Nathan of Harvard Medical School who met commissioner Albert R. Jonsen in August at a meeting on birth defects sponsored by the National Foundation–March of Dimes. Nathan expressed surprise at the regulation allowing artificial maintenance of vital functions of the nonviable fetus, in part because it is so liberal and in part because a provision immediately following it seemed to be saying that once you put a nonviable fetus on a respirator, for example, you cannot then do anything to terminate its life. It seems to raise the possibility of fetuses being kept "alive" for unpredictably long periods.

Jonsen turned out to be just as surprised as Nathan. He was carrying the *Register* in his briefcase but had not got around to reading it. He did so that night, and the next day he discarded prepared remarks about the general operation of the commission to speak about the regulations. He was upset by the changes and about the fact that the commission seemed to have been reduced to nothing more than an ordinary advisory body.

This latter point has been a source of mild tension throughout the commission's short existence. It thinks of itself as being more authoritative than the usual advisory committee although it knows it has no legal power. HEW staffers tend to think of it as being advisory only, and legally they are correct to do so. Certainly, HEW has the responsibility of reviewing and the right to change the commission's recommendations.

For the most part, however, the HEW regulations and the commission's recommendations are in accord. In the HEW report accompanying the regulations, there is the following statement, made with respect to the recommendations about research on fetuses in utero:

> The Department notes that the Commission was created to represent the best judgment of the community, and to make recommendations following an intensive study of the issues. All of the arguments which were submitted to the Department were considered by the Commission in its deliberations, and it is therefore reasonable to accept the findings of the Commission as the best possible judgment on the matter.

It can be said fairly that the commissioners represent a wide spectrum of views. These 11 men and women representing science, ethics, and law were not handpicked by HEW or NIH to see that research got the best possible shake. They are the survivors of an intensely political process in which the biases of congressmen, scientific societies, antiabortion groups, minority interests, and others came to bear. Indeed, their philosophical outlooks are so different that some people were amazed that they themselves could reach as close agreement as they did on their recommendations.

When the commission met last in September, Jonsen called the issue of the regulations and recommendations to the attention of his colleagues, most of whom were hearing about it for the first time. The commission staff is now at work on a detailed analysis of the situation and will report at the October meeting. Then the commissioners will have to decide whether they will stand firm behind their recommendations and put pressure on the secretary to amend the regulations or whether they will let this challenge pass.

—BARBARA J. CULLITON

Peer Review: NSF Faces Changes, the Question Is How Extensive

When the House Science and Technology Committee's oversight hearings on the National Science Foundation's (NSF's) peer review system ended in July (*Science*, 15 August) there were no signs that the congressmen were appalled by what they had learned. Neither, however, did they give NSF a resounding vote of confidence on peer review.

The hearings do seem to have convinced subcommittee chairman James W. Symington (D–Mo.) and his colleagues that peer review raises complicated questions and that changing the system requires a deliberate approach. The hearings record is expected to emerge from the Government Printing Office in the next few weeks and a report should follow, indicating the general lines of corrective action—if any—the panel will recommend. The likely timetable would put any such action in the next cycle of authorization legislation, which will begin after the Congress convenes for its second session in January.

Since the end of the hearings, however, several things have happened to keep the peer review pot boiling:

- Most recently, NSF's constant critic in the House, Representative John B. Conlan (R–Ariz.) has introduced legislation (H.R. 9892) which would drastically revise the NSF review system and grants management generally. Senator Jesse Helms (R–N.C.) has introduced a generally similar version (S. 2427) in the Senate.
- In mid-September, NSF got what amounted to a negative peer review of its peer review system from Philip Handler, president of the National Academy of Sciences (NAS). Handler suggested that NSF adopt a review system which relies "systematically" on advisory panels to replace the present mixed system, which uses both advisory panels and mail reviews from individual scientists (*Science*, 6 June).
- NSF is taking a number of internal actions aimed at improving the present peer review system. The effect, essentially, will be to amplify the array of checks and balances in the system.
- NSF's policy-making body, the National Science Board (NSB), which is considering the major policy question of whether to make names of reviewers available in certain circumstances, has decided to conduct an opinion survey to elicit a more comprehensive answer to the question of how scientists react to a possible change in NSF policies on confidentiality.

