Here I believe the federal government could take the lead. It could state, as a matter of broad federal policy, that the government views such arrangements with favor, and that federal laboratories can make their people available for educational work as part of their regular jobs. The laboratory would be reimbursed by the cooperating university for this service, but at a rate which the university could afford. I believe this is a matter that should be taken up by the Federal Council of Science and Technology, and that a general statement approving such arrangements throughout government ought to be made.

Lesser degrees of involvement may be indicated in special cases. A great extension of the policy of granting sabbatical leaves for academic teaching, by the federal laboratories, paid for at least in part by the government, and by industrial laboratories, paid for in part by the industry, would increase the nation's science teaching staff significantly. One need not confine the teaching to graduate level; many industrially as well as federally employed scientists could profit by occasionally going through the intellectual discipline required for proper teaching of even undergraduate science. Is it too much to hope that industries, to say nothing of the federal government, will appreciate the long-term advantage they get from allowing their scientists to participate in teaching, and that they can be persuaded to pay part of the bill? Other possibilities for interweaving the academic and the nonacademic scientific communities will surely present themselves.

The proposal to recast the federal laboratories into combination graduate schools and research institutions is likely to be received with suspicion—in particular, perhaps, by the academic community, which might see in such a move an encroachment on the proper domain of the universities. Yet the realities of the present age of Big Science cannot be ignored: the enormous public support of science has converted our universities, in varying degrees, into centers of Big Science. Many universities can no longer claim to be primarily "educational" institutions in the traditional sense. The situation is symmetric: if the graduate schools have attached federal laboratories, why should not the federal laboratories have attached graduate schools? What seems to be emerging, in this interpenetration of the academic and nonacademic worlds, is a kind of hybrid which undoubtedly hurts the sensibilities of our traditionalists, both in education and in research, yet which appears to me to be inevitable. Under the circumstances I would hope that both communities, the academic and the nonacademic, accommodate gracefully and work together for the common goal: the strengthening of our country's science, and, one hopes, the improvement of our general welfare. To quote the President's Science Advisory Committee report (*3*), in this effort to find better connections between the two communities, "the right note, we think, is one of hope, not fear. . . ."

References and Notes

1. The number of medical-school applicants reached a postwar peak of 24,000 in 1949. Another, much smaller, peak of about 16,000 was reached in 1957, probably the aftermath of Korea [*J. Am. Med. Assoc.* **178**, 597 (1961)].
2. "Investing in Scientific Progress," *National Science Foundation Report No. NSF 61-27* (1961), p. 15.
3. President's Science Advisory Committee, "Scientific Progress, the Universities, and the Federal Government" (The White House, Washington, D.C., Nov. 1960).
4. Some observers claim it is difficult, for example, to tell whether Massachusetts Institute of Technology is a university with many government research institutions appended to it or a cluster of government research laboratories with a very good educational institution attached to it.

News and Comment

The Tennessee Case: Notes on the Supreme Court's Decision to Open Apportionment to Judicial Review

It is easy to talk in general terms of the long-range impact of the Supreme Court's decision last week, hard to talk in specific terms. Yet there is no doubt that the decision is going to have a substantial effect on the shape of American politics and, therefore, on the whole range of issues, from funds for basic research to conservation of natural resources, that are regularly discussed here as of special interest to the scientific community.

There is going to be a shift (just how much of a shift is not yet clear) in political power at the state level away from the rural minority and toward the urban and suburban majority, and later and much less emphatically, a shift at the national level. A few minor consequences can be pinpointed: the present overbalance of emphasis in state universities on agricultural problems, for example, is presumably going to be shifted toward emphasis on urban problems as the urban populations win a greater share of power in the state legislatures which control the universities. But the effects which happen to be easy to pinpoint are quite trivial in comparison with the shifts that cannot be pinpointed but will inevitably come. Twenty years from now historians will be able to look back and tell us what happened; all we can be reasonably sure of now is that something significant is going to happen.

To pick out a horrible example of malapportionment: In Florida, the worst-apportioned state, 12 percent of the population elects a majority of one house of the legislature; 15 percent elects a majority of the other house. More important, though, than the situation in one state or another is that the problem is nationwide, and that the malapportionment is consistently in favor of the rural third of the population. As a general rule of thumb, the most recent survey suggested, a vote in a small rural community, nationwide, is worth something more than twice as much as a vote in a big city. If this arrangement were true for presidential elections Nixon would have been elected by a landslide of electoral votes, even though he carried a minority of the popular vote; so would Dewey; Hoover

would have been re-elected in 1932. The point is not that this would necessarily have been worse, or better, for the country; only that it would have been different.

