A practical test of one's treatment of others is reciprocity. What if the Andromedans arrived (a question posed in essence by Nozick), demonstrated that they were as intellectually superior to us as we are to animals, and said that they regretted that they would have to use a few million humans in a basic research project of quite considerable merit? The APA's code of principles would not be much of a fence to hide behind.

"Surely one day," Singer observes in *Animal Liberation*, "our children's children, reading about what was done in laboratories in the 20th century, will feel the same sense of horror and incredulity at what otherwise civilized people can do that we now feel when we read about the atrocities of the Roman gladiatorial arenas or the 18th-century slave trade." The projection may sound far fetched, yet history teaches that only fashion in clothes changes faster than fashions in ethics.—NICHOLAS WADE

Science Court: High Officials Back Test of Controversial Concept

A proposed test of the value of a "science court" for resolving the technical disputes underlying such controversial issues as nuclear power, food additives, and the supersonic transport won support from high-ranking members of the Ford Administration late last month. Elliot L. Richardson, Secretary of Commerce, H. Guyford Stever, the President's science adviser, and Russell E. Train, administrator of the Environmental Protection Agency, were among those who endorsed a trial of the court concept at a colloquium sponsored by the Commerce Department, the National Science Foundation, and the American Association for the Advancement of Science. The colloquium—held at the Xerox Center in Leesburg, Va., on 20 and 21 September—attracted some 250 scientists, engineers, doctors, lawyers, and other experts from government, industry, and the universities.

The conference was structured as a debate between proponents and opponents of the court proposal. But the debate largely fizzled out when anthropologist Margaret Mead, who was put on the program in the belief that she opposed the court concept, ended up endorsing the desirability of a variety of trials. "We need a new institution—there isn't any doubt about that," she said, because existing science advisory mechanisms involve "a prostitution of science and a prostitution of the decision-making process."

That left only one scheduled speaker—Alan McGowan, president of the Scientists' Institute for Public Information—strongly opposed to the science court. He, and a handful of others in the audience, expressed fears that the science court would prove highly fallible in practice but its pronouncements would be taken as authoritative, thereby stifling public debate and the conduct of research needed to resolve important national issues.

The science court proposal is largely the work of Arthur Kantrowitz, chairman of the Avco Everett Research Laboratory, Inc., in Everett, Massachusetts, who first raised the issue a decade ago only to meet with yawns and polite indifference. The proposal went nowhere until this past year when Kantrowitz, operating through his positions on advisory committees to the Commerce Department and the White House, began pushing hard for a federal experiment. Several months ago a presidential task force headed by Kantrowitz produced a report explaining how the science court might work (see *Science*, 20 August 1976, pp. 654–656).

The core of the proposal is that disputes over technical issues would be argued out in adversary proceedings before a panel of scientist-judges. The goal of the proceeding would be to force the advocates on each side of an issue to confront each other's arguments directly, thereby illuminating the extent to which there is or is not real disagreement and diminishing the likelihood of exaggerated assertions that could not be substantiated.

At the end of the proceeding, the scientist-judges, who would presumably be more capable than lay judges of understanding the complexities of the argument, would issue a report giving their opinion of the meaning of the scientific evidence. Their opinion would deal only with scientific questions and would not make value-laden recommendations for public policy. Thus the court might render an opinion as to whether or not X cases of cancer might occur in a population receiving Y amount of a food additive. But it would not voice an opinion as to how many cancers are acceptable, and it would not recommend regulatory action against the additive.

Many crucial aspects of the proposal remain fuzzy despite a decade of on-again off-again consideration. Some proponents seem to think of the court as an institution, which conjures up images of a marble-columned building with a permanent bureaucracy. Others seem to be talking about a process for resolving disputes which could be adopted by existing institutions. Nor is it clear what issues the court might tackle. Some expect it to unravel such complex problems as the use of nuclear power, with its dozens of controversial issues and subissues. Others think a court would be useful only in such narrowly defined issues as whether a particular food additive is safe and effective. The chief proponents see the court as a "last resort" mechanism which would resolve only a handful of the most important issues that surface each year. But others see no reason why the mechanism could not be used in scores of cases at the federal, state, and local levels.

