Letters

Science Information

A report of prime importance to all scientists was issued recently by the President's Science Advisory Committee. The report, *Science, Government, and Communication: The Responsibilities of the Technical Community and the Government in the Transfer of Information*, was prepared by a special panel on science information.

The major recommendations in the report are: (i) all those concerned with research and development—individual scientists and engineers, industrial and academic research establishments, technical societies, and government agencies—must accept responsibility for the transfer of scientific information in the same degree and spirit in which they accept responsibility for research and development itself, and (ii) the scientific and technical community generally must devote a larger share than heretofore of its time and resources to management of the ever-increasing scientific and technical record.

These recommendations are based on two propositions, that scientific literature with its long tradition of self-criticism helps by its very existence to maintain the standards and hence the validity of science, and that scientific literature is increasing so rapidly that it is becoming indigestible and is threatening to swamp our entire scientific effort.

The report makes specific recommendations for the training of "library scientists," who would be dedicated to sifting, reviewing, and criticizing scientific information, and who would justify the esteem and support of "bench scientists" for so doing; for the establishment of science data depositories by scientific societies and agencies, to which scientific reports would be sent, and from which the reports and data could be obtained on request, after announcement by abstract; for curtailment of traditional scientific reporting journals in favor of abstract and review periodicals; for individual author discipline in wording titles, in preparing abstracts, and in refraining from unnecessary publication; and for academic instruction in communication and information handling.

Here, then, is a clear challenge from the highest government sources to scientists to accept more individual and group responsibility for improving the handling of scientific information and communication. Under the leadership of Senator Hubert Humphrey, there is strong legislative interest in the problem. Great advances have been made in government agencies, as well as in the Library of Congress and the National Library of Medicine, in facilitating the collection, storage, and retrieval of scientific information. The National Science Foundation has aided greatly in promoting better communication, nationally and internationally, among scientists. Its Office of Scientific Information is charged with coordinating activities directed toward better management of scientific information.

Scientists themselves have also been concerned with the problem, and several of the major scientific organizations are actively engaged in trying to improve the control and use of information and to better the ways of scientists in interpersonal and intergroup communication.

However, there is growing pressure on individual scientists to discipline themselves in these matters. The report of the President's Science Advisory Committee makes specific suggestions: that authors must do better in retrieving pertinent information; that unnecessary publication must be eliminated; that higher status must be given to reviewers and reviewing; that conventional techniques of handling information and library procedures should be critically examined; that centralized depositories deserve trial; that specialized information centers should be established; that citation indexes deserve attention; that circulation of preprints should be discouraged; and that scientific and technical publications must have increasing support. The report suggests that scientists generally might benefit from knowledge of the government's internal information systems.

All of this indicates that a big change may be coming in a lot of the library, publication, and study habits to which scientists have traditionally been accustomed. Individual scientists, as well as scientific societies, may profit greatly from investigating these pressing problems of scientific information and communication, and by accepting appropriate responsibility in aiding in their successful solution. The report of the President's Science Advisory Committee on *Science, Government, and Information* makes a good starting place.

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Requirements for Science

The editorial in the 1 February issue urged science and scientists to be wary of an unqualified marriage with either the executive or legislative branches of government. I hope W. Albert Noyes' sobering views, described in "News and comment" in the same issue, on the administration's proposal for hothouse forcing of Ph.D's are an indication of a growing concern among scientists (and people in other professions) about the limits to the useful effect of government economic stimulation as a developmental tool.

In the same issue, D. S. Greenberg reports that channel 37, one most useful in radio astronomy, may be used for a commercial TV station in New Jersey.

Political leaders as well as the general public may not be aware that science requires more than a large number of trained people, well-endowed research laboratories, and gigantic sums of research funds. While these things are necessary, their usefulness is limited by the general acceptance of science and its requirements by the community at large.

The tremendous growth of science and accumulated scientific knowledge in the past 50 years is due to many causes. But one of the most important

of these causes is the belief, in the minds of most people, that when it is considered totally, science is a relevant and important aspect of our society and individual lives.

Until radio astronomy is as important to the Paterson wards as it is to the administration, Noyes and others like him will do well to caution the government to save its money and go slowly. If New Jersey cannot afford to forego an additional TV channel, our nation cannot afford an accelerated science training program.

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Memory, Enzyme Induction, and Porphyrins

C. E. Smith speculates shrewdly [*Science* **138**, 889 (1962)] on the question of whether memory may be associated with enzyme induction. He indicates at least three aspects of experimental evidence suggesting that the basis of a form of biological "memory" lies in an increase in enzyme concentrations associated with transmitter substances "as a long-lasting effect of stimulation."

From the viewpoint of enzyme induction it may be in order to consider the two different components in the enzyme—namely, the template protein and the prosthetic porphyrin. Chemically, these parts of the molecule are different in structure and action. While the bonding compound has not yet been identified, in the scheme suggested by Smith, the question arises whether the substance might be a porphyrin, either metal-containing or metal-free?

There seems to be another factor which deserves investigation. This is the increase in the concentration of porphyrins in the central nervous system with evolutionary development. This has been clearly shown by H. Klüver [*Science* **99**, 482 (1944); *J. Psychol.* **17**, 209 (1944); *Biochemistry of the Developing Nervous System* (Academic Press, New York, 1944), pp. 137–144]. Porphyrins have not been isolated from the peripheral nervous system. There appears to be an "ascending porphyrinization" in the postnatal development of the central nervous system in birds and mammals.

It has been found that porphyrins exist in both the metal-containing and the metal-free conditions. In the enzyme the porphyrin is associated with a metal; the metal-free derivatives are located