

Physical sciences

Physics.—Physics research at ORNL lies predominately in the low- and medium-energy ranges. A large fraction of the program concerns reactions of neutrons, especially those pertaining to reactor development or the utilization of neutrons as tools for research. Important problems under investigation are elucidating the physics of fission, nuclear structure determinations, measurements of cross sections of importance to both thermal and fast reactors (and the origin of the universe), and studies of shielding both reactor and space radiation. In much of this work the Laboratory's superb reactors and medium-energy accelerators are used.

Chemistry.—Studies of chemical properties and of reactions in aqueous and nonaqueous media are carried out, to a large measure, in support of the AEC's reactor programs. The first weighable quantities of technetium were separated at ORNL, and the element promethium was discovered at the Laboratory. More recently, emphasis has been placed on the chemistry of the transplutonium elements; and, in early 1968, two new isotopes of neptunium were discovered at ORNL.

Metallurgy and Solid State Physics.—The importance of materials problems in reactor technology were fully appreciated in 1946 when the Metallurgy Division was established. Early work on fuel element development resulted in an aluminum plate-type fuel technology upon which much of the current generation of research reactors is based. More recently, attention has been focused on the materials problems of new reactor types and on high-temperature materials suitable for high-performance reactors and space applications.

Research in solid state physics deals not only with the effect of radiation on simple systems such as single crystals but also on actual material of construction, with the hope of understanding the processes involved and ultimately controlling them.

Education

Since its inception, the Laboratory has been active in education and training, beginning with training the staff for such AEC installations as Hanford, Savannah River, and the National Reactor Test Site. Between 1950 and 1965 more than 1000 individuals, many from industry, were provided formal training in the Oak Ridge School of Reactor Technology. Almost from the beginning, ORNL staff members have taught at the neighboring University of Tennessee, but a major step forward was taken in 1963 with the awarding of a Ford Foundation grant to UT. This makes it possible for 30 senior ORNL staff members to spend one day per week teaching at the University as regular members of the faculty. In late 1965 a major new undertaking, the Oak Ridge-University of Tennessee Graduate School of Biomedical Sciences, was initiated. The school is jointly administered by the Oak Ridge National Laboratory and UT; the first class of students entered in the fall of 1967.

For many years the Massachusetts Institute of Technology maintained a practice school in Oak Ridge. This school was re-established in September, 1966; and, in late 1967, the University of Tennessee established a similar practice school. Other educational activities at the Laboratory include the Research Participation Program, under which college faculty members work at the Laboratory, a Traveling Lecture Program, and a program which permits promising technical students to work at the Laboratory during the summer months. Currently, more than 140 people are engaged in graduate thesis activities at ORNL.

March 25, 1968.

QUESTIONS SUBMITTED TO DR. ALVIN M. WEINBERG BY THE SUBCOMMITTEE ON SCIENCE, RESEARCH, AND DEVELOPMENT

1. In your prepared statement you say that the key to responsible redeployment is the role and attitude of top management, and that a laboratory director must view very broadly his responsibilities in a way that transcends the confines of his supporting agency.

(a) Are there any policy statements that you are aware of at the OST or Bureau of the Budget level that would specifically foster or hinder this policy?

(b) Do you believe that you could have redeployed your laboratory as you described without the specific authorization of the AEC and the Joint Committee?

(c) The other side of the redeployment question is duplication of activities. How do you encourage the former without encouraging the latter? What guidelines would you recommend?

1. (a) I know of no statements sponsored either by OST or BOB that partic-