

# Knowledge

## INTRODUCTION

KNOWLEDGE, like being, is a term of comprehensive scope. Its comprehensiveness is, in a way, correlative with that of being. The only thing which cannot be an object of knowledge or opinion, which cannot be thought about in any way except negatively, is that which has no being of any sort—in short, *nothing*. Not all things may be knowable to us, but even the skeptic who severely limits or completely doubts man's power to know is usually willing to admit that things beyond man's knowledge are in themselves knowable. Everyone except Berkeley would agree that the surfaces of bodies which we cannot see are not, for that reason, in themselves invisible.

The consideration of knowledge extends, therefore, to all things knowable, to all kinds of knowers, to all the modes of knowledge, and all the methods of knowing. So extensive an array of topics exceeds the possibility of treatment in a single chapter and requires this chapter to be related to many others.

The Cross-References which follow the References indicate the other chapters which deal with particulars we cannot consider here. For example, the nature of history, science, philosophy, and theology, and their distinction from one another, are treated in the chapters devoted to those subjects. So, too, the chapters on metaphysics, mathematics, physics, mechanics, and medicine deal with the characteristics and relations of these special sciences. The psychological factors in knowing—the faculties of sense and mind, of memory and imagination, the nature of experience and reasoning—also have their own chapters. Still other chapters deal with the logical elements of knowledge, such as idea and judgment, definition, hypothesis, princi-

ple, induction, and reasoning, logic and dialectic.

THE PROGRAM which Locke sets himself in his essay *Concerning Human Understanding* is often taken to include the basic questions about knowledge. His purpose, he tells us, is "to inquire into the original, certainty, and extent of human knowledge, together with the grounds and degrees of belief, opinion, and assent." Two other matters, not explicitly mentioned by Locke in his opening pages, assume central importance in the fourth book of his essay. One is the question about the nature of knowledge itself. The other concerns the kinds of knowledge.

It may be thought that certain questions are prior to these and all others. Is knowledge possible? Can we know anything? The man the skeptic challenges is one who thinks that knowledge is attainable and who may even claim to possess knowledge of some sort. But the issue between the skeptic and his adversaries cannot be simply formulated. Its formulation depends in part upon the meaning given knowledge and the various things with which it is sometimes contrasted, such as belief and opinion, or ignorance and error. It also depends in part on the meaning of truth and probability. It would seem, therefore, that some consideration of the nature of knowledge should precede the examination of the claims concerning knowledge which provoke skeptical denials.

The theory of knowledge is a field of many disputes. Most of the major varieties of doctrine or analysis are represented in the tradition of the great books. But the fact that knowledge involves a relationship between a

knower and a known seems to go unquestioned. William James expresses this insight, perhaps more dogmatically than some would allow, in the statement that knowledge "is a thoroughgoing dualism. It supposes two elements, mind knowing and thing known . . . Neither gets out of itself or into the other, neither in any way *is* the other, neither *makes* the other. They just stand face to face in a common world, and one simply knows, or is known unto, its counterpart." This remains true even when attention is turned to the special case of knowledge about knowledge or the knower knowing himself. The mind's examination of itself simply makes the mind an object to be known as well as a knower.

This suggests a second point about the nature of knowledge which seems to be undisputed. If knowledge relates a knower to a known, then what is somehow possessed when a person claims to have knowledge, is the object known. It does not seem possible for anyone to say that he knows something without meaning that he *has* that thing *in mind*. "Some sort of signal," James writes, "must be given by the thing to the mind's brain, or the knowing will not occur—we find as a matter of fact that the mere *existence* of a thing outside the brain is not a sufficient cause for our knowing it: it must strike the brain in some way, as well as be there, to be known." What is not in any way present to or represented in the mind is not known in any of the various senses of the word "know." What the mind cannot reach to and somehow grasp cannot be known. The words which are common synonyms for knowing—"apprehending" and "comprehending"—convey this sense that knowledge somehow takes hold of and surrounds its object.

