SCFS FORUM

Southern California Federation of Scientists

"Science in the Public Interest"

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Founded in 1951 as the Los Angeles Chapter of the Federation of American Scientists, the Southern California Federation of Scientists is a non-profit educational organization dedicated to issues affecting SCIENCE, SOCIETY and PUBLIC POLICY. The **FORUM** is intended as a communications vehicle among our members and readers. We hope that our readers will send their comments and debate one another on the issues of the day. Please contact or send all materials to:

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PUBLIC POLICY MAKING PROBLEMS INVOLVING SCIENCE AND TECHNOLOGY

by John M. Bachar, Jr.

Policy makers in general are confronted by many complex problems whose solutions rest inherently on scientific knowledge or technical insight. Since most policy makers have little or no background in science or technology, this puts a considerable premium on the clarity, veracity and reliability of advice and information that Policy makers and other non-experts receive from various issuers. Such advice and information must be as free as practicable from certain inherent flaws to which any issuer may be susceptible. These include:

1. Distortions or biases may occur due to self- serving aims.
2. Facts may be only partially revealed, or released in an untimely manner, or deliberately withheld in order to achieve purposes contrary to, or to influence, or to distort public policy, thereby contravening the pure scientific objectivity function to which the issuer is generally bound.
3. Advice may be based on ignorance, or uncertainty, or errors in judgment.

By themselves, these flaws already present obstacles to realistic and objective policy making but they may be further exacerbated by the existence of secrecy rules under which some issuers operate, particularly scientific/technological agencies providing specific services. In such cases, the agency often has possession of all the pertinent facts and information to the exclusion of nearly everyone else.

In processes involving science/technology-based policy making, the following structure often exists (a concrete example is parenthetically indicated):

1. There is a ***provider*** of a scientific service (example: national scientific laboratories, such as Livermore or Los Alamos National Laboratories).

2. There is a ***recipient*** of the scientific service (example: the Department of Energy, an agency of the federal government).
3. There is a set of ***policy makers*** (example: the Congress and the Executive branch of the federal government).
4. There is a ***manager*** of the provider (example: a public university such as the University of California).
5 There is a ***dominion entity*** to which the manager is accountable (example: the state of California which delegates managerial authority to the University of California as a public trust).

The ***recipient*** and ***policy makers*** have a right to know with assurance, and the ***provider, manager,*** and ***dominion entity*** have a responsibility to assure, that all ensuing advice and information have the characteristics of integrity, objectivity, veracity, and reliability.

There is a structure that can sustain this desirable state as well as provide a safeguard against the above-named flaws, particularly in situations where secrecy rules are in effect. The structure is an independent, external review board of experts that regularly scrutinizes the operations of, and the advice and information issued by, the provider. Such a board must have access to all pertinent facts controlled by the provider in order to ascertain the integrity of the operations of the provider as well as the reliability, veracity, and scientific objectivity of the advice and information issued by the provider. Moreover, the board must have independent authority to issue its analyses and critiques to Policy makers and the public.

It is the responsibility of the ***dominion entity*** to create such a board or to direct the ***manager*** to do so subject to requirements imposed by the ***dominion entity***. Likewise, it is the responsibility of the ***Policy makers*** and the ***recipient*** to create such boards as well.

There are other aspects of science/public-policy issues. These are given in the following list.

