculties of the mind. So Bacon provided Diderot and d'Alembert with the model they needed, and they followed it so closely that they were accused of plagiarism.[14] But they also deviated from it at several significant points, as they emphasized repeatedly in the *Prospectus* and the *Discours préliminaire.* They devised a "mappemonde" to suit their own purposes, just as Bacon created "a small globe of the intellectual world" to suit his.[15] By superimposing their map on his, one can see shifts in the topography of knowledge, which may serve as clues to the underlying strategy of the *Encyclopédie.*

Like Bacon, Diderot and d'Alembert began with history, the branch of knowledge derived from memory; and like him, they divided it into four subbranches: ecclesiastical, civil, literary, and natural (see appendix to this chapter). But the proportions of their schema differed completely from his. To them, ecclesiastical history was a minor branch, which they hurried over in one sentence in the body of the *Discours préliminaire* and failed to mention at all in the commentary on Bacon's tree printed at its end. For Bacon, ecclesiastical history had a rich set of subdivisions, including the history of Providence, which demonstrated the hand of God at work in human affairs, to "the confuting of those which are as without God in the world."[16] The place of natural history on the two trees is exactly the reverse. Bacon considered it a "deficient" branch, one that needed developing, especially in the area of the mechanical arts.[17] Those arts occupied a vast area of the encyclopedic tree and constituted the most extensive and original part of the *Encyclopédie* itself. Diderot and d'Alembert did not seek out the hand of God in the world but rather studied men at work, forging their own happiness.

Of course, Bacon also advocated the study of the workaday world, but he did not cut it off from Providence, while the Encyclopedists attributed its improvement entirely to the influence of intellectuals like themselves; hence their version of the distinction between civil and literary history: "The history of man has for its

object either his actions or his knowledge, and consequently is civil or literary. In other words, it is divided between the great nations and the great geniuses, between the kings and the men of letters, between the conquerors and the philosophers."[18] This formulation cast the *philosophes* in a grand role. History followed a glorious trajectory from the philosophers of the Renaissance to the philosophers of the Enlightenment, according to the sketch that d'Alembert included in the *Discours préliminaire.* To Bacon, however, literary history (the "just story of learning" as opposed to "poesy" or the arts of the imagination)[19] did not reveal the progressive march of reason. It was so deficient as hardly to exist at all: "The history of the world seemeth to me to be as the statue of Polyphemus with his eye out; that part being wanting which doth most show the spirit and life of the person."[20] Diderot and d'Alembert drew a different conclusion from the same metaphor, strategically misconstrued: "The sciences are the work of the reflection and of the natural light of men. Chancellor Bacon was therefore justified in saying in his admirable work *De dignitate et augmento scientiarum* that the history of the world without the history of scholars is the statue of Polyphemus with his eye torn out."[21] Where Bacon saw darkness, they saw light and gloried in their role as purveyors of Enlightenment.

The arts derived from the imagination, rather misleadingly labeled poetry, look pretty much the same on the two trees, except that the *Encyclopédie* pursued their ramifications through plastic arts that Bacon did not mention. The greatest differences appeared among the sciences derived from reason, that is, philosophy, the third of the three main divisions of knowledge. In defending the encyclopedic tree against the attacks of the Jesuit journalist, Guillaume-François Berthier, Diderot insisted on the originality of "the philosophical branch, which is the most extensive, the most important of our system, and of which almost nothing can be found in Chancellor Bacon."[22] The observations on Bacon's tree at the end of the *Discours préliminaire* made the same point, adding cryptically, "It is for philosophers, that is to say, for a very small number of persons, to judge us on this point."[23] To a philosopher of Diderot's stripe the point would be obvious, for in the tree of the *Encyclopédie* philosophy was not so much a branch as the princi-

pal trunk. Out of it, on a rather remote twig, grew "revealed theology" amidst a cluster of dubious subjects: "superstitions," "divination," "black magic," "the science of good and evil spirits." The Encyclopedists conveyed a message merely by positioning things, as in the notorious cross references of their articles (for example, ANTHROPOPHAGY: "See EUCHARIST, COMMUNION, ALTAR, etc."[24]). A new dimension had developed around the mapping of knowledge. Shape yielded significance, and morphology turned into irony.