That knowledge is a kind of possession occasions the comparisons which have been made between knowledge and love. The ancients observed that likeness and union are involved in both. Plato, for example, suggests in the *Symposium* that both the knower and the lover strive to become one with their object. "Love is also a philosopher," Diotima tells Socrates, and, as "a lover of wisdom," the philosopher is also a lover.

With regard to some objects, love and knowledge are almost inseparable. To know them is to love them. But this does not hold for all objects, nor does the inseparability of knowledge and love in certain cases prevent their analytic distinction in all. Like is known by like, but unlikes attract each other. Furthermore, according to one theory of knowledge, expounded by Aquinas, the knower is satisfied to possess an image of the thing to be known. This image provides the likeness through which knowledge occurs; and thus, Aquinas writes, "the idea of the thing understood is in the one who understands." The lover, on the other hand, is "inclined to the thing itself, as existing in itself." He seeks to be united with it directly. The nobility or baseness of the object known does not affect the knower as the character of the object loved affects the lover. This understanding of the difference between knowledge and love leads Aquinas to say that "to love God is better than to know God; but, on the contrary, to know corporeal things is better than to love them."

The principle of likeness between knower and known does not go undisputed. On the contrary, the opposite views here form one of the basic issues about the nature of knowledge. The issue is whether the thing known is actually present to the knower, existing in the mind or consciousness exactly as it exists in itself; or whether the thing is represented in the mind by a likeness of itself, through which the mind knows it. In this view, the mode of existence of the thing outside the mind is different from the way in which its representative exists in the mind.

Berkeley, at one extreme, identifies being and being known. "As to what is said of the absolute existence of unthinking things without any relation to their being perceived, that seems perfectly unintelligible," he writes. "Their *esse* is *percipi*, nor is it possible they should have any existence, out of the minds or thinking things which perceive them."

At the other extreme are those like Kant for whom the thing in itself is unknowable precisely because there can be no resemblance between the phenomenal order of objects represented under the conditions of experience

and the noumenal order of the unconditioned. "All conceptions of things in themselves," he writes, "must be referred to intuitions, and with us men these can never be other than sensible, and hence can never enable us to know objects as things in themselves but only as appearances . . . The unconditioned," he adds, "can never be found in this chain of appearances."

In between these extremes there are those who agree that things exist apart from being known without ceasing to be knowable, but who nevertheless differ with respect to whether the thing exists in reality in the same way that it exists in the mind. The several forms of idealism and realism, distinguished in the chapter on IDEA, mark the range of traditional differences in the discussion of this difficult problem.

FOR ANY THEORY of what knowledge is there is a distinction between knowledge and ignorance—between having or not having something in mind. Nor does anyone confuse ignorance and error. The mind in error claims to know that of which, in fact, it is ignorant. This, as Socrates points out in the *Meno*, makes it easier to teach a person aware of his ignorance than a person in error; for the latter, supposing himself to know, resists the teacher. Hence getting a person to acknowledge ignorance is often the indispensable first step in teaching.

But though the difference between knowledge and ignorance and that between ignorance and error seems to be commonly understood, it does not follow that everybody similarly agrees upon the difference between knowledge and error. This much is agreed, that to know is to possess the truth about something, whereas to err is to be deceived by falsity mistaken for truth. The disagreement of the philosophers begins, however, when the meaning of truth and falsity is examined.

Truth is one thing for those who insist upon some similarity between the thing known and that by which it is known or represented in the mind. It is another for those who think that knowledge can be gained without the media-

tion of images or representations. In the first case, truth will consist in some kind of correspondence between what the mind thinks or understands and the reality it tries to know. In the other, truth will be equivalent to consistency among the mind's own ideas.

