Agriculture: Research Planning Paralyzed by Pork-Barrel Politics

The agricultural research system is an organizational leviathan that employs some 10,000 scientists and consumes about half a billion dollars a year. The system is replete with paradoxes. It is credited with a major share in the remarkable productivity of American agriculture yet, in the opinion of some economists, the present burgeoning of food prices may be the delayed result of a decline in research quality. It has caused over the years a revolution in every aspect of agriculture, yet it has itself changed hardly at all. Its pattern of growth has been determined by history rather than the needs of the time, and when its growth is curtailed, as at present, it finds adaptation painful or impossible. Its business is innovation, but it innovates conservatively, choosing to achieve numerous small advances rather than revolutionary breakthroughs. Its productive workers are its scientists, but it is ruled by a higher caste that consists chiefly of administrators. It is finely attuned to the immediate needs of its clients, but its central nervous system has only vestigial control over its working parts. It is said to be governed by the rational dictates of planning, priority-setting, and coordination. In fact, it obeys a quite different logic. The agricultural research system is politicized from crown to grass roots. Its operation needs to be understood not in terms of the administrators' organization charts, but as the behavior of a highly political animal.

The animal that the agricultural research system most nearly resembles, in elegance, coordination, and singleness of purpose, is without doubt Siamese twins. One twin is the system of state agricultural experiment stations (SAES), of which there is one in each state, usually located on the campus of a land-grant college or university. The SAES are designed to serve needs down to a quite local level, and to this end each station may have up to 53 branch stations. Under the terms of the Hatch Act of 1887, the SAES receive a significant proportion of their funds, virtually without strings attached, from the federal government. (Federal Hatch funds, totaling $83 million in the current fiscal year, account for 22 percent of the average station's budget, varying within wide limits according to a formula based on the size of the state's rural population and other factors.) Of the rest of the SAES budget, about half is derived from state legislatures and the remainder from industry, foundations, and other federal agencies such as the National Science Foundation and National Institutes of Health.

The counterpart to the SAES is the federal research system of the U.S. Department of Agriculture (USDA), comprising the Agricultural Research Service (ARS), the research arm of the Forest Service, and the Economic Research Service (ERS). The present budgets of these three organizations are $200 million, $57 million, and $17 million, respectively. The total USDA effort amounts to about 40 percent of the public investment in agricultural research, the rest being performed by the SAES. The research conducted by industry is roughly equal to that of the USDA and SAES combined.

It might be logical to suppose that, if the 53 state stations and their numerous branches cater to regional needs, the USDA would elect to look after national needs and hence would concentrate its resources in a few laboratories of more than critical size. The ARS and Forest Service do support some large installations, notably the ARS laboratory complex in Beltsville, Maryland, the large utilization research labs in each of the ARS's four regions, and the forest products laboratory in Madison, Wisconsin. But the resources of the two agencies are in fact spread over a total of some 280 separate laboratories, stations, and work sites. Many of these laboratories are evidence of an extreme fragmentation of effort. The Southwest Cotton Insects Laboratory in Waco, Texas, for example, is manned by just two professional scientists. And the Boll Weevil Research Laboratory in Tallulah, Louisiana, is home to just a single researcher.

Both the state and federal research systems are thus doing essentially the same kind of work and are following the same fragmented approach. There are, of course, some particular differences—the ARS accepts research responsibility for certain national problems such as the threat of foot-and-mouth disease—but by and large the general character of the research undertaken by the two systems is indistinguishable.

The reason why the ARS developed into a mirror image of the state station system goes back to before 1954, when the agency was created out of a number of different bureaus devoted to entomology, dairy science, and other disciplines. Following the customary laws of bureaucratic survival, each bureau chief built up ties with the particular farm industry his bureau served and with the congressmen who shared this constituency. The congressmen liked to place new facilities where the voters could see them, and each bureau chief tended his own satrapy without caring what the others did. Federal research stations were thus distributed piecemeal over the country on a strictly pork-barrel basis.