Diderot and d'Alembert could also hide their meaning by claiming that they shaped their tree after Bacon's. Like him, they divided philosophy into three parts, divine, natural, and human; and by putting the science of God at the top, they seemed to preserve its place as the queen of the sciences. In fact, however, they completely undermined Bacon's system. He included only pagan "natural theology" within philosophy and emphasized its imperfection. It sufficed to confound atheism, because the contemplation of God's works compelled one to acknowledge His existence. But inductive reasoning from observed phenomena—arguments for theism from design—never could lead to knowledge of the true, Christian God. "We ought not to attempt to draw down or to submit the mysteries of God to our reason," Bacon warned. So he separated religion from philosophy, underscoring "the extreme prejudice which both religion and philosophy hath received by being commixed together; as that which undoubtedly will make an heretical religion and an imaginary and fabulous philosophy."[25]

Nothing could be further from the reasoning of Diderot and d'Alembert. By subjecting religion to philosophy, they effectively dechristianized it. Of course, they professed orthodoxy. They noted that God had revealed Himself in "sacred history." Revelation therefore was an impeccable fact, which could be culled from memory and submitted to reason like anything else: "Thus, to separate theology from philosophy [as Bacon had done] would be to cut the offshoot from the trunk to which it is united by its very nature."[26] The premises sounded pious, but the conclusion smacked of heresy because it seemed to subordinate theology to reason, which they described in a Lockean manner, as if one could arrive at knowledge of God by building sensations into ever more complex and abstract ideas. Indeed, when they came to the "science of God" in their account of the tree of knowledge, Diderot and d'Alembert advanced an argument that could have come straight out of *An Essay Concerning Human Understanding:*

> The natural progress of the human mind is to rise from individuals to species, from species to genera, from closely related genera to distantly related ones, and to create a science at each step; or at least to add a new branch to some science already in existence. Thus the concept, which we meet in history and which sacred history announces to us, of an uncreated and infinite intelligence, etc.[27]

To pursue induction so far was impiety, according to Bacon. He guarded against it by placing "divine learning" on a separate tree, which had no connection with "human learning" and the faculties of the mind. Thus Bacon actually envisaged two trees of knowledge, one for revealed and one for natural theology, while the Encyclopedists grouped revealed and natural theology together on a single tree and subordinated both to reason.

The implications of all this pruning, grafting, and uprooting of Bacon became clear in d'Alembert's *Discours préliminaire.* D'Alembert expounded the tree of knowledge in the central section of his essay, which dealt with, the systemic connections of the arts and sciences. He situated this section between a discussion of the genesis of knowledge within individual minds, on the one hand, and an account of its development within society, on the other. Thus the *Discours préliminaire* can be seen as a triptych, in which the central panel provides a morphological picture of knowledge, while the side panels present epistemological and historical views.

The three-sided structure of the *Discours préliminaire* is not easy to discern, however. Although the essay certainly deserves to be considered as a major manifesto of the Enlightenment, it is not a model of clarity. Like Bacon, d'Alembert set out to produce a "mappemonde" by circumnavigating the world of knowledge; but he wandered off course, ran into contradictions, and floundered in inconsistencies as he tried to find a way through everything that had accumulated since Bacon's time. It was the difficulties that made the journey so momentous. So its zigs and zags are worth following in some detail.

D'Alembert embarked on a bold, Lockean tack. All knowledge derived from sensation and reflection, he explained. Ideation began with the buzzing of the senses rather than from some introspective unpacking of innate ideas: I feel, therefore I am. From knowledge of the self, I advance to knowledge of external objects, the experience of pleasure and pain, and thence to notions of morality. At this point, d'Alembert seemed to root ethics in a kind of utilitarianism, and he shifted from the consideration of how ideas developed in the individual to the question of how individuals formed societies. This tack took him back to the beginning, to man in the state of nature. Presocial men lived like Hobbesian brutes, by "the barbarian right of inequality called the law of the strongest,"[28] rather than by Lockean natural law. But their experience of oppression awakened their moral sense and drove them to protect their legitimate rights by organizing in societies. Once engaged in social life, they began to question the source of their newly acquired morality. It could not come from the physical world, so it must come from some spiritual principle dwelling within us, which had forced us to reflect on justice and injustice. We recognize two principles at work, mind and body; and in the act of recognition, we sense our imperfection, which implies a prior notion of perfection itself. In the end, therefore, we arrive at a conception of God.

