

[blog] NOVUM ORGANUM ANALYSIS AND SUMMARY

Francis Bacon wrote and published *Novum Organum* in 1620. The subject of the work is the method by which one ought to seek truth. According to Bacon, men ought to begin with observations - i.e. the senses - and then move incrementally from intermediate axioms to the most general axioms. This process is called induction, which is the method employed by modern science. For example, a man observes that all cats that he has encountered have tails. He concludes that it is highly probable that all cats have tails. The contrary method is called deduction. The process of deduction is when general principles are proposed and then used to assert particular truths. For example, all cats have a tail. X is a cat. X has a tail. To summarize the difference between the two methodologies, induction begins with particulars and moves to generalities while deduction begins with generalities and moves to particulars.

To support his argument that the inductive method is preferable to the deductive method, Bacon discusses four impediments <hindrance/obstruction> to attaining the truth if one relies on deductive reasoning. He names these impediments Idols. They are the Idols of the Tribe, the Cave, the Market, and the Theater.

The Idols of the Tribe are the common prejudices for certain incorrect conclusions. For example, Bacon asserts that mankind seeks out patterns and imposes order upon natural things that might not possess such qualities. For example, men mistakenly supposed that the revolutions of the planets were perfect circles.

The Idols of the Cave are the individual biases of particular men due to variable circumstances such as education, environment, habit, etc. These prejudices render men less capable of objective reasoning. For example, men tend to adhere to the particular religion that they were taught when they were children. Regardless of evidence to the contrary, men will stubbornly resist changing their beliefs.

The Idols of the Market are the discrepancies between the meanings of words and the physical phenomena that the words are supposed to indicate. Locke discusses this discrepancy too in Book III of his *Essay Concerning Human Understanding*. Both authors identify the confusion and problems that arise in communication and the search for truth when words are imprecisely used. Bacon goes so far as to say that one does not resolve these issues even if one provides precise definitions of words because words compose the definitions; and so words beget more words *ad infinitum*.

Finally, the Idols of the Theater are the philosophical dogmas created by previous philosophers. Bacon associates these dogmas with the theater because he believes that the doctrines are mere fantasies of the philosophers like plays are the imaginations of playwrights. According to Bacon, no previous philosopher, except for Thales, derived their system purely from empirical observations, but rather tainted their philosophical system with the Idols described above.

I think Bacon is correct in asserting the superiority of the inductive method of reasoning. The advances of modern science serve as tangible proofs of its effectiveness. Nevertheless, the inductive method is not without faults. A Scottish philosopher named David Hume drew attention to the inherent problems and shortcomings of induction. I will refrain from discussing Hume's arguments against the reliability of induction because I am certain that this subject will be addressed in his *Enquiry Concerning Human Understanding*, which is one of the next few assigned texts in this reading plan. But to give a brief overview, consider the example I provided in the first paragraph of this post - the example of a man concluding that all cats have tails because all the cats that he has encountered have tails. Though the man has never seen a cat without a tail, there are cats without tails. This case demonstrates that we are incapable of drawing conclusions with absolute certainty from mere empirical observations. We can definitively conclude that the principle of non-contradiction is valid; we can definitively conclude that all bachelors are unmarried men; but we cannot definitively conclude anything that relies upon empirical observations because there exists a possibility that we cannot account for everything affecting our perception.

"I propose to establish progressive stages of certainty. The evidence of the sense, helped and guarded by a certain process of correction, I retain. But the mental operation which follows the act of sense I for the most part reject; and instead of it I open and lay out a new and certain path for the mind to proceed in, starting directly from the simple sensuous perception."

