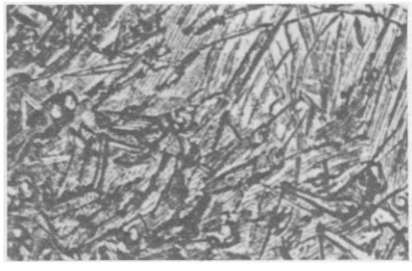
Sprague-Dawley rats and took 3 years to complete. In contrast to earlier studies with nitrites, amines were not added to the animal feeds, and the type of cancers that subsequently developed appear to rule out the possibility that the nitrites were converted to nitrosamines.

The regulatory implications of the finding are significant and difficult. Until now, the FDA and USDA have been faced with a trade-off between the certainty that nitrites prevent botulism and

Briefing

Year of the Grasshopper Keeps EPA on the Hop

When grasshoppers began appearing in unusually large numbers in the high plains states late in the spring the reaction of some farmers and ranchers was to call their congressmen. They were not asking for federal disaster relief, but rather were seeking help in pressuring federal officials to relax the rules on certain pesticides outlawed under regulations administered by the Environmental Protection Agency. Farmers were seriously alarmed because the assault by the hoppers was the worst in years, probably since the early 1950's, which, of course, was long before strict controls on pesticides were applied. And the response of state and federal officials was vigorous; it is, after all, an election year.



In the fields, the first phase of the battle against the hoppers seems to be over, with mature crops better able to withstand the attack. But growers are now beginning to sow the next crop of winter wheat and they are concerned that the seedlings which appear a month or so later will be vulnerable to the grasshoppers, especially to a voracious second generation which some of the insects are expected to produce.

Hundreds of thousands of acres of crop- and rangeland have been affected by the hoppers in Colorado, Kansas, Nebraska, and Oklahoma, and in adjacent states including Texas. Damage has varied greatly from state to state and locality to locality. Assessments of the toll are now being conducted, but no solid estimates are available. Overall, however, despite heavy damage in some areas, the grasshopper invasion is not expected to make a serious impact on predicted bumper harvests of wheat and corn and other crops.

Such conclusions are not much consolation to farmers in areas where losses are heavy. As one sympathetic federal official put it, "A farmer doesn't read those projections. When a guy looks up and the hoppers are eating the paint off his outbuildings and his corn is going down, what he does is call his senator."

When the grasshoppers struck, high plains farmers wanted to use pesticides that they remembered as working for them in the past, mainly aldrin, dieldrin, and heptachlor—especially heptachlor. These, however, had been "canceled" by EPA. They are chlorinated hydrocarbon pesticides and are highly persistent. Heptachlor was banned from use after being found to cause cancer in laboratory animals. Farmers valued heptachlor because they felt it gave effective, long-term protection to crops, and fairly heavy pressure was exerted on state governors to permit its use. Most state agriculture officials, however, advised against it, arguing that residues of the pesticide would be likely to show up on crops or in the meat or milk of animals and cause them to be confiscated. Requests for permission for emergency use of heptachlor were turned down.

The EPA has sought to meet the Westerners halfway, essentially by permitting broadened use of pesticides which were available for use on some crops in some situations. In late July, EPA announced that states could exercise authority to allow farmers to use the pesticides diemthoate, carbofuran, chloropyrifos, and orthene on all major crops attacked by grasshoppers. The EPA had approved each of these pesticides for use against grasshoppers on one or two crops but not on the wide variety of crops attacked by the hoppers. This was the core of EPA's effort to collaborate with the states on a broad strategy against the insects.

Extension entomologists in the region say that one problem in dealing with the emergency this summer was that the hiatus in serious grasshopper problems in the region had caused uncertainty about what pesticides would work on them and under what conditions. There was particular concern that some of the approved materials would not be effective on heavy infestations. Some fast field testing apparently produced needed answers.

USDA

Many farmers still are far from satisfied with the restrictions on insect controls, but the compromise program seems to have worked well enough to have brought a lull in the chorus of complaints directed at Washington and the state capitals.

The coming crunch on the winter wheat, however, is not the only crisis pending. A worried watch is being kept on one species of "migratory" grasshoppers reported to be thick on the ground in southwest Kansas. Adult grasshoppers all have wings, but most types tend to spread slowly and rather haphazardly. One species, *Melanoplus sanguinipes*, however, has a tendency to swarm and can move en masse 50 miles a day or

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the uncertainty that they cause cancer. The Newberne findings reduce but do not eliminate uncertainty on the latter point. The rats fed nitrite in their diets had 4.6 percent more lymphomas, or tumors of lymph tissues, than those in the control group, and 3.6 percent more precancerous lesions. Two previous studies, in 1958 and 1963, had not shown that nitrites induce cancer in test animals, but the FDA considers both to be technically deficient by today's standards.