It was an odd argument. After a brush with Hobbes, which anticipated Rousseau, d'Alembert became entangled with Descartes. His mode of exposition shifted from hypothetical history to epistemological introspection. He argued that the dawning of ethical thought forced man to examine his own thinking substance or soul, which he immediately recognized as having nothing in common with his body. That is, he induced Descartes's dualism; and in the next, swift leap, he derived Descartes's God: "This mutual slavery [of body and soul], which is so independent of us, together with the reflections that we are compelled to make on the nature of the two principles and on their imperfection, lifts us to the contemplation of an all-powerful Intelligence to whom we owe our being and who consequently requires our worship."[29]

D'Alembert had taken a Lockean route to a Cartesian God. After following Locke's argument about the combination of increasingly complex and abstract ideas, he had reversed himself and arrived at the supreme abstraction in the manner of Descartes, by a direct

jump from the consciousness of imperfection to the logically prior notion of perfection. From this high ontological ground, Descartes had gone on to derive the world of extension, ending where Locke began. D'Alembert proceeded in the opposite direction, beginning where Locke did; so his epistemology ran forward and his metaphysics backward. Indeed, the recapitulation of his argument reads like a series of non sequiturs:

> It is therefore evident that the purely intellectual concepts of vice and virtue, the principle and the necessity of laws, the spiritual nature of the soul, the existence of God and of our obligations toward him—in a word, the truths for which we have the most immediate and indispensable need—are the fruits of the first reflective ideas that our sensations occasion.[31]

D'Alembert may have been less than orthodox in religion, but he was no fool. Why did he compress such incompatible propositions into a single argument? The rather casual style of his exposition suggests that he did not mean the *Discours préliminaire* to be read as a formal treatise in philosophy. He intended it to serve as an introduction to an encyclopedia, and so he moved fast. Thus he noted that a perceptive knowledge of the soul came "naturally" from considerations of morality, as if one could shift from an ethical to an epistemological argument with no difficulty at all. "It is not necessary to probe deeply," he added, in order to recognize the dualism between body and soul.[31] He dashed through Descartes's proof of the existence of God in a sentence, almost in a parenthetical remark. The hasty turns of phrase suggested that the modern philosopher could dispatch with metaphysical questions quickly, or at least that he need not tarry over them. Malebranche and others had erected Cartesianism into a new orthodoxy. By echoing their arguments, d'Alembert established his own credentials as a good Catholic; and by splicing the arguments with inconsistencies, he undercut them, perhaps intentionally. As noted above, the *Discours préliminaire* ended with a revised version of the *Prospectus,* which argued about God as if it were a gloss on *An Essay Concerning Human Understanding.* Having appeared confusedly Cartesian in one place, the *Encyclopédie* sounded audaciously Lockean in another. The reader could draw his own conclusions.

But it would be wrong to conclude that d'Alembert meant to

becloud his argument by fogging it over with incompatible propositions. Arguments often burst at the seams with incompatibilities, not because their author intended them to but because he unconsciously utilized different idioms. D'Alembert wrote at a time when scholastic, Cartesian, and Lockean language jostled one another in philosophic discourse. He easily slipped from one idiom to another whenever he dropped his guard or needed to negotiate around a difficult point. In fact, a certain amount of slippage suited the meandering character of the *Discours préliminaire.* In the section following his epistemological account of knowledge, d'Alembert spoke out against excessive coherence in scientific method. Instead of laying out a rigorously consistent set of premises and proceeding deductively, he maintained, philosophers ought to take nature as they found it, reduce its phenomena down to their underlying principles, and then reconstruct those principles systematically. This *esprit systématique* rested on the postulate that underlying principles really existed, but it did not, like the *esprit de système,* take their existence as its starting point. Still, it could be objected that d'Alembert's postulate—expressed at its most dramatic in his contention that "the universe, to someone who could embrace it from a single point of view, would be so to speak only a single fact and one great truth"[32] –was a matter of faith, not knowledge. How did he know that knowledge ultimately would cohere?

Instead of confronting that question directly, d'Alembert tried to demonstrate the cohesion of the arts and sciences by surveying all their branches. He shifted from an epistemological to a morphological mode of argument, which culminated in his discussion of the tree of knowledge. Even so, the argument continued to sway between incompatible types of exposition. At times it developed a 'philosophical history"[33] of the arts and sciences, continuing the earlier discussion of their genesis from the state of nature. At times it took them up according to their "philosophical order"[34] or logical relations.

