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Strategies for Dissenting Scientists

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Abstract — Those who challenge conventional views or vested interests in science are likely to encounter difficulties. A scientific dissenter should first realize that science is a system of power as well as of knowledge, in which interest groups play a key role and insiders have an extra advantage. Dissenters are likely to be ignored or dismissed. If dissenters gain some recognition or outside support, they may be attacked. In the face of such obstacles, several strategies are available, which include mimicking science, aiming at lower status outlets, enlisting patrons, seeking a different audience, exposing suppression of dissent, and building a social movement.

Keywords: dissent — whistleblowing

Introduction

Science is normally presented to the public as an enterprise based on skepticism and openness to new ideas, in which evidence and argumentation are examined on their own merits. Trusting newcomers who present views that conflict with conventional ideas may thus expect that their work will be given a prompt, fair, and incisive analysis, being accepted if it passes scrutiny and being given detailed reasons if not. When, instead, their work is ignored, ridiculed, or rejected without explanation, they assume that there has been some sort of mistake, and often begin a search to find the "right person"—someone who fits the stereotype of the open-minded scientist. This can be a long search!

Certain sorts of innovation are welcome in science, when they fall within established frameworks and do not threaten vested interests. Aside from this sort of routine innovation, science has many similarities to systems of dogma. Dissenters are not welcome. They are ignored, rejected, and sometimes attacked. To have their ideas examined fairly, it is wishful thinking to rely on the normal operation of the scientific reception system. To have a decent chance, dissenters need to develop a strategy. They need to understand the way science actually operates, to work out their goals, and then to formulate a plan to move toward those goals, taking into account likely obstacles and sources of support. The following sections cover, in turn, the dynamics of the scientific community, the problems faced by challengers, likely responses to dissenters, and strategies.

My perspective on dissent in science — which in a single article can only be outlined rather than fully justified— is based on many years of experience as a scientist and social scientist both in presenting dissenting ideas as well as in studying their reception. This includes debates over supersonic transport aircraft, nuclear power, fluoridation, nuclear winter, pesticides, and the origin of AIDS, with a special focus on the treatment of dissenters (*e.g.* Martin, 1979, 1981, 1986, 1991, 1996, 1997; Martin *et al.,* 1986). Having given advice to many challengers, it is my perception that there is a great need to better understand the role of power in science, to be aware of the likely responses to dissenters, and to consciously examine and try out strategies.

The Dynamics of the Scientific Community

There are various ways to understand the operation of the scientific community, including a search for truth, a puzzle-solving enterprise within paradigms (Kuhn, 1970), and a social enterprise in which scientists seek to enroll others, both humans and objects, to their own cause (Latour, 1987). To understand the response to dissenters, though, it is more useful to think of the scientific community in terms of "interests" (Barnes, 1977). Company owners have an interest in making a profit, and scientists have an interest in publishing their papers and being recognized. "Interests" can be thought of in terms of a stake in money, power, status, privilege, or other advantages.

To talk of interests is to focus on the social organization of science. Often, when thinking about "science," people think of scientific knowledge, which is conceived of as some sort of essence above and beyond human interests. It is useful to remember that scientific knowledge is created by humans and, as a result, is inevitably shaped by human concerns (Watson, 1938). By understanding the social dynamics of the scientific community, it is possible to gain insight into processes that influence the direction, pace, and content of scientific knowledge. The study of the scientific community then leads back to interests.

Some types of interests are corporate, government, bureaucratic, professional, career, and psychological. In each case they can exert strong pressures on the direction of research and shape the response to challengers. Note that interests influence science without the necessity of conscious bias, since interests shape people's world views.

Corporations fund a large amount of research, naturally enough the sorts of research that are likely to lead to corporate advantage. A large corporation can be considered to have a "vested interest" in certain types of research and certain results, because it has used these to build a position of power which it wishes to maintain. A pharmaceutical company, for example, has a strong interest in its best-selling drugs. It will fund research into drugs that it can patent and sell, but not into nonpatentable substances. It has an interest in opposing treatments that do not rely on drugs at all (Abraham, 1995).

Governments are much like large corporations, funding research that serves their interests. The military, a key part of the governmental apparatus, funds a

great deal of research in weapons but very little in methods of nonviolent struggle such as strikes, boycotts, rallies, and non-cooperation. The influence of governments and corporations on the direction and content of scientific research is considerable (Boffey, 1975; Dickson, 1984; Primack & von Hippel, 1974).

