Paul Feyerabend: Science and the Anarchist

Progress only occurs, he argues, because scientists break every methodological rule and adopt the motto "anything goes"

The notion that science is an enterprise both rational and progressive is one that is deeply held. During the first half of the 20th century, philosophers of science attempted to justify this belief by describing the rational elements of the scientific method and the underlying logic of the process by which old theories give way to new. Popular notions of how science proceeds have in great part been shaped by these philosophers. During the past two decades, however, the logical edifice they erected has come under increasingly severe attack.

One of the most radical challenges has come from Paul K. Feyerabend, 56, a Viennese-born philosopher of science who has taught at the University of California at Berkeley for the past 20 years. Using examples drawn from a series of historical studies, Feyerabend argues that science does not proceed according to a rational method. If there has been progress, it is only because working scientists have broken every principle in the rationalist's rule book and have adopted the motto "anything goes." The pool of resulting theories has increased, but individual theories are not consistent with one another. Today's Mendelian genetics, for example, cannot in Feyerabend's view be logically derived from molecular genetics. It is rather the competitive pressure between tenaciously held and incompatible theories that makes for progress. Since there is no one "scientific method," success in science depends not only on rational argument but on a mixture of subterfuge, rhetoric, and propaganda.

Feyerabend has pushed his relativistic approach to wider political ends. Since no one theory is "true," all must be given equal time. Feyerabend thus argues that Big Science, codified in textbooks and cozy with government, now occupies a position in Western society incommensurate with the free exchange of ideas and the further development of science. Equal weight, he says, should be given to competing avenues of knowledge such as astrology, acupuncture, and witchcraft.

Although his position is obviously extreme, Feyerabend has gained an international audience. His major work *Against Method* (New Left Books, London, 1975) has now been translated into Spanish, Italian, Portuguese, Swedish, Dutch, German, French, and Japanese. His arguments are regularly discussed in philosophy of science courses. In addition to his chair at Berkeley, he recently was appointed to a half-time chair at the Zurich Polytechnic, the school where Albert Einstein received his Ph.D. and later taught.

Three times married and divorced, Feyerabend has no children, and today lives atop the Berkeley hills in semiseclusion with his books and a 7-foot poster of King Kong. From the back porch of his house one looks down on the Berkeley campus, the Bay, and the fog-covered skyscrapers of San Francisco. It is a writer's paradise, and Feyerabend is fierce about protecting his privacy. This reporter was able to interview Feyerabend at his home only after making several phone calls to his secretary, writing two letters, and sending a telegram. "This is my own place," he says. "Most of the calls I used to get had to do with things down on campus. Professor Feyerabend is an act I put on down there for monetary gain. These things have to be clearly separated, or else in the end you take seriously what you are doing and then you are in a big mess."

Success in science depends not only on rational argument but on a mixture of subterfuge, rhetoric, and propaganda.

The "act" that Feyerabend says he puts on in the classroom is often well received. As one observer who has sat in on many of his seminars put it, he has "this mixture of disarming charm on the one hand and the capacity to cut with a rapier on the other, making him a very good value from an entertainment point of view. It is remarkable to see how he can get people interested in issues that they hadn't previously thought important."

Critics have questioned just how serious Feyerabend really is about his critique of science. Feyerabend scoffs at this. "An *argument* is not a confession," he says. "It does not reveal the 'true beliefs' of its author. It is an instrument designed to make an opponent change his mind."

What especially riles many critics is his steadfast refusal to conform to the canons of scholarly discourse, his writing often sounding like the work of a student revolutionary. He says, for example, that scientists have "more money, more authority, more sex appeal than they deserve, and the most stupid procedures and the most laughable results in their domain are surrounded with an aura of excellence. It is time to cut them down in size."

Feyerabend not only preaches "epistemological anarchism," he practices it. He claims that his health has been considerably improved by the work of faith healers and an acupuncturist. He consults astrologers. "Respect for all traditions," he writes, "will gradually erode the narrow and self-serving 'rationalism' of those who are now using tax money to destroy the traditions of the taxpayers, to ruin their minds, to rape their environment, and quite generally to turn living human beings into well-trained slaves." To save the situation, he not only recommends a "methodological pluralism" for working scientists but also a "flippant Dadaism" that appears to call for madcap clowning to deflate whatever he views as pompous nonsense.

