

200-Inch Telescope for California

Astronomy

The world's largest telescope, with a concave mirror two hundred inches in diameter, twice that of the greatest existing instrument, will be under construction in southern California within a few months. The funds will be provided by the International Education Board of New York, which administers some of the Rockefeller benefactions.

"The interest of the Board is based chiefly upon the successful cooperation of the Mount Wilson Observatory and the California Institute, and their belief that the provision of additional means of furthering this joint work may lead to many new advances in astronomy, physics and chemistry," it was stated at the California Institute of Technology. "The full cooperation of the Carnegie Institution of Washington, of which the Mt. Wilson Observatory is a branch, has been assured by the unanimous action of President John C. Merriam and the executive committee of the Institution, and by that of Director Walter S. Adams and other members of the Mt. Wilson staff. The research policy of the new Astrophysical Observatory of the California Institute, which will be designed to supplement and not duplicate the Mt. Wilson Observatory, will be determined by a joint committee representing the two institutions, aided by other leading investigators."

Dr. George Ellery Hale, honorary director of the Mt. Wilson Observatory, and chairman of the Observatory Council of the Institute, told of the plans.

"In designing this instrument," he said, "we shall have the collaboration of leading physicists and engineers as well as of astronomers and instrument makers. When the telescope is completed it will be used to extend our present researches in various directions, as in spectrum photography of the stars, direct photography of very faint celestial objects, investigation of the nature of the spiral nebulae or 'island universes' beyond the Milky Way, and in radiometry, or the measurement of the heat from the stars. By making a special study of the various instruments and methods to be used in conjunction with the new telescope for these and other purposes, and by securing the cooperation of the ablest authorities, we expect greatly to increase the effi-

ciency of the telescope.

"The equatorial mounting of the telescope will be designed by a group of experts, including Dr. J. A. Anderson, Dr. Francis G. Pease and other members of the staff of the Mt. Wilson Observatory, working in conjunction with several eminent engineers, opticians and physicists. It is the great mirror, nearly 17 feet in diameter, double that of the largest that has yet been made, that will offer the most difficulty. We expect to make it out of fused quartz, and are much pleased by the cordial and generous offer of cooperation received from President Gerard Swope of the General Electric Company and Dr. Elihu Thomson, director of the Thomson Research Laboratory of this company at West Lynn, Mass. Dr. Thomson is deeply interested in the problem, and has already succeeded in making quartz discs of considerable size. His method is to cast a quartz disc full of fine bubbles and to fuse a layer of very pure quartz, free from bubbles, on the surface, in which to grind the proper dish-shaped figure. Such a mirror behaves as well as a perfectly solid one, and has the advantage of being lighter.

"The great advantage of quartz is that it changes its form so slightly with temperature. With the 100 inch telescope now at Mt. Wilson, we must always be careful to avoid exposing the glass mirror to the heat of the day, and some changes often occur due to differences in temperature at night. With a quartz mirror the effect of temperature is too slight to give any trouble. We feel confident that, by the time we are ready for the mirror, Dr. Thomson will have succeeded in making a quartz disc of the requisite size. Pyrex glass, which is much better than ordinary glass, but not equal to quartz, might be used as a substitute if necessary."

Just how long it will be before the new telescope is in operation, it is at present impossible to tell, but it will doubtless be several years. The plans for the 200 inch telescope have no connection with the project of Prof. George W. Ritchey for a large telescope at the Grand Canyon, in Arizona. Prof. Ritchey has been working in Paris for several years on a method of constructing large telescope mirrors in a cellular

fashion, but it is not planned to employ his method in the 200 inch.

The exact location of the new telescope also remains to be decided. Perhaps it will be placed on Mt. Wilson, 5900 feet altitude, where there would be the advantage of proximity to the other observatory facilities. However, it is possible that the smoke, dust and glare of electric lights from Los Angeles in the future, with the city's increased growth, may prove a disadvantage, especially because of the comparatively short focus of the instrument. Several other sites are therefore being tested in comparison with Mt. Wilson.

The trustees of the California Institute have placed the entire project in the hands of a committee of the Executive Council of the Institute, consisting of Dr. Hale; Dr. Robert A. Millikan, director of the Norman Bridge Laboratory of Physics; Dr. Arthur A. Noyes, director of the Gates Laboratory of Chemistry; and Henry M. Robinson, well-known for his work as a member of the Dawes Commission and in other international undertakings. Dr. John A. Anderson, physicist and astronomer of the Mt. Wilson Observatory, will serve as executive officer of the Observatory Council, in direct charge of design and construction. They will be assisted by an advisory committee including Dr. Walter S. Adams, director of the Mt. Wilson Observatory; Prof. Frederick H. Seares, assistant director; Dr. A. A. Michelson, of the University of Chicago; Dr. Charles G. Abbot, secretary of the Smithsonian Institution; Prof. Henry Norris Russell, of Princeton University; and Profs. Richard C. Tolman, Paul S. Epstein and Ira S. Bowen, of the California Institute. George Eastman, and Dr. C. E. K. Mees, director of his research laboratory, have offered fullest cooperation in the study of special photographic problems. Ambrose Swasey, chairman of the Warner and Swasey Co., Gano Dunn, president of the J. G. White Engineering Co., and recently chairman of the National Research Council; Dr. Frank E. Ross, of the Yerkes Observatory, and others equally well-known, will aid in the work of design, and many other scientists especially qualified will contribute useful suggestions.

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