Power of Officials Broken

When the ARS was created, the bureaus were renamed divisions, but the power structure remained the same. The old alliance between the division chiefs and Congress continued, and the administrator of ARS was effectively powerless to coordinate or shift resources from one division to another without the consent of the division chiefs and Congressman Jamie L. Whitten (D–Miss.), the chairman of the House agriculture appropriations subcommittee. George W. Irving, ARS administrator from 1965 until last year, tried and failed three times to assert control over the divisions. Meanwhile, ARS laboratories continued to be created in accordance with political realities. The ARS was reorganized last June in order to simplify administration, as the official explanation has it, which is true as far as it goes. The real purpose was to strip the division chiefs of their power and to channel more authority through the ARS administrator's office. "It looks to me like the whole thing may be an effort to get away from responsibility to the Congress," growled Whitten when shown the reorganization plan. It was, but he could not stop it.

The same forces that fragment the

federal research effort are also operative in the states. There are economic data to suggest that large stations give almost twice as much value for money invested as smaller stations. But SAES directors who would like to close out some of their less productive, small branch stations know that their state legislature will soon hear from the farmers whom the branch stations serve. The SAES directors have considerable lobbying power with the federal government, both individually through their own congressmen and collectively through their Washington-based lobbying organization, the National Association of State Universities and Land-Grant Colleges (NASULGC). The NASULGC discusses the agricultural research budget with officials of the USDA, the Office of Management and Budget, and Congress but has generally been more effective at warding off threatened cuts than at wheedling more money from the federal coffers. Some believe that the SAES lobbyists have held back the ARS by insisting that the two organizations grow in step. Joint SAES-ARS statements speak of the necessity that "each of these two partners be funded in such a manner as to maintain a reasonable balance"—which suggests that the two partners see themselves as rivals. Certainly the SAES tend to complain bitterly when the ARS receives a larger budget increase. Sometimes this is of their own doing: SAES directors often lobby individually with their own congressmen in favor of ARS facilities proposed for their own state, and the effect of 53 SAES directors lobbying for the ARS is not negligible. This year, for the first time in recent memory, the federal allocation to the SAES was cut back, and the SAES are uncertain whether to blame the Office of Management and Budget (OMB) or the report of the Pound committee (see below), or both. The reason for the cutback is that the Secretary of Agriculture chose to let the budget ax fall on the SAES rather than elsewhere in his domain.

How is research policy made in the agricultural research system? Outward signs of fervent policy-making are not too evident. Comparison of the total SAES budget allocated to 15 different research areas in the periods 1951 to 1954 and 1961 to 1964 shows that only three of these areas changed in their relative share of support by more than a single percentage point. A similar conservatism is evident in the research allocations of the ARS. The formula funding system under which the states receive their federal subventions does not assist the allocation of resources according to merit or need. In the case of the ARS, policy-makers have been hampered by a number of constraints of varying degrees of severity.

Many of the constraints spring from Congress. The autonomy accorded to the division chiefs was a major obstacle to research planning. So is the circumstance that Whitten, who has been chairman of the House agriculture appropriations subcommittee since 1949, knows the USDA like the back of his hand and is liable to query item changes as small as $2000. Congress also earmarks funds for particular commodities, such as cotton, often to an extent disproportionate to their relative economic worth. Earmarks, however, tend to remain in the budget after their designated problem has been solved and thus lose some of their restrictiveness.

Another source of inflexibility is Congress's possessiveness toward even minor research installations. "It's often less trouble to close down a military base than a two-man agricultural research station," says an OMB official, not entirely in jest. The ARS has succeeded in closing down only 30 or so stations in the last 10 years. Construction of facilities at Congress's behest has probably been the major determinant of the ARS research program. Over the last 100 years Congress has followed a cyclical pattern of erecting buildings and then neglecting to fund them properly. At present the ARS is in the trough of a cycle, and its latest batch of research laboratories are only 60 percent staffed.

ARS Budget a Christmas Tree

A different sort of problem is that the ARS budget is sometimes used as a Christmas tree whereon to hang the goodies that will secure the appropriation for the whole USDA an easy passage through Congress. USDA officials have also been able to play Congress against the executive branch, warding off cuts threatened by the OMB by citing the threat of congressional opposition.

A major constraint internal to the ARS—and SAES—is that almost all research is conducted by tenured staff whose specialized training makes it difficult to switch them to new research fields. New work is most easily undertaken with new resources, but in the last few years the ARS has lost both funds and personnel, making major shifts of emphasis almost impossible.

