Reflection on the Scientific Method

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This essay argues for the importance of subjectivity in the scientific method and outlines the effectiveness of the hypothetico-deductivism philosophy of science in relation to Alan Chalmers’ quote from ‘*What is This Thing Called Science?’* (1976, pg 1). While Alan Chalmers’ statement holds elements of truth to the nature of science, it largely sensationalises the objectivity of the scientific method; discounting the importance of creative speculation and prediction while falsely cementing the unfounded basis of “proof”, neglecting the power of refutation. This thesis will be supported by the logic of Karl Popper’s arguments towards the inductivism method of science, although Alan Chalmers’ statement does convey certain truths about the scientific method. Also discussed will be the importance of creativity and curiosity in science, supporting the thesis statement.

The current philosophy of the scientific method, hypothetico-deductivism, is generally stronger than inductivism due to the nature of universal statements. Karl Popper famously introduced the philosophy of falsification as the strongest power to refute, and thus advance, current scientific knowledge based on contradicting observations. In adopting this method, more accurate and reliable theories are proposed. While inductivism would have a ‘truth’ enforced by repeated observation, falsification would have it rejected by a single, contradicting piece of evidence (SCIE1000 Notes, 2018, page 166). That is where the strength of the scientific method lies, similar in attitude to a court of law; “*Innocent until proven guilty*”. As a hypothetico-deductivist, Popper would no doubt reject Chalmers’ statement in citing the nature of disproof and contradiction regarding the assumption of ‘proven’ knowledge. While some observed phenomena may be described to a degree of detail by current theorems, it is incredibly important to remain sceptical of the truth of the theory and eager to find disproof in nature – a philosophy that Alan Chalmers seemingly lacks. In doing this, theories would likely develop to a point where Alan Chalmers’ perspective may become rational. Until then, however, scientists must maintain a falsificationist philosophy to further scientific belief and enforce rational scepticism. While Chalmers’ statement is a textbook case of inductivism, there are some strong perspectives from his view; namely the objectivity of truth.

One thing that inductivists and falsificationists consistently agree on is the objectivity of truths, whether observational or conditional. Chalmers cites that “*[Scientific knowledge] is objectively proven knowledge”*, which is, from recollection of history, a blatant falsehood. For example, the 16th century saw Copernicus famously introduce the heliocentric model of the universe – the Sun was the centre of the universe, with the planets and stars in its orbit. At the time, this *was* scientific knowledge. Now, we know that this model is incorrect, although a step in the right direction away from the Earth-centric model prior. Such a piece of contradictory evidence is enough to refute the validity of Chalmers’ statement. Although objectively wrong, the text does correctly describe some aspects of objective truth and the scientific method. Observation is the basis of updated knowledge, and as such, scientific knowledge is based on “*what we can see and hear and touch”*. Because of this, science is objective; it relies not on the biased opinion of individuals but is unforgiving, just and based on testable evidence rather than any anecdotal evidence that opinion is subject to. Some of the most theorems, such as Newton’s Laws and Einstein’s theories, are the product of incredible masses of evidence, so much so that they may as well be proven. That is the case that Chalmers’ makes when he states that “*Scientific theories are derived … from facts of experience … and experiment.*” Be it as it may, the curiosity to experiment must be conjured from somewhere, leading to a contradiction in Chalmers’ statement.

While opinion (which is not founded on a basis of substantial evidence) does not have place in the refutation of scientific theories, “*speculative imaginings”,* as Chalmers puts it, are an important aspect of the scientific method. Hypotheses are based on imaginings that stem from an individual’s curiosity into scientific investigation, which may then develop into evidenced theorems. This process leads to updated, reliable scientific ‘knowledge’ although not objectively proven. Thus, if no speculation ensues on the basis of evidence, no ground-breaking hypotheses will ever be proposed, and no scientific progress will be made. Since “*science is in the business of proposing bold conjectures*” (SCIE1000 Notes, 2018, page 166), ‘*speculative imaginings’* play an integral role in the process of advancement. Chalmers’ ignorance to the fact further cements the philosophy of hypothetico-deductivism as the leading method of scientific investigation, and the most effective until a better philosophy may be proposed. While Chalmers’ does effectively argue that opinion and preferences do not fit into the scientific method, his position on speculation (providing it’s based on evidence and theory) is far from meditated.

Alan Chalmers’ statement is inherently inductive and is consequently not as rational as a hypothetico-deductive account. While elements of truth regarding the scientific method are present within his position laid out in ‘*What Is This Thing Called Science?’* (1976), he vastly understates the importance of creativity and *personal* impact on the outcome of investigations. Correct in arguing that the scientific method is objective, history contradicts Chalmers’ evidence and as such, his position on the philosophy of science should be taken lightly. Even though reliable, scientific evidence is by no means proven and it would be a logical fallacy to argue otherwise. It is, however, more logical to present current theories as *rational* as opposed to factual as Chalmers’ argues.

Bibliography:

1. Adams, Peter et al. 2018. *SCIE1000 Lecture Notes, Eleventh Edition*
2. Chalmers, Alan. 1976. *What Is This Thing Called Science?*