In a statement accompanying the introduction of his bill, which he read into the *Congressional Record* on 29 September, Conlan said that "The main purpose of the bill is to establish a grants award and management system at the Foundation which is fair, open and accountable to the scientific community and to the Congress."

He called the present peer review system "secret and arbitrary" and charged that "Recent statistics show that NSF funding is restricted primarily to a small group of preferred institutions in a few states, with special preference to an elite corps of academic institutions heavily represented on the Foundation's advisory committees."

Conlan's criticism of peer review seems to have been triggered by NSF's refusal to comply with his requests for peer review material and the identification of reviewers in connection with NSF-funded social science course improvement projects. Conlan's bill calls for establishment of a "Peer Review Office" in NSF to administer the

peer review system, which would compile the sort of detailed information in which Conlan is interested and make it available to Congress. The office, for example, would maintain an elaborate log on applications, containing details of proposals, reviewers, and foundation action. The log would make it possible to trace relationships between applicants and reviewers more readily.

The bill also requires that grant applicants be given access to verbatim reviews

Briefing

NACOA Backs Industry Ocean Bills

Taking a new tack, the highest level committee advising the government on ocean affairs urged last week that Congress pass legislation to extend U.S. fishing jurisdiction to 200 miles from shore and to give U.S. mining companies a green light to mine the deep seabed. In doing so, the National Advisory Committee on Oceans and Atmosphere (NACOA), a scientific group that advises the President and the Secretary of Commerce, reversed its previous opposition to these bills. Both bills have been vigorously advocated by the fishing and mining industries for years, while NACOA counseled delay.

NACOA's previous annual reports have been broad policy statements that usually pleaded for more money for ocean research. Ocasionally it has criticized government activities, such as military weather modification research. On the questions of deep-sea mining and fisheries, past reports have reflected the view of many university scientists that the United States should postpone taking unilateral action that might offend other nations at the United Nations Conference on the Law of the Sea, and endanger the chances of a new oceans treaty.

But this year, NACOA changed its stance. Its report calls for passage of a fishing bill enabling the United States to "create . . . an Economic Resource Zone," which would include "a model system for rational use of the zone" and its fish stocks. The creation of such 200-mile-wide zones is one of the few points of agreement at the sea law meeting. In effect, NACOA is recommending that the United States lead the way.

On mining, NACOA recommends a bill ensuring that "the minerals of the deep seabed will be available to decrease the United States' dependence on foreign sources and to increase world supply." The Secretary of Commerce, however, reflected the Administration's view in his formal comments and disagreed with both these recommendations.

Why the change of course? For one thing, the scientists whose views NACOA reflects are themselves—like many other observers—getting impatient that the sea law meetings have not made more progress. NACOA itself warned last year that it could not advocate waiting beyond 1975. Second, among NACOA's new members this year are some well-known industry figures, such as Marne A. Dubs of the Kennecott Copper Corp., a key proponent of the industry's mining bill.—D.S.

Another Energy Study

A "balanced, comprehensive" study of the future of nuclear power in the United States is about to be undertaken by the National Research Council of the NAS-NAE at the behest of the Energy Research and Development Administration (ERDA). The study, intended to take 2 years and consume $2 million, will be cochaired by Harvey Brooks of Harvard and Edward L. Ginzton, electrical engineer, former Stanford professor, and now chairman of the board of Varian Associates, an electronics firm in Palo Alto.

It has taken quite a while to get the project organized (the contract was signed the end of June)—partly because people are hard to track down during the summer, but also because Brooks took time to say Yes. He retired in July as dean of engineering and applied physics but now has a full-time appointment as Benjamin Peirce professor of technology and public policy at Harvard.

The study is to be a detailed, long-range look at nuclear power, within the context of other energy systems, with emphasis on the period between 1980 and 2010. Organizer Micah Naftalin, director of the Assembly of Engineering, says there will be considerable attention given to how the nation can keep its energy options open through research and development without automatically committing itself to particular courses of action made possible thereby. And the NRC states it will not be taken for granted that a major role for nuclear power is necessary.