The conference did little to illuminate just how a science court might be superior to such existing mechanisms as advisory committees, individual scientific advisers, congressional hearings, regulatory hearings, and court suits. Many speakers simply asserted that existing procedures are producing irrational, erroneous, or biased public policy decisions and that a science court would improve things. But each speaker seemed to have his own notion as to what is wrong with the current mechanisms.

In opening the conference, Kantrowitz suggested that a science court is needed because the United States is in danger of losing its world technological leadership. "Today we epitomize fright," he said. "Fear of the unknown—fear of the side effects" that may accompany technological leadership. That formulation of the problem sent tremors of apprehension through some public interest advocates who fear that the court will be used

by the "pro-technology crowd" to beat back further attempts to bring about anti-technology social decisions.

Attitudes toward the court are difficult to classify. One can find government officials, industrialists, public interest advocates, science policy specialists, and academic scientists on either side of the issue. In some cases, an individual's attitudes toward the court seem shaped by his perception as to how well his "side" would fare before such a court. Thus, antagonists on the safety of food additives—Howard E. Bauman, vice president of the Pillsbury Co., and James S.

Briefing

New Violations of Soviet Nuclear Test Limit?

The Soviet Union detonated an underground nuclear blast on 28 August which—according to shock wave readings by government seismometers—could have been 250 kilotons in yield, or well beyond the 150-kiloton limit the Soviets have previously said they would observe.

The 150-kiloton limit is found in two pending treaties negotiated between the United States and the Soviet Union, one for weapons tests and one for peaceful explosions, that are now before the Senate for ratification. Although the treaties have not yet entered into force, the Soviet government, on 10 August, announced it would abide by the provisions of the weapons treaty in the period before it takes effect.

The 250-kiloton estimate is based on measurements of the shock waves traveling through the body of the earth, called body waves (M_b), filed with the National Earthquake Information Service (NEIS) in Golden, Colorado. The NEIS collects readings from hundreds of stations operated by local governments all around the world; its main purpose is estimating the size of earthquake tremors.

Louis C. Pakiser, Jr., Chief of NEIS, says that body wave measurements from the twelve "most reliable" NEIS stations average a reading of M_b 5.7 for the 28 August tremor which occurred at Semipalatinsk, the Soviet underground nuclear weapons test site.

The 250-kiloton estimate is arrived at with figures developed by Howard C. Rodean, a Lawrence Livermore Laboratory explosion seismologist, and published in a public document.* According to the report, a tremor of M_b 5.7 would have been produced by a 250-kiloton explosion in "hard coupling" rock of the type reportedly found in Semipalatinsk.

(But calculating yields from body wave data is by no means a cut and dried procedure. One government official using NEIS data concluded the blast could have been only 120 kilotons.)

Rodean, speaking for himself and not his laboratory, says it is possible to use NEIS data to estimate Soviet blasts relative to one another, so long as blasts at the same site are compared and assuming the waves are propagating in the same manner. If these assumptions are made, then the 28 August shot was somewhat smaller than a previous 4 July shot at Semipalatinsk which the same twelve NEIS stations recorded at M_b 5.9. According to Rodean's numbers, the 4 July shot had a yield of 400 kilotons. This earlier shot had already caused a considerable political stir because of reports it exceeded the 150-kiloton limit. Four hundred kilotons is within the range of uncertainty government officials admit exists about this event.

The U.S. government classified yield estimates of Soviet underground blasts this summer following the 4 July event and another one on 29 July at another site. The Administration was deeply embarrassed by these reports, because they came on the heels of the treaties' submission to the Senate. Emphasizing that it didn't really know whether violations had occurred, the Administration silenced ERDA from announcing future yields. ERDA, in keeping with the new policy, announced the August shot as soon as it happened, without mentioning yields. the ERDA information is based on a separate seismic network, run by the military and called the Atomic Energy Detection System.