D'Alembert began with logic itself because he considered it first in importance, even though it did not rank first in the order of discovery. At the same time, he proclaimed his intention of discussing the sciences according to a hypothetical chronology of their development. Continuing in this inconsistent manner, he

picked his way through grammar, eloquence, history, chronology, geography, politics, and the fine arts until he arrived at the encyclopedic tree. It provided him with an overview of everything, because it emblematized the totality of knowledge both in "the encyclopedic order" and in "the genealogical order"[35] — that is, it brought together the two modes of argument that had threatened to fly apart from the very beginning of the *Discours préliminaire.* Bacon had shown how to turn this trick. His tree demonstrated that knowledge grew into an organic whole while emanating from the faculties of the mind. But it did not illustrate a full-blown epistemological argument. Insofar as it suggested any epistemology at all, it conjured up notions from Aristotle and Aquinas. D'Alembert and Diderot wanted to bring the old faculty psychology up to date. So they trimmed Bacon's tree in the Lockean manner and thereby brought morphology into line with epistemology.

This second trick more than doubled the power of the argument because it ruled out of bounds any knowledge that could not be derived from sensation and reflection. D'Alembert prudently left room for "revealed facts"[36] under the rubric of history, but he subjected revelation to reason under philosophy, the most important division of knowledge. Of course, it might be argued that Aquinas had done as much. But the *Summa* of Aquinas embraced everything that could fit within the predicate of a syllogism, while the *Summa* of Diderot and d'Alembert excluded everything that could not reach reason through the senses. On their tree, unlike Bacon's, "natural theology" (balanced by "religion") received equal billing with "revealed theology" (balanced by "superstition"). It was difficult to find any place at all for the traditional doctrines of the church. Although memory might summon them out of history, they would look no more reasonable than Stoicism or Confucianism in the realm of philosophy. In fact, they had ceased to be knowledge altogether. The morphological and epistemological arguments combined to cut orthodox religion off the map, to consign it to the unknowable, and thus to exclude it from the modern world of learning.

The historical argument completed the job. D'Alembert presented history as the triumph of civilization and civilization as the work of men of letters. The last section of the *Discours préliminaire*

propounded a kind of great-man view of history in which all the great men were philosophers.[37] After deploring the Dark Ages and celebrating the Renaissance, it concentrated on the greatest of the great: Bacon, Descartes, Newton, and Locke.

Bacon appeared in this grand tableau as the progenitor of philosophy, the first man to dissipate darkness and to restrict reason to its proper sphere, the study of natural phenomena. To be sure, he failed to break completely with scholasticism. That task fell to Descartes, who destroyed the fetters that had held back philosophy since the time of Aquinas, if not Aristotle. D'Alembert hailed Descartes the doubter, not Descartes the metaphysician. The doctrine of innate ideas actually represented a step backward, he explained, for it led reason astray into a world beyond sense experience, whereas the scholastics at least "retained from the peripatetic sect the sole truth that it had taught, namely that of the origin of ideas in the senses."[38] Although this formulation made Aquinas sound like Locke, it had the advantage of undercutting neo-orthodoxy in metaphysics; and it cleared the way for Newton, who "gave to philosophy a form that it seems certain to conserve."[39] D'Alembert's Newton served as the perfect modern philosopher not merely because he discovered the fundamental law of the solar system but because he restricted philosophy to the study of observed phenomena. Unlike Descartes, who tried to know everything, he limited knowledge to the knowable; he was Newton the modest. From this Newton, the Newton of Voltaire's *Lettres philosophiques* rather than of the Book of Revelation, it was but one step to Locke and "the experimental physics of the soul."[40] Locke represented the ultimate in modesty, the definitive reining-in of philosophy, because he fixed the final limits to the knowable. By reducing all knowledge to sensation and reflection, he at last eliminated extraterrestrial truth from the world of learning.

