References and Notes

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6. This program depends for its success upon the work of many individuals. Personnel of the Defense Atomic Support Agency (formerly the Armed Forces Special Weapons Project) were responsible for the initiation and coordination of the work. Dr. F. H. Shelton, Lt. Col. R. W. Swanson, Lt. Col. H. C. Rose, Col. R. D. Maxwell, Maj. A. K. Stebbins, III, and Maj. L. E. Trapp contributed to that phase of the program. Personnel of the 4080th Strategic Reconnaissance Wing, Light, and of the Air Rescue Service of the U.S. Air Force performed the extremely difficult sample-collecting operation. At Isotopes, Inc., planning of the sampling program and interpretation of the results were carried out largely by Dr. D. R. Carr, Dr. J. L. Kulp, Dr. J. Spar, Dr. H. L. Volchok, and myself. The radiochemical analysis program was directed by Mr. P. W. Krey, and the evaluation of data on sampling efficiency was carried out by Dr. J. P. Friend. Many other scientists and technicians made substantial contributions. Advice and information were supplied by many other persons, notably Dr. J. Van den Akker of the Institute of Paper Chemistry and Prof. E. G. Reid of the Guggenheim Laboratory, Stanford University.
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John A. Anderson, Astronomer and Physicist

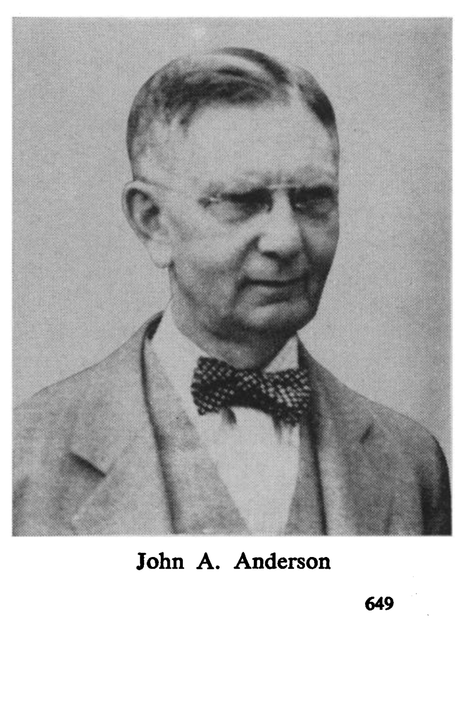
The 200-inch telescope on Palomar Mountain, California, was the work of many men. George E. Hale, of course, was responsible for the concept of such an instrument and for the enthusiasm that brought adequate financial support. The man chiefly responsible for its actual construction and for its present very successful operation was John A. Anderson.

Anderson was born at Rollag, Minnesota, 7 August 1876 and died suddenly in Altadena, California, 2 December 1959. He received his B.S. degree from Valparaiso University (Indiana), in 1900 and his Ph.D. from Johns Hopkins University in 1907. He remained at Johns Hopkins until 1916, advancing through the ranks of instructor, assistant professor, and associate professor. While in Baltimore he carried out various investigations on absorption and emission spectra and on the rotation of tourmaline by polarized light. He also took charge of the ruling machine constructed by Rowland for making spectroscopic gratings. Besides ruling a number of the finest gratings that had been produced up to that time, he developed methods for making replicas. With C. M. Sparrow he published a theory of the effect of groove form on the distribution of light by a grating. This was one of the important early steps toward the production of "blazed" gratings of high efficiency which play so important a role in current astronomical spectroscopy.

During the second decade of the present century, the Mount Wilson Observatory of the Carnegie Institution of Washington, under Hale's direction, was building up a group for the investigation of various fields of physics in order to obtain the fundamental data necessary for the interpretation of astronomical phenomena. In 1916 Anderson was invited to join this group of physicists, which included Harold Babcock and Arthur King. He immediately took charge of the large ruling engine which was then under construction.

Shortly after World War I Anderson developed the exploding-wire techniques for producing very high temperatures approximating those of the hotter stars. These high temperatures were obtained by discharging a large 50,000-volt condenser through a fine metallic wire; this procedure instantly evaporated the wire and raised the vapors to temperatures of 20,000°C or more. Since these explosions lasted only microseconds, Anderson and Sinclair Smith developed new techniques and instruments, including the rotating-mirror camera, the rotating mirror spectrograph, and the Kerr cell shutter, for studying them. These techniques and instruments came into common use during World War II in connection with atomic-bomb problems. Indeed, one of the original Anderson and Smith rotating-mirror cameras was used on that project and became the prototype of later models. During this same period Anderson contributed significantly to the development of Michelson's stellar interferometer and, in particular, to its application to the measurement of double stars. In collaboration with Harry O. Wood he developed the theory of the torsion seismometer. He designed equipment for, and participated in, eclipse expeditions in Spain in 1905, in Wyoming in 1918, in California in 1923, and in Sumatra in 1926.