Briefing

more, cutting a swath of devastation as it goes.

Then there is the matter of next year. Adult hoppers are laying eggs now and, although there are a lot of variables, experienced observers expect that the "hatch" next year will be a big one. The theory is that the cycle of dry weather of the past few years on the plains set up the grasshopper population explosion and that 1979 could well be another tough year for farmers and the EPA.

Some Insights from Inside in NSB Report on Research

The National Science Board's tenth annual report is titled *Basic Research in the Mission Agencies*, and, since it is based on information solicited from federal agencies with major research programs, it has a bit of an *Apologia pro Vita Sua* flavor. It essentially provides the insiders' view of what the agencies are doing and where they think their research programs are going. Not startlingly, a solid consensus is reached that basic research is useful. However, interpretations by the NSB, which is the policy-making body for the National Science Foundation, and some mild self-criticism from the agencies themselves convey a sense of the issues facing federal science. And the problems turn out, at least in part, to be caused by fancy new government regulations and plain old red tape.

Much of the report is devoted to descriptions of existing programs and information on trends in research policy and financing. The report, for example, documents the decline in federal support of basic research in dollar terms adjusted for inflation. It notes that in the years between 1968 and 1976 obligations for basic research grew by 4.3 percent annually in current dollars; this translated into an average 1.8 percent yearly decline in constant dollars over the period. Basic research has made something of a comeback in the budget since 1975, but that recovery has been threatened this year as Congress, reportedly reacting to California's Proposition 13, has aimed the economy ax at basic research in the Carter budget.

Federal funding has been the major factor in basic research increasing much more rapidly in universities than in industry. In the 25 years after 1953, basic research in universities increased 25-fold, while in industry the increase was 5-fold. Federal support of basic research in universities totaled about $1.3 billion in 1977, while the figure for industry was $201 million in current dollars, or about 7.3 percent of total federal obligations for basic research.

Limitations on basic research funding per se pain federal research officials, but the ways of their congressional paymasters add to their discomfort. According to the "overview" section of the report, "The chief agency concerns have to do with (1) sharp yearly fluctuations in budget authority and (2) legislative expansion of agency responsibilities without commensurate increases in funding. The latter unintentionally can lead to reductions in basic research funding to meet operational or other requirements." Examples of agencies called on to do substantially more without allowances being made at budget time are the National Bureau of Standards, United States Geological Survey, and the National Oceanic and Atmospheric Administration.

Increasing hindrances to the government's doing its scientific business are seen as being created by legislation and regulation. The Mansfield Amendment, which restricts mission agencies to supporting only that basic research which is directly relevant to their missions, is cited as causing some agencies "to deemphasize basic research." The sponsors as well as performers of federal research find themselves enmeshed in requirements of laws intended to protect the public's health, safety, and civil rights and the environment. And new congressional emphasis on accountability imposes record-keeping and research-justification tasks that greatly complicate life for the feds. These complaints are hardly unfamiliar to the clients of the science agencies. What is different is the perspective of the report and the tone, which is the aggrieved one of a man bitten by his own watchdog.

For the Eleemosynary Elite and Others, a New Magazine

A brand new entry among specialized periodicals is *Grants Magazine*, which is aimed at an audience of grantors and aspiring grantees. Subtitled "The Journal of Sponsored Research and Other Programs," the new quarterly is intended to range across private philanthropy and public patronage and run the disciplinary gamut from the sciences through the arts and humanities.

The publisher is Plenum, a New York commercial publisher of scientific and technical books and journals. Plenum seems to have got the idea for *Grants* from a book of the same name they had published and by whose sales they had been pleasantly impressed. As editor of *Grants* they recruited the author of the book, Virginia T. White, who had other credentials to commend her. As a grants-person, White has had experience in both public and private sectors and both cultures. Before assuming the editorship she was director of sponsored programs at the City University of New York, and earlier worked at the Smithsonian's Woodrow Wilson Center, Salk Institute, and Oak Ridge National Laboratory.

White says that *Grants* will combine comment on policy and trends in the field—the first issue includes articles by Senator Edward Kennedy and Adam Yarmolinsky—with how-to-do-it help. A regular "grants clinic" section will feature model applications illustrating how it's done.

Volume 1, Number 1, came out in July, which was a little confusing since it was dated March 1978, but Plenum, after a leisurely start, plans to catch up with the calendar. Subscriptions for the quarterly are $45 a year ($20 for those who pledge it is for personal use). A good question is whether subscribers can charge *Grants* off to their research grants.

—John Walsh