

The Emergence and Evolution of the Expression “Conflict of Interests” in *Science*: A Historical Overview, 1880–2006

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Abstract The tendency is strong to take the notion of “conflict of interests” for granted as if it had an invariant meaning and an ethical content independent of the historical context. It is doubtful however, from an historical and sociological point of view, that many of the cases now considered as instances of “conflicts of interests” would also have been conceived and perceived as such in, say, the 1930s. The idea of a “conflict of interests” presupposes that there are indeed *interests in conflict*. Conversely, as long as there is a consensus among the different groups involved, they will not *conceive* and even less denounce a given practice as being an instance of a “conflict of interests”. In this article we will show that the content of the discussions over conflicts of interests has changed over time in close relation with the transformations of the research system. In other words: there are social conditions for the emergence of “conflicts of interests”. The changing meaning of the notion is assessed by analyzing the presence of the expression “conflicts of interests” in the magazine *Science* over the past century. Three different meanings emerge and their content has evolved in close link with the changing structure of the relations between the scientific community first with the State and then with industry. It moved from a situation external to the scientific community to a debate going on inside the scientific community generated by the growing relations between university and industries.

Keywords Conflicts of interests · Government · Scientific community · Fraud · Public trust · Public interest

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The problem of conflicts of interests in scientific research has been the subject, over the last three decades, of significant media coverage, scholarly interest and ethical concern by scientists, their scientific societies as well as by academic journals and governmental organizations [1–4]. However, the tendency is strong to take the notion of “conflict of interests” for granted as if it had an invariant meaning and an ethical content independent of the historical context. It is doubtful however, from an historical and sociological point of view, that many of the cases now considered as instances of “conflicts of interests” would also have been perceived as such in, say, the 1930s. The idea of a “conflict of interests” presupposes that there are indeed *interests in conflict*. Conversely, as long as there is a consensus among the different groups involved, they will not *conceive* and even less denounce a given practice as being an instance of a “conflict of interests”. By contrast, the same practice can be perceived as generating a conflict when a person or a group has a particular interest in denouncing that practice as encroaching on his/her/its own interests. Thus, whereas some universities in the 1930s were active in selling medical products like vaccines, that situation was rarely seen as generating conflicts of interests until the pharmaceutical industry was well developed and perceived the presence of universities in that market as a conflict of interests and as creating unfair competition [5]. In this article we will show that the content of the discussions over conflicts of interests has changed over time in close relation with the transformations of the research system. In other words: there are social conditions for the emergence of “conflicts of interests”.

The increasing concerns about this topic can be assessed by analyzing the presence of the expression “conflicts of interests” in the magazine *Science* over the past century.¹ The results are presented in Fig. 1. Not surprisingly, two-thirds of the 607 occurrences of the expression (singular or plural) are found after 1980. More interesting is the fact that the semantic content of the expression has evolved and we can distinguish three different meanings of the expression over the entire period. The first meaning of “conflict of interests” appears in the context of reports of academic meetings in which the program makes it impossible to attend different sessions in which one is interested. The use of the expression “conflict of interests”, in this context, applies to a situation where two events, which interest the same group of persons, take place simultaneously. The usual accompanying terms are “meetings”, “program”, “duplication”, “congestion” [6]. This particular meaning vanished completely from the journal after 1959 and occurred only ten times since 1886 when it first appeared. Though it was not expected, it provides a nice example of an expression whose meaning has been forgotten and replaced by a new one.

The second meaning refers to a clash between two individuals or groups, having different economic or political interests to promote. The term “conflict” thus refers

¹ Practically, it would have been impossible to carry out manually an exhaustive reading of all news articles published in *Science* (and *Scientific Monthly* which was absorbed in *Science* in 1957) since its creation in 1880 in order to find the occurrences of “conflict of interests”. Thanks to the recent availability of the complete electronic collection of *Science*, a computer search for our chosen expression is now possible and we searched the full-text edition for the expressions « conflict of interest » in singular or plural. The software used by JSTOR allows the recognition of more than 97% of characters. Though we may have missed some occurrences, the general trend is not affected by this limitation.

