Letters

Effective Science Advising

I have followed with interest the articles in *Science* on the process of advising the President on scientific matters. Abelson's editorial (23 Aug., p. 651) indicates that Congressman McCormack (D–Wash.) may be in favor of a cabinet post for science and technology. I believe this proposal should be adopted. Readers of *Science* would generally agree on the increasingly technical nature of the problems facing the political process. The crucial question is what organizational structure will be the most effective in providing rational decision-making on scientific questions.

The cabinet department has much to recommend it over any other possible advisory system. A department of the government would have staff support far in excess of any advisory council. This would allow the proposed agency to undertake studies and to monitor the activities of other agencies to a much greater extent than could an advisory committee. The proposed department would also be an ongoing enterprise more capable of providing a degree of continuity to federal support of scientific activities.

Some practical examples bear out the contention that agencies with administrative powers are more effective than advisory committees. Who has had more real impact on the direction and scope of the nation's space program, the National Aeronautics and Space Council or NASA? Who is actually responsible for the success or failure of the pollution abatement efforts, the Council on Environmental Quality or the Environmental Protection Agency? And who is more likely to more effectively direct our country's response to the energy crisis, a department of the government or yet another council? Does an advisory committee or a cabinet department have a better chance of bringing rationality to research funding?

The need for effective leadership on scientific questions grows more urgent every day. I hope that the scientific community is not mislead into thinking that a committee "with the ear of the President" is a viable alternative to effective administrative control.

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The current lack of a science and technology advisory capacity within the Executive Office of the President is a serious failing that should be remedied as President Ford sets up and organizes his Administration. Currently, the director of the National Science Foundation (NSF) serves as the President's science adviser. This arrangement creates a serious built-in conflict of interest for the NSF director. In this respect I can do no better than to quote from a recent report published by the National Academy of Sciences entitled *Science and Technology in Presidential Policy-making* (*1*). The report states:

> It is not merely that an Advisor outside the White House and the Executive Office has a different status than one who is within it. It is also the untenable position of one who is at the same time both applicant to the OMB [Office of Management and Budget] and counselor to it, who must at the same time battle for the prerogatives of science and technology and weigh those prerogatives against the demands of others who make competing claims on resources.

The ad hoc committee which wrote this report recommended that the President's science adviser be reconstituted in the form of a three-man council, preferably established by law, whose members would be chosen by the President with the advice and consent of the Senate and supported by a staff of sufficient size and appropriate expertise. The committee made several other suggestions concerning how the council should function, with which executive agencies it should have close working relationships, and the need for expert support from outside the Executive Office. These are sound proposals, worthy of serious consideration. In my own judgment, however, the essential element of success will rest in the choice of the individual advisers—they must be men and women who command universal respect among their professional peers, and in whom President Ford feels complete confidence.

We all know (sometimes to our sorrow when they are misused) of the enormous power and potential of modern science and technology. Within just the past year, the long-term problems of worldwide food and protein shortages, nonrenewable natural resources management, climate change, and energy conservation and resource development, have taken on frightening new dimensions. These have to be added to the more familiar list of problems which depend vitally on science and technology for their solution: national defense and international arms control, health care and its delivery, urban development, and many more. The list is awesome in its breadth and consequence. The search for wise solutions will require that the President of the United States have at his right hand, directly and intimately in his service, the best scientific and engineering advice he can find (*2*).

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References and Notes

1. Ad Hoc Committee on Science and Technology, *Science and Technology in Presidential Policy-making* (National Academy of Sciences, Washington, D.C., 1974).
2. This letter is adapted from a personal communication sent to President Ford on 22 August in which I set forth similar recommendations.

Drought Prediction

This summer's "drought" in the Great Plains has renewed interest in the possibilities of long-range climatic prediction. In 1938, C. G. Abbot, then director of the Smithsonian Institution's Astrophysical Observatory, published the following (*1*, p. 48).

> Records have been kept of the levels of the Great Lakes of North America regularly since 1860. In addition, partial records exist which fairly indicate the levels of some of the lakes since 1837. . . . [G]reat depressions [in lake levels] following years 1838, 1885, and 1929 were each associated with disastrous droughts in the Northwestern States and adjacent regions of Canada. There is much reason to expect a recurrence of such a drought beginning about 1975.

In 1963 he added these comments (*1*, p. 51).

> The two principal periods of 91 and 45½ years, 4 and 2 times 273 months, depress Lake Huron about 5 feet. . . . A drought of less magnitude in the supply area of Lake Huron has the single 273-month period. I predicted about 1938 its recurrence in the decade of 1950–1960. It proved very severe in [the] Southwest United States. . . . The two great droughts will probably begin about 1975 and 2020, respectively.