The attention of the ARS administrator has often been diverted from research planning by day-to-day crises, whether regulatory duties (until these were transferred in 1971) or outbreaks of epidemics such as southern corn blight, citrus blackfly, or exotic Newcastle fowl disease. These crises have been met successfully, although sometimes not without effort. "The ARS did respond to southern corn blight, and they did it well, but there was some screaming and gnashing of teeth," says a close observer of the USDA, who adds that the department "was not always anticipating as well as they could have done" the regulatory decisions coming out of the Food and Drug Administration and the Environmental Protection Agency.

Maybe the most serious obstacle to formulating a research policy in the ARS is the apparent caste barrier between the top and bottom of the organization, or between the scientists and administrators. The higher echelons of the ARS are filled with people who long ago left the laboratory and have worked their way up through the ranks. Nothing wrong with that, but so few working scientists rise to the highest salary grades in ARS that research is clearly the harder path to promotion, and active scientists seem to be seriously underrepresented in the agency's top counsels.

Scientists in the ARS are usually referred to by administrators as "bench scientists," as if the administrators conceived of themselves as a higher order of desk scientists. "We are the bench scientists, the foot soldiers of science, at the same level as the plumbers and technicians," says an ARS scientist of national reputation. As a graphic example of the scientists' place at the bottom of the totem pole, he cites the case of a power failure at the Beltsville laboratories that lasted for several days. "Quickly they ran emergency lines to the administrative office so that the paperwork could go on, but no one thought about our freezers. I had to go grabbing around for dry ice to save my specimens." Another well-known scientist says of the period before last year's reorganization (the effects of which, he says, it is too early to judge): "There was a horrible morale problem in the whole of ARS. Things here [at Beltsville] were so bad that we were

saying that what was needed was a bomb out here so that you could start all over again."

While morale is good or not so bad in many other laboratories, in some it is rather worse. The committee chaired by Glenn S. Pound, the report of which has been discussed in previous articles (*Science*, 5 Jan., 27 April, 4 and 18 May), chanced upon one large ARS laboratory where scientists reported that mail was censored, telephone conversations monitored, and the staff on the verge of mutiny. The director of the laboratory reportedly 'intends to rule this laboratory by calculated intimidation' and he was said to operate 'by threatening people with reassignment to more unpleasant jobs, demotion, abolition of their jobs, and dismissal. Nothing riles him as much as basic research and professional recognition.' Pound says that this laboratory was not unique. His committee learned of other laboratories where there was a "question whether the administrators had the kind of philosophy that would provide the atmosphere for an unfettered quest for truth." Other sources have said that the laboratories in question are the four utilization laboratories, which, after Beltsville, are among the largest of the ARS's installations. (It may be significant that the work on utilization has not been considered a very successful effort in total.)

Steps have been taken to assist the director of the laboratory that horrified the Pound committee, and morale at Beltsville has improved since last year's reorganization. Talcott W. Edminster, administrator of ARS since July 1972, says that he has never sensed a division between scientists and administrators in ARS. Asked if scientists are concerned about their status in the ARS, Edminster says that "If they were, they would leave. I have talked with 2000 of our scientists in the last few months and I think most of them are pretty happy."

Unlike SAES scientists, many of whom are located on campus and hold dual appointments with the university, ARS scientists are relatively isolated from academic life. Many ARS stations are located off campus. The agency performed only 3 percent of its research work extramurally last year and hired the services of only ten outside consultants. University scientists, in turn, have often made their agricultural colleagues feel like poor cousins

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U.S.-Soviet Pacts Threatened by Scientists

All may not be smooth sailing for the spate of United States-Soviet Union science agreements concluded by President Nixon and his emissaries in Moscow last May. The opposition is coming from an unlikely source—the scientists themselves.

A petition, signed by 150 government scientists at NIH, declares that the signers welcome the new exchanges, but that their "readiness, personal and professional," to "welcome" the Soviet scientists here is "impaired" by the authorities' treatment of scientists in that country. One of the originators of the petition, Jack Cohen of NIH, says that its careful wording implies a veiled threat of noncooperation with the agreements. He says that he has heard of individual scientists who already have declined to participate because of the Soviet government's actions.