Rural domination is limited to the legislative branches of the state governments, since the state governors (except in Georgia) are chosen by popular vote. But this limitation is at least partially counterbalanced by the effect that rural domination has on the positions of the two parties: to take the useful, although not wholly accurate, analogy of presidential elections again, if these elections were weighted as are the votes for state legislatures it would probably not have led to the nomination of Nixon in 1960 but of Goldwater; for surveys of the Republican convention delegates showed that the convention would have gone for Goldwater if it had thought he could win. In 1952 it would have produced Taft rather than Eisenhower, for there was no doubt that the Republican convention that year abandoned Taft only because it thought he could not win, a belief that never would have existed if the presidential vote were weighted to reflect the weighting of votes for state legislators. The Democrats, in turn, would have been more conservative in order to appeal to this weighted electorate. They might have won some of these elections, after all, but, if so, they would probably have been won by different men and certainly by men running on different platforms. The kind of men who are nominated and elected, in turn, affects the whole tone of politics: an important factor in what the public considers sound political positions is where the public sees the bulk of its elected leaders standing. Despite a great deal of grumbling, the overwhelming majority of the public supports the foreign aid program. An important source of this wide support is simply that ever since the program began in 1947, the presidential candidates of both parties have invariably been strong supporters of foreign aid.

The effect of changing the tone set by the state legislators is hardly going to be comparable to the effect if the change was at the level of national candidates, but you are still changing an important variable. There can be no real doubt that, for better or worse, it is going to make a difference, and only a very slight doubt that the difference is going to involve a shift within both parties toward the liberal end of the political spectrum.

Given the near certainty of *some* change, the question now is how far in the direction of fair apportionment the Supreme Court is going to force the states to go. Technically, the decision handed down last week does not necessarily mean that the Court will press any states to reapportion at all, not even Tennessee. The Tennessee constitution requires both houses of its legislature to be apportioned every 10 years according to population. The legislature, in violation of the state constitution, has not reapportioned since 1901. The federal courts in Tennessee refused to try a law suit aimed at forcing the legislature to reapportion on the grounds that the courts do not get involved in such "political questions." An earlier review here (26 Nov.) outlined the details of the situation. All the Supreme Court decided last week was that the lower court was wrong (although it was merely following the precedents that seemed to have been set by Supreme Court rulings) and that the lower court could, and should, try the case.

Unlocking the Gate

Last week's decision has virtually nothing to do with the plain and undisputed fact that the legislature is violating the *Tennessee* constitution. Instead it involved the question of whether the Tennessee apportionment violates the *federal* constitution, specifically the clause in the 14th Amendment guaranteeing all citizens "equal protection of the laws." It is *conceivable* that the decision was almost meaningless: that is, that although it is now possible for citizens of Tennessee and other states to challenge an apportionment as a violation of their rights, there is no guarantee that the federal courts will agree that their *federal* rights have been violated: that is, that the apportionment so unfairly waters down their right to vote that they have been denied "equal protection of the laws." If not, the federal courts will do nothing to help them, for as the decision pointed out, "we do not consider, let alone enforce, rights under a state constitution which go further than the protections of the 14th Amendment."

But although this is a conceivable outcome, it is not a remotely probable one. It is normal practice for the Supreme Court to feel its way into a new area. The decision on school segregation, for example, did not come out of the blue, but as the culmination of a long line of decisions gradually defining the interpretation of the Equal Protection Clause as applied to segregation. The decision last week, in fact, was precisely the decision that the lawyers for the Tennessee citizens and the Department of Justice, supporting them, had asked the Court to hand down. It unlocked the gate. How wide the gate will eventually open will be decided in future cases.

The key question is what constitutes apportionment so unfair as to violate the Equal Protection Clause? The chances are that the Court will be in no hurry to pin itself down on this question. How far the Court will go depends, among other things that will not be explicitly discussed in the opinions, on the makeup of the Court and on the Court's feeling of the mood of the country. The retirement of Justice Whitaker last week (he had been hospitalized and did not take part in the decision) led to the replacement of a man of uncertain leanings on reapportionment by a man close to the President and presumably sharing the President's strong views favoring judicial intervention. Consideration of the national mood shows up obliquely in several opinions: Justice Frankfurter remarks, in his impassioned dissent, that the decision "may well impair the Court's position as the ultimate interpreter of the Constitution . . . [by] injecting itself into the clash of political forces in political settlements," for "the Court's authority—possessed neither of the purse nor the sword—ultimately rests on its moral sanction." He called the decision "a massive repudiation of the experience of our whole past in asserting destructively novel judicial power" and said that to define fair apportionment would require the Justices "to make their private views of political wisdom the measure of the Constitution."

From the other side, Justice Clark replied: "It is well for this Court to practice self-restraint . . . but never in its history has [the Court refused to act] where the national rights of so many have been so clearly infringed for so long a time. National respect for the courts is more enhanced through the forthright enforcement of those rights rather than by rendering them nugatory through the interposition of subterfuges. In my view the ultimate decision today is in the greatest tradition of this Court."