1. The purpose for an "independent review board of experts" is to protect the public interest in matters that involve science and technology. The above-named bodies in 1 to 5, other science advisers, and the general public must explore ways to improve the quality, veracity and timeliness of scientific advice and information provided to decision makers.
2. A major challenge is how to blend technical and non-technical considerations into the final decision(s) — how to act, for example, when scientific information is uncertain or there are large areas of scientific ignorance or wide disagreements among apparently equally respectable experts both as to the characterization and the implication of the data for political or other societal action.
3. Here are some questions of interest to scientists and Policy makers:
   (a) How should knowledge be packaged in a form that is most useful to those faced with the task of using this knowledge in the making and implementation of policy decisions?
   (b) What guidance should scientists reasonably expect from Policy makers as they try to establish their research agendas in such a way as to be relevant to policy?
   (c) What guidance would scientists prefer and what kind would they consider inappropriate as, for example, compromising their independence as scientists?
   (d) What kinds of answers can Policy makers reasonably expect from scientists without attempting to push them to conclusions that simply cannot be extracted from existing data, given the current state of knowledge in the relevant technical fields?
   (e) How do the findings of research get onto the agenda of Policy makers, and what role should science and research play in establishing priorities among policy issues that should command the attention of the public and decision makers?
   (f) What is the dividing line between keeping research relevant to policy and distorting the scientific process through excessive responsiveness to current policy needs or institutional and power structures?
4. The more that the results of science are explicitly designed to function as tools in the policy process, the more that knowledge is shaped by its intended function, and hence, the greater the danger that not only the form, but also the substance of scientific truth will be distorted to fit policy preferences, not just policy needs.
5. Ideally, policy decisions should be prompted by "compelling scientific evidence". Unfortunately, this is the exception rather than the rule, for all too often, technical uncertainty makes policy problems. Although uncertainty or ignorance exists only at the "margins" of science, it is at these margins that most public policy problems involving science occur. One reason for this is that the consequences of the application of technology frequently carry us into domains where there exist no systematic or codified body of knowledge on which policy can be based. Yet, the possible consequences of what we do not know do not allow us the luxury of suspending judgment pending the acquisition of more data and better theory, as would be the case in ordinary science (example: hazardous waste management of toxic and radioactive materials).

6. It is highly important for policy purposes to make a distinction between ignorance and uncertainty. Uncertainty is an absence of knowledge within a "completely articulated structure", a definite intellectual framework. It is simply a recognized gap in a systematic body of knowledge. Ignorance, on the other hand, involves knowledge whose very existence may be unsuspected. There is knowledge that, for all practical purposes, nobody knows exists, not even to look for it, never mind knowing where to look for it. There is also ignorance that is contextual: the knowledge actually exists but the people — Policy makers and experts — who are in a position to apply the knowledge are unaware of its existence and the few people who have mastered the knowledge are not aware of its public significance.
7. Even when experts strive to be impartial, policy preferences nevertheless significantly influence the interpretation of data and evidence when uncertainties are present.
8. Adversary forms concerned with technology policy issues should address all questions relevant to a choice among policy options, political and ethical as well as scientific and technological. One possible adversary form is the adversarial hearing with expert advocates appearing together to present their own views and to cross-examine each other. With respect to technical disputes, adversary forms may be suited to map areas of disagreement as well as areas of consensus.
9. With respect to the problem of the burden of proof in decisions concerning technology that involves uncertainties, the burden of proof may be upon those who are opposed to a particular technology (**"Let the buyer beware"**) or upon those promoting it (**"Let the seller beware"**). It is more and more the case that promoters share the burden of proof (example: modern day environmental protection requirements to which promoters must conform).

Reference:

Science for Public Policy, edited by H. Brooks & C. L. Cooper, Pergamon Press, 1987. ###

Next General Meeting

January 19, 1994

7:30 pm

"Ward Valley Nuclear Waste Dump"

-- Dan Hirsch, et al. --

Ken Edwards Center

1527 4th Street

Santa Monica

TIDBITS OF SCIENCE

INTERCONNECTIONS: INFECTIOUS AND GENETIC DISEASES

By James C. Warf

In prehistoric times the intrepid Malay sailors explored and colonized not only the numerous islands of their Indonesian archipelago, but also as far west as Madagascar and the African continent. They established a number of settlements in the areas which today are Kenya, Tanzania, and Mozambique. Eventually they were absorbed into the black populations. The African languages still retain some words of Malay origin.

But another facet of these contacts survives. The old Malays also introduced the agricultural technique of slash and burn. This procedure yields quick results, and is therefore appealing to hungry peoples. But on the longer scale, it is exceedingly damaging to the land, and crop yields slowly dwindle, forcing the populace to move on and become nomadic. In those times, that was tolerable, but with population pressures of today, it is no longer feasible. But the worst part is that land subjected to slash and burn becomes a far more fertile breeding ground for mosquitoes. This meant that the incidence of malaria accelerated.

