# Elements of the 'Self-Policing Mechanism' of Science

The policing effort he mentioned rests on several foundations. The first is that anyone wanting to be a scientist must first complete four years of college in his chosen field, then spend several years under the supervision of a practicing scientist being screened carefully for work efficiency, scientific imagination and cleanliness of purpose. If the student survives, he receives the scientific union card -- the doctoral degree. The second is rigid observance of scientific method. And that requires him to choose a problem in science which has not been solved, to devise experiments to see if the problem can be answered, to collect the information accurately with the most appropriate instruments or tests available to him, to interpret the information with rigid logic, and to see if the interpretation affects theories which explain a larger and more general set of scientific phenomena. Third, the scientist must expose his findings to his fellow scientists in professional journals or at professional meetings -- and see if his results might survive attack, criticism and objective examination. If his results are really good, other scientists will also attempt to study the same problem by experiment to see if our scientist really knows what he is talking about. That's scientific method, and it's a tough life. If the scientist is working in industry, however, the approval of his results is not based on checking with his scientific equals, but usually on the opinion of his boss.

Theory of U.S. Press as 'Ombudsman'

That view is an intrinsically American one. It is the theory that factual information, pro and con alike, will help the citizen to protect himself against abuses of power. The press has traditionally been considered this window upon the power centers of politics, the military, industry and the like ( a role which it still plays, though unevenly). Under this reasoning, facts about power abuses or economic wastes by one power center are made public. Armed with this information, other opposing power centers can help check the abuses, in the way that one political party acts as a check on other parties, for example, or in the way that Congress acts as a check on the Presidency. The lonely citizen can also act upon this information through exercising his vote or withholding other forms of personal patronage or support to the offending power center. In this sense, the press is not simply a factory for fun, "isn't that interesting" facts, and routine notices, but also is an ombudsman and defender of the public against power centers.

And science -- with $17 billion a year in tax funds, with vast influence on Universities and the lower schools, with the so-called military-industrial complex heavily dependent upon its contributions to basic knowledge and to technology -- fits all the requirements for being a power center.

Most of what the American public knows about science comes from the science writer.

Ralph Nader, who was turned away by several science writers before he achieved striking public success as a critic of automobile safety engineering, made this sardonic remark about science writers in our Washington conversation:

"Science writers are notoriously extra-terrestial, submersible or transplantable." He felt that science writers were interested in little more than space exploration, oceanographic expeditions or daring organ transplant operations.

Due to a variety of circumstances, some of them beyond their control, many science writers help to create the perfumed fog separating the real world of science from the public. Exceptions are writers like Hines; John Lear of The Saturday Review, whose targets have included doctors who conduct experiments on patients without their consent, and Morton Mintz of the Washington Post, who specializes in exposing "killer drugs" sold by the pharmaceutical industry.

Who and what are science writers?

They are largely laymen -- outsiders -- who write about science for the nation's newspapers, magazines, electronic media, special and trade publications, and commercial publishing houses. Science in their definition includes the classic sciences, medicine, engineering and some of the social sciences. Their principal organization, the National Association of Science Writers, enrolls some 250 regularly-employed or free-lance writers and editors, and another 500 or so public relations men and officials with universities, science-oriented industries and government agencies. The scope of membership ranges from the science editor of the New York Times, who prefers stories on quasars and high energy physics, to the small town reporter who occasionally covers meetings of the local medical society. As a rule, they are better paid than their other colleagues receive most of their information from attending press conferences at scientific meetings, interviewing the few scientists who feel compelled to talk to reporters, and reading scientific journals and press releases.

The 1963 brochure from Science Service, designed to convince newspaper editors to buy its regular dispatches on science, gives an indication of what the editors want (and the capital letters are reproduced exactly):

-- SEASONS, SHIFTS IN THE WEATHER, HURRICANES, TORNADOES, GREAT STORMS, ECLIPSES, EARTHQUAKES, THREATENED WILDLIFE, BIRD MIGRATIONS, ANCIENT MAN, FALLOUT , FUNDAMENTALS OF SPACE, INSIDE THE ATOM, ETC... These are the types of things that our feature stories must cover.

-- Science Service ... often gives the public the first news about VACCINATIONS, OPERATIONS, DANGEROUS EPIDEMICS and the PREVENTION OF DISEASE.