The examination of this fundamental disagreement is reserved for the chapter on TRUTH. Here the identification of knowing with having the truth calls for the consideration of another distinction, first made by Plato. In his language, as in that of Aristotle and others, it is the difference between knowledge and opinion. Sometimes, as with Locke, a similar distinction is made in terms of knowledge and judgment; sometimes it is made in terms of knowledge and belief; sometimes in terms of adequate and inadequate, or certain and probable, knowledge.

The difference between these opposites, unlike that between knowledge and error, is not a matter of truth and falsity. There is such a thing as "right opinion," according to Socrates, and it is "not less useful than knowledge." Considering the truth so far as it affects action, Socrates claims that the man with right opinion "will be just as good a guide if he thinks the truth, as he who knows the truth." The difference between right opinion and knowledge is here expressed by the contrast between the words "thinks" and "knows." It does not consist in the truth of the conclusion, but in the way that conclusion has been reached or is held by the mind.

The trouble with right opinion as compared with knowledge, Socrates explains, is that it lacks stability and permanence. Right opinions are useful "while they abide with us . . . but they run away out of the human soul and do not remain long, and therefore they are not of much value until they are fastened by the tie of the cause"—or, in other words, until they are fixed in the mind by the reasons on which they are grounded. "When they are bound," Socrates declares, "they have the nature of knowledge and . . . they are abiding."

At this point in his conversation with Meno, Socrates makes the unusual confession that "there are not many things which I profess to know, but this is most certainly one of them,"

namely, that "knowledge differs from true opinion." It may be that Socrates claims to know so little because he regards knowledge as involving so much more than simply having the truth, as the man of right opinion has it. In addition to having the truth, knowledge consists in seeing the reason why it is true.

This criterion can be interpreted to mean that a proposition which is neither self-evident nor demonstrated expresses opinion rather than knowledge. Even when it happens to be true, the opinion is qualified by some degree of doubt or some estimate of probability and counterprobability. In contrast, when the mind has adequate grounds for its judgment, when it knows that it knows and why, it has the certainty of knowledge.

For some writers, such as Plato, certitude is as inseparable from knowledge as truth is. To speak of "a false knowledge as well as a true" seems to him impossible; and "uncertain knowledge" is as self-contradictory a phrase as "false knowledge."

Others use the word "knowledge" more loosely to cover both adequate and inadequate knowledge, the probable as well as the certain. They make a distinction within the sphere of knowledge that is equivalent to the distinction between knowledge and opinion.

Spinoza, for example, distinguishes three kinds of knowledge. He groups the perception of individual things through the bodily senses, which he calls "knowledge from vague experience," with knowledge "from signs" which depends on ideas formed by the memory and imagination. "These two ways of looking at things," he writes, "I shall hereafter call knowledge of the first kind—opinion or imagination." In contrast, that which is derived "from our possessing common notions and adequate ideas of the properties of things," he calls "reason and knowledge of the second kind."

The third kind, which he calls "intuitive science," is that sort of knowing which "advances from an adequate idea of certain attributes of God to the adequate knowledge of the essence of things." Knowledge of the second and third kinds, he maintains, "is necessarily true." That there can be falsity in the first kind, and only there, indicates that it is

not genuinely knowledge at all, but what other writers would insist upon calling "opinion."

The several meanings of the word "belief" are determined by these distinctions. Sometimes belief is associated with opinion, sometimes with knowledge, and sometimes it is regarded as an intermediate state of mind. But in any of these meanings belief stands in contrast to make-believe, and this contrast has a bearing on knowledge and opinion as well. To know or to opine puts the mind in some relation to the real or actual rather than the merely possible, and subjects it to the criteria of truth and falsity. The fanciful or imaginary belongs to the realm of the possible (or even the impossible) and the mind in imagining is fancy-free—free from the restraints and restrictions of truth and reality.

SKEPTICISM IN ITS MOST extreme form takes the position that there is nothing true or false. But even those who, like Montaigne, deny certitude with respect to everything except matters of religious faith, do not go this far.