The 150-kiloton limit is in a legal limbo at the moment, as the chances are slight that the Senate will ratify the treaties before a new Administration takes office. If President Ford is reelected, he will press for ratification. Jimmy Carter, on the other hand, has not said whether he favors ratification; however he has called for a joint 5-year moratorium on all underground nuclear tests.

In the meantime, the Administration would clearly like to keep Soviet yield estimates—especially ones above 150 kilotons—quiet. The above exercise shows that the scientific community and the public can make such estimates, anyway.—D.S.

TID 25572 (National Technical Information Service, Springfield, Va., 1971), p. 128, chart 7.16. $3.00.

NRC to Increase, Rethink Inspection

One of the tangible results of the disastrous 1974 fire at the Brown's Ferry nuclear power station is that the Nuclear Regulatory Commission (NRC) has decided to give more attention to fire prevention and such related things as the spacing of electrical cables in its inspection efforts. The agency has requested permission from the Office of Management and Budget to ask Congress for 25 or 30 new inspectors to be assigned to the task, and more sweeping changes in the inspection program may be in the offing. According to Ernst Volgenau, NRC's new director of inspection, a "complete reexamination of the entire philosophy of what we do, how, and why" is under way, with preliminary results promised in a few months. Volgenau, who took office in April and promptly began the reexamination effort, describes it as a "broad gauge study" that covers alternatives ranging from resident government inspectors at all nuclear facilities to a greater emphasis on inspection during the construction of the plants.

The present inspection force totals about 275, and their efforts are concentrated not primarily on direct inspection but rather on auditing what industry does to inspect itself—checking records, observing key tests, and checking procedures. For the Commission to take over the direct inspection of all phases of the nuclear industry would require about 10,000 inspectors, Volgenau says, and he is not going to recommend that to Congress. More realistic options appear to include mixing some additional direct inspection with such approaches as statistical sampling and analysis of the most likely causes of safety problems, so that they can be given greater attention.

A more active federal role in monitoring nuclear power plant operations has also emerged as part of Jimmy Carter's energy program. In the first television debate, Carter appeared to promise resident federal officers empowered to shut down the plants in the event of any malfunction. —A.L.H.

Turner, a consumer attorney—endorsed exploration of the science court concept in the belief that its findings would buttress their cases in future disputes over food additives.

Proponents of the science court argued that it would provide a sounder, more rational base for decision-making, separate fact from rhetoric, and screen out the value judgments which often color the recommendations of scientists. They also suggested that the court's findings would have a presumptive validity that would make it difficult for policymakers to "hide political motivations behind a smoke screen composed of scientific confusion."

But skeptics and opponents expressed doubt that the science court would work any better than existing mechanisms, and some even suggested it would cause harm. They argued that the court's findings would be "authoritarian," thus inhibiting the public debate on which a democracy depends. They also warned against separating the scientific and value-judgment aspects of an issue, lest the scientific aspects be given far more attention than they deserve. Many participants on both sides of the debate also expressed concern that the adversary system might put a premium on "winning at all costs" through rhetorical skills and other lawyerly wiles, to the detriment of the search for objective truth.

Objections were repeatedly raised that the name science court is inappropriate because it implies some kind of final verdict on controversial issues. Several speakers suggested alternatives built around the notion that the court would really be a board of inquiry, but others suggested that the name has become too engrained to be changed at this point.

Most participants in the conference endorsed the idea of an experiment to test the value of the science court concept, but very little thought has been given to what such an experiment might entail. The only member of Kantrowitz' task force who seems to have wrestled much with the matter is Allan Mazur, professor of sociology at Syracuse University, who describes himself as a "strong proponent" of an experiment but an "agnostic on the issue of a permanent, institutionalized Science Court." Mazur described a number of approaches toward evaluating whether or not the court functioned smoothly, whether it widened or squelched public debate, and whether it reached plausible conclusions. But he seems to be one of the few who is thinking of a genuine experiment. Most proponents are really talking about a demonstration or pilot project whose outcome would be difficult to evaluate on other than subjective grounds.

