establishment. With more than 5000 professionals and supporting staff, the labs have the manpower resources to mobilize for major efforts in interdisciplinary research. But with 18 scientific divisions to be administered, a rigid bureaucratic structure could easily develop. In some divisions the staff has fallen into a civil-service pattern of the routine 8-hour day, which does not provide optimum conditions for scientific endeavor.

While the labs have been growing at an average rate of about 8 percent annually in recent years, many of the new arrivals work on new projects. In general there is relatively little turnover at the administrative or senior scientist level, and while most divisions are active, a few are what one administrator described as "over the hill."

Weinberg has been one who clearly recognized the need for rejuvenation and for maintaining vitality in a place like ORNL. A lucid and fairly prolific writer on science policy, Weinberg has been a leading advocate of giving the federal laboratories a greater role in science education (*Science*, 6 April 1962). He has also urged that federal laboratories keep deployed against the truly important problems facing the society.

In a state-of-the-laboratory talk at the end of 1964 Weinberg said, "during this period of stationary budgets for science, we as a government laboratory are particularly vulnerable to the perennial question: 'Why do we exist and what are we for?'" Weinberg went on to point out that a committeee had been established by the President's science advisor, and chaired by E. R. Piore, to review the functions and validity of the many hundreds of government research establishments. The AEC labs were omitted from the study, but Weinberg predicted their turn for scrutiny would come.

In his statement Weinberg identified five "central problems" facing society and said that ORNL is "at the forefront of the attack on each of these problems."

1) In pursuit of a source of cheap and abundant energy, concentrated work is being pushed on the thermal breeder reactor. And potentially even more revolutionary, although much more difficult, is the attempt at achieving controlled fusion—the ultimate jackpot of thermonuclear energy.

2) The increasingly serious need for cheap and abundant water has attracted attention to ORNL and the group associated with Philip Hammond in work on water desalination.

3) Research to meet what Weinberg calls "the problem of chemical and physical assault on the biological environment, and of cancer," is being expanded. Some $3.5 million in grants from the National Institutes of Health represent a kind of collaboration with other federal agencies which ORNL partisans hope will keep growing.

4) Since September 1964, Wigner has been spending about a week a month at Oak Ridge to head the ORNL Study of Civil Defense. An outgrowth of the Project Harbor study which was sponsored by the Defense Department and the National Academy of Sciences, the ORNL project is devoted in part to further examination of the thesis that a civil defense program, including blast shelters, is feasible. Because the study involves key social and political factors, the small Wigner group includes three social scientists, a new departure for Oak Ridge.

5) The change in ORINS should enhance ORNL's capacity to assist in the raising of educational and cultural standards in deprived or depressed regions.

In his statement Weinberg saw ORNL entering "a sort of Golden Age" as it followed the manifest destiny of the big national laboratory to attack big national problems.

—JOHN WALSH

Auto Safety: New Study Criticizes Manufacturers and Universities

One day next week, auto executives in Detroit will awake to find themselves confronted with a book that is likely to be the *Silent Spring* of traffic safety. Called *Unsafe at Any Speed*,* the book, by a young Washington attorney, Ralph Nader, describes in a straightforward way why it is that our cars are dangerous and how they could be made safer.

The manufacturers will howl, but his analysis is detailed, well-documented, and subtle. He provides an illuminating study of the 1960–63 models of Chevrolet Corvairs, whose handling characteristics were cited in over 100 damage suits against General Motors and also spawned a subsidiary industry—small supply companies that developed special stabilizing equipment for the Corvair. More important than the analysis of one-car accidents is Nader's discussion of "the second collision": what happens inside a vehicle when cars crash. Since shortly after World War II, a handful of scientists have been studying ways of "packaging" car occupants to reduce the hazards of collisions and have accumulated a good deal of significant data. But car-design reformers have consistently run into Detroit's preoccupation with styling and cost. Inventions developed independently—such as an energy-absorbing bumper—have often been dismissed or ignored. The result is a wide gap between what the scientists and engineers know and what Detroit produces.