The petition and reports of noncooperation are the first sign of a chill in the warming relations between the two countries in the fields of health and science (*Science*, 6 April). Cohen and other organizers on behalf of Jewish scientists in Russia say that, despite such apparent relaxations as the ending of the government education tax on educated persons who try to emigrate to Israel, harassment of Russian Jewish scientists continues.

The most prominent example of this continued harassment, according to reliable sources, is the mistreatment of the family of Benjamin V. Levich, one of the most prominent Soviet scientists to try to go to Israel, who has already lost his job as a result. On 16 May, Levich's 25-year-old son Yevgeny apparently was abducted from a Moscow sidewalk and forced into a car; his family eventually learned that he had been inducted into the army and stationed in the Zabikal military district near Mongolia. In the past he has been deferred from the Army because of poor health: sources close to the family believe the authorities, by drafting the son, will have an excuse to keep the whole family in the Soviet Union. Levich himself has recently been threatened with dismissal from his post as a corresponding member of the Soviet Academy of Sciences.

The extent to which the Levich case and others are generating resentment among sympathetic American scientists cannot be ascertained. However, the NIH petition was signed by three Nobel laureates: Christian B. Anfinsen, Julius Axelrod, and Marshall Nirenberg. It is now being circulated elsewhere.

The authors of the petition, who addressed it to the President, have had no reply from Administration officials charged with implementing the agreements in health and science. It remains to be seen, then, how sensitive these officials are to the Jewish protest, and hence, whether the accords themselves will reflect the actual wishes and feelings of the scientists who are supposed to be benefiting from them.—D.S.

AEC Shakes Up Nuclear Safety Research

A long and often bitter internal conflict over the management of nuclear safety research appears to be heading toward resolution within the Atomic Energy Commission. A major staff shake-up announced on 15 May by AEC chairman Dixy Lee Ray promises to give safety research new prominence and independence in the AEC hierarchy, a move advocated by a number of safety researchers themselves and rejected last year by Ray's predecessor as chairman, James Schlesinger.

The reorganization of safety research is reported to have provoked some angry protests from key staff members in AEC headquarters at Germantown, Maryland, and it also sparked a brief power struggle between the commission and the congressional Joint Committee on Atomic Energy (JCAE). But it appears now that tempers have cooled, and Ray is said to have emerged victorious from a closed-door grilling on the matter before the JCAE. The incident suggests that Ray is firmly in control of the AEC and capable of leading it on an independent course. There are

at the academic table, and for this reason, some say, have accorded them relatively few academic honors. Does the ARS lack its fair share of outstanding researchers, as the Pound committee suggests? "I would like to see this as unmerited," says Irving, "but if I were to make a case against it, there is not a great deal of evidence I could find. One measure is the number of people anointed by the National Academy of Sciences. If you compare the ARS with the numbers that come from M.I.T. or Illinois, it makes agricultural research look pretty puny."

Academic merit, the criterion by which the Pound committee measured the USDA-SAES system, is in some ways an unfair yardstick. Unlike universities, the system is not designed to produce Nobel Prize winners, although this it does do. It is designed to solve seemingly pedestrian but economically important problems in response to the needs of its clients, which is why much of the direction comes from the grass roots rather than the top. Such apparatus for directing research policy as is visible to the outside observer appears, on closer inspection, to play a largely ceremonial role.

The principal reef on which research planning founders is the jealously guarded autonomy of the 53 state stations. The SAES directors supposedly plan research through their own organization, the Experiment Station Committee on Organization and Policy (ESCOP). In practice, ESCOP is chiefly a lobbying organization with little effective influence on individual state policies. It collects and coordinates the directors' wish list but has no power to tell the directors what to do.

A similar degree of impotence characterizes the other body supposed to coordinate state research, the Cooperative State Research Service (CSRS). The CSRS, an agency of the USDA, is charged with disbursing federal funds to the state stations and with reviewing the projects the states propose to undertake with the funds. To this end, the CSRS has a staff of 111 and an administrative budget of $2.3 million. The teeth of the review process, however, have been drawn by the station directors. Few proposals are rejected. Some are deferred but, according to an internal CSRS report,*

* J. J. Endean, "CSRS administrative procedures: An outsider's appraisal," mimeographed (16 August 1971).

