Professionalism in science

In everyday speech, the word "professional" has an ambiguous ring, applied to one who follows, by way of profession, what is ordinarily regarded as a pastime (e.g., a sport), or disparagingly applied to one who "makes a trade" of politics and the like. In this sense it is contrasted with "amateur", one who does something, literally, for the love of it, without remuneration. The latter is generally regarded as superior to the former; remuneration being considered as likely to irremeably invest the activity with self-interest, resulting in the task at hand being merely accomplished with the minimally sufficient expertise and skill to obtain the offered remuneration, whereas the amateur strives to do whatever task is at hand as well as he or she possibly can, " excellence for its own sake".

In parallel, since 1793 "professional" has also meant "engaged in, or belonging to, one of the learned or skilled professions." Since membership of a profession is usually connected with membership of a society with strict entrance requirements, in this sense "professional" means roughly the opposite of the everyday meaning, namely it implies a stamp of quality, a guarantee of a certain (high) standard of workmanship, whereas "amateur" implies a mere dilettante or dabbler. Before their union to form the Royal Society of Chemistry in 1980, the Chemical Society existed for amateurs, and the Royal Institute of Chemistry, regarded as far more prestigious than the Chemical Society, existed for professional chemists.[1] It was furthermore realized that since one needs to be remunerated in order to live, remuneration in itself need not distort the goal of supreme quality inherent in undertaking any work.[2]

Professionalism has some interesting implications for the work carried out at universities, many of which are now eager to accept industrial research contracts. Traditionally, as in the Soviet research institutes belonging to the Academy of Sciences, or in the French Centre Nationale de la Recherche Scientifique (CNRS), scientists joined their institute through a competitive admissions procedure and for the rest of their lives did not have to worry about remuneration. It was up to them to determine what were the most suitable topics to work on, and since it is part of the ethos of science inculcated in young scientists during their undergraduate education that one should work on important problems that are also likely to be useful to society, the system was, in principle, one that effectively prevented irrelevant work from being carried out, and could be said to be socially useful, building up knowledge for advancing human civilization.

In these countries, however (and in others such as the United Kingdom, where a similar rôle was played by the universities), this mode of organization has now changed (typically brought about by severe reductions in the public funds allocated to financing institutes or universities) and nowadays the scientist is largely responsible for bringing in the funds to support his or her work, preferably from external sources such as industries. Hence, the mode of working has become more akin to that of other liberal professions such as law or surveying, in which work is undertaken for a fee.

The transformation has been, on the whole, a gradual one, which is perhaps why this new mode of working has become established without any real debate about its merits and implications. Donald Denman, who upon retirement from his Cambridge professorship continued professional work through accepting commissions and consultancies, found the transition very difficult. "Truth, as one saw it [in academic life], was outspoken and expectant of contradiction, confrontation, rebuttal, denunciation and criticism. Words were not trimmed nor ideas double-thought. Straight flung speech was never considered impolite. The professional world, on the contrary, appeared to confuse politeness with deference. The shopkeeper's code, the customer is always right, was the aphorism to work by. Should a principal or client wish to think that black is white, don't disillusion him—you might lose a fee! What the French called *prévenance* held precedence over a hammered-out truth."[3] The dilemma that this poses the academic working with industry when the continuing existence of the academic work group depends on continuing industrial contracts seems never to have been properly addressed.

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[1] In the beginning, of course, before the profession existed as such, all chemists were amateurs.

[2] Sport has similarly become "officially" professionalized, but since it is indubitably, by its inherent nature, a pastime the professionalism is presumably justified by the fact that spectator sport has become a very large and lucrative industry. Within sporting circles, the debate has been rather acrimonious. The Marylebone Cricket Club, founded in 1787, long upheld amateur status, only abolishing it in 1962. The Rugby Football Union (formed in 1871) removed all restrictions on payments in 1995. The Wimbledon lawn tennis championship, which started in 1877, became "open" in 1968. The Olympic Games, refounded in 1896 in Athens, accepted professional athletes in all sports in 1992. Some people maintain that the events as a spectacle have become more exciting and interesting as a result, but others perceive the opposite; this is evidently a rather subjective matter.

[3] Denman, D.R. *A Half and Half Affair*, p. 315. London: Churchill Press (1993).

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The obvious danger is, of course, that truth will no longer be hammered out, since everyone will be too busy earning their fees. Uniquely among the professions, scientists have always worked with that implacable and immutable arbiter, nature, and have always had the confidence that erroneous ideas will, sooner or later, fail the test of hard experiment. This ethos has served science well for many hundreds of years. But as things become more complicated, designing a direct experiment to test an idea becomes more difficult, and it seems already now to be possible to construct large zones of stability, upon which further construction may take place, while the whole rests upon an initially unsuspected fallacy. Hence, hammering out truths has become more vitally important than ever before, yet professional pressures cause it to be done ever more seldom. This trend severely erodes the reputation of scientists as objective, independent thinkers.

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