

On the Interpretation of Nature
Francis Bacon

1. Man, as the minister and interpreter of nature, does and understands as much as his observations on the order of nature, either with regard to things or the mind, permit him, and neither knows nor is capable of more . . .

19. There are and can exist but two ways of investigating and discovering truth. The one hurries on rapidly from the senses and particulars to the most general axioms, and from them, as principles and their supposed indisputable truth, derives and discovers the intermediate axioms. This is the way now in use. The other constructs its axioms from the senses and particulars, by ascending continually and gradually, till it finally arrives at the most general axioms, which is the true but unattempted way . . .

71. The sciences we possess have been principally derived from the Greeks; for the additions of the Roman, Arabic, or more modern writers, are but few and of small importance, and such as they are, are founded on the basis of Greek invention. But the wisdom of the Greeks was professional and disputatious, and thus most adverse to the investigation of truth. . . .

79. A second cause [of the present neglect of science] offers itself, which is certainly of the greatest importance; namely, that in those very ages in which men's wit and literature flourished considerably, or even moderately, but a small part of their industry was bestowed on natural philosophy, the great mother of the sciences. For every art and science torn from this root may, perhaps, be polished, and put into a serviceable shape, but can admit of little growth. It is well known, that after the Christian religion had been acknowledged, and arrived at maturity, by far the best wits were busied upon theology, where the highest rewards offered themselves, and every species of assistance was abundantly supplied, and the study of which was the principal occupation of the western European nations during the third epoch; the rather because literature flourished about the very time when controversies concerning religion first began to bud forth.

In the preceding age, during the second epoch (that of the Romans), philosophical meditation and labor were chiefly occupied and wasted in moral philosophy (the theology of the heathens); besides, the greatest minds in these times applied themselves to civil affairs, on account of the magnitude of the Roman empire, which required the labor of many.

The age during which the natural philosophy appeared principally to flourish among the Greeks, was but a short period, since in the more ancient times the seven sages (with the exception of Thales) applied themselves to moral philosophy and politics, and at a later period, after Socrates had brought down philosophy from heaven to earth, moral philosophy became more prevalent, and diverted men's attention from natural. No, the very period during which physical inquiries flourished, was' corrupted and rendered useless by contradictions, and the ambition of new opinions. Since, therefore, during these three epochs, natural philosophy has been materially neglected or impeded, it is not at all surprising that men should have made but little progress in it, seeing they were attending to an entirely different matter . . .

106. In forming our axioms from induction, we must examine and try whether the axiom we derive be only fitted and calculated for the particular instances from which it is deduced, or whether it be more extensive and general. If it be the latter, we must observe, whether it conform its own extent and generality by giving surety, as it were, in pointing out new particulars, so that we may neither stop at actual discoveries, nor with a careless grasp catch at shadows and abstract forms, instead of substances of a determinate nature: and as soon as we act thus, well authorized hope may with reason, be said to beam upon us . . .

111. Nor should we omit another ground of hope. Let men only consider (if they will) their infinite expenditure of talent, time, and fortune, in matters and studies of far inferior importance and value; a small portion of which applied to sound and solid learning would be sufficient to overcome every difficulty. And we have thought right to add this observation, because we candidly own that such a collection of natural and experimental history as we have traced in our own mind, and as is really necessary, is a great and as it were royal work, requiring much labor and expense.

112. In the mean time let no one be alarmed at the multitude of particulars, but rather inclined to hope on that very account. For the particular phenomena of the arts and nature are in reality but as a handful, when compared with the fictions of the imagination removed and separated from the evidence of facts. The termination of our method is clear, and I had almost said near at hand; the other admits of no termination, but only of infinite confusion. For men have hitherto dwelt but little, or rather only slightly touched upon experience, whilst they have wasted much time on theories and the fictions of the imagination. If we had but anyone who could actually answer our interrogations of nature, the invention of all causes and sciences would be the labor of but a few years.

121 . . . In short, we may reply decisively to those who despise any part of natural history as being vulgar, mean, or subtle, and useless in its origin, in the words of a poor woman to a haughty prince, who had rejected her petition as unworthy, and beneath the dignity of his majesty: “Then cease to reign,” for it is quite certain that the empire of nature can neither be obtained nor administered by one who refuses to pay attention to such matters as being poor and too minute.

FOR ANALYSIS

1. What, according to Bacon, does man understand with regard to nature? What does he not understand?
2. Chapter 19 deals with deduction, then with Bacon’s especial contribution to modern science, the method of induction. What does each term mean? Can you define them in simple, everyday language and offer examples of your own to illustrate them?
3. According to Chapter 71, what was wrong with the wisdom of the Greeks?
4. What reasons does Bacon offer in Chapter 79 for the neglect of science in the past?
5. According to Chapters 106 and 111, what two reasons for hope does Bacon see in his new, experimental scientific method?
6. “Then cease to reign,” says Bacon in Chapter 121. What does he feel must cease to reign with the coming of the new kingdom of science?
7. What, according to Bacon, is the advantage of modern science over that of the ancients? How completely do you agree with him?

FOR DISCUSSION

1. Chapter 19 of Bacon's essay describes his new approach to science, his so-called inductive method which arrives at general truth about a subject only after all possible experiments and observations have been made. Why do you think mankind took so long to discover this method?
2. Bacon refers to a natural history as something quite desirable. Compare his view of natural history with Pliny's. How do you account for the differences you find?

Francis Bacon. *The New Organon*. Trans. James Spedding, Robert Leslie Ellis, and Douglas Denon Heath. *The Works of Francis Bacon*. Vol. 8. Boston: Taggard and Thompson, 1863. Questions from Joseph Henry Satin. *Ideas in Context*. Boston: Houghton Mifflin, 1958. Text in public domain.

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