

# Pointers to institutionalize processes such as peer review and publication to mirror ethics in science

Aarti N. Wazalwar

Department of Physics, Dr Ambedkar College, Deekshabhoomi, Nagpur

## Abstract

The paper discusses first science and its conflict. Then the paper discusses Dr. Robert Merton's essay on an ethos of science in "A Note on Science and Technology in a Democratic Order. The paper also discusses some pointers on 'How can institutionalize processes such as peer review and publication be improved to reflect the values of the scientific ethos?' In the end the paper also throws light upon guidelines for potential reviewers.

**Keywords** : Science; Conflict; Peer Review; Publication; Ethos

## Introduction

Science is a deceptively inclusive word which refers to a variety of distinct though interrelated items. It is commonly used to denote:

- a set of characteristic methods by means of which knowledge is certified;
  - a stock of accumulated knowledge stemming from the application of these methods;
  - a set of cultural values and mores governing the activities termed scientific; or
- any combination of the foregoing.

Science, like any other activity involving social collaboration, is subject to shifting fortunes [1]. Difficult as the notion may appear to those reared in a culture that grants science a prominent if not a commanding places in the scheme of things; it is evident that science is not immune from attack, restraint, and repression. The revolt from science which then appeared as improbable as to concerns only the timid academician who would ponder all contingencies, however remote, has not been forced upon the attention of scientist and layman alike. Local contagions of anti-intellectualism threaten to become epidemic.

Conflict becomes accentuated whenever science extends its research to new areas toward which there are institutionalized attitudes or whenever other institutions extend their control over science. In modern totalitarian society, anti-rationalism and the centralization of institutional control both serve to limit the scope provided for scientific activity.

There is competition in the realm of science, competition that is intensified by the emphasis on priority as a criterion of achievement, and under competitive conditions there may well be generated incentives for eclipsing rivals by illicit means. But such impulses can find scant opportunity for expression in the field of scientific research. Cultism, informal cliques, prolific but trivial publications – these and other techniques may be used for self-aggrandizement. But, in general, spurious claims appear to be negligible and ineffective. The translation of the norm of disinterestedness into practice is effectively supported by the ultimate accountability of scientists to their compeers. The dictates of socialized sentiment and of expediency largely coincide, a situation conducive to institutional stability [2].

In 1942, sociologist Dr. Robert Merton articulated [1] an ethos of science in “A Note on Science and Technology in a Democratic Order.” He argued that, although no formal scientific code exists, the values and norms of modern science can nevertheless be inferred from scientists’ common practices and widely held attitudes. Merton discussed four idealized norms: Universalism, Communalism, Disinterestedness, and Organized Skepticism. Here we define and explore each of these norms:

1) **Universalism** - The idea that scientific claims must be held to objective and “preestablished impersonal criteria.” This value can be inferred by the scientific method or the requirement of peer review before publication in the vast majority of academic journals.

2) **Communalism** - Merton actually calls this norm “Communism,” but scientists tend to refer instead to “communalism” or “communalism” due to Communism’s political-economic connotations. The ideas, however, are similar – that the findings of science are common property to the scientific community and that scientific progress relies on open communication and sharing.

3) **Disinterestedness** - Science should limit the influence of bias as much as possible and should be done for the sake of science, rather than self-interest or power. Merton says that

4) **Organized Skepticism** - The necessity of proof or verification subjects science to more scrutiny than any other field. This norm points once again to peer review and the value of reproducibility. If a study cannot be replicated, can we say that its results are robust or credible?

### **How can institutionalized processes such as peer review and publication be improved to reflect the values of the scientific ethos?**

Peer review is intended to serve two primary purposes [2]. Firstly, it acts as a filter to ensure that only high quality research is published, especially in reputable journals, by determining the validity, significance and originality of the study. Secondly, peer review is intended to improve the quality of manuscripts that are deemed suitable for publication. Peer reviewers provide suggestions to authors on how to improve the quality of their manuscripts, and also identify any errors that need correcting before publication.

Peer review in the systematized and institutionalized form has developed immensely since the Second World War, at least partly due to the large increase in scientific research during this period [3]. It is now used not only to ensure that a scientific manuscript is experimentally and ethically sound, but also to determine which papers sufficiently meet the journal's standards of quality and originality before publication. Peer review is now standard practice by most credible scientific journals, and is an essential part of determining the credibility and quality of work submitted.

### **How To Peer Review Effectively**

---

The following are tips on how to be an effective peer reviewer as indicated by Brian Lucey, an expert on the subject [4]:

**Be professional:** Peer review is a mutual responsibility among fellow scientists, and scientists are expected, as part of the academic community, to take part in peer review.

**Be pleasant :** If the paper is of low quality, suggest that it be rejected. There is no benefit to being ruthless.

**Be helpful :** Suggest how the authors can overcome the shortcomings in their paper. A review should guide the author on what is good and what needs work from the reviewer's perspective.

**Be scientific:** One should focus on adding value with scientific knowledge and commenting on the credibility of the research conducted and conclusions drawn.