-- Our nature writer dealing with BIRDS, BEASTS, BUGS and other phases of BIOLOGY will not usually cover PEOPLE AND EMOTIONS which is the field of the staffer knowledgeable about psychology,psychiatry and anthropology. The writer covering ATOMIC ENERGY, ATOMS, MOLECULES, CHEMICALS and other content in chemistry and physics may be expected to write important angles on the TEST BAN, FALLOUT and AUTOMATION.

The tone of the science writer is a generally positive one for these reasons:

1. Science at its best truly <u>is</u> glorious. The first chemical analysis of the soil of the Moon by the Surveyor spacecraft, the unraveling of the structure, function and meaning of the genetic material DNA and similar events were among the most exciting happenings of the century. The method for determining the validity of any information and use of the highest intellectual powers in interpreting it is -- at its best -- a view of things which could profitably be imitated by politicians, lawyers, industrialists, writers, leaders (and followers) in the U. S. This excitement and respect heavily influences the science writer and those among the

public who read his articles.

2. When the science writer happens upon a story which arouses his suspicions (in being either faulty, fraudulent or insignificant) he generally does not print it. In political and other types of reporting, the negative story is frequently on the front page -- but seldom in science writing. The net effect is that the public sees news of a great many breakthroughs but few breakdowns.

3. The editors of newspapers generally regard science reporting as belonging to the "good works department," such as the religion or real estate page. Bad things happening in science is an inconceivable idea in the upstairs editorial suites. A reporter for one of the world's great newspapers, for example, was assigned by his editor to do a background investigation of a scientific development planned for announcement by a major university. The reporter's conclusion was that the development was faulty, but the editor, since the prestige of a university backed the development, ordered the story printed straight. The development later turned sour. When I asked the reporter to tell me the full story of his editor's decision, he replied:

"What do you want me to do? Crack my rice bowl?"

4. There are at least two public relations men for every science writer who turn out frequent stories about scientific accomplishment. Universities have employed more and more science writers in the past decade in the search for better students, better faculty members and bigger financial support from public and private sources. Industries employ them to boost sales of the medicines or scientific instruments they manufacture. Scientific groups, such as the American Chemical Society and the American Institute of Physics, use science writers in preparing accurate public announcements of major research findings.

Government uses them to answer requests from the public and to demonstrate -- factually -- that tax money is behind many major scientific developments. Never do they issue news releases about failures (although the more conscientious ones will provide information on failures if it is requested by the press or public.) But, in general, the press must find about the failure first. Never do they suggest that the system which produced the scientific accomplishment could be improved.

An idea of the value of these public relations men is given by an ad published in the newsletter of the National Association of Science Writers. The ad was placed by a public relations agency seeking a medical writer to handle news about a pharmaceutical firm. The salary: Between $15,000 and $25,000 a year.

5. Scientists are accustomed to conducting their business, including their federally-financed business, out of sight. Massive federal grants and subsidies have been around for less than two decades, while the scientific tradition itself is several hundred years old. Scientists, consequently, are mystified at talk about public obligation or accountability, since for centuries they have been accountable largely to themselves alone. When such accountability is required, the average scientist loudly brands it as "red tape." The taxpayer should support science for the good of the culture, their reasoning goes, and why try to explain what the public wouldn't understand anyway.

An inbred tradition of secrecy also exists within science, and is found largely in the "referee system." This comes into operation when a scientist attempts to fulfill his most revered function -- to publish a report of his research in a respected scientific journal. His "paper" is usually passed along by the journal editor to "referees", or experts in the scientist's field, who judge its quality. The referee has the privilege of exercising all the cruelty and pettiness he may desire in criticizing the paper, and may choose to have his identity shielded from the scientist-victim. The principle of the referee system has been extended into several government science agencies. Anonymous referee-like scientific advisors may wreck a scientist's application for a research grant — and the scientist may never know who did this or why it was done.

Learning to live with such secrecy, then, might very well condition a scientist to laugh cynically when one of the "windows" to the public -- a reporter or a Congressman, for example -- speaks of the public's right to know whether tax monies are spent honestly and efficiently.

6. Scientists are so well regarded by the public in general that they are asked for advice on many things outside of their specialty. Dr. Benjamin Spock, a pediatrician by training, is the darling of peace groups, for example. And Dr. Edward Teller, the physicist who ramrodded the development of the hydrogen bomb, has offered well-reported opinions on air pollution. Few groups, whether private or governmental, feel really safe without their "scientific advisors."