In his *Apology for Raymond Sebond* he concedes that if opinions are weighed as more or less probable, their truth or falsity is implied—at least as being the limit which an increasing probability or improbability approaches. Referring to ancient skeptics of the Academic school, he comments on the fact that they acknowledged "some things were more probable than others"—as, for example, that snow is white rather than black. The more extreme skeptics, the Pyrrhonians, he points out, were bolder and also more consistent. They refused to incline toward one proposition more than toward another, for to do so, Montaigne declares, is to recognize "some more apparent truth in this one than in that." How can men "let themselves be inclined toward the likeness of truth," he asks, "if they know not the truth? How do they know the semblance of that whose essence they do not know?"

In this respect Montaigne's own skepticism tends to be of the more moderate variety, since, in the realm of action at least, he would admit the need for judgments of probability. But in all other respects, he takes a firm skeptical stand that nothing is self-evident, nothing

has been proved. The contradictory of everything has been asserted or argued by someone. "There cannot be first principles for men," he writes, "unless the Divinity has revealed them; all the rest—beginning, middle, and end—is nothing but dreams and smoke . . . every human presupposition and every enunciation has as much authority as another . . . The impression of certainty is a certain token of folly and extreme uncertainty."

The skeptical extreme is represented in the great books only through references to it for the purpose of refutation. Aristotle in the *Metaphysics*, for example, reports the position of those who say that all propositions are true or that all propositions are false, and who therefore deny the principle of contradiction and with it the distinction between true and false. But if all propositions are true, then the proposition "Some propositions are false" is also true; if all propositions are false, the proposition "All propositions are false" is also false. The skeptic may reply, of course, that he is not checked by arguments which try to make him contradict himself, for he does not mind contradicting himself. To this there is only one answer, which is not to argue with the skeptic any further.

From the skeptic's point of view his position is irrefutable so long as he does not allow himself to accept any of the standards by which refutation can be effected. From his opponent's point of view, complete skepticism is self-refuting because if the skeptic says anything definite at all, he appears to have some knowledge or at least to hold one opinion in preference to another. His only choice is to remain silent. If he insists upon making statements in defiance of self-contradiction, his opponent can do nothing but walk away.

"It may seem a very extravagant attempt of the skeptics to destroy *reason* by argument and ratiocination," Hume writes, "yet this is the grand scope of all their enquiries and disputes." He has in mind the excessive skepticism, or *Pyrrhonism*, from which he tries to distinguish a mitigated and beneficial form of skepticism. Referring to Berkeley's arguments against the independent reality of matter or bodies, Hume says their effect is skeptical,

despite Berkeley's professed intention to the contrary. That his arguments are skeptical "appears from this, *that they admit of no answer and produce no conviction*. Their only effect is to cause that momentary amazement and irresolution and confusion, which is the result of skepticism."

Here and elsewhere, as in his comment on Descartes's skeptical method of doubting everything which can be doubted, Hume does not seem to think that excessive skepticism is refutable or even false. But it is impractical. "The great subverter of *Pyrrhonism* or the excessive principles of skepticism," he says, "is action, and employment, and the occupations of life." Extreme skepticism becomes untenable in thought the moment thought must face the choices of life and take some responsibility for action.

There is, however, "a more *mitigated* skepticism or *academical* philosophy which may be both durable and useful." This, according to Hume, consists in becoming "sensible of the strange infirmities of human understanding," and consequently in "the limitation of our enquiries to such subjects as are best adapted to the narrow capacity of human understanding."

His own view of the extent and certainty of human knowledge seems to him to exemplify such mitigated skepticism in operation. The only objects with respect to which demonstration is possible are quantity and number. Mathematics has the certitude of knowledge, but it deals only with relations between ideas, not with what Hume calls "matters of fact and existence." Such matters "are evidently incapable of demonstration." This is the sphere of "moral certainty," which is not a genuine certainty, but only a degree of probability *sufficient for action*. Probabilities are the best that experimental reasoning or inquiry about matters of fact can achieve. If probability is characteristic of opinion rather than knowledge, then we can have nothing better than opinion concerning real existences.