Industry's attitude toward the proposition that cars could be safer is summed up in the quotation from a speech by General Motors president John F. Gordon in 1961, with which Nader begins his study. "The traffic safety field," Gordon said, "has in recent years been particularly beset by self-styled experts with radical and ill-conceived proposals. . . . The general thesis of these amateur engineers is that cars could be made virtually foolproof and crashproof, that this is the only practical route to greater safety and that federal regulation of vehicle design is needed. This thesis is, of course, wholly unrealistic. . . . The

* The book, subtitled "The Designed-In Dangers of the American Automobile," will be published by Grossman, 30 November, $5.95. The author is a graduate of Princeton and of Harvard Law School and was formerly a consultant to the Office of Policy Planning and Research, Department of Labor.

suggestion that we abandon hope of teaching drivers to avoid traffic accidents and concentrate on designing cars that will make collisions harmless is a perplexing combination of defeatism and wishful thinking."

The dogma of Detroit is that the chief cause of accidents is careless driving or, occasionally, poor highways. Subscribing to this thesis is a vast array of industry-sponsored committees, associations, foundations, and councils, with a political base in the White House and an intellectual base in the universities, which makes up what Nader calls the "traffic safety establishment." This establishment, he remarks, "is not a conspiracy; it does not have to be. As the only organized constituency in traffic safety, one which represents the interests of the automotive and allied industries, it has been more like a great power with no challengers. By championing driver safety and resistance to federal 'encroachment,' and by providing funds to 'sound' recipients, the establishment has enlisted the support or understanding of state and local officials and of volunteer groups and workers."

The most generous thing that can be said about this establishment is that it is an obvious failure. Despite the sums it spends on research, statistics, driver education, and other public campaigns, car accidents are the leading cause of death for persons aged 5 to 29. For the rest of the population they rank fourth, coming after heart disease, cancer, and stroke. With nearly 50,000 traffic fatalities and nearly 5 million injuries every year, the record is not one to inspire praise. But Nader's charge against the traffic safety establishment is not only that it threatens public health. It is also that industry has been able to co-opt both government and science into agreement with, or silence about, its sophistries. U.S. scientists and engineers have solved problems far harder than producing a car body that can absorb force, designing a safe interior, or developing effective systems of passenger restraint. When a society that can put a man into orbit cannot guarantee his survival in a collision at 20 miles per hour, the cause is more likely to be an underdeveloped public policy than an underdeveloped technology. And the distinguishing mark of Nader's book is that, while he concentrates on "unmasking" Detroit, he goes to the heart of the public policy questions as well.

A Foot in the White House

At the summit of the various industry-related organizations which dominate the traffic safety field* is an institution the book describes as "quite without parallel in the history of American government." The institution, which Nader compliments for "creativity in political science," is known as the President's Committee for Traffic Safety. It occupies government office space. Its staff director supervises civil servants. On its publications it displays the Presidential seal. Its staff drafts almost every White House statement on traffic safety. But the salaries of the committee's chief officers are paid by the President's Action Committee for Traffic Safety, a private, tax-exempt "paper" organization that receives most of its money from the Automotive Safety Foundation and the Insurance Institute for Highway Safety. And while the committee itself is drawn largely from prominent private citizens (the chairman is William Randolph Hearst, Jr.), the advisory council and its executive committee are made up of people directly or indirectly tied to industry. This is rather like having a committee on smoking and health chaired by the president of American Tobacco. The committee is, in effect, a private interest group running a public agency and speaking with the authority of the President of the United States. Its purpose, the book points out, is "to see that the federal government stays out of traffic safety and that the entrenched view of accidents and injuries as being due to driver behavior is not disturbed."