7. There are almost no incentives for investigative, critical reporting of science. Most of the awards available to science writers are sponsored by industries or scientific societies with the implied goal of obtaining favorable

public attention. In contrast is the most coveted of all the awards in journalism -- the Pulitzer Prize. Since World War I, about a third of the Pulitzers have been awarded for exposure of graft and corruption in government or industry. In science writing, several Pulitzers have gone to newspapers or individuals who did penetrating studies of birth control or pollution programs, and for stories such as William L. Laurence's exclusive New York Times stories on the development of the atomic bomb in World War II. But none have been awarded for studies of scientific mismanagement of public funds, or of breakdowns of the system, ethical as well as financial, under which science operates.

Another insight to the motivations of the science writer comes from Issac Asimov, the Boston biochemist who is now approaching the 100 mark in the number of books he has written on science for children and adult laymen. In a publicity pamphlet on Asimov by the publishing firm of Houghton Mifflin Company, the fantastically prolific Asimov wrote the following:

"...I have a particular attachment for my science books for teen-agers. Among my readers (I sometimes secretly think) may be someone who someday will be a great scientist and will recall that he grew interested in his profession through reading one of my books."

Asimov, among his other goals then, is <u>recruiting</u> for science.

Another well-known science writer is Arthur J. Snider, science editor for the Chicago Daily News and former president of the National Association of Science Writers. This gentle-mannered man is known among science writers as one reporter who chose not to praise Krebiozen as a cancer cure when it was unveiled in a 1951 press conference.

I was chatting with him about science writing.

"We, the science writers, wouldn't write that a scientist's report is hogwash. We would just drop it and go on to someone else's story. So you're writing upbeat stories. This is bad, I suppose, but with science, you are looking for the new world to come."

"You're looking for something better than we've got?" I asked.

"Yeah. Utopia. We feel, I suppose, that there is so much bad news that when something comes along in science, we have to feature it as good news. So you get your 'Eureka' stories."

Probably the most articulate supporter of the optimistic approach to science writing is a young Harvard sociology graduate, Victor McElheny. He has written for Science, the British Broadcasting Corporation, the Washington Post, and is now the science editor of the Boston Globe. Here are excerpts from a long and concentrated tape-recorded conversation between McElheny and I:

"I believe it is very important to talk about details of budgets of scientific agencies. I believe it is important to talk about technological screw-ups," he remarked. "But there is the other problem, which is sort of taken as hymn singing, which isn't well done.

"What I'm really driving at is that the hardest thing to be, the most critical thing for a science journlist to be, is in fact very optimistic. I don't have time to carp, because what I am busy talking about is what is possible, not what is impossible or what is being done wrong. The hardest story, the one which is resisted violently as a standard intellectual posture, is the really optimistic story. People are more interested in hearing tales of people starving to death on the streets of Calcutta than they are in hearing that India herself is feeding 150 million more people than she was 20 years ago.

"India is a rocking, rolling craphouse, but despite the fact that they are living on the borderline of the Middle Ages, in many ways, they ARE feeding 150 million more people. The real story is the really fantastic power of modernity to operate even in a very primitive culture. This is much more important than a lot of negative carping about doomsday."

There are valid historic reasons for defending science to the public. Much past criticism has been rather crude -- of the "evolution is a cruel hoax" approach, or the "taxpayer is paying science to study the sex life of the tse tse fly" variety.

There is the legacy of the Scopes "Monkey Trial" of the 1920's in which a teacher was tried in a Tennessee court for teaching Darwin's theory of evolution in a public school. And there is the legacy of the Indiana Legislature which, in the 1890's, attempted to pass a bill changing the value of Pi -- the mathematical symbol representing the ratio of the circumference of a circle to its diameter -- from an actual 3.141 to a nice, round 3. Biblical reference to the design of round sacrificial altars were cited as evidence of the validity of the even number. And there are prevailing undercurrents of fear of many technological developments such as the computer, a growing distrust of physicians largely over fee practices and a considerable amount of misunderstanding of the goals and methods of basic science. The optimistic approach toward interpreting science to the public is based on a sincere desire to overcome the resistance to the best in science.

But science is no longer the pursuit of the gentleman butterfly collector or the pastime of the dotty professor. It is institutionalized, it is a power center, it is tax supported, it represents both the best and worst in Man, and its accomplishments are now campaign items in U. S. presidential elections. Its traditions of secrecy and self-exile from the public offer protection for the creative scientific thinker -- as well as for the sharp scientific operator.