G. H. Hardy seems to agree with Hume on the distinction between mathematical knowledge and knowledge of reality when he notes that "a chair may be a collection of whirling electrons, or an idea in the mind of God: each

of these accounts of it may have its merits, but neither conforms at all closely to the suggestions of common sense."

THE DIAMETRICAL opposite to the extreme of skepticism would have to be a dogmatism which placed no objects beyond the reach of human knowledge, which made no distinction between degrees of knowability and admitted equal certitude in all matters. Like excessive skepticism this extreme is not a position actually held in the great books. All the great thinkers who have considered the problem of human knowledge have set limits to man's capacity for knowledge. They have placed certain objects beyond man's power to apprehend at all, or have distinguished between those which he can apprehend in some inadequate fashion, but cannot comprehend. They have indicated other objects concerning which his grasp is adequate and certain.

They all adopt a "mitigated skepticism"—to use Hume's phrase—if this can be taken to mean avoiding the extremes of saying that nothing is knowable at all and that everything is equally knowable. But they differ in the criteria they employ to set the limits of knowledge and to distinguish between the areas of certainty and probability. Consequently they differ in their determination of the knowability of certain types of objects, such as God or the infinite, substance or cause, matter or spirit, the real or the ideal, the self or the thing in itself.

For example, Plato and Aristotle agree that knowledge must be separated from opinion and even appeal to certain common principles in making that separation; but they do not define the scope of knowledge in the same way, as is indicated by their disagreement about the knowability of sensible things. Nor do Descartes and Locke, Francis Bacon and Spinoza, Hume and Kant agree about the conditions any object must meet in order to be knowable. All alike proceed from a desire to be critical. Each criticizes what other men have proposed as knowledge and each proposes a new method by which the pursuit of knowledge will be safeguarded from illusory hopes or endless controversy.

In this last respect the moderns depart most radically from their medieval and ancient predecessors. At all times men have been interested in examining knowledge itself as well as in exercising their powers to know. But in the earlier phase of the tradition knowledge about knowledge does not seem to take precedence over all other inquiries or to be prerequisite to them. On the contrary, the ancients proceed as if the study of knowledge necessarily presupposed the existence of knowledge. With them the examination takes place because the mind is essentially reflexive rather than for reasons of self-criticism. But beginning with Descartes's *Discourse on the Method*, in which a method of universal doubt is proposed to clear the ground before the foundations of the sciences can be laid, the consideration of knowing is put before any attempt to know.

Sometimes, as with Descartes and Bacon, the emphasis is upon a new method which will at last establish knowledge on a firm footing or advance learning. Sometimes, as with Locke and Hume, attention is given first of all to the faculty of understanding itself.

"If we can find out," says Locke, "how far the understanding can extend its views, how far it has faculties to attain certainty, and in what cases it can only judge and guess, we may learn to content ourselves with what is attainable by us in this state . . . When we know our own strength, we shall the better know what to undertake with hopes of success; and when we have well surveyed the powers of our own minds, and made some estimate of what we may expect from them, we shall not be inclined either to sit still, and not set our thoughts to work at all, in despair of knowing anything; nor, on the other side, question everything, and disclaim all knowledge, because some things are not to be understood."

Hume also proposes that a study of human understanding precede everything else, to "show from an exact analysis of its powers and capacity" what subjects it is or is not fitted to investigate. "There is a truth and falsehood in all propositions on this subject which lie not beyond the compass of human understanding." No one can doubt that a science of the mind—or knowledge about knowing—is pos-

sible unless he entertains "such a skepticism as is entirely subversive of all speculations, and even action."