The female anopheles mosquito feeds once every four or five days. The biochemical conditions for survival of the malaria bacteria in the insect's stomach are favorable (in contrast to other species), and so the disease is transmitted easily. The ancient Romans knew that malaria is spread by mosquitoes, but that knowledge was lost during the Dark Ages. It was rediscovered by Americans who were digging the Panama Canal. The bacteria attack the red blood cells and digest their hemoglobin. Of course other kinds of mosquitoes are the vectors for other diseases: yellow fever, dengue fever, elephantiasis, etc. Other insects also carry diseases, for example the tsetse fly transmits sleeping sickness. Ticks might play a role too, since they are known to spread some illnesses, such as Lyme disease.

The AIDS virus lives only a day or so inside the stomachs of insects, so this disease is not transmitted by bites, at least so far. This might not always have been the case. There is some evidence from studies of human inter-gene DNA that prehistoric people suffered one or more devastating outbreaks of AIDS-like infections, drastically depopulating large areas. These disorders

(Continued on page 5)

Rocketdyne Cleanup Coalition
—by Shel Plotkin

(Note that opinions are those of the author and not necessarily shared by his colleagues.)

The Rocketdyne Cleanup Coalition, RCC, is alive; its health is questionable because it has been a long, hard struggle that will not be over for some time. There are three culprits we have to deal with: Rockwell Corporation, U.S. Department of Energy (DOT), and the California Department of Health Services (DHS). These three groups work together in an effort to obscure the problems, while appearing not to be devious and manipulative as they twist and hide the facts.

Original goals several years ago were to (1) stop the Nuclear Regulatory Commission from relicensing the Rockwell's Santa Susana Field Lab (SSFL), Hot Lab, (2) initiate an epidemiology study of the Rockwell SSFL workers, and (3) oversee the SSFL property cleanup of radioactive and toxic chemicals plus ground water contamination. (This is the same Rockwell Corporation that operated Rocky Flats so negligently.) Of these goals (1) was accomplished some time ago as Rockwell shifted its one job, TRUMP-S, to Missouri and ceased all radioactive work at the SSFL.

Then with the help of Assemblymen Terry Friedman and Richard Katz the employee epidemiology study was forced on Rockwell, DOE, and DHS with significant RCC participation. In fact, four members represent the RCC on the Epidemiology Study Advisory Panel and the EPA SSFL Workgroup. Besides Dan Hirsch, Barbara Johnson, Jerry Raskin, and Shel Plotkin from the RCC there is also Caesar Julian, an appointment by former Assemblywoman Cathy Wright, representing the community on these panels also.

At present UCLA has been chosen to be the epi study contractor. Community concerns center on the fact that the entire UCLA study team has zero experience performing radiologic epi studies. That deficiency can be alleviated by utilizing a consultant or two with the proper experience and public confidence to "structure and monitor" the radiologic part of the study. Thus far, UCLA with DHS support has fought this use of outside consultants. There are only two or possibly three epidemiologists who have the experience and can be trusted by the community: Alice Stewart, Greg Wilkinson, and possibly Steve Wing. Of these Greg Wilkinson has actually been appointed as a consultant to the project, but UCLA, with support from the non-community part of the Advisory Panel thus far, has absolutely refused to agree that he will be used to "structure and monitor" that part of the study. Exactly how much Greg Wilkinson will be able to participate in the study is yet to be determined.

At one point all four RCC representatives were going to resign over the apparent attempt to bias the study. However, at the moment attempts are being made for a compromise position. It is very interesting that the other members of the Advisory Panel, including national Physicians for Social Responsibility members do not share the RCC fears regarding Rockwell, DOE, and DHS pressures that appear to have been brought to bear on UCLA.

With all efforts being expended on this epi study, little has been done to monitor the contamination cleanup. Dan Hirsch did visit the and found that they were using a supposed radioactive background sample only a very short distance from the contamination being cleaned up. Apparently the Rockwell crew was completely oblivious to the distinct possibility that they were using a contaminated background sample. Such use would result is their honestly believing the contaminated section had been cleaned up when it was still contaminated. This is the type of technical error Rockwell, DOE, and DHS are making continuously.

In fact, Dan Hirsch was called to observe the Ventura County Water Commission's examination of a "cleaned up" section. Of ten samples taken, seven by the water commission, one by a reporter, and two by Dan, the two from Dan plus one from the water commission were found to still be contaminated — that's after Rockwell thought everything was OK and the background sample had not been reevaluated yet.