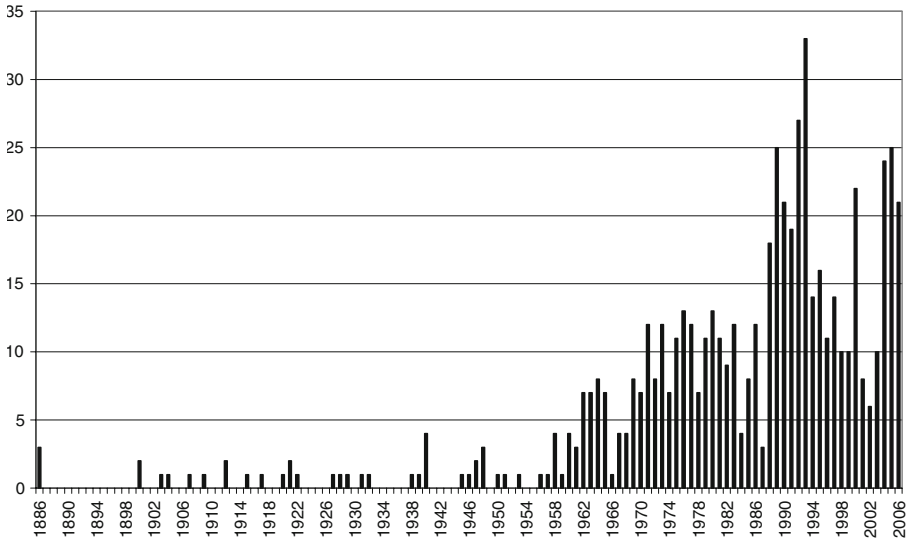


Fig. 1 Occurrences of the expression “conflict of interests” in *Science* (1886–2006)

to a controversy between actors [7]. This type is much more frequent than the first and has occurred 65 times over the whole period. The accompanying terms are usually “groups”, “nation”, “individuals”, “war”. Generally however, those conflicts are external to the scientific community and refer for example to political debates in the context of the Second World War.

The third meaning first occurs in 1947 but really emerges at the end of the 1950s and refers to a single individual, group or institution denounced for having an illegitimate influence [8]. It rapidly becomes dominant and its meaning distinguishes itself from the previous one by the presence in its semantic field of terms such as “ethic”, “law”, “regulation” and “code”. It is certainly the one that gets closer to the current meaning.

In the Interest of the Nation

The first upsurge of discussion (visible in Fig. 1) in the period 1958–1965 is related to regulations governing possible conflict of interests of federal employees. In this period of massive hiring of scientists, the question arose:

May a government scientist who is invited to attend a scientific program of public interest accept travel and related expenses from a private non profit organization? [9, p. 385]

The author noted that “the current statutes governing conflicts of interest were designed mainly to prevent bribery and the prosecution of claims against government by employees or former employees in the days before the government required so many consultants and temporary employees” [9, p. 385]. A document

prepared by the Association of the Bar of the City of New York concluded that the same rules of conflicts of interests applied to part-time as well as to full-time federal employees [10, 11]. The tensions were an effect of the tight federal policies:

The relevant laws are a group of seven poorly defined, vaguely interpreted statutes, which, in their broadest interpretation, prohibit anyone working for the government from having a financial interest in any group having dealings with the government. They tend to put almost anyone working for the government on less than a career civil service basis in an extremely awkward position. [12, p. 1508]

The point is not to develop this story in detail but to note that the notion of conflict of interests emerges here in a specific context: the multiplication of consultants who can be serving different and conflicting interests, which could also be in contradiction with national interests incarnated by the government. And, as it was noted, the situation could not be avoided:

The government clearly needs the best scientific advice it can get, and it can get this advice only from men with the pertinent experience- that is in most cases, precisely from the men who will find themselves in a conflict-of-interest situation. [12, p. 1509]

This first phase of the discussions of “conflict of interest” is in a sense external to the scientific community itself as it does not involve debates on the content of science but is generated in the context of the hiring practices and rules of the government: scientists are involved as civil servants and not as competitors in a scientific field.

In Defense of Public Interest

A second phase of the discussions of conflicts of interests emerges during the 1960s when the expression is closely associated with a defense of the “public interest”, an expression whose presence triple between 1960 and 1965 and 1970 and 1975. In the context of social movements associated with the Vietnam war, one sees allegations of conflicts of interests proffered against regulatory institutions such as the FDA, the EPA and the AEC [13, 14]. In that sense, questions over conflicts of interests concern primarily the capacity of these institutions to protect the public interest. Links between universities and Eisenhower’s military-industrial complex become the subject of incisive and polemical charges. Industrial interests are then described as incompatible with the missions of universities and regulatory institutions. With increasing commercial ties between universities and industries, the consequences of this partnership became the main subject of the discourse on conflicts of interests. A good example is provided by the controversy around a major oil leak that occurred in the Santa Barbara Channel. A special committee was formed in 1969 to investigate the causes of the leak and the allegation of conflict of interests surfaced when Charles O’Brien, President of the committee, publicly complained about the difficulties he encountered in recruiting university expert for his investigation:

