

coordinating its effort with the national agencies and committees working in the fields of oceanography and engineering.

Other efforts now underway are in such areas as marine biology, oceanography, underwater photography, and the man-in-the-sea program. These provide NUWC with skills and capabilities for the pursuit of research and development tasks for other agencies outside the Department of Defense.

The most difficult problem for the laboratory director is to understand and evaluate the multiple conflicting inputs which he receives, and from them choose a course of action for the employment of his limited resources to do research and exploratory work on which to base future programs. His guesses may be inaccurate but he must take them. My guess at the present is that the Navy will continue to execute its historical mission of exploration and control of new resources and of providing the tools for furtherance of the U.S. international aims. The changes during the next 10 years will reflect the facts that the new resources are on the sea floor and that the exertion of political pressure by the United States is limited by the existence of mutual atomic deterrence.

We, therefore, should be putting research and exploratory effort into:

1. New equipment to explore and operate on the sea floor.
2. Understand how to define and recognize limited and definite objectives.
3. Creating a variety of the precise tools, equipment and procedures needed to achieve objectives of limited scope.

It would appear that a limited war operating with clearly defined objectives involving persuasion rather than destruction will require procedures similar to those needed for the control of crime under the objectives created by national law.

You discussed yesterday the question of a national policy for laboratories. This question is related to the whole problem of organizational life cycle. A laboratory of the type I have been associated with takes at least 5 years to become productive and after perhaps 20 years has come to know its field so well that it is sure that nothing new is likely to arise. Creativity requires bringing together previously unassociated ideas; that is, change requires knowledge applied to new problems. The continuing resource and essential product of Government laboratories is the accumulated experience of its people. The organizational problem is to continue to generate changes which will allow this experience to be applied in new areas. Organizational changes are needed at a rate matched to the effective life cycle. For R. & D. labs, changes at rates less than 5 years will stop productivity and at more than 20 years will promote atrophy.

Mr. DADDARIO. Do you fit into that the need to retrain people?

Dr. McLEAN. To send the people away for training.

Another method is to reorganize so that you need people in new positions. Any mechanism that keeps things from becoming too stable I think will keep the laboratories alive.

Mr. DADDARIO. Since you depend to a degree upon guesswork, it would help in making your guesses more accurate.

Dr. McLEAN. Broader experience will help make the guesses more accurate.