Disagreeing with the principles of Locke and Hume, as well as with their conclusions, Kant does approve the priority they give to the question of the possibility of knowing certain objects. To proceed otherwise, as Kant charges most other philosophers with doing, is dogmatism. The use of the word "critique" in the title of Kant's three major works signifies his intention to construct a critical philosophy which does not presume that "it is possible to achieve anything in metaphysics without a previous criticism of pure reason." He does not object to what he calls "the dogmatical procedure of reason" in the development of science, but only after reason's self-criticism has determined just how far reason can go. For Kant, as for Bacon, dogmatism and skepticism are the opposite excesses which only a critical method can avoid. Russell attributes to Kant his "having made evident the philosophical importance of the theory of knowledge"; and also his "having perceived that we have *a priori* knowledge which is not purely 'analytic', i.e. such that the opposite would be self-contradictory."

THESE TWO DIFFERENT approaches to the theory of knowledge seem to result in different conclusions concerning the nature and scope of human knowledge. Those who begin with the established sciences and merely inquire into their foundations and methods appear to end with unqualified confidence in man's ability to know. Those who make the inquiry into the foundations and methods of science a necessary preparation for the development of the sciences tend for the most part to set narrower boundaries to the area of valid knowledge. The two approaches also affect the way in which the various kinds of knowledge are distinguished and compared.

There are two sorts of comparison involved in the classification of kinds of knowledge. One is a comparison of human knowledge with divine, or with angelic knowledge and the knowledge of brute animals. The other is a comparison of the parts or modes of human

knowledge according to such criteria as the objects to be known, the faculties engaged in the process of knowing, and the manner of their operation. Though made separately, those two comparisons are seldom independent of one another. As the nature of man is conceived in relation to other beings, superior or inferior to himself, his faculties will be rated accordingly, and his power as a knower will suggest the methods or means available to him for knowing.

Aquinas, for example, attributes to man the kind of knowledge appropriate to his station in the hierarchy of beings. Man is superior to the brutes because he has a faculty of reason in addition to the faculties of sense and imagination which he shares with them. Man is inferior to purely spiritual beings—the angels and God—because, since he is corporeal, his intellect cannot function independently of his bodily senses and imagination. Unlike the angels and God, he is not a purely intellectual being.

Accordingly, the essential characteristics of human knowledge are, first, that it is always both sensitive and intellectual, never merely sense perception as with the brutes or pure intellectual intuition as with the angels; second, that its appropriate object is the physical world of sensible, material things, with respect to which the senses enable man to know the existence of individuals, while the intellect apprehends their universal natures; and, finally, that the way in which the human mind knows the natures of things is abstractive and discursive, for the intellect draws its concepts from sense and imagination and proceeds therefrom by means of judgment and reasoning.

This analysis denies innate ideas. It denies man's power to apprehend ideas intuitively or to use them intuitively in the apprehension of things. It can find no place for a distinction between *a priori* and *a posteriori* knowledge, since sense perception and rational activity contribute elements to every act of knowing. It affirms that knowledge is primarily of real existence, not of the relations between ideas; but it does not limit human knowledge to the changing temporal things of the material universe. Though these are the objects man is able

to know with greatest adequacy, he can also know something of the existence and nature of immaterial and eternal beings.

Yet, according to Aquinas, even when man's knowledge rises above the realm of experienceable things, it is obtained by the same natural processes and involves the cooperation of the senses with reason. The theologian does, however, distinguish sharply between knowledge gained through man's own efforts and knowledge received through divine revelation. In addition to all knowledge acquired by the natural exercise of his faculties, man may be elevated by the supernatural gift of knowledge—the wisdom of a faith surpassing reason.

The foregoing summary illustrates, in the case of one great doctrine, the connection between an analysis of the kinds of knowledge and a theory of the nature and faculties of man in relation to all other things. There is no point in this analysis which is not disputed by someone—by Plato or Augustine, Descartes, Spinoza, or Locke, by Hume, Kant, or James. There are many points on which others agree—not only Aristotle and Bacon, but even Augustine, Descartes, and Locke.