Membership of the 16-person task force is now being firmed up. Much care has been taken to create a balance of biases. Brooks has a nuclear background, and Ginzton's expertise is in solar energy. The principal concerns of the study director (chosen but not yet announced), according to Naftalin, are over the environment and conservation. Some members are experts in particular energy systems, but most specialize in areas such as health and economics that cut across these fields.

A preliminary report is due 18 months after the onset of the study.

—C.H.

Minorities Report Sells Fast

The Scientific Manpower Commission published recently a report* in a humble, loose-leaf binder that has become a surprise best seller. The report is the first quantitative compendium of women and minority group members in all academic fields and most professions in the United States. The data is needed by colleges, corporations, even government agencies to cope with the welter of federal civil rights laws, which may explain why some 800 copies have sold since June, despite the $40 purchase price and $20 annual fee for updates.

The report will tell you everything you ever wanted to know about women and minorities but never dared to ask—because the answer was likely to be buried in someone else's computer. For example, most blacks, American Indians, and Puerto Ricans attending graduate schools today enroll in the field of education; only miniscule numbers study science, so much so that only 1 percent of all physics doctoral recipients are black. Orientals, by contrast, enroll in larger numbers in engineering and physical sciences.

By law, every employer of 25 people or more must hire in proportion to the availability of persons in a specific field in the labor force. The commission's re-

*"*Professional Women and Minorities: A Manpower Data Resource Service,*" Scientific Manpower Commission, 1776 Massachusetts Avenue, NW, Washington, D.C. 20036.

and the identities of reviewers of their proposals. A formal appeals mechanism would be set up. NSF would have to carry out a "needs assessment" on research projects and curriculum development projects before funding was approved. Under the provisions of the bill, NSB would get its own small professional staff, a move clearly designed to lessen its dependence on regular NSF staff.

Conlan's passion to reduce the influence of NSF program managers is evident in

port details the labor pools they draw from, such as the fraction of health technicians who are of Oriental, Spanish, or American Indian origin.

The womens' movement will find fuel for its fires in the report as well. For example, despite all the brouhaha about womens' gains, only 3.4 percent of all 4-year college presidents are women and they are paid 84 percent of what their male counterparts receive. In science generally the number of women is increasing, but in astronomy the proportion of doctorates given to women has been halved, from 15.8 percent in 1959 to 6.2 percent in 1973.

The 2½-person commission has run in the red in recent years. But as a result of having institutions from Vassar College to the American Express Company buying the report like hot cakes, it may turn a profit this year.—D.S.

Narrow Reprieve for EPA Pesticide Control

A controversial proposal to change drastically the existing program of pesticide regulation by giving the U.S. Department of Agriculture (USDA) the right to veto key decisions by the Environmental Protection Agency (EPA) was defeated in the House of Representatives on 3 October, but by a surprisingly narrow margin. The closeness of the outcome could be interpreted as a warning to the EPA that the farming and agricultural chemical interests who have been bitterly complaining about EPA regulatory decisions are winning over many members of Congress, however unjust many of their complaints may be.

Earlier this year the Ford Administration asked for a simple 2-year extension of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), which would have expired on 30 September 1975 except for an interim measure recently adopted by Congress to extend the act for 45 days. Still pending before the House is a bill reported by the House Agriculture Committee that would extend FIFRA for 1 year and amend it in various ways to please the farming and chemical interests.

For instance, the committee bill would require that, anytime the EPA decides to cancel the registration of a pesticide, it must give the Secretary of Agriculture notice of its intent and an analysis of the proposed action's impact on the agricultural economy. Then, if the Secretary chooses to comment within 30 days on the proposed action, this comment, together with EPA's reply, must be published in the Federal Register.

The fact that this new procedure would apply even to orders to suspend the use of pesticides that are declared to be an "imminent hazard" to human health has made it particularly objectionable to environmental groups, who point out that USDA views and economic considerations are by no means ignored under existing regulations. These groups are also much opposed to the provision in the committee bill that would allow farmers and other "private applicators" of potentially hazardous pesticides to meet EPA certification requirements simply by signing a form to be provided by the dealers from whom these chemicals are purchased.

The committee itself voted in early September to exclude from its bill a provision that would have made all new EPA pesticide regulations and suspension or cancellation actions subject to the Secretary of Agriculture's concurrence. The feeling was that it would be overwhelmingly rejected by the House.