When it comes to Feyerabend, most philosophers and historians of science are somewhat at a loss for words. Sever-

0036-8075/79/1102-0534$01.00/0

al contacted by *Science* refused to comment. Many of the half-dozen who did comment refused attribution. Some samples:

• "He is terribly selective. He moves too quickly from a little bit of factual material to the position he wants. But my god, given the way philosophers of science use historical examples, Feyerabend is not so bad."

• "He is extremely bright. He is a hell of a lot sharper than most of us who do philosophy of science, and that shows through all the antics and the theatrical polemic. That isn't to say that he isn't sloppy, or that all his arguments are compelling, but in terms of capacity to come up with ingenious points of view that nobody has thought of before, he is extremely bright. I would say he is among the half-dozen sharpest people in this field in the 20th century."

Though some philosophers and historians ignore his work and claim that in the past decade his style has outgrown his substance, Feyerabend is nevertheless on the minds of a few. "Why bother with Feyerabend?" writes David Jorvasky, a historian at Northwestern University, in a recent issue of the *New York Review of Books*. "Because his hokey act provokes thought about important issues, and does so more effectively than the usual sober treatises in philosophy of science. He would deserve warm applause, if his performance were as bold in substance as it is brash in manner."

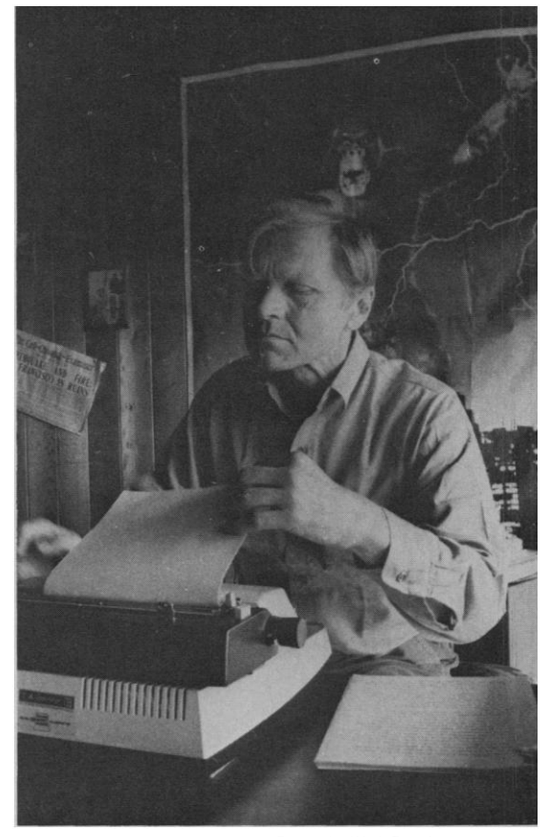
The intent of Feyerabend's attack is to deflate the received view of how science is performed. Shaped during the 1930's and 1940's by the school of positivist philosophers known as the Vienna Circle, this view holds that science is a strictly logical process. Scientists propose theories on the basis of inductive logic, and confirm or refute them by experimental test of predictions derived from the theory. When old theories fail, new ones are proposed and adopted because of their greater explanatory power. Science thus marches inexorably closer and closer to the truth.

Known as logical positivism, this view deliberately ignores the historical context of science as well as psychological factors that many people now consider important to science. The view still has its defenders, but many philosophers and historians of science now take human factors into account as well as the purely logical structure. A major force behind this change was the *Structure of Scientific Revolutions* by Thomas Kuhn (*Science*, 8 July 1977). Kuhn holds that the peaceful and logical interludes in the march of knowledge, called periods of "normal science," are punctuated by violent intellectual revolutions. There is, moreover, no logical relation between theories before and after a revolution. The study of mechanics after the conceptual revolution brought about by Newton's *Principia* is one example of a period of normal science. Astronomy after Copernicus is another. Kuhn's point is to emphasize the importance of nonrational factors, such as the historical context and the psychology of the individual, in the genesis of scientific theories.

Feyerabend goes further. In *Against Method* he argues that even "normal science" is a fairy tale—that scientific decision-making, as revealed by the historical record, is a political and propagandistic affair in which prestige, power, age, and polemic determine the outcome of the constant struggle between competing theories and theorists. This, he argues, is because no theory, however good, ever agrees with all the facts in its domain. Facts that contradict the theory must therefore either be ignored, defused by an ad hoc hypothesis, or rhetorically nudged out of the picture. Feyerabend cites instances from Einstein's theory of general relativity, Newton's theory of colors, and Galileo's dynamics.

