

Analytical Instrumentation

The progress of science has always depended upon the interplay of concept and methodology. At the present time we can foresee many unrealized inspirations for analytical techniques at the level of single atoms, molecules, cellular organelles. Our concepts of structure in molecular biology far outreach our capacity to determine structure by direct observation.- procedures to establish the sequence of amino acids in proteins or of nucleotides in nucleic acids would be worth many thousands of years of time of our most inspired scientists. Similar needs apply to technological development in materials, technology, in all the environmental sciences, and in space research.

At present the development work in the field of analytical instrumentation (despite some proving exceptions) fall in an awkward gap. It needs the management, skill and technical organization of industrial enterprise, but lacks the evident profitability needed to motivate industrial commitment on a large scale. At the same time the scientists who need such instruments are too preoccupied with substantive problems and do not necessarily bring the aptest qualifications to the task.

It seems fair to say that the financial and managerial support which has been available for the more applied aspects of technology through the Department of Defense and for the basic sciences through the NIH and NSF has been grossly inadequate in the field of instrumentation development that lies between these extremes. Yet the efficient use of scientific talent and thereby the very progress of science must rely upon the adequacy of developments in this area. We have an urgent need to bring together a fraction of the cogent scientific insight from one pole and the financial and organizational support from the other to meet this national need. One constructive approach that might help to dramatize our national interest in this direction would be the establishment of one or a few central laboratories for the development and utilization of advanced instruments dedicated to analysis in the range of single molecules to macromolecules.