In 1928 the International Education Board granted $6 million to California Institute of Technology for the construc-



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tion of a 200-inch telescope. An observatory council, composed largely of institute trustees, was placed in charge of the project. Because of his broad experience in instrumentation and in optical techniques, Anderson was immediately appointed executive officer of the council, a position which he held until the essential parts of the telescope were completed, in 1948. In this position he was in direct charge of all phases of the observatory project. This included observations of "seeing" and other meteorological conditions at dozens of sites in southern California and Arizona. This survey resulted in the selection of Palomar Mountain as the location of the new observatory. At the same time a search for the best material for the 200-inch mirror was started. After extensive efforts to make a disk of fuzed quartz were finally abandoned, Pyrex glass was selected.

The detailed design of the telescope was then undertaken. This involved many studies to eliminate or compensate for flexure, to provide a smooth and accurate drive mechanism, and to investigate innumerable other problems. In all these projects the best engineers and scientists of the country were called in as consultants but to Anderson and the small group working with him fell the responsibility of integrating the information and the various suggestions into a design for an effective instrument. When the mirror was completed and shipped to Pasadena, Anderson directly supervised the optical work done on it. During the long period of polishing it to its final figure he personally made most of the detailed optical tests.

In its first decade of operation the 200-inch telescope has proved itself to be an unusually effective instrument. It is also one of the very few large instruments which has gone smoothly into operation with only minor adjustments and modifications being required to perfect its performance. Much of the credit for this unusual record is due to John A. Anderson.

Anderson, a quiet retiring person, was very reticent about his own investigations and published a relatively small number of papers, but every one represented a major contribution to its field. He was always ready to give helpful suggestions on instrumental problems to his colleagues, and many of his ingenious ideas bore fruit in their publications and investigations. His broad interests were shown by his membership in the American Astronomical Society, the Seismological Society, the Physical Society, the Optical Society, the Chemical Society, the National Academy of Sciences, and the American Association for the Advancement of Science.

I. S. BOWEN
Mount Wilson and Palomar Observatories, Pasadena, California

Science in the News

Navy Releases Sounding Information; Availability of Data Will Expedite International Scientific Exchange

A recent revision of Navy policy has made available for the first time all oceanic sounding data obtained by Navy ships when they are on routine operations and are using conventional methods of navigation. A very large amount of bathymetric material has been accumulating in Navy files for many years, yet only the very few scientists specially qualified in this field who are working for the Navy, and about ten civilian scientists, have had access to this reservoir of invaluable information.

Action Recommended by Academy

In recent years, and particularly since the International Geophysical Year, science has been increasingly concerned with the structure of the earth, 70.8 percent of which is covered by ocean. The Committee on Oceanography of the National Academy of Sciences–National Research Council has long urged release of the Navy data, pointing out that classification of the data was retarding research in an area of growing importance. All of the eleven members of the academy committee, which is headed by geochemist Harrison Brown of California Institute of Technology, have worked on classified government projects and are therefore well aware of security requirements.

A committee spokesman commented recently: "We need a large number of people working in a field in order to have a reaction to a new idea—or, in fact, even to have a new idea. Release of this information may increase by a factor of about 100 the possibility of finding something new."

He also pointed out that the revised policy would put this country in a much better position internationally by speeding up the flow of information. Other countries have sometimes been somewhat slow and erratic in providing data for United States research because the exchange has been one-sided. Most maritime countries make such material freely available—England and Japan, for example, although not the U.S.S.R.

Bathymetric data have commercial as well as research value, as demonstrated by the fishing industry's need for knowledge of the sea floor.

Data of Little Military Use

The Navy's move to declassify these data was first mentioned on 26 January in a *New York Times* report on the International Symposium on Arctic Geology, held recently in Canada. The *Times* article implied incorrectly that data of military importance were to be declassified. This prompted Senator Styles Bridges to write in protest to Secretary of the Navy William B. Franke. Bridges said, in part:

"I am deeply disturbed by the report . . . stating the Navy is about to issue an open-door policy on hitherto secret deep-sea soundings. . . .

"I cannot go along with the underlying philosophy that our scientists are hampered by having to keep such information secret. I notice the Soviet