

sulted in modification of the stiffer sentences and the mutterings have been muted.

Averch's critics among the curriculum developers tend to regard him as a "management expert" sent in to clean up the procedural mess in the directorate by knocking heads and redrawing flow charts. They say that Averch is not, after all, an educator and that he slighted the substance of the programs.

Averch is, in fact, an economist by training. There is some *prima facie* evidence of systems analysis conditioning. His experience at NSF before moving to the science education directorate was in the RANN program, and he came to NSF from the Rand Corporation. But his work has been mainly on education and urban problems.

Averch's partisans argue that the overhaul of directorate organization and review of curriculum projects he directed provided a sort of firebreak against the blaze set by Conlan. And they note that the precollege program survived substantially intact, whereas many observers felt that, under the circumstances, it might be decimated or even completely dismantled.

While reorganizing the directorate and tightening up of its operating procedures are his most visible contributions as its chief. Averch, in departing, says he thinks that more important was the effort he made to clarify the basic question of what NSF should be doing to carry out its mandate to foster science education.

His valedictory on the subject is to be found in an NSF program report titled "Models and programs in science education, 1959-1976" published in June 1977. The report is couched to some extent in systemspeak, stressing strategies, models, and options. It does, however, provide a clear interpretation of the science education policies followed in the Foundation for the past two decades and some suggestions for a "scenario" for the 1980's.

In brief, what the report calls the "1959 Model" was based on the view that NSF's proper role in education was to sponsor the training of highly talented manpower to man the research system. The 1971 Model was characterized by the attempt to deal with an excess total supply of scientific manpower while at the same time meeting criticisms about the quality and variety of available sci-

entists and engineers. More attention was also given to meeting national needs by applying various kinds of leverage to the R & D system.

The immediate future calls for devising measures to cope with a "steady state" situation by divising policies which will assist institutions and individuals through what is proving to be a painful transition. The final section of the report is less a blueprint than an admonition to NSF and the Congress to think more clearly about the problems.

Congress is not through with the education directorate. Several of the programs seriously disputed in House-Senate negotiations over NSF legislation are in the education bailiwick, and the issue of the proper function of the federal government curriculum development is ripe for review. So Rutherford can expect to be busy as an "outside" man representing the directorate.

Inside NSF, Rutherford will be dealing with programs with a proven capacity to cause controversy. For as Averch says, "Unless someone continues to pay attention to the problems, both conceptual and procedural, they'll get into trouble again."—JOHN WALSH

NAS and Justice Panels Pan Federal Crime Research Effort

The Law Enforcement Assistance Administration (LEAA), the hastily legislated product of the late 1960's era of fear on the streets, is widely reputed to be one of the most inefficient and ill-thought-out agencies ever to have graced the federal government. Its research arm, the National Institute of Law Enforcement and Criminal Justice (NILECJ), has also been criticized for not knowing what it was doing, and, whatever it was, doing it badly.

The dilemma of NILECJ is the subject of a forthcoming report from the National Academy of Sciences, whose central recommendation is that NILECJ be totally severed from LEAA and established as an autonomous agency within the Justice Department. In a 23 June report, a Department study group calls for a strengthened, centralized criminal research program but does not recommend it be split from LEAA.

The research arm of any mission agen-

cy always has a difficult time trying to justify its activities while at the same time holding itself aloof from the day-to-day needs and political currents driving its parent agency. This circumstance has been especially stressful for the Institute, which was supposed to build a research structure in a field—the causes and prevention of criminal behavior—where the intellectual foundations were weak, and where, as its former director Gerald Caplan has said, precious little usable knowledge has been accumulated over the past few thousand years.

In its report, the Academy's Committee on Research on Law Enforcement and Criminal Justice lays out the problems besetting the Institute, which it depicts as unhappily straddling divergent and sometimes irreconcilable goals.

According to the committee, which was headed by Samuel Krislov of the University of Minnesota, "the projects funded by the Institute have been pre-

dominantly mediocre." It would be almost impossible for the Institute to produce good research, says the committee, given the administrative structure and political environment in which it must operate. Its money (\$150 million since 1969) has been put into a welter of projects, ranging from the development of new items of hardware for police use, to assessments of innovative programs to deal with offenders; very little emphasis has been placed on basic investigations into criminal behavior.

So distressed was the committee with the quality of the Institute's work that it gave some thought to proposing that it be put out of business altogether. It concluded, however, that a central national research effort on crime is desirable. The committee considered the effects of putting the Institute in the National Science Foundation or the National Institute of Mental Health, but decided that it should remain in the Justice Department if it is to retain its visibility and its ties with the rest of the criminal justice system. The severing of its relationship with its parent agency would free it from the tyranny of LEAA which, the report notes, "should be a primary constituent of the Institute rather than its administrator."

The report paints a sorry history of NILECJ which, it says, "has never had

the benefit of a rich intellectual environment to provide guidance in structuring its program."