This state of affairs is by no means secret. Nader reports that between 1962 and 1964 "high officials in the Department of Commerce and certain government agencies tried in vain to dissolve or at least to curb the committee, so anomalous and notorious had been its status and activities. . . ." But while they apparently were making some headway under Kennedy, an interview between Hearst and President Johnson shortly after the assassination apparently resulted in Johnson's consenting to keep the committee unreconstructed. And while inquiries last week to officials in relevant executive agencies confirmed the discomfiture which Nader notes, there was no hint that any change is in the offing.

If the White House has failed to resist the Detroit mystique, so, unfortunately, have the universities. Perhaps the most important accident research being conducted in this country is the work of the Cornell Aeronautical Laboratory, formerly the Cornell Automotive Crash Injury Research project. It is supported jointly by the government—the Public Health Service—and the manufacturers. The result of the joint sponsorship. Nader believes, has been the creation of a set of policies designed to insulate the industry from any adverse findings of the Cornell staff.

Universities Criticized

Close relations between the Cornell project and its sponsors have several ramifications. First is the question of prior review of Cornell's findings. A Cornell spokesman interviewed by telephone last week agreed with Nader's assertion that it is common practice for industry sponsors to keep close checks on work in progress or about to be published. In at least one case—the publication of an analysis of steering-column penetration which described differences among makes of cars—this policy resulted in an incident which looks very much like suppression. The report was scheduled to come out, was referred to the industry for "technical guidance," and has not appeared. The Cornell spokesman pointed out that the subject was so complex that it had appeared to deserve further study; the book contends that difficulties so serious as to require 2 years of reevaluation might well have been discovered "before the announcement that the report would be issued on a specific date."

Another issue arising from the Cornell–industry relationship is the question of naming manufacturers involved in the studies. Cornell data are developed from accident reports turned in by state and municipal authorities of several cooperating areas. On only two occasions, according to Nader, has Cornell named makes of cars in its reports. One instance was in an analysis of the effectiveness of door latches, which, Nader says, showed only small differences among the three major manufacturers. The other was in a comparison of 1962–63 door latches with earlier-model latch designs, which showed, among other things, that "the doors of General Motors cars were torn off more frequently than those of Ford or Chrysler and the type of hinge damage appeared to be different. . . ." With these exceptions, Cornell's published reports have omitted references to manufacturers.

*These groups, which finance most of the activity in the field, include the Automotive Safety Foundation, the Insurance Institute for Highway Safety, the American Automobile Association, the National Safety Council, and various state and municipal groups.

Editor of "Nature" Dies

Lionel John Farnham (Jack) Brimble, joint editor of *Nature* from 1938 to 1961 and sole editor since 1961, died in his London home on 15 November.

Born 16 January 1904 in Radstock, Somerset, Brimble studied biology at the University of Reading and was a lecturer in botany for a year at the University of Glasgow and for 4 years at the University of Manchester before becoming assistant editor of *Nature* in 1931. He was appointed in part on the strength of his review, published in *Nature* in 1930, of Sir Jagadis Chunder Bose's book *Growth and Tropic Movements of Plants.*

Author of 19 books on biology and other topics, Brimble was a fellow of the Royal Society of Edinburgh, the Royal Society of Arts, and the Linnean Society.

Nature, an international journal published by Macmillan, has had only four editors in its 96-year history. The founding editor, Sir Norman Lockyer, an astrophysicist, served from 1869 until his retirement in 1919. Lockyer's successor, Sir Richard Gregory, who appointed Brimble assistant editor, retired in 1938 in favor of A. J. V. Gale and Brimble as joint editors. Gale retired in 1961.

At the end of Brimble's editorship, *Nature* was publishing research communications and letters to the editor at the rate of about 3,500 a year. In 1964 the communications and letters came from 65 countries. About one-third of these came from the United Kingdom, another third from the United States. It was not Brimble's practice to send many of these out for review. He felt that the responsibility for selecting the letters and communications was one of his own chief tasks.

