

Probing advisory committees: EPA shows independence

Hearings before a Senate Government Operations subcommittee this year have gradually uncovered a network of "shadow government" by advisory committees to Federal agencies (SN: 7/31/71, p. 82).

This week and last the hearings returned to the subject of advisory committees that deal with environmental and scientific matters. It appeared that the new Environmental Protection Agency and its administrator, William D. Ruckelshaus, may yet retain an exceptional independence from their advisers.

Sen. Lee Metcalf (D-Mont.) and his subcommittee counsel, E. Winslow Turner, sharply questioned EPA's Thomas E. Carroll about various EPA advisory committees. Carroll often was frank—in contrast to earlier witnesses from older agencies—in acknowledging inadequacies of the committees and voicing EPA's apparent resolve to take their advice with a grain of salt or even ignore them.

Much of the colloquy centered on the newly appointed National Research Council committee on auto emissions (SN: 10/2/71, p. 224). The committee was established by Congress to advise EPA on whether to grant extensions to auto companies for meeting 1975 emission standards. The companies can apply for the extensions any time after Jan. 1, 1972; but the NRC committee was established only this September.

"How can [the busy committee members] possibly work night and day in the next three months to be able to come up with anything?" Turner asked.

"We have obviously been interested in answers at the earliest possible date," Carroll commented. "We are dismayed at the delay."

He indicated EPA is dismayed by some other things, too. For instance, EPA had asked for a chance to review candidates for the NRC committee, but, said Carroll, "We were denied this opportunity."

Carroll agreed with a comment by Turner that the committee is deficient in not including economists who could evaluate such matters as the possibility of paying for emission controls by halting annual style changes; he said EPA is therefore making its own economic analysis.

Carroll added that when EPA hires individual consultants, possible conflict of interest questions can be reviewed. The NRC (and its parent, the National Academy of Sciences) are operating under contract to EPA but the Federal agency has been given no such opportunity for review.

In view of these objections, EPA has

come up with a simple expedient for dealing with the NRC committee: Ignore it, if necessary. EPA is now making its own independent analysis of the auto companies' ability to meet the standards, says Carroll.

If EPA ignores the NRC committee, it will not be the first time it has taken such action with an advisory group. A Science Advisory Panel to EPA claimed that the herbicide 2,4,5-T was safe for use; EPA refused to heed its recommendations. But Carroll and lawyer Harrison Wellford of Ralph Nader's Center for the Study of Responsive Law disagreed as to how this happened.

Wellford claimed the panel's report was leaked to anti-2,4,5-T scientists such as Dr. Samuel Epstein (SN: 6/26/71, p. 134), who say the herbicide may be mutagenic, carcinogenic or teratogenic. Wellford said Epstein and others then made their disagreement public in a press conference, and that EPA was forced to act. But Carroll claimed EPA knew all along that the panel—which was originally named by the U.S. Department of Agriculture, before EPA came into existence—was biased, and that Ruckelshaus acted against its recommendations on his own.

Whatever the actual sequence of events, Wellford's comments on the selection and the procedures of the 2,4,5-T committee bear attention: "The members were selected by USDA from a list of candidates prepared by the National Academy of Sciences. The members were screened for financial interests but the question of environmental or chemical industry biases never came up. As it turned out all the members except Dr. Thomas Sterling, who wrote a scathing dissent, tended to come from one side of the philosophical divide. . . . Moreover the list of witnesses who appeared before the committee is composed almost entirely of administrators, not active scientists. The committee chairman also declined to hear evidence from environmentalists. . . ."

Carroll said all future committee reports to EPA, as well as minority reports such as Sterling's, will promptly be made public. But Wellford claimed Sterling's membership on the 2,4,5-T panel was an accidental oversight by USDA officials. Nader and Metcalf would avoid such arguments over what happens in private by requiring public meetings of advisory committees and public representation on them.

Nader, in his testimony, made it clear he believes NAS should be subject to some such constraints, too. He described the Academy as a quasi-governmental body which exists in an accountability vacuum—without procedures for checking on "dual allegiances or conflict of interest" of committee members.