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also signs that the committee's domineering leadership has begun to lose its grasp on junior members, some of whom openly sided with Ray.

For over 2 years, citizens' groups and researchers in the national laboratories have complained that major uncertainties in the ability of nuclear power plants to control accidents have gone unattended, while research projects meant to settle these questions have taken a backseat to the AEC's star enterprise, the nuclear breeder program. The reorganization seeks to solve this difficulty by removing safety research on conventional, light-water reactors from the AEC's huge Division of Reactor Development and Technology (RDT) and placing it in a new division by itself, answering directly to the AEC's general manager, Robert Hollingsworth. The effect is to elevate safety research by one step on the commission's bureaucratic ladder and to remove it from direct competition for funds and attention with the breeder.

In announcing the reorganization, Ray said the commission was seeking "greater emphasis and effectiveness" in safety research programs in order to "speed resolution of the still-unanswered questions in this rapidly developing technology."

Within the commission staff and the AEC's laboratories, reactions to the shake-up ranged from cautious praise from long-time critics to raised hackles among the RDT leadership. One former safety research administrator at the National Reactor Testing Station in Idaho called the move "one big step in the right direction," while the *Weekly Energy Report*, a Washington newsletter, said that Milton Shaw, the RDT's powerful and controversial director, had briefly considered resigning in protest. Shaw has been the main target of critics, both inside the laboratories and out, who have heaped on him much of the blame for long delays and huge cost overruns suffered by key safety research projects. Shaw will remain in charge of the breeder program.

Within the JCAE, Representative Chet Holifield reportedly was enraged that three AEC commissioners—Ray, William O. Doub, and Clarence Larson—apparently drew up the reorganization plan without fully consulting with commissioner James Ramey or the JCAE. (A fifth seat is vacant. To fill it, President Nixon has nominated William E. Kriegsman, 41, a former staff assistant on energy affairs with the White House Domestic Council.) A California Democrat, Holifield has more clout than anyone else in Congress in matters of nuclear energy, and he has been an important source of political strength to both Ramey and Shaw. Sources said that Ramey was the only commissioner who opposed the reshuffle. It is worth noting that his term expires on 30 June, and that, as a Democrat, Ramey's chances of reappointment are regarded as slim.

Whether bureaucratic surgery will solve the safety program's problems remains an open question. Details—such as whether Shaw or the head of the new safety division will exercise control over operation and construction of the program's test reactors—are still to be worked out. The AEC's choice of safety director, however, seems calculated to mollify critics. He is Herbert J. C. Kouts, a senior staff member of Brookhaven National Laboratory and a member from 1962 to 1966 of the AEC's Advisory Committee on Reactor Safety, a group which, since 1969, has publicly and sharply criticized the laggard pace of safety research under Shaw. One acquaintance, an Idaho researcher with intimate knowledge of the long tribulations of safety research, says he thinks Kouts "has the right credentials, the right frame of mind" to revitalize the program.—R.G.

Milton Shaw

the common practice of state scientists is to rewrite the proposal without changing the project. The CSRS does not veto any project which a state director believes should go through. As for the coordination of SAES research strategy, the previous CSRS administrator, T. C. Byerly, attempted to play such a role but was, in the words of one observer, "crucified" by the state directors. The present administrator, Roy L. Lovvorn, is a former state director. "We don't have any direct control over the state stations," Lovvorn explains. "We cannot tell them what to do, but we can point out duplication to them." The two principal coordinating bodies for the states, ESCOP and CSRS, thus have no power to coordinate.

The fact that there is no means to ensure the coordination of state agricultural research raises certain obstacles, if not an impassable roadblock, in the path of harmonizing state research with the federal effort. The body supposed to do this is the Agricultural Policy Advisory Committee (ARPAC), which includes as members the chairmen of ESCOP, the administrators of ARS, CSRS, and ERS, and the head of the Forest Service's research arm. It is hard to see that ARPAC has exerted any more control over the agricultural research system than does ESCOP or CSRS. ARPAC's functions are by definition advisory. Lloyd Davies, the executive secretary of ARPAC, cannot name any new line of research ever initiated by the committee.