Temporarily assuming Brimble's duties is R. J. Fifield, assistant editor since 1959.—VICTOR K. MCELHENY

According to a spokesman for Cornell, their policy is clearcut—to publish all scientific reports. "Where we find significant differences between manufacturers," he told *Science,* "we publish those too. In general, however, it is fair to assume that we either don't find significant differences or that that's not what we're looking for." In this regard, the problem facing the Cornell researchers is in some measure technical: it is evidently fairly easy to discover differences in the case of mechanical parts such as door latches, where manufacturers tend to use standardized items in all models, but the complexity and variety of designs and objects on instrument panels, for example, limit the size of the sample and make statistical evaluation difficult. Lack of statistical data, however, does not keep Cornell from filing with its sponsors specific case materials on accidents involving the company's products. Every quarter, Ford gets details on accidents involving Fords, Chrysler on Chryslers, and so forth. Furthermore, whenever Cornell discovers an unusual case of structural collapse or injury, the manufacturer is notified even if the case is unique.

The difficulty here is not that Cornell shares its data with the manufacturers—if something is going wrong, surely they need to know it and they need to know it fast. The problem is that the data are given only to the manufacturers. The material is denied to the individuals involved in the accidents that are the subject of the reports, lest Cornell become involved in subsequent litigation, and it has even been denied to various public agencies, such as a pioneering committee of the New York state legislature which was attempting to investigate the need for design safety standards. "We give our case data only to sponsors," the Cornell spokesman said last week, and while this category theoretically includes the Public Health Service, in fact the PHS has never requested the information. "What would we do with it?" one PHS official is reported to have replied to Nader's questioning. What they should do with it, in Nader's opinion, is immediately release it to the public, which might be happy to make its choices about cars on something less than the statistically perfect evidence which is necessary for the Cornell researchers' formal scientific efforts. "If single cases are worth reporting to Detroit," Nader commented in a recent interview, "they are worth reporting to the public."

One difficulty underlying the Cornell situation appears to be an inappropriate funding mechanism. The book points out that the Cornell research is financed under the same premise that characterizes most government support for basic research in this country—that the responsibility of the government agency ends with evaluating the merit of the proposal. The result of what Nader described in an interview as an "uncritical transfer of grants policy" has been to encourage the Public Health Service in the timidity with which it characteristically approaches all controversial areas of environmental health. The PHS views its job as supporting worthy research, not as promoting safer cars. The Cornell project is in large part a public one. Sixty percent of its funds come from the federal government, and in addition it relies heavily on data supplied freely by a large array of police and public health officers. In this situation, the book's argument that the Cornell information "should be considered a national data bank to be used for the benefit of the public generally" has a good deal of persuasiveness.

The problem is by no means limited to Cornell. Nader does not question the value of the research. What he does question is the public policy, typified by Cornell, that permits a mixture of public and private support on terms that leave the industry in a privileged position. Even if the industry were perfect, or were doing all it could, someone besides the industry itself should tell us so. But at present there is no antidote to the inevitable self-interest of Detroit. "Whenever an independent research capacity seems likely to develop," Nader commented recently, "the industry always steps in and offers aid. The Bureau of Public Roads, for instance, recently gave a large grant to the Franklin Institute for research on how force is transferred through metal. Right away American Motors offered to supply the cars." Nader believes that, despite some recent improvements, the industry does not have a well-developed in-house capacity for safety research, and that it is not anxious to see an independent capacity develop elsewhere. And he also believes that financial dependence on industry undermines the independence of the researchers. In a West Coast project,

for example, researchers have for several years been studying the results of controlled collisions; the cars they crash are supplied by the industry. But the industry has provided only conventional sedans. The hard-top models that lack a center door pillar, and the obviously less crashworthy convertibles, have never been tested.

Lately there have been signs that the system that Nader describes is breaking down. Within the last several months the federal government has developed new safety standards to be met by manufacturers for the thousands of cars purchased annually by federal agencies. Two Senate committees and the Federal Trade Commission held controversial inquiries into various aspects of vehicle safety. New York State enacted legislation authorizing a feasibility study for a prototype safety car. In New York, a group known as Physicians for Automotive Safety picketed the auto show, for safer designs. In Washington, behind the scenes, the President's Science Advisory Committee is reported to be beginning to look into the whole traffic safety problem. To these omens must be added *Unsafe at Any Speed*. As in all works of this kind, there are plenty of statements that invite challenge, and there is no doubt that the author is very hard on several groups of people, who undoubtedly see themselves very differently from the way he sees them. The companies, the researchers, the politicians, and the bureaucrats will all find the book uncomfortable and will do their best to fight it down. But it seems likely that the public will react differently.