It is understood, also, that the President's oil spill Committee, created last February, has been discussing formation of a subpanel to study the question of the Union well in the channel, and that some difficulties have been encountered in enlisting university engineers with the required expertise because of conflicts of interest, apparent or real. [...] O'Brien said that petroleum engineers at the University of California campuses at Santa Barbara and Berkeley and at the privately supported University of Southern California refused to testify, and indicated that they did not wish to risk losing industry grants and consulting arrangements. [15, p. 411]

Clearly, in this case, one finds allegations of conflicts of interests linked to the fact that university scientists were refusing, because of their ties with some enterprises, to participate in a public investigation and thus defend the public interest.

We still find echo of this problem at the 1982 Pajaro Dunes Conference devoted to the various "ramifications of academia new-found interests in collaborating with industry, particularly in biotechnology" [16, p. 155]. The report underlines preoccupations engendered by the new entrepreneurial function of universities:

research agreements and other arrangements with industry [must] be so constructed as not to promote secrecy that will harm the progress of science, impair the educational experience of students and post-doctoral fellows, diminish the role of university as a credible and impartial source, interfere with the choice by faculty members of the scientific questions they pursue, or divert the energies of faculty members and the resources of the university from primary obligations to teaching or research. [16, p. 156]

Participants at the Pajaro Dunes Conference saw the obligation to manage possible conflicts of interests because "these new relationships do pose a danger to traditional academic values" [16, p. 155]. As this example suggests, the discourse on conflicts of interests at the beginning of 1980s, is characterized by the apprehension of an alteration in the traditional mission of universities and a subordination of universities to industrial interests [17].

By the end of the 1980s a new element appears: the multiplication of discussions around frauds and plagiarism in the scientific field. One of the major characteristics of this discourse lies in the use of the notion of "public trust". The objective is to prevent conflicts of interests in order to maintain public trust in the scientific institutions. Still recently, an editorial provides a good example of this sensitivity: "with more and more scientists straddling the line between the commercial and academic worlds, it's no surprise that the editors and the public are asking deeper questions about institutional commitments and financial relationships". This situation could imply "the erosion of public trust in institutions and occupations that were once highly respected" [18, p. 15].

The notion of public trust is now connected, in the discourse on conflicts of interests, to the discussion of frauds and one can locate their common origin to the end of 1980s. The context in which this discourse emerged is the well-known and widely covered inquiries surrounding Nobel prize winner David Baltimore [19].

Justified or not, these allegations brought to the forefront a new discourse aiming at preserving public trust in scientific institutions. Even the relationships between industries and universities were re-described as situations undermining public trust in scientific institutions. The debates thus moved from the fear of altering the mission of universities to assessing the capacity of research institutions to protect themselves from misconduct.

By the end of 1980s, an important number of controversies surrounding frauds are discussed and they move the attention toward disclosure policies for scientists supported by government or private funds. From then on, preservation of “public trust” in institutions has become a main objective together with the defense of “public interests”. Preserving public trust implies, for scientific institutions such as journals and universities, a profound revision of the normative structure described by the sociologist Robert K. Merton [20] for it now demanded the explicit inclusion of new criteria such as disclosure of financial interests and even explicit mention of the precise contributions of each author signing a paper. The most recent growth, after 2002 (Fig. 1), in the frequency of occurrence of the expression “conflict of interests” reflects these discussions of various guidelines and disclosure policies, notably the new rules on conflicts of interests put forward by NIH [21].

As this survey of the various uses of the expression “conflict of interests” in the *Science* magazine has shown, debates on this question have been present since at least the mid 1950s and its meaning and content have evolved in close link with the changing structure of the relations between the scientific community first with the State and then with industry. It moved from a situation external to the scientific community to a debate going on inside the scientific community generated by the growing relations between university and industries. The most recent phase emerged at the end of the 1980s and was associated with an upsurge of allegations of frauds and plagiarisms. Whereas the second phase turned around the notion of “public interest”, the latest one is centered on the idea of “public trust”. As a consequence, the scientific community is now adapting its norms and practices to a situation where the “republic of science” is no more taken for granted and scientists are now held accountable and subject to closer public scrutiny.

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