Governments, corporations, and other large organizations are typically structured as bureaucracies, with a hierarchy and division of labor. Bureaucratic elites resist challenges to their power and privilege even when changes would benefit the organization as a whole. For example, military commanders resisted military innovations such as accurate naval gunnery and the machine gun for decades because they upset normal organizational arrangements. Scientific research in corporations, governments, and universities is organized bureaucratically, to some extent. Top scientific administrators have a vested interest in maintaining their power (Blissett, 1972; Elias, *et al.*, 1982; Rahman, 1972).

Professions such as medicine and law can be understood as systems for maintaining control over an occupation, which includes controlling working conditions and entry to the field. Professions have a vested interest in this control, which sometimes is protected by laws preventing non-professionals from practicing (Collins, 1979; Larson, 1977).

Individual scientists have interests in their own careers, for example, in publishing papers, gaining jobs and promotions, and winning honors. They can also develop a psychological interest in particular theories and methods. If a challenger comes along with a simple alternative to the theory on which they have built their careers, most scientists are not likely to be receptive, since their status will be undermined and their lifelong commitment apparently wasted (Mitroff, 1974).

These different interests are often interconnected. Governments fund research by corporations and universities. Corporations fund research by medical professionals. Individual scientists build up careers in government or corporate labs.

The interests model of science is quite a contrast to the traditional model of science as a search for truth which is guided by norms such as skepticism, universality, and communality. The usefulness of these norms for describing science has been questioned (Mulkay, 1976). Indeed, science is possibly just as well described by "counternorms" such as emotional commitment and organized dogmatism (Mitroff, 1974). Using the interests model, we would expect the scientific community to respond to the most salient interests.

For example, because certain chemical companies make a lot of money selling pesticides, they heavily fund research in pesticides, do not fund much research in alternatives to pesticides, and are threatened by adverse findings about pesticides. Just as important as these direct links between interests and research are indirect influences. Priorities for seemingly independent fields can be influenced by chemical company interests.

Another important interest is that of the scientific community as a whole in the status of science as a superior method of gaining knowledge. Scientific experts are given greater credibility because they are seen as having special access to truth about the world. Scientific truths are not supposed to be tainted by interests, which is why scientific knowledge is portrayed as rising above the limitations of the system that created it. Interests are influences on the way science proceeds, but do not determine it. There is always some room for resistance.

Incidentally, within the social studies of science, analysis of interests has become quite unfashionable. Perhaps this is related to the field becoming more career-oriented and hence less helpful to those wanting to expose vested interests!

Problems Faced by Challengers

If there are strong interests behind a particular position or theory, then the task of challengers is difficult. This difficulty is aggravated if challengers are outsiders who don't "play the game." If you are a talented scientist with a good track record, working at an elite institution, and write a conventional looking scientific paper — but with challenging ideas — there may be difficulties enough. For anyone else, it is much tougher.

If one is a scientist from a low status institution, that is a big disadvantage (Peters & Ceci, 1982). It is even worse to not belong to an institution at all and to write from a home address. It is also a disadvantage to be unknown in the field, to have no prior publications, to be female, to be too young or too old, or to be from a country with low scientific status.

Although the rhetoric about science is that ideas count, not who expresses them, in practice ideas are commonly judged by their source. Ideas are given much more credibility if they come from a respectable source. Outsiders face an uphill battle.

Just as important is presenting one's ideas in the expected way. A paper, to be recognized as scientific, must conform to the standard mold. This mold varies from field to field, but usually means a restrained, impersonal style, suitable references to earlier work, and use of jargon appropriate to the topic, all in a concise package that is similar to other writings in the field. Anyone who writes about their own personal discovery, not mentioning prior work, and writes for a general audience, has little chance of being published in a scientific journal, even if the ideas are conventional and would be publishable if they were in standard form. Outsiders sometimes betray their ignorance of the usual style by using ALL CAPITALS and by making bold claims.

Once again, rhetoric about science might suggest that contributions should be judged on their content rather than on their appearance, but the reality of the situation is otherwise. Learning the standard style usually occurs during the conventional career route involving years of formal study and apprenticeship, plus working in a speciality field to become familiar with prior work.

Indeed, without being an active player in the field, it may be impossible to keep up, since this requires having access to the latest preprints, attending major conferences, or knowing key people. Furthermore, without coming through conventional channels, it is often impossible to gain access to equipment needed to do the most advanced work in the field.

Arguably, one reason that science is so successful is that it is a very conservative and insular operation. By concentrating enormous resources on solving the puzzles that are on the immediate frontier, scientists are able to make steady advances and occasional breakthroughs. (Because of the role of funding and paradigms, this tends to be in areas that are useful to powerful interests.) The cost of this focus on current puzzles is a neglect of foundational questions, anomalies, and unconventional ideas.

