portation, shops, and the very important function of security should eventually all be accomplished with far greater efficiency and at much less total dollar cost. According to present plans the now existing three laboratories operating quasi-independently in four separate areas will be consolidated into six operating technical divisions reporting upward in a simple chain of command, thereby eliminating one entire supervisory echelon. These Divisions will be: Communications; Radar; Countermeasures; Physical Sciences; Electron Devices; and Components, Materials and Power Sources. A seventh Division, Production and Maintenance Engineering, will serve in the capacity of providing field engineering, maintenance engineering and procurement data as required by the Signal Corps Supply Agency in the build-up of stock combat materiel for the Department of the Army and the other Services as requested.

In operation, the new laboratory will have a military man at its head. His immediate staff will include both military and civilian personnel, while technical divisions will be headed by civilians. Military project officers will be spread throughout the organization to assure that the various development and engineering projects are responsive to the actual needs of the using Services. Engineering, development, and supporting research will appear in each of the technical divisions. Basic research will be concentrated mainly in the Physical Sciences; Electron Devices; and Components, Materials and Power Sources Divisions.

This new technical center should greatly improve the effectiveness of the Signal Corps-industry-educational institution team. Since most of the Signal Corps' research and development proceeds through the medium of contracts, this is a very important aspect. Improvement will appear immediately by the ease in which the contractual representatives can visit and accomplish their business without an expensive search of coastal New Jersey to find the areas they must visit, thus saving their time and that of government employees. Naturally, the same desirable end follows for the numerous military visitors and for the actual employees themselves, numbers of whom must spend many hours each week in moving between widely separated areas in which their technical interests and/or responsibilities lie.

In closing, a word as to security would perhaps be appropriate. Certainly in a purely physical sense the new enclosed laboratory will provide a means for greatly increased protection of classified equipments and documents with fewer security personnel required. Also items carrying military classification will be more safely and readily movable within restricted areas.

Those who have long been in the Signal Corps know that the accomplishment-to-dollar ratio has fallen off as the technical areas spread from one to hundreds of buildings. In the final consolidation and improvement of the technical environment, a major step forward is being taken on all the fronts which leads ultimately to superior military equipment for which the Signal Corps is responsible within the Department of the Army.

Miscellany

Research Notes

Two new elements, 99 and 100, have been created by the "fattening up" of plutonium atoms with neutrons from the AEC materials testing reactor at Arco, Idaho. Reported respectively in the February 15 and March 1 issues of *The Physical Review,* the new and as yet unnamed elements were identified by nuclear chemists Bernard G. Harvey, Stanley G. Thompson, Albert Ghiorso, and Gregory R. Choppin, all of the University of California at Berkeley. Element 99, originally obtained by cyclotron bombardment of uranium with nitrogen nuclei, has a half-life of about a month. In the case of the present experiments, plutonium 239 has been bombarded with neutrons to form atoms of element 98 (californium 252), which, with the addition of another neutron, decayed by beta emission into element 99 (253). With the addition of a neutron to the element 99 nuclei, these decayed by beta emission into element 100 (254). The latter, isolated in January, has a half-life of about three hours. Neither element has any discernible military significance.

Cosmic-ray studies far below the earth's surface are becoming popular these days, only a little out of phase with similar investigations high up in the atmosphere. As a rule the underground work has been concerned with mu mesons which, because of their feeble interaction with nuclei, are able to penetrate remarkable thicknesses of rock before decaying or being absorbed. Another tack has been taken by J. Eugster of the University of Zürich, who studied the neutron intensity in an underground station beneath more than a mile of solid rock. He used nuclear emulsions loaded with boron 10, since this isotope captures slow neutrons readily with the subsequent emission of an alpha particle whose track is visible in the developed plate. The results obtained after a 37-day exposure, as reported in *The Review of Scientific Instruments* for January, showed that 608 neutrons passed through each square centimeter per day—a remarkable figure in view of the considerably smaller (by several powers of ten) number of mesons observed at lesser depths. To explain this paradox Eugster states that "another source [apart from cosmic rays] must here be supposed to be the cause of the increased neutron flux". Two possibilities are suggested: radiation originating in the center of the earth, and neutrons produced by spontaneous fission of radioactive elements in the vicinity.