Community oversight is absolutely essential, but thus far the RCC has not been able to work on this third phase of its objectives. Cleanup oversight is by far the most time-consuming part of our goals and objectives, so we have not been able to "do our job" as it should be done. Unfortunately, we will probably have some time once we are "forced" to resign from the Advisory Panel, because we will not be able to trust the accuracy of the forthcoming UCLA epi study.

Latest Flash:

At an informal meeting between RCC reps plus two MDs with the UCLA epidemiology study team leaders it was learned that Rockwell literally destroyed all chemical pollution records in 1984. This is a criminal offense that has just come to light. All this after Rockwell reps became incensed at recent EPA meeting when community people expressed concern that they might destroy environmental records because of present studies. Needless to say, there will probably be some fireworks at the next EPA SSEL Workgroup meeting as well as the next Epi Study Advisory Panel meeting. It is inconceivable that Rockwell could have hidden this criminal act by it's corporate executives from DOE and DHS authorities all these years. Word has it that they are claiming now that some deranged and unknown employee did the shredding act. Anyone who has ever worked for a large corporation will realize that no employee ever takes such gross initiative on their own. Anyway, so much for Rockwell's corporate dishonesty somehow changing for the better because of a desire for a better public image. ###

might have been insect-borne instead of being sexually (transmitted. When all human beings with the infection perished, the AIDS-like disease disappeared, as was the case recently with smallpox.

But the more immediate consequence of the greatly enhanced malaria outbreaks was this. Somewhere in Africa there arose a mutation in the structure of the hemoglobin of human blood. It occurred in a gene which controls synthesis of a hemoglobin protein. The resulting hemoglobin has less oxygen-carrying capability, and also leads to physical weakening of the red corpuscles. The corpuscles, normally shaped like saucers with thickened rims, flex and break in two, leaving halves which sometimes resemble sickles, hence the name sickle-cell anemia; various other shapes are also found.

It turned out that malaria bacteria get indigestion when they try to assimilate the mutant hemoglobin. Their enzymes cannot accommodate the changed amino acid sequence. This gave an evolutionary advantage to carriers of sickle-cell anemia who lived in areas of high malaria incidence. The genetic disorder has a range of intensities, and many, despite showing some symptoms of the genetic disorder, live long enough to reproduce. In heavily malarial regions, those without the mutant gene find their numbers severely reduced. Thus over the generations, people with the new gene began to predominate. The incidence of sickle cell anemia in American blacks is 1 to 5%. One technique for treatment consists of injecting chemotherapeutic drugs for leukemia in order to kill red blood cell-producing tissue in the bone marrow, and then introducing bone marrow from a suitable donor. Another technique, known in principle but not yet developed, lies in gene engineering.

After the above information became widely known, medical anthropologists began to wonder whether there might be other similar histories among other peoples. There are more than 3000 genetic disorders in the human race, so there were abundant diseases to study. Cystic fibrosis is one, and it is mostly confined to people of European origin. Like sickle cell anemia, some cases are fatal in early childhood, but others are light and the subjects live to reproduce. Could it be that there is a serious infectious disease among peoples of European origin which gave an advantage to those suffering from cystic fibrosis? Examination of all the candidate sicknesses indicated that tuberculosis might qualify. Comparative studies of death rates from tuberculosis of those with and those without cystic fibrosis gives strong support for the hypothesis. In some unknown way, the genetic disease seems to provide some immunity to the infectious disease. It is too early to state this as a conclusion, but it seems to be true. Today it is known that cystic fibrosis arises from a defective gene at location 508, resulting in the deletion of a single amino acid.

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SCFS Projects Reports

1. Economic Conversion/Jobs Task Group.

The initial phase of this work has been completed. SCFS can spell out in some detail just exactly how the economy can be shifted from military to non-military production. A significant increase in the number of jobs available resulting from the program is insufficient to solve the jobs problem and leaves a fraction of previous military workers unemployed.

Putting everyone to work requires an independent jobs program which is something the country has already had experience doing. Perhaps the key feature of this SCFS jobs program is the source of funding. It turns out that money has been available all along to put everyone to work and revitalize the economy through increased consumer purchasing power.