The 273-month period described by Abbot is twice the "sunspot cycle" of 11⅜ years and is associated with the magnetic cycle in sunspots first described by Hale (*2*, p. 2). The meteorological effects of solar-climatic cycles in west central North America have been discussed by Willett (*3*).

Since Abbot successfully predicted the drought of the 1950's, his prediction of a much more severe drought beginning in 1975 should be a matter of major concern. Verification of this prediction by means of other climatic indicators would be of great value.

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References

1. C. G. Abbot, *Smithson. Misc. Collect.* **146**, No. 3 (1963).
2. ———, *ibid.* **138**, No. 3 (1959).
3. H. C. Willett, *J. Atmos. Sci.* **22**, 120 (1965).

Dog Control

Bruce Max Feldmann (Editorial, 13 Sept., p. 903) mentions briefly the destruction of livestock and wildlife by dogs. This is by no means a local or minor matter. It discouraged sheep raising in New England after agriculture became unprofitable there. It prevails on the rangelands of the West and on the smaller farms of the Midwest. While wild predators generally kill for food, dog packs, whether feral or partly or wholly domestic, kill wantonly. More than two dozen of my sheep have been killed and left on an Ohio farm in a single night.

In New Mexico, outside the larger municipalities, the only laws that seem to apply to dogs are those requiring vaccination against rabies. Even this is difficult if not impossible to enforce. Rural dogs are seldom allowed in the house and are free to join roaming packs at night. These packs not only menace wild and domestic animals, but can be dangerous to unarmed humans.

Undoubtedly the coyote is often blamed for the damage done by dogs, although exact information is not available. This is a matter of concern to those who oppose the poisoning of the coyote and, in addition, has serious economic implications.

When I was working with a field class in ecology from Montana State University in 1947, we visited an area of fine grassland near West Yellowstone that was rapidly being invaded by sagebrush. This unpalatable plant was seeding itself on mounds of earth where rodents had destroyed the original grass. Inquiry revealed that the area had been cleared of coyotes by cyanide bombs. The diet of the coyote consists chiefly of rodents and insects; with the coyote gone, gophers and other rodents have a field day destroying the nutritious grasses that are the basis of the livestock industry.

Blame for the destruction of livestock and wildlife should be apportioned on solid information, not on opinion or sentiment, and policy should be shaped accordingly. There can be no doubt at present of the need for the humane and intelligent dog controls urged by Feldmann.

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Food shortages are a current reality in many areas of the earth, and the dietary component in shortest supply is protein (*1*). Simultaneously, as Feldmann reminds us, we are confronted with a major dog problem: too many dogs are uncontrolled, unwanted, and unowned (*2*). The measures proposed to control the dog problem—leash laws, population control, and public education—are expensive and ineffective. But with a more enlightened viewpoint, could we not consider excess dogs a significant nutritional resource that deserves our attention?

Western man seems to suffer a total mental block about the concept of eating dogs. However, in many cultures, dogs have been a traditional component of man's diet. In much of Oceania, dogs have been preferred over pork. Early British visitors to Hawaii and Tahiti described Polynesian methods of dressing and cooking dogs and compared the product favorably with English lamb (*3*).

Undoubtedly some will raise objections because, in Western culture, dogs have been sanctified as pets. Such objections are without merit. In the first place, as Feldmann and Beck (*2*) point out, stray and unowned dogs (which are not pets) are a major part of the dog problem. Second, many animals (chickens, ducks, rabbits, calves) fill dual roles as pets and as food. In my experience such pets have been every bit as delicious as their relatives with whom I have had no personal relationship. Third, could anyone bestow a higher honor on a pet than to make it part of oneself (*4*)?

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References and Notes

1. L. R. Brown, *Science* **180**, 373 (1973).
2. A. Beck, *The Ecology of Stray Dogs* (York, Baltimore, Md., 1973).
3. M. Titcomb and M. K. Pukui, *Dog and Man in the Ancient Pacific* (Special Publication 59, Bishop Museum, Honolulu, Hawaii, 1969).
4. I have nothing personal against dogs—some of my best friends have been dogs.

In addition to the urban dog problems described by Feldmann, the canines of New York City are creating a further ecological and economic dilemma. Copious amounts of dog urine are being sprayed on the lower trunks of sidewalk trees and eroding the cortical and suberized layers of juvenile bark. Before the advent of contemporary urban pollutants (including dog urine), urban trees persisted for 40 or 50 years; currently, their life expectancy is 10 to 20 years.

Attempts to alleviate urine damage by placing cylindrical metal shields around tree bases have increased the cost of planting a tree in New York City by $5 to $10. A newly perfected flanged shield designed to deflect and disperse dog urine will cost $15 to install and maintain. However, with current and predicted budgetary reductions, the New York City Parks, Recreation, and Cultural Affairs Administration may be prohibited from installing the new shield. To reinforce Feldmann's contention, one solution to the urine problem would be to reduce the total number and size of urban dogs.

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