Once these great men had established the frontiers of knowledge, it remained for their successors to fill in the gaps. D'Alembert surveyed the leading ranks of scientists and philosophers, passing rapidly from Galileo, Harvey, Huyghens, and Pascal to Fontenelle, Buffon, Condillac, Voltaire, Montesquieu, and Rousseau. It was an impressive array, but d'Alembert had difficulty keeping the men in line. He suggested that each thinker consolidated part of the territory conquered by Bacon, Descartes, Newton, and Locke; so that history since the Renaissance demonstrated the progressive march of reason. But some of the philosophers had come before the four *chefs de file,* and others, though they followed, marched to different tunes. Pascal could hardly be passed off as a partisan of natural religion or Leibniz as an adversary of the *esprit de système.* So Pascal appeared as an experimental physicist with a weakness for theology and Leibniz as a mathematician who lapsed into metaphysics. Rousseau presented a particularly embarrassing problem, because his *Discours sur les sciences et les arts* undercut the whole encyclopedic enterprise. D'Alembert skirted that difficulty by remarking that Rousseau's collaboration on the *Encyclopédie* effectively repudiated his paradoxical deprecation of the value of the arts and sciences. Despite their differences, therefore, the entire population of philosophers seemed to advance in the same direction, sweeping superstition before them and carrying enlightenment in triumph, right up to the present—that is, to the *Encyclopédie* itself.

To d'Alembert it was a stirring story, though to the modern reader it may look a little unilinear. The *Discours préliminaire* abounds in violent and heroic metaphors: the breaking of chains, the rending of veils, the clashing of doctrines, the storming of citadels. Thus Descartes:

> Descartes dared at least to show intelligent minds how to throw off the yoke of scholasticism, of opinion, of authority—in a word, of prejudices and barbarism.... He can be thought of as a leader of conspirators who, before anyone else, had the courage to rise against a despotic and arbitrary power and who, in preparing a resounding revolution, laid the foundations of a more just and happier government, which he himself was not able to see established.[41]

This version of the past cast the *philosophes* in a heroic role. Persecuted or disdained, they battled alone, fighting for future generations who would grant them the recognition that their contemporaries had refused. D'Alembert acknowledged the existence of real generals waging real wars, but he wrote as if there were no history but intellectual history and the *philosophes* were its prophets.

This theme emerged in tandem with the cult of the *philosophe* throughout Enlightenment literature in the mid-eighteenth century. D'Alembert carried it further in his *Essai sur la société des gens*

de lettres et les grands, published a year after the *Discours préliminaire*. Here again he celebrated the man of letters as the lone warrior in the struggle for civilization, and went on to issue a declaration of independence for *gens de lettres* as a social group. Although they had been humiliated and ignored, they deserved well of mankind because they had carried the cause of Enlightenment forward since the Renaissance and especially since the reign of Louis XIV, when the "philosophic spirit" began to set the tone in polite society.[42] This view of history owed a great deal to Voltaire, who had proclaimed the importance of men of letters in the *Lettres philosophiques* (1734) and then identified them with the progressive drive in history in *Le siècle de Louis XIV* (1751). Voltaire's own contributions to the *Encyclopédie*, notably in the article GENS DE LETTRES, developed the same theme and made its implications clear. History advanced through the perfection of the arts and sciences; the arts and sciences improved through the efforts of men of letters; and men of letters provided the motive force for the whole process by functioning as philosophes. "It is this philosophic spirit that seems to constitute the character of the men of letters."[43] The article PHILOSOPHE made much the same point. It was adapted from the celebrated tract of 1743, Le Philosophe, which established an ideal type—the man of letters committed to the cause of Enlightenment.[44] Throughout the 1750s, in pamphlets, plays, journals, and treatises, the philosophes came to be recognized or reviled as a kind of party, the secular apostles of civilization, in opposition to the champions of tradition and religious orthodoxy.[45] Many of them contributed to the *Encyclopédie*—so many, in fact, that *Encyclopediste* and *philosophe* became virtual synonyms, and both terms crowded out their competitors—*savant*, *erudit, gens d'esprit*—in the semantic field covered by the general expression *gens de lettres*.[46] D'Alembert contributed to this shift in meaning by glorifying his fellow *philosophes* as the ultimate in *gens de lettres,* the heirs to Newton and Locke, at the end of the *Discours preliminaire*. The entire *Encyclopédie* proclaimed itself to be the work of "a society of men of letters" on its title page, while its friends and enemies alike identified it with *philosophie*.[47] It seemed to embody the equation *civilization =gens de lettres=philosophes* and to funnel all the progressive currents of history into the party of Enlightenment.