**Be timely:** One should stick to the timeline given when conducting a peer review.

**Be realistic:** The peer reviewer must be realistic about the work presented, the changes they suggest and their role.

**Be empathetic:** Ensure that the review is scientific, helpful and courteous. Be sensitive and respectful with word choice and tone in a review.

**Be open:** Remember that both specialists and generalists can provide valuable insight when peer reviewing.

**Be organized:** A review requires structure and logical flow. A reviewer should proofread their review before submitting it for structural, grammatical and spelling errors as well as for clarity.

## Science and Society

Incipient and actual attacks upon the integrity of science have led scientists to recognize their dependence on particular types of social structure. Manifestos and pronouncements by associations of scientists are devoted to the relations of science and society. An institution under attack must reexamine its foundations, restate its objectives, and seek out its rationale. Crisis invites self-appraisal. Now that they have been confronted with challenges to their way of life, scientists have been jarred into a state of acute self-consciousness: consciousness of self as an integral element of society with corresponding obligations and interests [5]. A tower of ivory becomes untenable when its walls are under prolonged assault. After a long period of relative security, during which the pursuit and diffusion of knowledge had risen to a leading place if indeed not to the first rank in the scale of cultural values, scientists are compelled to vindicate the ways of science to man. Thus they have come full circle to the point of the reemergence of science in the modern world. Three centuries ago, when the institution of science could claim little independent warrant for social support, natural philosophers were likewise led to justify science as a means to the culturally validated ends of economic utility and the glorification of God. The pursuit of science was then no self-evident value. With the unending flow of achievement, however, the instrumental was transformed into the terminal, the means into the end. Thus fortified, the scientist came to regard himself as independent of society and to consider science as a self-validating enterprise which was in society but not of it. A frontal assault on the autonomy of science was required to convert this sanguine isolationism into realistic participation in the revolutionary conflict of cultures. The joining of the issue has led to a clarification and reaffirmation of the ethos of modern science.

We are here concerned in a preliminary fashion with the cultural structure of science, that is, with one limited aspect of science as an institution. Thus, we shall consider, not the methods of science, but the mores with which they are hedged about. To be sure, methodological canons are often both technical expedients and moral compulsives, but it is solely the latter which is our concern here. This is an essay in the sociology of science, not an excursion in methodology. Similarly, we shall not deal with the substantive findings of sciences (hypotheses, uniformities, laws), except as these are pertinent to standardized social sentiments toward science.

## Peer Review of Science Publications

Scientific progress depends on the communication of information that can be trusted, and the peer review process is a vital part of that system [10]. As a peer reviewer for *Science* magazine, you are part of a valued community.

## Some Ethical Guidelines for Reviewers

- Reviews should be objective evaluations of the research. If one cannot judge a paper impartially, one should not accept it for review or you should notify the editor as soon as you appreciate the situation.
- If, as a reviewer, you believe that you are not qualified to evaluate a component of the research, you should inform the editor in your review.
- The reviewer should not reveal his or her identity to outsiders or members of the press.
- One should be aware of *Science's* policies for authors regarding conflict of interest, data availability, and materials sharing

## Inference

As a sociologist, Merton was interested in understanding science as a social group. He wasn't primarily concerned with providing some independent justification for how scientists conduct their research. It's worth noting, though, that he seemed to think the norms of science were good ones to have if you're interested in building good knowledge about the world.

Though the peer review process still has some flaws and deficiencies, a more suitable screening method for scientific papers has not yet been proposed or developed. Researchers have begun and must continue to look for means of addressing the current issues with peer review to ensure that it is a full-proof system that ensures only quality research papers are released into the scientific community.

The mores of science possess a methodological rationale but they are binding, not only because they are procedurally efficient, but because they are believed right and good. They are moral as well as technical prescriptions.

## References

- [1] Merton, Robert K. 1973. The Sociology of Science: Theoretical and Empirical Investigations. University of Chicago Press.
- [2] <https://www.futurelearn.com/courses/open-social-science-research/0/steps/31422>
- [3] Ware M. (2008). "Peer Review: Benefits, Perceptions and Alternatives." PRC Summary Papers, 4:4-20.
- [4] Lucey B. (2013). "Peer Review: How to Get It Right - 10Tips." The Guardian. Web. Retrieved from <http://www.theguardian.com/higher-education-network/blog/2013/sep/27/peer-review-10-tips-research-paper>
- [5] <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4975196/>
- [6] <https://nptel.ac.in/courses/109103024/pdf/module2/SM%20Lec%2011.pdf>
- [7] [https://en.wikipedia.org/wiki/Mertonian\\_norms](https://en.wikipedia.org/wiki/Mertonian_norms)
- [8] <https://www.panarchy.org/merton/science.html>
- [9] <https://scienceblogs.com/ethicsandscience/2008/01/29/basic-concepts-the-norms-of-sc>
- [10] <https://www.sciencemag.org/authors/peer-review-science-publications>