In light of the foregoing, Representative Steven D. Symms (R-Idaho), who offered a floor amendment to restore the requirement for USDA concurrence, must himself have been surprised when his proposal lost by only 175 to 167 on a recorded vote. After the vote on the Symms amendment, the House rejected by a vote of 272 to 66 a proposal by Representative George E. Brown, Jr., (D-Calif.) to extend FIFRA for 1 year unchanged.

The House is expected to complete action on FIFRA on 8 or 9 October, and, to judge from the voting on the Symms and Brown proposals, the committee bill may very well win approval pretty much as reported. Environmental lobbying against the farmers "self-certification" provision could prove to be telling, however. And, in the case of the procedural delay that would affect "imminent hazard" suspensions, Representative Thomas S. Foley (D-Wash.), chairman of the Agriculture Committee, has himself indicated that he wants this struck from the bill.

But, already, it seems clear that when critics of the pesticide regulatory programs speak of EPA choosing "moths over trees, coyotes over sheep, and fire ants over people," their credibility in Congress is greater than what one might have expected.—L.J.C.

Scientists Seen as Respected but Bespectacled

"When I think of a scientist, I think of a highly intelligent, practical, and logical person, usually somewhat eccentric." So runs the typical response to an English survey designed to establish what people imagine scientists are really like.

The survey was based on a questionnaire completed by 1559 readers of the English magazines *New Scientist* and *New Society* and is reported in the former. Some 58 percent of the scientists responding to the survey, and 67 percent of the nonscientists, agreed with the statement that "scientists are respected by the public," an attitude the survey analysts find surprising. Respondents included two minorities who were extremely friendly (129) or extremely hostile (92) toward science. The latter group cited animal experimentation among their grouses.

The prevailing physical stereotype of the scientist is that of a white-coated man working in a laboratory and wearing spectacles. The spectacles are variously described as "gold rimmed" or with "thick black rims," and the hair is said to be "smooth, carefully brushed back" and "sticking up in uneven tufts." How far such stereotypes extend beyond Britain is hard to say, but the generally positive view of scientists' public standing is similar in direction and extent to the attitude found in the United States by a survey conducted for the National Science Foundation.

—N.W.

many sections of the bill and is reflected most clearly in the detailed provisions written into the section on the peer review system. For example, the bill specifies that each proposal submitted to the foundation have at least five reviewers, that the program officer select no more than 50 percent of reviewers and the applicant 20 percent, and that the rest be selected by random sample from an approved list.

In arguing for disclosure of reviewer identities in his statement, Conlan made the following allusion to testimony at the July hearings.

> The National Science Board recently empaneled a special Task Force headed by Dr. Donald B. Rice, president of the RAND Corporation, to study the whole question of NSF peer review and make recommendations to the Board.
>
> Dr. Rice testified before our recent Subcommittee hearings that it was the *unanimous* recommendation of the Task Force that signed verbatim peer reviews be made available upon request to grant applicants.
>
> Dr. Rice testified that the Task Force carefully studied arguments on both sides of the confidentiality issue before recommending an open peer review system to the full National Science Board.
>
> The Task Force unanimously rejected arguments that only confidentiality in the peer review process encourages candor in peer review evaluations. Its members agreed, instead, that qualified reviewers can be relied upon to participate and be candid and straightforward in their evaluations, and that openness would result in more responsible, objective reviews with fewer superficial or personality-based criticisms.

Conlan's recapitulation differs substantially from Rice's account of his testimony before the Symington subcommittee. Rice says that he summarized arguments both for and against identification of reviewers. The hearings followed the decision by NSB to change NSF policy and make verbatim reviews available to applicants. NSB, however, decided to give further consideration to the question of also changing policy to identify reviewers. Rice says that the task force had been asked to frame a proposal on peer review changes for the board to discuss and the task force voted to propose that the board take both steps at once. He says that the task force members, with one exception, voted in support of the board action.

Rice described the prevailing attitude in the task force as a "disposition toward more openness in the process" but "consistent with an equitable and effective system." As for the question of identifying reviewers, he said there was "a lot of sentiment to think about it seriously" before taking action.