Thus the historical argument of the *Discours preliminaire* com-

pleted the work undertaken in the epistemological and morphological arguments. It legitimized the *philosophes* by identifying them with *gens de lettres* and by presenting *gens de lettres* as the moving force in history. Just as the first parts of the essay demonstrated that there was no legitimate knowledge beyond the branches of the Baconian tree, the last part showed that there were no legitimate *gens de lettres* outside the circle of *philosophes.* Part two had trimmed the tree to fit the requirements of sensationalist epistemology, and part one had excluded all knowledge without an empirical base. So nonempirical knowledge, the doctrine taught by the Church, was ruled out of bounds, and the boundary keepers turned out in part three to be the *philosophes.*

Despite their tensions and inconsistencies, the segments of the *Discours preliminaire* interlocked in the execution of a single strategy. It succeeded in dethroning the ancient queen of the sciences and in elevating philosophy to her place. Far from being a neutral compendium of information, therefore, the modern Summa shaped knowledge in such a way as to remove it from the clergy and to put it in the hands of intellectuals committed to the Enlightenment. The ultimate triumph of this strategy came with the secularization of education and the emergence of the modern scholarly disciplines during the nineteenth century. But the key engagement took place in the 1750s, when the Encyclopedists recognized that knowledge was power and, by mapping the world of knowledge, set out to conquer it.

APPENDIX: THREE TREES OF KNOWLEDGE

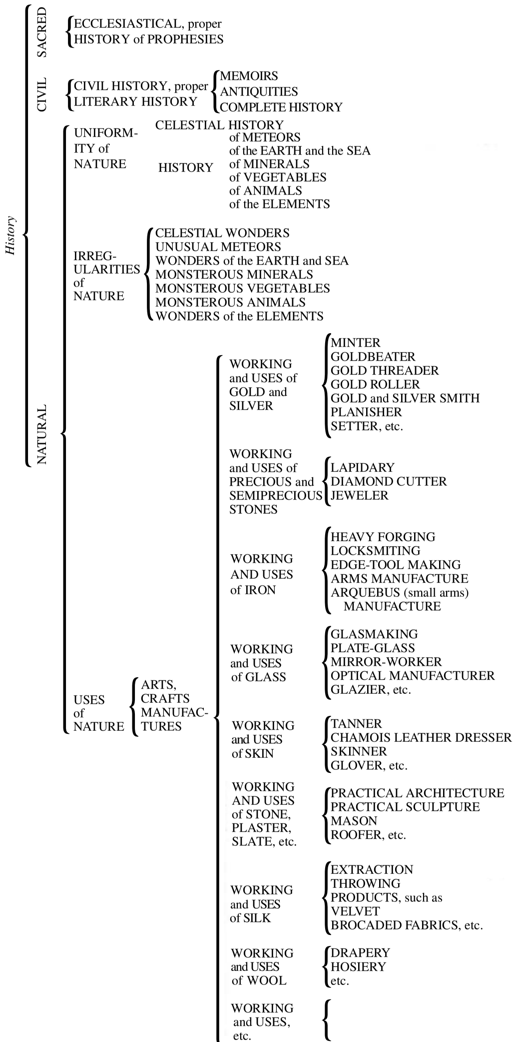
The following schematic pictures of all human knowledge come from the *Encyclopédie* of Diderot and d'Alembert reprinted from Denis Diderot's *The Encyclopedia: Selections* edited and translated by Stephen J. Grendzier (New York: Harper Torchbook, 1967), the *Cyclopaedia* of Ephraim Chambers, and *The Advancement of Learning* by Francis Bacon. The first two represent the tree of knowledge typographically as a diagram. Bacon developed his in the form of an outline from which a diagram has been drawn.