One important example comes from a study of how Galileo attempted to discredit his rivals. With the aid of the telescope, Galileo showed that the moon was covered with mountains. He even estimated their height from the length of their shadows. This observation undercut the then-prevailing notion (passed down from Aristotle) that the celestial bodies were made of crystalline spheres, and were thus superior to the earth. By refuting this view, Galileo sought to pave the way for the sun-centered cosmology of Copernicus.

The rationalist's view of science would interpret Galileo's observation as a sterling example of how an experiment can help establish a new, more comprehensive theory. Not so Feyerabend. To him the whole incident was a farce. The epoch-making sketches of the moon that Galileo drew in his *Sidereus Nuncius* of 1610 were so inaccurate that any naked-eye observation could expose them as illusory—as Galileo's critics pointed out. In the end, however, Galileo prevailed. He did so because he wrote in Italian rather than in Latin, the scholarly language of the day. He had a persuasive style. He advertised his successes, hid his failures, and rewrote the life story of Copernicus to make it more acceptable to the church. He was, in short, a propagandist.

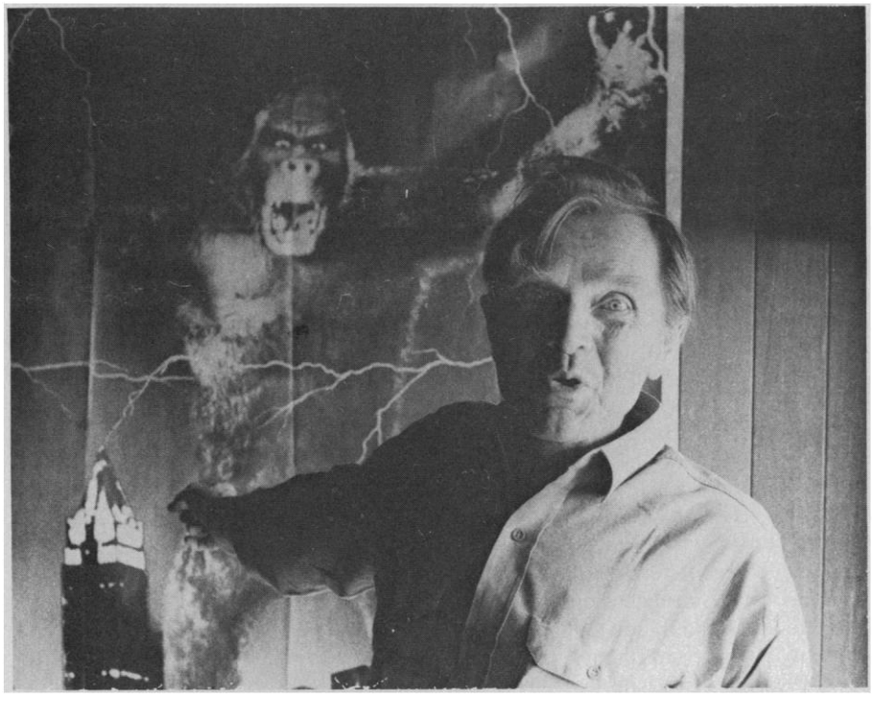


Photos by W. J. Broad

Paul K. Feyerabend

By extension, Feyerabend argues, all creativity in science is revolution in which the standard rules of the rationalists and their so-called "normal science" do not apply. A particular philosopher who Feyerabend takes to task on this point is Karl Popper of London University. Popper's falsificationist theory of science holds that theories cannot be "proved true," only refuted, and when refuted in any serious way are abandoned. To Feyerabend, all theories must be abandoned if Popper is taken seriously, for there are always important facts that do not agree with a theory. Though pre-Copernican astronomy was confronted by refuting instances and implausibilities, Copernican theory was in even greater trouble at the time. Feyerabend's moral is clear. All scientific "methods," even the most obvious ones, have their limits. Since there is no one approach to the practice of science, techniques of persuasion are a decisive factor in determining which theory will prevail.

A principal criticism of Feyerabend's position is that it is based on just one significant study. Judging his work from a wider perspective, other critics say Feyerabend is clearly lost in a cloud of academic delusion. The fact that the philosophy of science has so far failed to explain the patterns of discovery revealed by the historical record is no reason to suggest that the practice of science is therefore irrational. According to Stephen Toulmin, a philosopher at the Uni-



"Why do I like the King Kong poster? Because I have sympathy for the poor creature. There he is, living peacefully, and they pick him up and subject him to their own bloody rules. Besides, it's a nice picture."

versity of Chicago, Feyerabend's exaggerated posturing about irrationality in science is just a by-product of his having taken a successful shot at Karl Popper's theory of falsification. "Having been very much impressed by Popper earlier, he is now attacking him, merely turning Popper's own weapons back on himself, and ending up with this confusion that science is therefore not rational. . . . We didn't need Paul Feyerabend to tell us what was wrong with logical positivism. Most of us have come home from the funeral and assumed that it is safely buried."

