Literature Review: "A Guide to the Interpretation of Nature" by Francis Bacon

Francis Bacon's article, "A Guide to the Interpretation of Nation" discusses Francis Bacon's experimental method for philosophers to use in weighing the truthfulness of knowledge. Bacon states that the new experimental style is designed to investigate the soundness of the very foundations of scientific theory — that is, to put nature itself to the test (Bacon, 1). In this literature review, I will illustrate Bacon's thesis, philosophical context, Bacon's motivations, Bacon's proposed solution, and corresponding effectiveness as following.

Bacon's thesis and philosophical context

In 1620, English politician named Sir Francis Bacon published *Novum Orgranum* which emphasizes the importance of experimental induction instead of deductive reasoning in scientific learning. In Bacon's view, Aristotle's syllogism does not affect on real scientific development not only since the intermediate propositions naturally deduce the internal meaning but also human bias makes it operate in confusion. In the preface of the book, Bacon argues that the two popular philosophy views in the early 17th century are both useless for scientific exploration and for innovation. One of the popular philosophy views claims that the laws of nature are already known to humans and people don't need to make further explorations. The other view turns to the conclusion that anything in the world is incomprehensibleness and people cannot have real knowledge. Given this philosophical context Bacon proposes the new scientific methodology which has the commitment that the observation and experiment play a vital role. Bacon points out that the new method places the foundations of the sciences deeper and lay them lower, and

set our starting points further back than men have ever done before, subjecting them to examination, while ordinary logic accepts them on the basis of others' belief (Bacon, 2).

Bacon's motivations for taking his position

Bacon's motivation is clear: to establish a new scientific methodology to explore reliable and practical science knowledge. The reason why Bacon rejects Aristotle's scientific method is that it would bring no effects to the active part of science (Bacon, 3). And Bacon addresses that there are underlying fraud in how humans really know that something is true. In other words, if people cannot control the humans errors when we explore the science, none of the old logic method and the new method will work. In details, Bacon feels that men's minds have been occupied in so many strange ways that they have no even, polished surface available to receive the true ray of things. Therefore, it is essential for us to realize that we need to find a remedy for this too (Bacon, 4). Accordingly, Bacon claims that senses are defective and it is essential for people to realize that we need to find a remedy for this (Bacon, 5). Bacon puts it in a formal way by stating the Idols Theory. Bacon borrows the term Idol to indicate that the mental obstacle that hinders the human race from gaining truthful knowledge. Bacon argues that when it is affected by things through the senses, the mind does not faithfully preserve them, but inserts and mingles its own nature of things as it forms and devises its own notions (Bacon, 6). If the human race cannot identify the source of cognitive errors, the human race will not be able to root out the errors. Thus, for Bacon, the most important task of Novum Orgranum is to provide a revolutionary scientific method for mankind's intellect to explore truthful knowledge, excluding human mental bias at same time.

Bacon's solution to the issues that he is addressing in his article

Bacon states that what the sciences need is a form of induction which takes experience apart and analyzes it, and forms necessary conclusions on the basis of appropriate exclusions and rejections (Bacon, 7). It is not hard to see that science theory will be built up much better if senses judge only of the experiment, the experiment judges of the thing. Before we talk about the details of how Bacon describes the procedures to get the desired form in his book, we first talk about his suggestion on how to eliminate human mental bias, the term Idols. Bacon points out that the teaching which cleanses the mind to make it receptive to truth consists of three refutations: a refutation of philosophies; a refutation of proofs; and a refutation of natural human reason (Bacon, 8).

Besides, Bacon's inductive reasoning differs from ordinary logic reasoning in three ways: in its end, in its order of demonstration, and in the starting points of its inquiry. As for the end, Bacons declares that axioms are gradually elicited step by step, so that we reach the most general axioms only at the very end, and our science is the discovery of arts, not of arguments, of principles and not of inferences from principles, or signs and indications or works and not probable reasonings (Bacon, 9). As for the order of demonstration, Bacon rejects syllogism by saying that there exists underlying fraud of it, and in contrast, Bacon regards induction as the form of demonstration which respects the senses, stays close to nature, fosters results, and is almost involved in them itself (Bacon, 10). As for starting points of inquiry, Bacon states that unlike ordinary logic, the inductive method starts from specific examples, and then more and more general properties come out at the very end following unbiased experimental steps.

After Bacon declares basic principles clearly about his induction reasoning, he reveals three detailed steps to implement the method. The first step, Bacon argues that the method's beginnings must come from a natural history, and a natural history of a new kind with a new organization (Bacon, 11). The second step, Bacon claims that for composition, people should give full description of all the experiments which will enable people to analyze and abstract the insight of nature in future. The third step, Bacon states that for choice of narratives and experiences, in every experiment which is new and even the least bit subtle, even if (as it seems to us) it is sure and proven, we give a frank account of the method of the experiment we used; so that after we have revealed every move we made men may see any hidden error attached to it, and may be prompted to find more reliable, more meticulous proofs (if any exist); and finally we sprinkle warnings, reservations, and cautions in all directions, with the religious scruple of an exorcist casting out and banishing every kind of fantasy (Bacon, 12). Finally, the human race can gain reliable and trustable knowledge from nature following Bacon's inductive methodology.

Effectiveness of Bacon's writing

Bacon claims that man is nature's agent and interpreter (Bacon, 13). Thus, knowledge and power are unified because nothing will be made without knowing the cause in advance. Bacon believes that, from the causality view, only when the human race recognizes true causes can they generate practical results. The knowledge of the cause is human knowledge, and the practical results produced is the proof of human power. In other words, knowledge is power. It is this idea that inspires people later to engage in the experimental philosophy which enables the human race to harness nature to the new journey in past three hundred years. Bacon appeals that we have made a start on the task, a start which we hope is not despicable; the end will come from the fortune of mankind, such an end perhaps as in the present condition of things and present

state of thought men cannot easily grasp or guess. It is not merely success in speculation which is in question, but the human situation, human fortune, and the whole potential of works (Bacon, 14). Without any doubt, Bacon's prediction comes true today, and all these are the evidence of Bacon's writing effectiveness.

To some extent, we should admit that there is also flaw in Bacon's philosophy. Bacon totally rejects Aristotle's deductive reasoning method, and then he believes inductive reasoning is universally powerful enough to conquer all possible questions. Bacon's assertion, in fact, naively ignore the importance of hypothesis test which plays a vital role in modern statistics science. However, indeed, Bacon's work left an indelible imprint of scientific history.

References

Francis Bacon. 'A Guide to the Interpretation of Nature', 1620.