"The human understanding when it has once adopted an opinion (either as being the received opinion or as being agreeable to itself) draws all things else to support and agree with it. And though there be a greater number and weight of instances to be found on the other side, yet these it either neglects and despises, or else by some distinction sets aside and rejects; in order that by this great and pernicious predetermination the authority of its former conclusions may remain inviolate. And therefore it was a good answer that was made by one who when they showed him hanging in a temple a picture of those who had paid their vows as having escaped shipwreck, and would have him say whether he did not now acknowledge the power of the gods.—"Aye," asked he again, "but where are they painted that were drowned after their vows?" And such is the way of all superstition, whether in astrology, dreams, omens, divine judgments, or the like; wherein men, having a delight in such vanities, mark the events where they are fulfilled, but where they fail, though this happen much oftener, neglect and pass them by. But with far more subtlety does this mischief insinuate itself into philosophy and the sciences; in which the first conclusion colours and brings into conformity with itself all that come after, though far sounder and better. Besides, independently of that delight and vanity which I have described, it is the peculiar and perpetual error of the human intellect to be more moved and excited by affirmatives than by negatives; whereas it ought properly to hold itself indifferently disposed towards both alike. Indeed in the establishment of any true axiom, the negative instance is the more forcible of the two."

"The human understanding is no dry light, but receives an infusion from the will and affections; whence proceed sciences which may be called "sciences as one would." For what a man; had rather were true he more readily believes. Therefore he rejects difficult things from impatience of research; sober things, because they narrow hope; the deeper things of nature, from superstition; the light of experience, from arrogance and pride, lest his mind should seem to be occupied with things mean and transitory; things not commonly believed, out of deference to the opinion of the vulgar. Numberless in short are the ways, and sometimes imperceptible, in which the affections colour and infect the understanding."

"I promise to myself a like fortune to that of Alexander the Great; and let no man tax me with vanity till he have heard the end; for the thing which I mean tends to the putting off of all vanity. For of Alexander and his deeds Aeschines spake thus: "Assuredly we do not live the life of mortal men; but to this end were we born, that in after ages wonders might be told of us;" as if what Alexander had done seemed to him miraculous. But in the next age Titus Livius took a better and a deeper view of the matter, saying in effect, that Alexander "had done no more than take courage to despise vain apprehensions." And a like judgment I suppose may be passed on myself in future ages: that I did no great things, but simply made less account of things that were accounted great."

"So again, if before the discovery of the magnet, any one had said that a certain instrument had been invented by means of which the quarters and points of the heavens could be taken and distinguished with exactness; men would have been carried by their imagination to a variety of conjectures concerning the more exquisite construction of astronomical instruments; but that anything could be discovered agreeing so well in its movements with the heavenly bodies, and yet not a heavenly body itself, but simply a substance of metal or stone, would have been judged altogether incredible. Yet these things and others like them lay for so many ages of the world concealed from men, nor was it by philosophy or the rational arts that they were found out at last, but by accident and occasion; being indeed, as I said, altogether different in kind and as remote as possible from anything that was known before; so that no preconceived notion could possibly have led to the discovery of them. There is therefore much ground for hoping that there are still laid up in the womb of nature many secrets of excellent use, having no affinity or parallelism with anything that is now known, but lying entirely out of the beat of the imagination, which have not yet been found out."

"It will not be amiss to distinguish the three kinds and as it were grades of ambition in mankind. The first is of those who desire to extend their own power in their native country; which kind is vulgar and degenerate. The second is of those who labour to extend the power of their country and its dominion among men. This certainly has more dignity, though not less covetousness. But if a man endeavour to establish and extend the power and dominion of the human race itself over the universe, his ambition (if ambition it can be called) is without doubt both a more wholesome thing and a more noble than the other two. Now the empire of man over things depends wholly on the arts and sciences. For we cannot command nature except by obeying her."

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[LECTURE] TITLE	
CUE COLUMN Questions/Cues	NOTE TAKING COLUMN Key Ideas/Important facts/Repeated (stressed) information
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SUMMARY	
Term	Definition

REVIEW QUESTIONS	
Link to Anki:	
Question	Answer in white

- INDUCTION
- DEDUCTION
- IDOLS
 - Tribe
 - Cave
 - Market
 - Theater