This liability continues to be manifested in the relatively minor role that has been given to researchers from academe. Liberally inclined academic researchers, according to the report, "took a dim view of the intellectual potential" of the Institute because of its identification with federal law enforcement and the notion that LEAA might emerge as a national police force. Also, the short time generally given for researchers to submit proposals has had the effect of excluding academics in favor of private firms like Mitre and Rand that live off government contracting.

"The problems of federal research for local consumption were not systematically considered by the Institute's founders and remain a basic dilemma to this day," says the report. As a consequence the Institute has rambled all over the lot, switching strategies with each new director, and has failed to develop a "cumulative" body of knowledge about crime and justice. To begin with, the Institute took as its original goal that of LEAA: crime reduction. From this simplistic aim grew a variety of notions, such as "crime-specific planning," which treated certain crimes as diseases for which cures could be formulated once their causes had been ascertained.

When it became clear this approach didn't work, the report says the Institute retrenched too far by giving up on the big questions and turning its attention to improving the criminal justice process—"... the Institute's most recent re-

sponse [to frustration] has been to deny its capacity to produce useful knowledge about crime problems at all and to substitute as its focus of concern the operation of the criminal justice system." Thus, it has assumed a "reactive stance" and has avoided the "hard questions of knowledge about crime and criminal behaviors in favor of easier but relatively trivial studies of system operations."

The committee also found that NILECJ has, willing or not, gotten mixed up in a lot of activity that has no business in a research establishment. "It has been asked to carry too large a share . . . such as technical assistance to SPA's [State Planning Agencies], training programs, project evaluation, and other direct service obligations that have turned its focus away from research." Cited as the prime clinker in this department is the "Impact Cities" program, an attempt to pour masses of money into a few cities to fund and then evaluate innovative programs. That 3-year program, terminated in 1975, has already been lambasted from other quarters; the report states flatly the methodology and data collection were so poor that the program "had no research value at all."

As for other research, the committee found most projects to be isolated in focus, unrelated to each other and therefore lacking in "cumulateness." Among the few programs it found promising are the Research Agreements Programs—a small group of long-term contracts with research teams at universities and research corporations that are designed to develop a continuous stream of knowledge on a few limited themes, such as white collar crime.

So what should the Institute do? It should recognize that its mission is to "develop reliable, generalizable knowledge about crime, criminal behaviors and the effectiveness of crime control methods and policies." Says the committee: "Research itself can never be an instrument for solving social problems." [The program] "should be judged by the value of its contribution to our knowledge about crime and criminal justice rather than by operational measures such as crime and recidivism rates."

The committee does not like the way the Institute is divided up (research, evaluation, and technology transfer) and proposes an agenda based on six program areas: data collection; deterrence; rehabilitation; consequences of change in the criminal justice system; "socialization to crime"; and criminal law.

Throughout the report is evidence that the "congressional ambiguity" surrounding creation of LEAA, the hot political climate in which it was forged, the persisting ideological conflicts over the causes of crime, and the persistent pressure to produce results to serve LEAA's immediate ends, have made it impossible to get a good research program going.

The Justice Department, which is now reviewing its own group's report on LEAA, has not yet reacted officially to the NAS report. Its feelings will probably become clearer in the course of current hearings, conducted by the House committees on science and technology and on the judiciary, over the federal role in criminal justice. Whatever the outcome, it is scarcely likely that LEAA will be allowed to continue indefinitely in its present form.—CONSTANCE HOLDEN

Asbestos: Trouble in the Air from Maryland Rock Quarry

To the north and west of Washington lie the lush, rolling hills and prosperous suburban communities of Montgomery County, whose residents are among the most affluent and generally most favored suburbanites in the United States. Chevy Chase, Bethesda, Rockville, Gaithersburg, Germantown—the names of such communities evoke a picture of solid middle-class comfort and security. Moreover, inasmuch as Montgomery

County has almost no polluting industries to speak of, it has been one of the last places where one would expect a major environmental health scare. But during recent months a growing number of county residents have been in an uproar over what they perceive as a serious possibility of a long-term cancer threat.

Crushed stone containing possibly dangerous concentrations of asbestos fibers has been produced for some years

now at a large quarry near Rockville from which serpentine rock is extracted. This asbestos-bearing stone has been used—often in a dusty, unbound form—in surfacing hundreds of roads, school playgrounds, and park recreation areas, not to mention innumerable private driveways and parking lots.

Evidence that such uses of the stone have contaminated the ambient air with asbestos fibers and possibly created a serious public health hazard was presented in a research report published in the 17 June issue of *Science*.* According to the report, five air samples were taken in residential and school areas in the Rock-

*Entitled "Environmental asbestos pollution related to use of quarried serpentine rock," this report was prepared by Arthur N. Rohl, Arthur M. Langer, and Irving J. Selikoff, all of the Environmental Sciences Laboratory, Mount Sinai School of Medicine, City University of New York [*Science* 196, 1319 (1977)].