ARPAC might be expected to resolve boundary disputes between USDA agencies. The entomology research programs of the ARS and the Forest Service, for example, are described by one source as "two separate empires—on one campus I visited they weren't even talking to each other, although they are working on the same problems." ARPAC's power of persuasion with the state stations seems to vary inversely with their degree of financial independence from the federal treasury. Stations attached to the North Central universities have access to several sources of funds and derive only a small part of their support from the federal government. They behave fairly independently of the USDA and each other. Southern universities, on the other hand, caught in financial straits, are more amenable. (Historically, however, the competitiveness of the SAES system, and its freedom from USDA bureaucracy, have been advantages that helped make it the stronger of the two rivals).

Following the reorganization of the ARS, ARPAC has initiated a regional research planning system. The system is coordinated by Davies and a member of ESCOP, but no one has overall direction, and the system, as is usual with agricultural research planning bodies, is purely voluntary.

Yet another body said by administrators to provide coordination and direction is the National Planning Staff of the ARS. A product of last year's reorganization, the National Planning Staff has four assistant administrators and a staff of 40. Its functions are purely advisory. It does not yet seem to have found a role in life. Finally, the ARS also supports a ten-man group known as the Program Analysis and Coordination Staff, the usefulness of which it is too early to assess.

ESCOP, ARPAC, CSRS, the National Planning Staff, the Program Analysis and Coordination Staff, the regional planning system—the common feature of these bodies is that their powers are considerably less grand than their titles. They are the window dressing on the political realities, producing for both public and internal consumption a geocentric explanation of a heliocentric system. This may be one reason why the agricultural research system has never been able to come to grips with the structural faults described in the report of the Pound committee. These included pedestrian research, inadequate support of basic science, duplication of effort, inept management of scientists, and administrative philosophies repressive of the vitality of science. Perhaps the most remarkable feature of the report was not the forcefulness of its conclusions, but their lack of novelty. A series of previous committees, whose reports never saw the light of day, apparently reached similar conclusions. "I am not displeased with the Pound report," says former ARS administrator Irving. "They said a good many things that have been said before, and in some ways they have said them better." (The USDA deserves credit for its sense in releasing the Pound report, although this was only bowing to the inevitable. The Pound committee was originally asked to look simply at scientific issues. When it broadened its scope to include the management of science, a high USDA official asked Pound to desist but was ignored. Until its report was delivered, the Pound committee was intended to have a permanent existence.

Assuming that the Pound committee and its predecessors are correct in saying that agricultural research is not managed in a sensible fashion, it does not necessarily follow that the system's output has suffered, likely though this would seem. The SAES have probably maintained the research leadership but the official list of even the USDA's research acheivements over the last 30 years, an impressive document by any standards, lists page after page of economically significant discoveries and improvements. As the defenders of the system are wont to say, agricultural research is good for agriculture, regardless of whether or not it meets various academic criteria. The clients whom the system serves want a more efficient dairy cow, not a substitute for milk; they need a stream of small improvements that will increase profitability, not a revolutionary discovery that will drive them out of business. This is precisely what the agricultural research system has provided. "Constant improvement in animals and plants is more important in the long run than flashy breakthroughs," says ARS administrator Edminster.

How has U.S. agriculture come to be so marvelously productive if the state of agricultural research is as poor as the Pound committee believes? This paradox, frequently posed by USDA officials, is perhaps not as tight an alibi as it might at first seem. Research is only one among other factors, notably capital investment, that have raised the crop yield per acre by some 70 percent in the last 40 years. Even the productivity gains attributable to research do not necessarily justify the present research system in its entirety. The gains could be the work of only a minority of the system's 10,000 scientists. They might also derive from work done long ago; the land-grant colleges, for example, probably found it harder to compete for good people after the 1950's, when other universities started to support large research efforts.

The pattern of productivity gains in fact suggest that the quality of agricultural research may, if anything, have dropped off in the last decade. According to Robert E. Evenson, a Yale University economist specializing in agricultural development, there has been an apparent slowdown in productivity growth since the early 1960's. "With a lag, that is showing up in the present rise in farm prices. It also suggests that the contribution of the research

system is lower than it once was." The lower contribution, Evenson believes, could be caused by the type of deficiencies described in the Pound committee report.