Typical working scientists have a hard time keeping up with conventional research in their speciality. There are experiments to be done, grant applications to write, papers to be written, seminars and conferences to attend, and perhaps teaching to be done. Research is very competitive. Delay may mean losing out to others in the field. It may mean loss of a publication, a job, a promotion, perhaps a discovery. In this context, many scientists do not want to "waste" their time looking at someone else's claim to have made a breakthrough, unless it is a top person in the field. What do they have to gain by spending time helping an outsider? Most likely, the alleged discovery will turn out to be pointless or wrong from the standard point of view. If the outsider has made a genuine discovery, that means the outsider would win rewards at the expense of those already in the field who have invested years of effort in the conventional ideas.

Responses

A person who challenges the conventional wisdom is likely first to be ignored, then dismissed, and finally, if these responses are inadequate, attacked. When an outsider sends a paper to established scientists, for example, many will not bother to reply. When an entire dissident field establishes its own publications, it may be ignored by the mainstream.

Dismissal is the most common response received from established scientists when a challenger is seeking formal recognition in orthodox channels. A paper sent to a top journal may be rejected without being sent to referees. Editors often perform a screening function, deciding what is credible enough to warrant serious consideration. Editors can also affect the likelihood of acceptance by their selection of referees.

Sometimes, though, dissidents cannot be silenced by ignoring and rejecting them. They may develop their own constituency or gain publicity. For example, nonscientists who point out the healing power of herbs, based on their own observations, are usually ignored by medical researchers. Some researchers carry out careful studies of herbs and seek publication; they are likely to encounter difficulties or, if their work is published, be ignored by the mainstream

medical profession. However, there is a thriving alternative health movement, which is very receptive to any findings about the benefits of herbs. This poses a threat to corporations, governments, and scientists with a stake in the conventional approach based on synthetic drugs. At this stage, one possibility is attack.

A scientist can be attacked in various ways, including ostracism, petty harassment, excessive scrutiny, blocking of publications, denial of jobs or tenure, blocking of access to research facilities, withdrawal of research grants, threats, punitive transfers, formal reprimands, demotion, spreading of rumors, deregistration, dismissal, blacklisting, and threats of any of these. There are numerous documented cases in various fields. For example, many scientists pursuing research critical of pesticides or proposing alternatives to pesticides have come under attack, having grants removed or being threatened with dismissal (Martin, 1996; van den Bosch, 1978). Dentists critical of fluoridation have been threatened with deregistration (Martin, 1991; Waldbott, 1965). Government scientists critical of nuclear power have lost their staff and been transferred as a form of harassment (Freeman, 1981; Martin, 1986). Parapsychologists have encountered difficulties in their careers (Hess, 1992).

Dr. John Coulter, a scientist at the Institute of Medical and Veterinary Science in Adelaide, South Australia, spoke out about various environmental and health issues. After he commented about hazards of pesticides in a talk, the pesticide manufacturer wrote a letter of complaint to the director of the Institute. After Coulter did a study of the mutagenic potential of a sterilizing agent used at the Institute and released his results to the workers, he was dismissed (Martin *et al.,* 1986).

Dr. George Waldbott, a prominent allergist and author of hundreds of scientific papers, was the leading U.S. opponent of fluoridation from the mid-1950s through the 1970s. Waldbott was visited by a German pro-fluoridationist who misrepresented his intentions, gained access to Waldbott's files and then wrote a critical account of Waldbott's methods. This misleading account later appeared in a dossier on opponents of fluoridation compiled by the American Dental Association and was used to undermine Waldbott wherever he appeared (Waldbott, 1965).

The actual cases that are publicized are the tip of the proverbial iceberg, for several reasons. Many dissenters do not make an issue of attacks, preferring to keep a low profile and continue their careers. Also, only some types of attacks are easy to document, such as reprimands and dismissals. It is very difficult to prove that failure to get a job or grant is due to discrimination.

Attacks on dissidents are never admitted as such. They are always justified as being due to inadequacies on the part of the dissident, such as low quality work or inappropriate behavior. To determine whether actions against someone are justifiable, it is useful to use the "double standard test." Is the same action taken against everyone with the same level of performance? Or is the

person who is challenging conventional wisdom harassed or reprimanded, while others with similar performance are unaffected?