These agreements or disagreements about the kinds of knowledge, or the scope of human knowledge, its faculties, and its methods, seldom occur or are intelligible except in the wider context of agreements and disagreements in theology and metaphysics, psychology and logic. Hence most of the matters considered under the heading "kinds of knowledge" receive special consideration in other chapters. The Cross-References should enable the reader to examine the presuppositions or context of the materials assembled here.

THE CULT OF IGNORANCE receives little or no attention in the tradition of the great books. Even those who, like Rousseau, glorify the innocence of the primitives, or who, like Erasmus, satirize the folly so often admixed with human wisdom and the foibles attending the advance of learning, do not seriously question the ancient saying that all men by nature desire to know. Nor is it generally doubted that knowledge is good; that its possession

contributes to the happiness of men and the welfare of the state; that its pursuit by the individual and its dissemination in a society should be facilitated by education, by the support and freedom of scholars and scientists, and by every device which can assist men in communicating what they know to one another.

But knowledge is not valued by all for the same reason. That knowledge is useful to the productive artist, to the statesman, to the legislator, and to the individual in the conduct of his life, seems to be assumed in discussions of the applications of science in the various arts, in the consideration of statecraft, and in the analysis of virtue. In this last connection, the problem is not whether knowledge is morally useful, but whether knowledge of good and evil is identical with virtue so that sin and vice result from error or ignorance.

If there is a negative opinion here, it consists in saying that knowledge is not enough. To know is not to do. Something more than knowledge is required for acting well.

The more radical dispute about the value of knowledge concerns the goodness of knowledge for its own sake, without any regard to its technical or moral utility. Is the contemplation of the truth an ultimate end, or does the goodness of knowledge always consist in its power to effect results in the mastery of nature and the guidance of conduct? The utility of knowledge is seldom denied by those who make speculative wisdom and theoretical science good in themselves, even the highest goods, quite apart from any use to which they may be put. The contrary position, however, does not admit the special value of contemplation or the separation of truth from utility. To those who say that "the contemplation of truth is more dignified and exalted than any utility or extent of effects," Bacon replies that "truth and utility are perfectly identical, and the effects are more of value as pledges of truth than from the benefit they confer on men."

How knowledge and action are related is one question; how knowledge itself is divided into the speculative and practical is quite another. Bacon, for example, insists upon the necessity of distinguishing the speculative and



practical branches of natural philosophy—concerned with “the search after causes and the production of effects.” Unlike Aristotle and Kant he does not use the word “practical” for the kind of knowledge which is contained in such sciences as ethics or politics, but only for the applied sciences or technology. Ethics and politics fall under what he calls “civil philosophy.”

Despite these differences in language, the way in which Bacon divides the whole sphere of knowledge closely resembles Aristotle’s tripartite classification of the sciences as theoretical, productive (or technical), and practical (or moral); and, no less, a similar threefold division by Kant. But Kant and Aristotle (and, it should be added, Aquinas) give a more elaborate analysis of these three types of knowledge, especially with regard to the principles appropriate to each, the nature of the judgments and

reasoning by which they are developed, and the character and criteria of their truth.

We owe to Russell an important distinction that, surprisingly, was not made by any of his predecessors. It is the distinction between knowledge by acquaintance and knowledge by description. “When, for example, we make a statement about Julius Caesar,” Russell points out, “it is plain that Julius Caesar himself is not before our minds, since we are not acquainted with him. We have in mind some *description* of Julius Caesar: ‘the man who was assassinated on the Ides of March’, ‘the founder of the Roman Empire’.” Russell goes on to say that “the chief importance of knowledge by description is that it enables us to pass beyond the limits of our private experience.” Nevertheless, “what is known by description is ultimately reducible to knowledge concerning what is known by acquaintance.”