Just who would conduct the experiment and who would pay for it remain uncertain. At one point the National Academy of Sciences indicated that it would be willing to serve as the host institution for an experiment, but key figures in the Academy have since cooled on the project, deeming it too fuzzy for meaningful investigation. (The proponents claim the Academy is simply afraid that the science court might prove a competitive threat to its own advisory committees.) Kantrowitz told *Science* that he hopes a university will serve as host institution, but no takers have yet been found.

At least one agency—the Environmental Protection Agency—has indicated it would be happy to refer a disputed issue to the court for an initial experiment. And the National Science Foundation has expressed a willingness to consider funding the experiment. But NSF's attitude will depend in part on how costly the experiment turns out to be. That is a matter which has received little sustained thought. One speaker estimated it would cost $100,000 to $300,000 for the initial experiment, while another suggested it would cost $1 million to $10 million for a year's worth of experiments.

Meanwhile, the federal judiciary is beginning to show interest in the science court. Chief Justice Warren Burger has appointed a small task force, headed by Judge Howard T. Markey, chief judge of the U.S. Court of Customs and Patent Appeals, to meet with NSF to explore the court concept further. In fact, Markey and at least two other judges attended the colloquium. The judiciary is said to be interested partly because a science court approach might prove a useful adjunct to judicial proceedings, and partly because the judges want to keep a wary eye on any institution that has pretensions of becoming a "court."

—PHILIP M. BOFFEY

RECENT DEATHS

Aleck Bernstein, 54; associate professor of microbiology, The Medical College of Wisconsin; 11 July.

John H. Brown, 41; associate professor of pharmacology and experimental therapeutics and medicine, Louisiana State University Medical Center; 12 July.

William T. Caldwell, 81; retired professor of chemistry, Temple University; 30 June.

George O. Curme, 87; chemist and former vice president, Union Carbide Corporation; 28 July.

Wayne Dennis, 70; professor emeritus of psychology, Brooklyn College; 21 July.

Philip R. Ferguson, 50; professor of chemistry, Eckerd College; 28 June.

Richard F. Flint, 74; professor emeritus of geology, Yale University; 5 June.

A. Robert Goldfarb, 68; associate professor of biochemistry, Wayne State University School of Medicine; 27 January.

Kermit Gordon, 59; president, Brookings Institution; 21 June.

Marcel Heiman, 66; clinical professor of psychiatry, Mount Sinai School of Medicine; 14 June.

Thomas B. Hinton, 51; professor of anthropology, University of Arizona; 30 June.

Victor E. Hoffman, 60; associate professor of education, University of Wisconsin, Milwaukee; 28 June.

John W. Lawlah, 71; former dean, College of Medicine, Howard University; 15 June.

Clayton G. Loosli, 71; former dean, School of Medicine, University of Southern California; 27 June.

Cyrus Mayshark, 49; dean, College of Applied Life Studies, University of Illinois, Champaign-Urbana; 24 July.

Robert L. Miller, 56; professor of marine geophysics, University of Chicago; 21 July.

Maurice G. Powell, 62; professor of chemistry, Potomac State College; 7 June.

John C. Slater, 75; Institute Professor emeritus, Massachusetts Institute of Technology; 25 July.

Arnold H. Sparrow, 61; senior radiobiologist, biology department, Brookhaven National Laboratory; 24 June.

Herbert E. Vandervoort, 50; associate professor of ambulatory and community medicine, School of Medicine, University of California, San Francisco; 15 July.

Jerome R. Vinograd, 63; professor of chemical biology, California Institute of Technology; 3 July.

Michael J. Walsh, 34; associate professor of pharmacology, Eastern Virginia Medical School; 16 June.

John N. Weber, 40; professor of marine geology, Pennsylvania State University; 1 June.

Herbert H. Williams, 55; professor of anthropology, San Francisco State University; 9 June.