To acquire more complete information, the task force is mounting a survey on the subject. A questionnaire is being designed and a final decision has not been made on whether a mail or telephone survey will be used. In either case, says Rice, the plan is to poll a "substantial sample" drawn from among both NSF's reviewers and applicants. The task force hopes to complete the survey by the end of the year.

Handler's recommendation on peer review came in a statement intended for inclusion in the hearings record but was submitted in mid-September because Handler was out of town when the hearings were held. He said he was basing his suggestions not only on his observations of the working of NSF—Handler was a member of the NSB from 1962 to 1974 and served as chairman from 1966 to 1970—but also on extensive experience as a participant in the review system of the National Institutes of Health (NIH). It is the NIH model, in fact, which he commends to NSF. His key point is as follows:

> *The most important single step that can be taken by the Foundation to improve its evaluative procedures and also meet various of the criticisms that have been directed at present procedures would be to rely, systematically, on the use of formally constituted advisory panels as the principal mechanism for rating the merit of individual research proposals.* As you have learned in all but a few areas, the NSF presently relies largely on a system of mail reviews performed by highly competent reviewers selected, ad hoc, by the appropriate agency program manager. It is immediately relevant to note that the National Institutes of Health, which manage the allocation of 3 or 4 times as much money for support of basic and applied research, relies entirely upon study sections (convened advisory panels) for the review of those research proposals to be supported by grants and is under great pressure to use the same mechanism for the small fraction of all its funds utilized to support research activities performed under contract.
>
> The personal interactions among a group of scientific experts who meet, formally, several times each year, to review research proposals offer a number of unique advantages as compared with *ex parte* criticisms by individual reviewers.

As for NSF director H. Guyford Stever's reaction to Handler's proposal, NSF sources say that the conversion to panel review has already been discussed, and it is "possible that NSF may go in that direction." Stever and NSB members, who would figure in a policy decision, are concerned that the agency does not commit itself to a single, rigid review mechanism which might limit the agency's flexibility in dealing with different types of projects.

Within NSF, a good deal of reformist activity is in progress. The foundation is in the midst of a major review of the NSF's social sciences program. Agency officials are now pondering whether other disciplinary areas should receive such examination, which goes far beyond the peer review issue.

Stever has ordered that each NSF directorate establish a formalized grant review board of its own. The main feature of the board is the involvement of foundation staff from outside the directorate concerned. For example, the science education directorate, the most recent directorate to set up a review board, will have four members from other directorates on its six-member review board. The main business of the boards is to look critically at project awards and declinations, but the boards are also expected to pay attention to the directorate's requests for proposals, program solicitations, and announcements. The idea of the review board started in NSF's RANN (Research Applied to National Needs) program and is said to have permitted a more unified oversight of that program.

NSF grants and contracts people have been told to give more intensive consideration to grant titles and to come up with titles that are more informative and less likely to incite the critics' risibilities. It was "silly" titles, after all, which attracted attention and started NSF's current round of troubles.

Longer Term Effort

A more long-term effort is under way to develop mechanisms for a formal "internal audit" of the grants award process. No decision has been made on what form it will take. Examination of the handling of projects randomly chosen might be instituted. There is some interest in using the approach taken in last spring's special crash study on selected science curriculum projects carried out when congressional criticism of behavioral science courses, in particular, was mounting. In the special study, scientific, financial, and management expertise was brought to bear, with results foundation officials thought helpful.

Does all this activity portend radical change in the peer review process? Conlan has succeeded in calling attention to peer review, which is now under the most searching scrutiny it has ever received from Congress. Conlan's bill would certainly open up peer review, but would complicate it considerably and require major bureaucratic reinforcements to handle the new mechanics.

There are few signs that many of Conlan's colleagues feel that the system is as deeply flawed as he does; there seems to be no rush to cosponsor the bill in either House or Senate. By introducing the measure even before the hearings and report are out, Conlan, in the congressional perspective, could appear to be taking unilateral, premature action which may not help him much when the bill comes to be considered in committee.

At this point, the odds seem to be against comprehensive change in the peer review system of the sort Conlan is calling for. At the same time, NSF is clearly on notice that it has to do better in managing the system and that Congress is watching.

—JOHN WALSH