Another useful test is to ask whether the response is in line with normal scientific behavior. If a scientist writes a challenging paper, it should be considered quite legitimate for someone to call or write to the scientist questioning the method or results or complaining about bias. This is a process of engagement and dialogue, and does not jeopardize the scientist's ability to continue research. Even strong language should be tolerated if it is directed towards the scientist or published in a journal where there is a timely opportunity for reply. On the other hand, when a critic threatens a lawsuit or writes to the scientist's boss or institution making a complaint, this is obviously an attempt to intimidate or hinder the scientist's work or career. The "call to the boss" is very common and is an excellent indicator that a response is an attempt to suppress dissent rather than engage in dialogue.

Attacks are much the same whether they are made against scientists presenting challenging ideas, against whistleblowers who speak out about scientific fraud or corporate corruption, or against scapegoats who become targets for whatever reason. Most scientists are completely unprepared for attacks. They do not realize that science can be a ruthless power play in which the most underhanded methods may be used against those who challenge vested interests. They believe, incorrectly, that formal channels, such as grievance procedures, professional associations, and courts, provide reliable avenues for justice, when actually they are strongly weighted in favor of those with more money and power. In order to survive and thrive as a challenger, it is necessary to understand the operations of power as well as to have knowledge. Most of all, it is important to work out a strategy for defense.

Strategies

Here are some defense strategies that can be used in the face of hostile interests. There is no single best strategy; each has advantages and disadvantages. These options each assume that one recognizes that success is very unlikely if one simply expects treatment without any bias.

Mimic Orthodox Science

Since mainstream scientists expect contributions to be in a certain standard format, then writing articles in this format may increase chances of success. Since submissions from institutional addresses are usually treated more seriously than those from home addresses, it may be useful to set up an institute — even if it contains only one person! Alternatively, it might be possible to obtain an honorary position at an established institution, such as a university. There are a few open-minded departments that may be willing to provide a haven for dissenters.

In addition to the superficial appearance of being orthodox, it may also be

useful to carry out research in what is known to be the orthodox manner, for example using double-blind randomized trials. Parapsychological research has followed this path, and as a result is carried out much more "scientifically" than most orthodox science.

Sometimes this is not enough: the ideas are too threatening even when they come from the most reputable scientists from prestigious institutions, and are investigated using all the methods of proper scientific research. In this case, it is useful to set up specialist scientific journals, with the highest standards, to give credibility to the field, and provide a focal point for its workers. Parapsychological journals fulfill this function.

The more a field is able to do research and produce results that look like conventional science, the more appropriate is the strategy of mimicking science: eventually the mimic will be taken for — and be — the real thing. A disadvantage is that squeezing a field or research into a scientific mold may exclude some of the most exciting and provocative aspects of that field. Furthermore, if opposing hostile vested interests are powerful, the dissenters may not be accepted, no matter how much they replicate the scientific model.

Aim at Lower Status Outlets

If it is impossible to gain acceptance in top journals and conferences, it may be possible to get a hearing in less prestigious outlets. There are thousands of journals and all sorts of conferences, of all different styles, orientations, and statuses. By picking an outlet that is less resistant to unorthodox ideas, it may be possible to gain an audience. Perhaps, from these beginnings, some people in the field will provide comment, critique, or support. This may provide the basis for building a better argument and gaining wider credibility. There are even some journals that specialize in work which challenges orthodoxy, such as *Speculations in Science and Technology* and *Medical Hypotheses*.

There is no dishonor in publishing in lower status outlets. After all, most scientists go through their entire careers never publishing in the leading journals in their fields. It makes sense to publish somewhere rather than nowhere. On the other hand, it is easier for challenges to be ignored when they only appear in lower status outlets.

In the case of fluoridation, critics have long had the greatest difficulty in publishing in mainstream dental journals. Australian dental researcher Geoffrey Smith could not get past the referees for the *Australian Dental Journal* but was successful in numerous international scientific journals. Applied mathematician Dr. Mark Diesendorf had similar difficulty in publishing his critiques of fluoridation in dental journals. He made a major breakthrough with an article in *Nature*, a highly prestigious scientific journal not controlled by the dental establishment (Martin, 1991). Scientists critical of fluoridation also set up their own journal, *Fluoride*.

Enlist Patrons

Is there, somewhere, an open-minded mainstream scientist who is willing to examine one's ideas fairly and, if they appear to have promise, help in ensuring that they obtain proper recognition? Many challengers believe the answer must be yes and spend a lot of effort trying to find this elusive scientist. Unfortunately, most scientists are too busy, not sufficiently intelligent or open-minded to grasp the new idea, biased by prejudice or self-interest, or have too much to lose by championing something unorthodox. The most desirable patron of a challenger is someone who is in a fairly senior position, with excellent mainstream credentials and a track record, plenty of spare time, and a willingness to take risks on one's behalf. It is quite likely that there is no one who fits this specification. But sometimes there is, so it pays to inquire. By asking at a few universities for recommendations about open-minded scientists in a certain field, one may well be directed to one or two candidates.