—ELINOR LANGER

Graduate Schools: Grants Awarded To Encourage Stronger Programs

A major goal of the Higher Education Facilities Act of 1963 was to bring about a wider distribution of high-quality graduate education in the United States. It was noted that about 75 percent of the doctoral degrees were being awarded by institutions in 12 states, which happened to include within their borders 20 of the nation's leading universities. Institutions in the other 38 states, with half the country's population, were awarding only about one-fourth of the Ph.D.'s

The imbalance was adjudged unsatisfactory, and the Congress moved to try to redress it. The higher education act authorized a graduate facilities grant-in-aid program which is now in its second year. A total of $60 million in grants had been approved for the fiscal year ending last June, and the announcement of another $14.2 million in grants is imminent. Grants may not exceed one-third of the project cost.

Years must elapse before the results of the program can be properly appraised, but the first year's experience suggests how the program's managers are interpreting their mandate. A central, though temporary, figure in directing the program is John William Ashton, who retired in January as vice president and dean of the graduate school of Indiana University to become director of graduate programs for the U.S. Office of Education. Ashton will remain at this post until next July, when he returns to Indiana to assume the position of University Professor of English and Folklore.

In an interview with *Science* last week, Ashton expressed satisfaction with the way in which the first grants have been distributed. An analysis of the 114 grants, totaling $74.2 million, for fiscal 1965 and the first five months of fiscal 1966 shows that all regions of the country have shared in them. Taking 12 states noted for having strong graduate institutions—Massachusetts and Connecticut in New England, several of the Middle Atlantic and Midwest states, and California—one finds that they got about 65 percent of the grant funds. However, the stronger institutions in these states, such as Yale, Columbia, Indiana, and Stanford, got only about 40 percent of the money.

As of early November no grant application had been received from the nine states of Alaska, Idaho, Montana, Nebraska, South Dakota, New Hampshire, Virginia, West Virginia, and Arkansas; one or more institutions in the other 41 states had requested grants, in most cases successfully. Thus, it is clear that the "developing" graduate institutions, as well as the institutions already recognized for their excellence, are receiving substantial assistance. The grants speak for themselves. The new Irvine campus of the University of California, which accepted its first students in September, was awarded a $1.5-million grant on a $9-million physical science building. The University of Alabama, whose graduate programs generally are not among the strongest even in the South, got a $420,900 grant on a building for multidisciplinary studies that will cost three times that much.

Some well-established graduate institutions are receiving aid, too, however. For example, Massachusetts Institute of Technology has been awarded a $987,000 grant toward a $2.9-million Center for Advanced Engineering Study, which will enable engineers of ability, temporarily on leave from their jobs in industry or teaching, to catch up with the rapidly advancing technology in their fields.

Ashton observed that the humanities and social sciences, left out under earlier government programs oriented toward medical and scientific fields, now are getting substantial support. (See Table 1 for the distribution of grants by field.) More than 22 percent of the first $60 million in grants is for facilities for the social sciences and education.

Grants for facilities for the humanities and fine arts amounted to about 5 percent, a share not in itself impressive. However, the 41 percent allocated for new library facilities is expected to be particularly helpful in strengthening graduate studies in the humanities and social sciences. An example of direct support of programs in these two fields is the $225,000 grant awarded Johns Hopkins University toward financing a $1.2-million building renovation project. Johns Hopkins has announced that, over the next decade, it will expand its graduate enrollment in the humanities by 70 percent. Thus far the Office of Education has not, for lack of funds, had to play favorites among fields of study. "We haven't