Others slight his research. "In the past 5 or 10 years, it's become increasingly clear that his historical work is extremely doubtful and lends itself to a wide variety of alternative interpretations," says Larry Laudan of the University of Pittsburgh. "He is the polemicist using history for polemical purposes rather then having history instruct the philosopher."

Sidestepping these attacks, Feyerabend tends to deal with his critics on a rhetorical level. He says they are not just incompetent professionals, but a new breed of professional incompetents. The critics cannot distinguish between straight argument and *reductio ad adsurdum*. They react to style and overlook substance. "The only passages the reviewers seem to perceive are the places where, with a sigh of relief, they see I stop reasoning and engage in a little rhetoric. This means that rationalists do not recognize an argument when they see one, or that they regard rhetoric as more important than argument, or that something in my book so jars their thought that dreams and hallucinations replace the reality in front of them."

The critics are not shaken by this, especially in regard to Feyerabend's politics. They accuse him of having as much a dream of perfect democracy as the rationalists do of a logical scientific method. Some suggest, moreover, that he is a political opportunist. "There was a time in the late 1960's," says Toulmin, "when he had his chair at the Free University of Berlin, and at that stage his epistemological anarchism was a doctrine that was applauded by politically radical students in West Berlin. I think this political success was one of the things that threw him off track."

Dismissing his career as a search for applause is perhaps unfair, but it is clear that playing for an audience of one sort or another has been a conspicuous feature in the life of Paul Feyerabend. While growing up in Vienna as an only child he was taken by his father to restaurants, placed on top of a table, and encouraged to sing. "And for that," says Feyerabend, "Papa would get a beer."

After high school he studied opera. During the Nazi occupation of Austria he was inducted into the army, serving as an officer, and, while retreating from the advancing Russians in 1945, caught a bullet in the lower back. Today he still has a severe limp. After the war he studied theater at the Weimar Institute, and periodically visited theaters in East Germany. "Most of the time the plays dealt with the work of the resistance in Nazi Germany," he says. "They were indistinguishable from earlier Nazi plays eulogizing the activity of the Nazi underground in democratic countries. In both cases there were ideological speeches, outbursts of sincerity, and dangerous situations in the cops and robbers tradition." The devices by which a playwright indicated the "good side" were of particular interest to him, and influenced his thought on the relativity of ideas.

In 1947 Feyerabend went to the University of Vienna to study history, physics, and astronomy. While informally delving into philosophy with Victor Kraft, who before the war had been a member of the Vienna Circle, Feyerabend attended many political discussions and was impressed by the limits of formal logic. "I began to suspect that what counts in a public debate are not arguments but certain ways of presenting one's case. To test the suspicion I intervened in the debates, defending absurd views with great assurance. I was consumed by fear—after all, I was just a student surrounded by big shots—but having once attended an acting school I proved the case to my own satisfaction." After receiving his Ph.D. in 1951 he went to study in England with Wittgenstein, but the untimely death of the philosopher sent him instead to Karl Popper—whose ideas he at first revered and then spent many years trying to refute.

Since he began teaching, Feyerabend has moved with rapidity from one academic arena to another. In the 1950's he taught at the University of Bristol in England and at the Institute of Science and Fine Arts in Vienna. At one point during the late 1960's he had simultaneous appointments at Berkeley, Yale, the University of London, and the Free University of Berlin. Though Feyerabend says he is not tired of his academic career, he laments the loss of another stage, saying that "one of the biggest mistakes of my life was when at the age of 25 I turned down the opportunity to become a production assistant of Brecht."

Feyerabend still thinks about a career as an entertainer. "This is very attractive to me," he says. "Bringing a faint smile to the faces of people who have been hurt, disappointed, depressed, or who are paralyzed by some 'truth' or by the fear of death, seems to me an achievement infinitely more important than the most sublime intellectual discovery."