Scientists who gain a public profile, especially those who communicate to a general audience, are obvious targets. David Suzuki, Paul Davies, and the late Carl Sagan are examples. They are likely to be totally and utterly overwhelmed by people seeking their help. It is probably better to seek someone who is known in a speciality area but less known to others.

A patron can be a great help. The main problem is that much effort can be wasted seeking a patron when in fact there is none available.

Seek a Different Audience

Rather than seeking to obtain credibility among orthodox scientists, another option is to seek a different audience. This might be practitioners, those in a different field, or the general public. For example, some investigators dedicated to "alternative health" distribute leaflets to nutritionists and alternative therapists, publish articles in popular health magazines, and give talks to community groups. Some parapsychologists have obtained support from industry, which is less hostile toward the paranormal than pure scientists.

The big advantage of this strategy is that it is possible to sidestep the most obvious hostile interests. If the "cancer establishment" is opposed to a treatment relying on a common substance, there are a number of groups that may be more receptive, including some patients and relatives, alternative therapists, and health food stores. The strategy can have many ramifications: setting up journals, newsletters, and conferences; establishing protocols and certification procedures; seeking mass media coverage.

Seeking a different audience has risks too. It may lead to an insular alternative community that cannot recognize its shortcomings due to its own interests. It may lead to associations with bizarre allies who serve to discredit what is sensible. It may make acceptance by the mainstream more difficult.

Any challenging group that develops a significant audience is a potential target for attack. Dissenters who have no following are usually ignored.

Dissenters with a mass audience are a threat to the mainstream. This suggests that it is wise to develop a solid foundation of research experience and results, organizations, networks, and activist skills before gaining too wide a public profile.

Expose Suppression of Dissent

When attacks are made on dissenters and their work, the best response is to expose the attacks and use them to gain wider attention on the original work. Detailed documentation should be kept of all attacks, and a careful, conservative, and scrupulously accurate account prepared and used to reveal the tactics of the attackers. However, it is a mistake to become preoccupied by the injustice of attacks, for example by litigation. Instead, the focus should always be returned to the work in question and the need for a fair evaluation.

Dissenters need to be prepared for anything. In the course of harassment, reprimands, transfers, dismissals, and other such actions, the opponents may engage in unscrupulous behavior, including spreading of lies, destruction of documents, blackmail of potential supporters, and frame-ups. Most people can scarcely believe what happens to whistleblowers, and indeed can scarcely believe it when it happens to them! It is salutary to read some whistleblower stories (Dempster, 1997; Glazer & Glazer, 1989; Martin, 1997; Martin *et al.,* 1986; Nader *et al.,* 1972) and study advice from people who have dealt with whistleblower cases (Devine, 1997).

Build a Social Movement

If vested interests are blocking the expression or acceptance of certain ideas, ultimately the only thing that will change this is a change in society, including decision making and attitudes. One way to help bring this about is through a social movement, which can be thought of as a loose alliance of individuals and groups pushing for a change in the way people do things. Conventional examples are the environmental, feminist, peace, and anti-abortion movements. Social movements normally challenge established interests; a successful movement can become a vested interest, as in the case of neoliberalism. Some movements are not so obvious. For example, computers did not appear by themselves: there was a strong push to introduce them, which has been called a "computerization movement" (Kling & Iacono 1988). Science was certainly a social movement in its early years, challenging the religious establishment.

Isolated dissenters can be suppressed easily; that is the fate of most whistleblowers. A movement, in contrast, has a better chance of gaining a hearing since it combines the skills and resources of many like-minded people who are committed to a cause and who can support each other. It is worthwhile for dissenters to contact activist organizations that are related to their area. Many activists have great skills in analyzing local power structures, mobilizing support, and building campaigns (Coover *et al.,* 1981; Shaw, 1996). Building a

social movement does not provide a quick road to success but in the long run it may offer the best prospect for challenging vested interests.

The social system of science has forged enormously strong links to governments and corporations and also has developed vested interests in education systems, career structures, and organizational arrangements. Indeed, science itself can be seen as a social problem (Restivo, 1988). Many aspects of the practice of science do not live up to the high ideals of "science" as a dispassionate search for truth. If there is any hope of reform, dissenters must play a crucial role. To be effective, they need to understand that science is a system of power as well as of knowledge, and consequently they need to be prepared for a power struggle as well as a struggle over ideas.

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