The Tree of Diderot and d'Alembert
Detailed System of Human Knowledge

Understanding

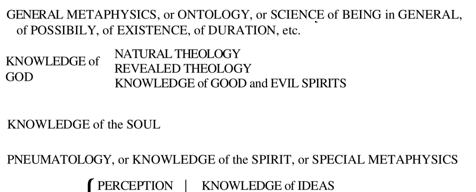
Memory

History

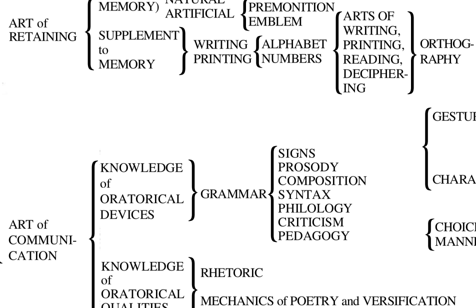


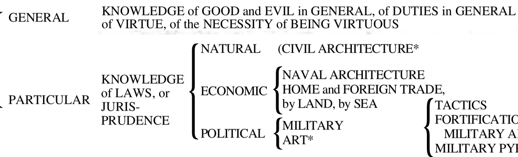
Reason

Philosophy

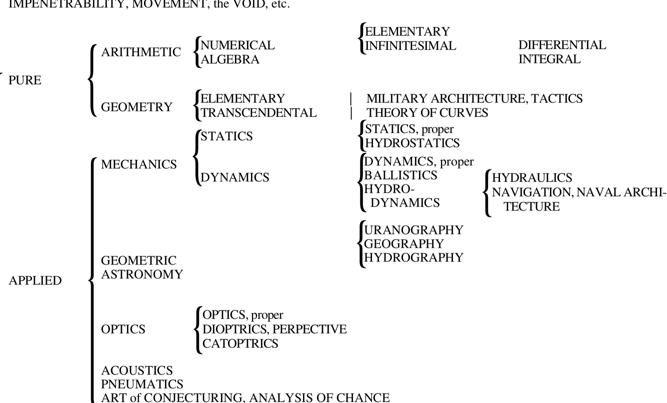


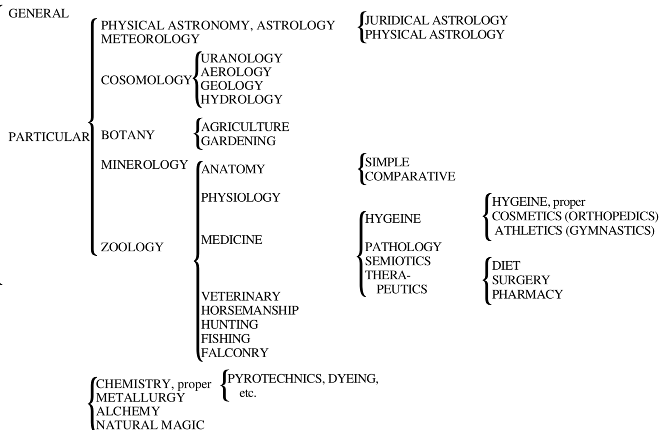
KNOWLEDGE OF MAN

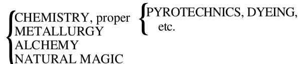




KNOWLEDGE OF NATURE

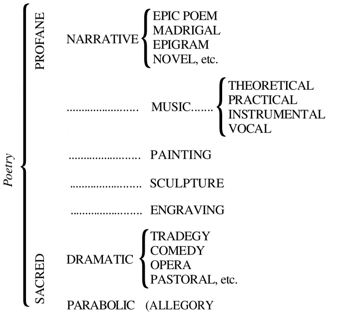




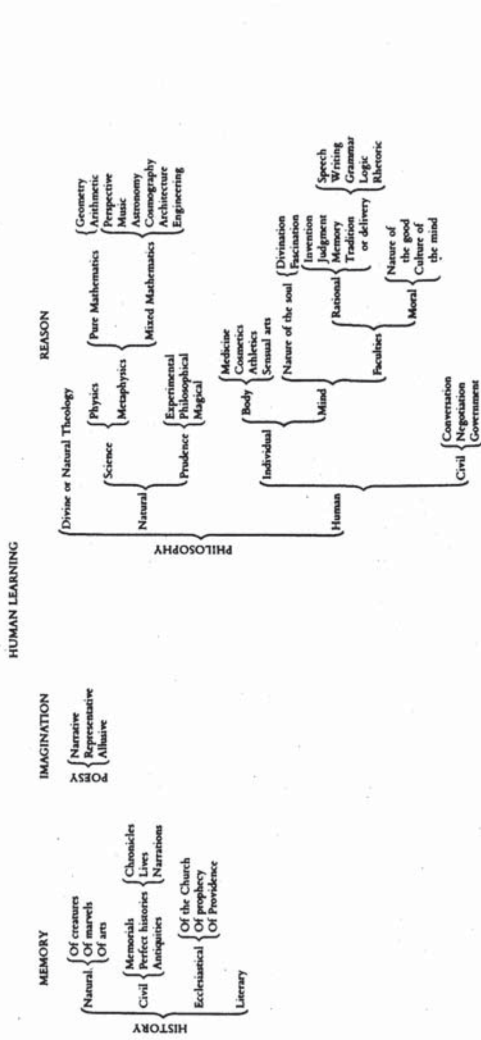

*These divisions can also be referred to the branch of mathematics which deals with their principles.

Imagination

Poetry



The Two Trees of Bacon



The Tree of Chambers