Despite his devotion to clowning and theatrics, Feyerabend gets very serious when it comes to the political control of science, his most recent book *Science in a Free Society* (New Left Books, London, 1978) being devoted to the subject. Here Feyerabend is confronted with a paradox. He wants to argue *for* the democratic control of science, but his relativistic views on the practice of science seem to make this impossible. Rationalists can envision a "scientific method" that anyone, even a nonscientist, can master with sufficient application. But irrationalists, such as Feyerabend, usually say science can only be learned by "intuition," by actually doing it. This view has been defended by Kuhn and by British philosopher Michael Polanyi.

Rather than capitulate to the "elitist" position, Feyerabend argues that citizens must judge science according to their own standards, not necessarily those of the scientists. Science, he says, is not beyond the reach of the natural shrewdness of the human race. "This assumption is confirmed in trial after trial. Conceited and intimidating scholars, covered with honorary degrees and university chairs, are tripped up by a lawyer who has the talent to look through the most impressive piece of jargon and to expose the monumental ignorance behind the most dazzling display of omniscience. I suggest that this shrewdness be applied to all important social matters which are now in the hands of experts."

The places to which logic leads are at times convincing, at other times not. What is clear in all this is that Feyerabend is dead set against what has been called "scientism"—the faith in the existence of a unique "method" whose application leads to exclusive "truths" about the world. When this becomes the ideology behind the Big Business of research, of teaching, of technology, Feyerabend wants to smash it, and open the way for diversity, personal choice, and play. Compared with the stiff and sober work that is often done in the philosophy of science, his views are a breath of fresh air. It is also clear that Feyerabend is far from naïve in his political world view. He recognizes that in different circumstances he might argue *for* reason and *against* anarchy. "There may," he says, "come a time when it will be necessary to give reason a temporary advantage and when it will be wise to defend its rules to the exclusion of everything else. I do not think we are living in such a time today."—WILLIAM J. BROAD

Ethics in Social Science Research

Deep thinkers convene at Kennedy Ethics Institute to define rights, wrongs, risks, and benefits of social research

In 1969 Laud Humphreys, an Episcopal minister working on his doctorate in social relations at Harvard, conducted a study designed to cast light on society's treatment of homosexuals. He set himself up as a "watchqueen" in a public bathroom in Saint Louis to alert homosexuals to intruders while they were engaging in fellatio with each other. Humphreys also observed the license numbers of the habitués of the "tea room," as it is called, and learned their identities by going to the Department of Motor Vehicles and representing himself as a market researcher. He then joined a public health survey team, changed his hairstyle, and interviewed his subjects as a public health researcher.

The social science community is still talking about that project. It has become a classic in the fast-growing field of ethics in social science research, where it is commonly cited as a crass violation of subjects' rights. Although Humphreys was scrupulous about guarding the confidentiality of his subjects, and although his book, *The Tea Room Trade*, is supposed to demonstrate that homosexuals are ordinary folk and not menaces to society, such a project is regarded as indefensible in the ethical climate of the late 1970's. Humphreys deceived his subjects, failed to get anything remotely resembling informed consent from them, lied to the Bureau of Motor Vehicles, and risked doing grave damage to the psyches and reputations of his subjects.

The Humphreys experiment was mentioned repeatedly at a recent 2-day conference on the ethics of social science research held at the Joseph and Rose Kennedy Center for Bioethics at Georgetown University. The meeting, funded by the National Science Foundation, brought together about 30 experts in philosophy, ethics, law, and social sciences to thrash out the costs and benefits and rights and wrongs of social research. The meeting was unusual, according to one observer, because most meetings on this topic are little more than "gripe sessions" about federal regulations or strategy meetings on how to conduct research without running afoul of them. Social scientists say the federal regulations on research with human subjects, which are based on the recommendations of the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, are primarily designed for biomedical research and are either too inflexible or inapplicable to the array of research situations in which social scientists are involved. They find little guidance in the codes of ethics of various professional societies, which rarely go beyond bland generalities.

In addition to government regulations, the participants discussed privacy and confidentiality, informed consent and deception, and harm in social science research. The theoretical talk, in other words, boiled down to the nature of harm and what should be done to avoid it.

Discussions among social scientists, as among biomedical researchers, represent two schools of thought. One is consequentialism, also known as utilitarianism, which holds that the rightness or wrongness of an act can be judged by its consequences. In this school of thought it can be inferred that certain apparently immoral practices are justifiable on the grounds that they provide a large benefit or prevent a greater evil. This philosophical framework is characterized by cost-benefit equations. Thus, for example, the introduction of hepatitis virus in a childrens' home might be justified on the grounds that many cases of hepatitis will ultimately be prevented by the research.

The consequentialist approach stands

0036-8075/79/1102-0537$00.75/0