The initial public reaction supported Clark's view: A good many lawyers

were worried about the mess the Court might be getting itself into; a few southern Senators complained about a further invasion of state's rights; but the common reaction was that it was just common sense to see that there was a limit to how far someone's voting rights could be diluted without violating the Constitution, and that there would be something wrong if a citizen could not go to the courts to protect this right. Senator Goldwater found it a fair decision. The *Wall Street Journal* said it was happy neither with the idea of the Court expanding its powers, nor with the likely political results, but that, after all, something was obviously wrong and it could not see where the Court had any choice but to intervene. This mood was apparent before the decision was made: such conservative publications as the *Journal* and *Reader's Digest* had run articles on the unfairness of the state apportionments, and such articles, appearing in such publications, made it easier for the Court to decide for intervention.

This mood, as reflected in the press and the polls and the statements of leading citizens, is going to continue to affect the Court: for precisely what it will try to do will be to avoid the appearance, in Frankfurter's terms, of "making their private views the measure of the Constitution." And this will necessarily involve, whether the Justices discuss it explicitly or not, a judgment of what the Court can say about the minimum standards of apportionment required by the Constitution that will be generally accepted as something more than the Justices' "private views of political wisdom."

The Court's Problem

The Court, for example, could solve its problem fairly easily by decreeing that at least one house of the state legislatures must be based on population, like the U.S. House of Representatives, with the requirements for the second house left undefined; perhaps to be apportioned, like the U.S. Senate, on an area basis if the individual state chose to do so. This has the great advantage, first, of being a neat and easily understandable principle, and second, of being acceptable as a particularly "obvious" or "reasonable" solution; that is, whether it is the best or fairest solution, it is at least one that is not likely to lead to any widespread feeling that the Justices are merely "making their private views the measure of the Constitution."

This is about the minimum that can reasonably be expected to come out of the decision. It could leave a small rural minority with a veto over the majority in many states through an area apportionment of one house. But even this minimum would be enough to justify the national attention being given to the decision: it would lead directly to a substantial shift in power in the many states in which a majority of both houses are elected by a third or less of the electorate; it would encourage the state courts to intervene to protect rights under the state constitutions, something they have hesitated to do because of the Supreme Court precedents for refusing (until last week) to intervene in such "political" matters; and it would encourage use of the initiative and referendum to force more extensive reapportionments on the reluctant legislatures in those states which have this option by focusing the public's attention on the problem.

But the easy solution is not necessarily the best solution. A good case can be made, in particular, that there should be some limitation on the *extent* to which a state legislature could justify minority control of even one house by appealing to the parallel with the U.S. Senate. The parallel is far from exact. It is questionable, for example, that a political expedient accepted in order to get the smaller states to join the Union can properly be elevated into a principle of government to be unqualifiedly accepted even when it can be avoided—particularly when equal state representation has most often served to spread political power to the new states that have been admitted to the Union while area representation within the states has served, in fact quite clearly has been used, to prevent the spread of political power to the cities and to the suburbs that are developing within the states.

But to get into this sort of judgment would obviously complicate the Court's problem and raise the question of "private judgment." The Court wants neither to commit itself to an "easy" solution which it may later regret, nor to undertake a "hard" solution until the country has talked the problem out and some implicit guidelines appear to develop. And so we get precisely the kind of open-ended decision the Court handed down last week.—HOWARD MARGOLIS

New Office of Science and Technology Proposed by Kennedy To Strengthen White House Advisory Setup

The President last week sent Congress a plan to give his science advisory body a firmer footing in the governmental hierarchy.

The proposal calls for relatively modest departures from the present setup; but implicit in it is the recognition that the government lacks a central voice to speak to Congress and the nation on scientific matters, and also lacks a vantage point for a broad view of its vast involvement with scientific research and development. This involvement now runs to $12 billion a year. The proposal represents a carefully worked out step toward institutionalizing that voice and vantage point without setting up anything resembling a scientific overlord.

Not the least of the pressures for the proposed reorganization has been a desire to head off a small but growing congressional interest in establishing a cabinet-rank Department of Science, an arrangement which appeals to those with an aversion to organizational untidiness and duplication. Although the proposed reorganization would provide a means of identifying such situations, the plan was prepared by men who hold to the view that untidiness and duplication in science are not necessarily undesirable, and that any attempt to dictate "efficiency" to the nation's huge, diverse, and dynamic science establishment would surely do more harm than good.

The formal channel for carrying scientific advice to the White House is through the President's special assistant for science and technology, a post that was established by Eisenhower after the first Soviet sputnik removed any doubts that science and government had better maintain an intimate relationship. At the same time, the Eisenhower Administration reactivated the President's Science Advisory Committee, a body of nongovernmental consultants that had played only a minor role since it was set up in 1951 to provide the Administration with advice on scientific matters. The special assistant became head of the Committee, supported by a staff of specialists that now totals ten persons. The whole advisory body was organizationally attached directly to the White House, with the special assistant occupying the role of personal adviser to the President, a position which made