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Custodians of Knowledge

This generation's major contribution to the human heritage is a great fund of new knowledge and the means of using scientific principles effectively. This knowledge was accumulated at a cost to society of billions of dollars, and scientists should consider how the facts that have been discovered can continue to be made available. So long as books and archives are preserved, information can be retrieved, if scholars are willing to spend enough time working at it. However, to many scientists the continuing increase in information is a source of worry. They wonder how anyone can keep up with the flood of publications. The answer, of course, is that no one, unaided, can. The situation is difficult enough in one's own field. The difficulty is compounded when one wants to become aware of, and locate, facts in adjacent or distant disciplines. Some scientists look hopefully to electronic data processing as a means of meeting the problem. Others manage to cope with the information explosion. They keep current in their own fields through participation in "invisible colleges." Outside their own specialties they rely on colleagues they can trust to lead them to experts who can be trusted, who in turn either directly provide the needed information or guide them to the most reliable relevant literature. In a short time and after a few telephone calls, the skilled scholar is in a position to tap much of the world's store of knowledge. Reliance on this human network provides more than raw information. It provides judgment, and suggestions of more feasible approaches to the problem being considered. In view of the many strengths of this information network, computer technology has far to go to match it in effectiveness and especially in cost.

Maintenance of a comprehensive network of this kind is not automatic. If the system is to be effective and if knowledge is to be easily accessible, there must exist living, communicative custodians of that knowledge. This is the case when the subject area is widely taught, or when at least a few scientists are actively pursuing research in the field in question. However, the social instincts of men repeatedly lead to fads and fashions in research. At one time, most areas of physics were depopulated as the majority of physicists turned to nuclear research. Today the center of attention is solid-state physics.

Almost everywhere in science one can note examples of virtual abandonment of once-flourishing fields. To a degree this is desirable, but it can be overdone. If information developed by research in an area is truly fundamental, there will be continuing demands for it, and indeed that information will often be of importance to new research. For example, Gerhard H. Dieke of Johns Hopkins was a spectroscopist who did not join the rush to nuclear physics. He continued his work on energy levels in molecules. When physicists turned to work on masers and lasers, Dieke and his publications were an invaluable source of information.

Today the latest fads in research enjoy support and attention. In considering priorities for support of research, we should recognize and weigh the desirability of maintaining at least minimal activity in all fundamental fields of science. We should also consider how the present human information network can be made even more effective.—PHILIP H. ABELSON