One reason for this suggestion is that a similar drop-off in research productivity which occurred in the 1920's seems to have been related to the isolation of agricultural research from basic science. The reintegration with basic science that was effected at that time led to the improvements in the breeding and health of plants and animals that underlay the productivity gains made in subsequent decades. The agricultural sciences "have by and large neglected their ties with the basic sciences," Evenson says. The recent major advances in biology do not seem to have worked their way into agriculture, despite the potential for large gains in efficiency. Evenson doubts if the system is capable of integrating these findings. The time may have come for another reintegration with basic science, similar to that which occurred in the 1920's. Others have expressed the idea that the agricultural research system may need some new source of inspiration. Sterling B. Hendricks, an eminent researcher now retired from the ARS, suggests that the methods which have underwritten the success story of agriculture—chiefly improvements in the control of disease and breeding—may already have yielded their full return, and some other source of payoff must be looked for in the future, maybe from more fundamental kinds of research.

Is the agricultural research establishment likely to recast its endeavors in this way? The short answer is no. Congress is content with the system as it is. The OMB has only eight examiners to monitor the entire USDA and seems in any case to take the general view that further research is of questionable value while the government is doling out subsidies to farmers to keep 60 million acres idle. (The counterargument is that agricultural produce is a major American export whose importance to the balance of trade is likely to increase in the years ahead; more and better research would therefore be justified.)

Within the ARS, all energies for change are still occupied in the recent reorganization which, however, was undertaken for political reasons and was not designed to affect the conduct of research one way or another. (The effect of the reorganization is to decentralize decision-making and to place it on a geographic instead of a disciplinary basis.) The contention of some ARS administrators that the reorganization has dealt with all the problems raised by the Pound committee is unconvincing. For one thing, the reorganization was planned long before the Pound committee reported. Peer review, one of the committee's chief recommendations, is a difficult process to apply to a largely tenured staff. Nonetheless, limited forms of peer review are being tested out in ARS, notably by the ARS deputy administrator for the northeastern region, Steven C. King.

In the years ahead, both the ARS and SAES seem likely to face small or negative growth in their budgets, the SAES especially as the rural power base in state legislatures continues to be eroded. There is already a case to be made for consolidating some of the state stations—all of the New England stations, for example, might be rolled into one, or a single mountain state station set up. There is also a case to be made for consolidating the rival ARS and SAES systems into a single organization that would cater to national, regional, and local needs on a rational instead of an historical-political basis. The integrated system might be subjected to a national peer review process of the type operated by the National Institutes of Health, in order to secure uniform judgments as to priority and scientific merit.

A radical restructuring of this nature is not at all likely to occur tomorrow. The system has in the past served its clients extremely well, and the arguments for change have so far convinced only a few. Too many powerful forces are combined in keeping the system as it is—decentralized, uncoordinated, fragmented, undirected, and easy for special interest groups to manipulate. Things will have to become a lot worse before they get any better.

—NICHOLAS WADE

Higher Education in Britain: A Rein on the Universities

Ten years ago the Conservative government in office in Britain committed itself to a major expansion of higher education. Policy then and in subsequent years closely followed the chief recommendations of a blue-ribbon committee headed by the Oxford economist Lord Robbins. The government accepted not only Robbins's recommendations on enrollments and expenditures but also the principle espoused by the committee that higher education should be available to all who are qualified and wish to pursue it. A strong assumption at the time was that the growth of higher education was crucial to the national interest. As the committee report expressed it, "Unless higher education is speedily reformed, it is argued, there is little hope of this densely populated island maintaining an adequate position in the fiercely competitive world of the future."

Now 10 years later, the numerical goals set forth in the Robbins report have been achieved—notably in a virtual doubling of university enrollment—but things have not worked out quite as expected either for individuals or for the country. The ideal of equality of opportunity in higher education remains elusive, and Britain, by most indices, has lost ground to its economic peers. These disappointments are reflected in a new government white paper titled "Education: A framework for expansion" which sets policy for a new phase of development in British education at every level. For the universities, which have enjoyed special favor during the past decade, the new policy is interpreted as bad news.

The rate of growth of university enrollment would be cut back under the white paper's provisions (see Table