## Changes at NSF

On 1 October Raymond L. Bisplinghoff became the first deputy director of NSF. Bisplinghoff, an aeronautical engineer, has been dean of MIT's school of engineering since 1968.

Other recent face and title changes at NSF occurred in the physics section, which is part of Edward Creutz's responsibility. Wayne Gruner, formerly head of the section, is now senior staff associate (planning) to Creutz.

The new head of the section is Paul F. Donovan, formerly program director for intermediate-energy physics. Marcel Bardon (on leave from Columbia as deputy director of the Nevis Laboratory) is the new program director for intermediate and high-energy physics.

Replacing Langdon T. Crane (now director of the institute for applied mathematics and fluid dynamics at the University of Maryland) as program director for atomic, molecular and plasma physics is Rolf M. Sinclair, who comes from the Princeton plasma-physics laboratory.

Harold S. Zapolsky and Angelo Bardasis are now associate program directors for theoretical physics; both are on leave from the University of Maryland. Joel A. Snow and Bernard Chern, both formerly with the theory program, are now respectively head of IRRPOS (see story on page 61) and a program manager in the NSF division of institutional development.

Continuing in their former positions are Howard W. Etzel (solid-state and low-temperature physics), J. Howard McMillen (elementary-particle physics), and William S. Rodney (nuclear physics).

lead comes from, where it goes, and how it goes there, the flux of the lead as well as the effect the lead has on organisms. So there's a lot of physics there; there is also a lot of chemistry and biology. And it's not separate from the social sciences because there are questions on the economics of lead and the social patterns of using leaded gasoline primarily, and also leaded paints.

*In what areas do you think you will be reducing your physics support?*

We've never been a very large supporter of high-energy physics (AEC is the larger supporter there). With the Batavia accelerator coming along—a very, very large investment—the NSF component of high-energy physics looks a little bit puny. We think we are now supporting some very important projects. But it's going to be hard to maintain an appreciable share of the high-energy physics support because of the large AEC investment.

*Have you been able to do anything for some of the facilities that are particularly hard hit?*

Yes, we're trying to. We're looking at these facilities being slowed down or closed out. We certainly can't, on a one-for-one basis, pick up all that are dropped by DOD or other agencies. We will study each facility on an individual basis; it has to be competitive with other areas of science or other scientific work in the same area.

*Will your background in industry help NSF to do more things with industry than it has before?*

I hope that's right, because, of course, NSF has done very little with industry traditionally and even legally until the Daddario Act of 1968, which enables the Foundation to do work in applied science as well as basic science.

*Do you think there is likely to be a significant increase in the fraction of NSF money going to industry?*

There will be a gradual increase because that fraction is essentially zero now. There are some areas where I think it's not only appropriate but really necessary to generate and encourage the ties between academic institutions and industry.

One of my strong interests is controlled thermonuclear energy. Gulf General Atomic has a substantial program; in fact I guess the largest industrial program in that area. The toroidal multipole, which was built by Tihiro Ohkawa, has now held plasma for the longest time yet—half a second, which is really long enough for a controlled thermonuclear reaction—but the temperature is too low and the density is too low.

The controlled-thermonuclear program has, of course, been largely carried out by the AEC laboratories and by some universities, and very little industrial effort existed because it's long range. Industry generally has to figure out how it's going to get its money back for research, which is quite proper.

But here's a case where important advances have been made by industry and, of course, the program has been well coordinated with Government laboratories and universities. This particular job was done by industry and not by universities. I don't think that this is a particularly unique situation.

*What do you think about the oversupply of doctorates in physics?*

We're very concerned, not just about this question, but about what the proper spectrum of educational programs should be. There's a lot of talk about some sort of an education that does not lead to a career as an independent basic researcher. Although it would be for an equivalent length of time as the PhD, the bent would be more along the lines of *applying* the education broadly.

Some of it may come out of the IRRPOS program, some will come out of the environmental problems.

Why shouldn't a PhD in physics, for example, work in a city government, or a state government, or Federal government? Of course there's nothing about education in science or in physics particularly that means there aren't applications of this discipline, this way of thinking about knowledge, putting knowledge together, synthesizing things, that says that it can't be useful in other activities besides research in science.

*Do you think that physicists intellectually or otherwise have a headstart among scientists in getting into other areas?*

I don't know if it's a headstart. I think there are some things specific about physics training: the training to absorb large amounts of information, to be very critical of information—consider the source, the evidence, the degree to which information holds up under careful examination, innovation, techniques of measurement. Physicists have always been very productive in developing new instruments to look finer and finer at the structure of nature—to try to see in greater detail what the phenomena are. This has, of course, been very useful to other fields of science and in the development of special instrumentation, starting with spectroscopy, up to nuclear magnetic resonance and electron spin resonance, Mossbauer effect, photoelectricity.

*What are the prospects of a turnaround in the physics-funding situation?*

We're just beginning to work on our fiscal 1972 budget. We certainly hope for some improvement then, but it's much too soon to say what the situation will be. This is a very bad year. Probably for the next couple of years we are going to have serious problems of supporting all the work that really should be supported. But we certainly intend for the Foundation to do everything we can to bring this picture back to where good science is supported, until much more of the good science is supported than it is now. —JBP and GBL