Tracing the breakdown of immunity in cancer

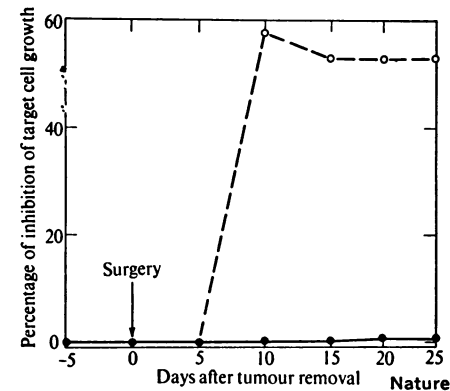
While many researchers are pursuing cancer-causing agents like viruses, others are trying to track down how the body defends itself against them. Experiments on the latter tack, and a proposed explanation for immune breakdown in cancer based on the work, are reported in the Oct. 1 NATURE by Kathleen R. Ambrose and two colleagues at the Oak Ridge National Laboratory.

There are few scientists today who believe that cancer is not in some way linked with a failure in immune defense. The explanation by Ambrose et al. may eventually provide a basis for an early warning system for human cancers which are still latent, and for assessing the success of cancer therapy.

The Oak Ridge biologists' first move was to prove that humoral antibodies, those that circulate in the blood, can retard or prevent proliferation of tumor cells in hamsters independently of the action of lymphocytes, scavenger white blood cells. Lymphocytes generally serve as a defense against infectious microorganisms and other foreign antigenic materials, and some scientists believe they play a role in warding off cancer.

With further experiments, the three—Ambrose, Norman Anderson and J. H. Coggin Jr.—established certain facts about the cancer-holding antibodies. They seem to be produced before tumors appear. They retard tumor growth. They are always present in immune animals. And when tumors are removed by surgery, the antibodies reappear, at least in some animals.

On the basis of this evidence, Ambrose and her colleagues thus propose how immune breakdown may trigger or at least encourage cancer growth. Usually after tissue is exposed to a carcinogen, say a virus, a small tumor mass is established in the tissue and may grow for a few hours without restriction. But as the blood sends fighting antibodies to this tissue, tumor



Antibody appearance after surgery.

cell growth is staunchly reduced and during a latent period forced to increase gradually.

But when a critical tumor cell mass is reached, if the cancer-holding antibodies find themselves mopped up by an excess of tumor antigen, then tumor cells grow rapidly, producing more antigen. (Tumor antigen, or protein, has been found in animal cells transformed by cancer-causing viruses, but not yet in human cells.) As this excess builds, circulating antibodies become undetectable, and the antigen has scored over the antibody, unless the tumors are removed by surgery. And once the antigen has the upper hand over the antibody, antigen-antibody complexes may be formed, confusing the lymphocytes.

Several pressing questions, of course, will probably have to be answered before this scheme might be used to detect cancer or assess the success of cancer therapy. One question is how cancer-holding antibodies might be detected in human blood. The cancer-holding antibodies Ambrose and her colleagues identified and studied have not yet been isolated in pure form. Another nettling question is, how blood antibodies (humoral immunity) and lymphocytes (cell mediated immunity) might interact—if they do—in warding off cancer. □

When you wish upon a Jupiter

Any theory of the origin and development of the solar system has to explain logically the extreme apparent differences between the Jovian planets (Jupiter, Saturn, Uranus and Neptune) and the terrestrial planets (Mars, earth, Venus and Mercury). One theory is that Jupiter, with a diameter 11 times that of the earth, is more starlike than planetlike.

Observations made by a University of Texas team seem consistent with this theory. The group led by William B. Hubbard, David S. Evans and R. E. Nather went to Australia, South Africa and India to observe the occultation of the star Beta Scorpii by Jupiter on May 13 (SN: 4/17/71, p. 267). Of the results, Evans says, "We knew it would be a rare event, but the real rarity we didn't realize; we will not see anything like this again in 1,000 years." What they saw was occultation of more than one component of Beta Scorpii, which is a multiple star.

