

Hobbes on science

reason is not, as sense and memory, born with us; nor gotten by experience only, as prudence is; but attained by industry; first in apt imposing of names; and secondly by getting a good and orderly method in proceeding from the elements, which are names, to assertions made by connexion of one of them to another; and so to syllogisms, which are the connexions of one assertion to another, till we come to a knowledge of all the consequences of names appertaining to the subject in hand; and that is it, men call SCIENCE. And whereas sense and memory are but knowledge of fact, which is a thing past, and irrevocable; *Science* is the knowledge of consequences, and dependance of one fact upon another: by which, out of that we can presently do, we know how to do something else when we will, or the like, another time; because when we see how any thing comes about, upon what causes, and by what manner; when the like causes come into our power, we see how to make it produce the like effects. (*Leviathan* 5.17)

No discourse whatsoever, can end in absolute knowledge of fact, past, or to come. For, as for the knowledge of fact, it is originally, sense; and ever after, memory. And for the knowledge of consequence, which I have said before is called science, it is not absolute, but conditional. No man can know by discourse, that this, or that, is, has been, or will be; which is to know absolutely: but only, that if this be, that is; if this has been, that has been; if this shall be, that shall be: which is to know conditionally; and that not the consequence of one thing to another; but of one name of a thing, to another name of the same thing. And therefore, when the discourse is put into speech, and begins with the definitions of words, and proceeds by connexion of the same into general affirmations, and of these again into syllogisms; the end or last sum is called the conclusion; and the thought of the mind by it signified, is that conditional knowledge, or knowledge of the consequence of words, which is commonly called SCIENCE. (*Leviathan* 7.3-4)

There are of KNOWLEDGE two kinds; whereof one is *knowledge of fact*: the other *knowledge of the consequence of one affirmation to another*. The former is nothing else, but sense and memory, and is *absolute* knowledge; as when we see a fact doing,

or remember it done: and this is the knowledge required in a witness. The latter is called *science*; and is *conditional*; as when we know, that, *if the figure shown be a circle, then any straight line through the center shall divide it into two equal parts*. And this is the knowledge required in a philosopher; that is to say, of him that pretends to reasoning. (*Leviathan* 9.1)

By PHILOSOPHY is understood *the knowledge acquired by reasoning, from the manner of the generation of any thing, to the properties; or from the properties, to some possible way of generation of the same; to the end to be able to produce, as far as matter, and human force permit, such effects, as human life requireth*. So the geometrician, from the construction of figures, findeth out many properties thereof; and from the properties, new ways of their construction, by reasoning; to the end to be able to measure land, and water; and for infinite other uses. So the astronomer, from the rising, setting, and moving of the sun, and stars, in divers parts of the heavens, findeth out the causes of day, and night, and of the different seasons of the year; whereby he keepeth an account of time: and the like of other sciences. By which definition it is evident, that we are not to account as any part thereof, that original knowledge called experience, in which consisteth prudence: because it is not attained by reasoning, but found as well in brute beasts, as in man; and is but a memory of successions of events in times past, wherein the omission of every little circumstance altering the effect, frustrateth the expectation of the most prudent: whereas nothing is produced by reasoning aright, but general, eternal, and immutable truth. (*Leviathan* 46.1-2)

A reference

Steven Shapin and Simon Schaffer, *Leviathan and the air-pump: Hobbes, Boyle, and the experimental life* (Princeton: Princeton University Press, 1985).

Chapter 46 outline

1. Philosophy defined: what it is, what it isn't. This is like ch. 5. (¶¶ 1-5)
2. History of philosophy. (a) It depends on leisure, the commonwealth (¶¶ 6-10). (b) Greek and Jewish philosophy "unprofitable," Christ's complaints about the latter prove it (¶¶ 11-12).
3. The dominant philosophy in Hobbes's time: Aristotelianism (¶ 13); everything else in this chapter is an attack on Aristotelianism.
4. Natural philosophy: metaphysics (¶ 15-23)
 - a. Abstract essences and substantial forms; materialist objections (¶ 15-17)
 - b. Why is this relevant to political philosophy? Answer: supports priestly power against the state (¶ 18).
 - c. A list of absurd positions: (1) soul is completely in every part of the body (¶ 19), (2) incorporeal substances can feel torments of hell (¶ 20), (3) spirits can move without occupying space (¶ 21), (4) eternity is a 'standing still of present time' rather than an endless succession of time (¶ 22),¹ (5) one body can be in different places at the same time, many bodies can be in one place at the same time (the eucharist, I assume) (¶ 23).
5. Natural philosophy: physics, "secondary causes" (¶ 24-29).
 - a. Explain movement of inanimate objects using "endeavours" (desires). (¶ 24)
 - b. 'Quantity' and 'body' distinct (¶ 25).²
 - c. Souls 'poured in' to bodies (¶ 26).
 - d. Account of perception using 'species' (¶ 27).

¹ I didn't follow the argument here.

² I didn't follow this either.

- e. Will is a 'faculty' (§ 28).
 - f. Occult qualities: sympathy, antipathy, ... (§29).
6. Moral and civil philosophy
- a. Free will, God isn't the cause of injustice (§ 31).
 - b. Define good and evil by appetites. Hobbes thinks this is true outside the state but not true within it (§ 32).
 - c. Priests can't marry. A doctrine needed to support the suggestion that the Church represents the Kingdom of God, given a scriptural passage stating that in the Kingdom of God people won't marry. See also ch. 47, § 9-10.
 - d. Call monarchies "tyranny," mistaken relationship between liberty and the form of the state (§ 35) (See also chs. 19, 21.)
 - e. Hold that laws rather than men rule. (§ 36) (See also ch. 26).
 - f. Laws over conscience (§ 37) Note: not from Aristotle.
 - g. Private interpretation of the laws (does he mean Scripture?) (§ 38) Note: not from Aristotle.
 - h. Forbid non-priests from teaching the gospel (§ 39) Note: not from Aristotle.
7. Three concluding remarks: (1) meaningless technical terminology (§ 40), (2) Errors from tradition: church fathers mistakenly believed in ghosts, purgatory (§ 41), (3) suppression of true philosophy: he means Galileo (§ 42).