Papers are being written with present target publications being Monthly Review and the Bulletin of Atomic Scientists. The idea here is to establish some credibility for the two programs and then attempt to assist politically active groups by making our material available. Hopefully, the two programs will become a reality in the not too distant future.

It is a tall order, but after all, what's SCFS for?

2. Rocketdyne Cleanup Coalition.

See the expanded write-up in this issue of the SCFS Forum.

3. Jack Jennings Memorial Fund.

It was decided by the SCFS Executive Board that there was no obviously appropriate award at this particular time, so we postponed the matter till next year. This fund was set up to honor Jack by giving a yearly (or so) award to a technically oriented project or person that we thought Jack would approve of.

4. Vietnam Wind Farm Project.

Preliminary data from the one 30m height pole was good. We have to be cautious because the data was taken during a windy time of the year and was acquired over only a short time period, but so far, so good! There seems to be a problem building and installing the second 30m pole that was arranged for. VN has the electronic equipment that the American Friends Service Committee paid for; however, we found out before that installing the pole after fabrication is very difficult. Hopefully, the second pole will get up soon, so we can begin collecting additional data. Communication with VN has been difficult for some reason that is not quite clear.

The object here is to try to orient VN toward alternate energy systems before they are committed to petroleum generating facilities. A multitude of oil companies from all over the world are presently badgering VN to develop offshore oil reserves. If left alone, it seems certain VN will go the same route as the rest of the developed world in so far as relying principally on petroleum as an energy source.

5. Ward Valley Nuclear Waste Dump.

See the LA. Times editorial for details. Note that SCFS is one of the plaintiffs in a law suite against the CA Department of Health Services, DHS, in an attempt to force them to deal with the real health and safety issues. Of significance is that some years ago the former Soviet Union tried to bury its nuclear power plant waste directly in the ground and was condemned so severely by the rest of the world that they stopped the practice . So now we in the US, in general, and California in particular are trying to do just exactly what we condemned the USSR for doing.

Besides providing technical analyses by a number of SCFS members, some of us assisted LA-PSR in lobbying effort with various congressional legislators. Attempts were made to convince them to assist Senator Barbara Boxer in her efforts to turn Secretary of Interior Bruce Babbitt around. The Clinton administration appears to have made some sort of deal with Governor Wilson to transfer the federal land at the Ward Valley site to California so the DHS can proceed with its industry supported, irresponsible nuclear dump project.

At present the law suit against DHS by SCFS, LA-PSR, CBG and the Fort Mojave Indians for not addressing the technical issues properly in the EIR (Environmental Impact Report) is proceeding. Secretary Babbitt indicates that he has had a change of heart and announced that he will not transfer the land until after the law suite has been resolved and then will see that a full adjudicatory hearing will be held. Obviously, this is a large victory because the law suite can take a number of years to resolve and then a full hearing rather the planned sham hearing seems in the offing. Readers are cautioned that we have experienced victories before only to have a new development turn the situation into a defeat at a later date.

It should be noted that Dan Hirsch and CBG are coordinating and literally orchestrating the Ward Valley opposition effort. On December 6 the West Hollywood City Council conferred commendations on the four law suite plaintiffs for their Ward Valley opposition efforts. John Bachar and Shel Plotkin represented SCFS at the awards proceedings. ###

Announcement

City of West Hollywood
issues
Certificate of Commendation

"Commending Southern California Federation of Scientists for their activism to halt the use of Ward Valley as a nuclear waste dump site."

"Now, therefore, be it resolved that the City Council of West Hollywood hereby commends (or proclaims), the Southern California Federation of Scientists for their steadfastness and leadership in this cause. The City looks forward to the adjudicatory hearing in the hope that the perils of the decision to use Ward Valley as a dump site for nuclear wastes will be fully examined and that the health and well-being of our citizens will be paramount in any judgments made about the dump site during the course of that hearing "

Signed by the following:
Sal Guarrielo, Mayor
Abbe Land Major Pro Tempore
Paul Koretz, Council member
Babette Lang, Council member
John Heilman Council member

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Identical Commendations were also given to the Campus Committee to Bridge the Gap, Los Angeles Physicians for Social Responsibility and the Fort Mojave Indian Tribe

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Please help the **Southern California Federation of Scientists** provide the scientific and technical knowledge that will enable the public and it's officials to better understand the issues affecting science, society and public policy.

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