The atmospheric temperature profile above the cloud layer of Jupiter turned out to be more complex than originally thought. The temperature does not remain a constant 110 degrees K. above the layer of heavy clouds, but rises and

falls and rises again with distance above the surface. For example, Hubbard estimates the temperature at the level where the density is 10^{12} molecules per cubic centimeter to be 300 degrees K., but at a lower level, where the density is 10^{14} , the temperature comes to 150 degrees K.

The temperature figures are drawn from measurements of the scale height of the Jovian atmosphere. The scale height is the distance over which the density changes by a factor of 2.7 (the base of the natural logarithms), and it depends on the ratio of temperature to mean molecular weight. The occultation observations measured the scale height to be 24 kilometers instead of the previous estimate of 8. The temperatures cited are high compared with earlier estimates, but they are the lowest allowed by the new scale height measurements. They require an atmosphere made largely of hydrogen instead of helium. (Previous estimates had given the hydrogen-helium ratio as 1:2). "Jupiter is apparently more starlike than we had thought," says Hubbard.

The oblateness, or flatness at the poles, of Jupiter had been measured as either 6.1 or 6.5 percent. The UT team found an oblateness of 6.0 percent.

The more oblate a planet is, the more uniform is the distribution of matter in the interior. The smaller oblateness indicates that the density near the surface of the planet is lower than previously thought, says Hubbard. The equatorial radius at the stratosphere was measured as 71,880 kilometers.

Io, one of Jupiter's 12 moons, occulted the component of Beta Scorpii, called C. Scientists had previously assumed the diameter of Io to be 3,000 kilometers. The occultation observations produced a diameter of 3,660 kilometers, plus or minus 5 kilometers. The occultation also showed no evidence of an atmosphere on Io. Hubbard places the upper limit of any atmosphere at 10^{-4} millibars of nitrogen or methane, or 10^{-3} millibars of molecular hydrogen.

The Jupiter occultation, observed by numerous groups in addition to the Texas one, also produced two unexpected bonuses. A phenomenon noticed in 1968 during an occultation by Neptune reoccurred with Jupiter, Evans reports. It is the phenomenon of flashing, when the occulted star disappears and then reappears as bright as the unobscured value. An amateur astronomer counted as many as 31 flashes for the occultation of Beta Scorpii. These flashes are believed produced by the layering in Jupiter's atmosphere.

In addition, Beta Scorpii had been thought to be a quadruple system. The group discovered a fifth component, a companion to Beta Sco C. □

Polluting the atmosphere with asbestos

A new substance has been added to the list of atmospheric pollutants that may threaten human health—*asbestos*. In a report prepared for the Environmental Protection Agency and released last week, a panel of the National Research Council's Committee on Biological Effects of Atmospheric Pollutants recommended that controls be placed on asbestos emissions into the atmosphere. The panel was chaired by W. Clark Cooper of the University of California School of Public Health at Berkeley.

It has been known for half a century that workers employed in the production of asbestos sometimes develop disabling or even fatal fibrosis of the lungs, and recently an association between prolonged exposure to asbestos and bronchogenic cancer has been established. Now there is increasing evidence that the population at large may be affected. Examination of lung tissues has shown that a much larger proportion of the general public has inhaled and retained asbestos fibers than had formerly been realized. Most urban dwellers have some such fibers in their lungs.

To date, says the panel, there is not enough data to tell if the concentrations of asbestos to which most people are exposed could cause malignancies. At present it appears that people with indirect occupational contacts, or those living in the vicinity of an asbestos source suffer the greatest risk; "there is no evidence that the small number of fibers found in most members of the general population affect health or longevity." But it adds, "It would be highly imprudent to permit additional contamination of the public environment with asbestos."

Asbestos fibers may enter the air in many ways: erosion or disturbance of natural rock formations; mining and milling of asbestos; transportation of asbestos ore and materials containing asbestos; manufacture and use of products containing asbestos. The major sources of asbestos emission, says the panel, must be defined and controlled; if they are not, concentrations of asbestos in the air of some localities might at times approach those encountered by workers in the asbestos industry.