

We begin with the origins of peer review in 17<sup>th</sup> century London and develop an institutional analysis of its purposes and practices, focused mainly on the US National Science Foundation. From this we will understand peer review as a process with varied purposes and values that is central to the practice of science. This leads to a brief discussion of how conflicting demands and a strained and turbulent organizational environment threaten the practice of peer review and science more generally. We will close by discussing the prospects for peer review (and, by extension, for science). Here is a preview of the argument I will develop.

Peer review is not ancillary to doing science—something that happens before the project begins, to secure resources, or after the project ends, to get the results out—peer review is of the essence of science, an integral part of the research process. It is, borrowing Michelle Lamont’s words, “how professors think.” Peer review arises in the mind of a scientist who anticipates what others (peers, broadly defined) would think of a finding or an argument and continues through the research process and contemplation of the consequences of research. From this formulation it follows that research fields, funding programs (requests for proposals), journals, and such are made and shaped through the review process. That is, in the course of review the arguments of a paper or proposal are not only *construed* (that is, understood or explained in a particular way, by those present, for the purposes at hand) they are *constructed* in ways that shape the science, the purpose, and the evaluation criteria.

New research initiatives created by funding agencies substantially under-specify what is intended or desired. As carefully as these may be formulated, they work as a jazz score does, open to improvisation at the time of performance. The research area takes shape through a multi-stage, scarcely visible and unexamined process in which the document is read, digested, interpreted, and personalized by members of the research community (itself an amorphous construct), sometimes with limited aid from agency officials (whose experience is also necessarily limited).

Viewing peer review as a place where science is shaped and accomplished, rather than a place where it is merely weighed and measured, has implications for such policy matters as the encouragement of transformative research and the meaning and amplification of societal benefits. Such qualities are not found, as if in a mining operation, but are made, collaboratively and iteratively with peer review a crucial element of the process.