objectives, based on standard formulas, bring only limited intervals of the ultraviolet spectrum to a common focus. These papers present a preliminary study of the markedly improved performance which may be realized by using mirrors as well as lenses in the microscope objective. It was found that spherical mirrors combined with spherical lenses of fluorite, or of fluorite and fused quartz, can form objectives which are fully corrected for ultraviolet, visible, and near infrared light.

As a result of the preliminary studies a series of ultraviolet objectives of various magnifications is now being computed. These objectives will be adapted to fit the conventional triple nosepiece. A major problem in the design of reflecting objectives of large numerical aperture is to provide object and image planes which are accessible and at the same time to make sure that neither mirror obscures a large portion of the objective aperture. Theoretical considerations, confirmed by experiment, indicate that image quality suffers if much more than ten percent in area of the objective aperture is obscured. It was found that the requirement of a small obscuring ratio may be satisfied if light from the specimen is first incident on a concave mirror and is then reflected onto a much smaller convex mirror located between the first mirror and the specimen. From the convex mirror, the light proceeds through a central hole in the concave mirror and continues to the plane of the magnified image. Lens elements may be inserted at any position in this optical path, and most desirably they may be located between the mirrors and the specimen. D.S.G.

A New Series of Microscope Objectives: I. Catadioptric Newtonian Systems. By D. S. Grey and P. H. Lee. *J. Opt. Soc. Am. 39: 719, September, 1949.* II. Preliminary Investigation of Catadioptric Schwarzschild Systems. By D. S. Grey. *J. Opt. Soc. Am. 39: 723, September, 1949.*

Oil Well Logging

The intense demand for more efficient production in the oil industry has opened a relatively new field of opportunity for the physicist in applying scientific methods to logging oil wells. An oil well log is a graphical record of some phenomenon such as temperature, electric potential, radioactivity, fluid velocity, etc., as a function of depth within a bore hole. With its help one may locate casing failures, identify formations, locate the position of cement behind casings, etc.; but the most important purpose of an oil well log is to locate oil and thus establish the best point of production.

The physicist in the field will find himself confronted by most of the familiar measuring devices of the physics laboratory such as thermometers, voltmeters, ammeters, flowmeters, Geiger counters, ionization chambers, viscosimeters, etc. The student of physics will find use for a knowledge of physical principles and for mathematics through calculus and vector analysis in order to understand the theories of oil well logging. There is also much opportunity in this field for applying ingenuity in invention, research, development, and discovery. H.J.H.

Oil Well Logging, An Opportune Field for the Physicist. By Harley J. Haden. *Am. J. Phys. 17: 368, September, 1949.*

CALENDAR of EVENTS

November 3–5	Conference on Gaseous Electronics, Pittsburgh (sponsored by Westinghouse Electric Corporation)
November 4–5	*Society of Rheology* (Annual Meeting) New York City
November 7–9	Conference on Electrical Insulation, Pocono Manor, Pennsylvania
November 7–10	American Institute of Chemical Engineers, Pittsburgh, Pennsylvania
November 10–12	Geological Society of America, El Paso, Texas
November 17–18	Dallas Geophysical Society and Fort Worth Geophysical Society (Regional Exploration Meeting), Dallas, Texas
November 17–19	*Acoustical Society of America*, St. Louis, Missouri
November 23–30	International Symposium on High Altitude Biology (Sponsored by Unesco and Peruvian Government) Lima, Peru
November 25–26	*American Physical Society*, Chicago, Illinois
November 25–26	American Mathematical Society, Chicago, Illinois
November 26	American Mathematical Society, Pasadena, Cal.
November 27–December 2	American Society of Mechanical Engineers (Annual Meeting), New York City
November 28–December 3	Exposition of Chemical Industries, New York City
November 30–December 3	American Society for X-Ray and Electron Diffraction, Philadelphia, Pennsylvania
December 4–7	American Institute of Chemical Engineers (Annual Meeting), Pittsburgh, Pennsylvania
December 6	Society for Applied Spectroscopy, New York City
December 7	Physics Club of Philadelphia and Franklin Institute (Joint Meeting), Philadelphia, Pennsylvania
December 26–31	American Association for the Advancement of Science, New York City
December 27–30	AAAS Science Teaching Societies, New York City
January 3–6	American Meteorological Society (30th Anniversary Meeting), St. Louis, Missouri
January 31–February 1	Division of Electron Physics of *American Physical Society* and the Panel on Electron Tubes of the Research and Development Board of the Department of Defense, New York City
February 2–4	*American Physical Society* (Winter Meeting), New York City
February 15–17	Conference on Analytical Chemistry and Applied Spectroscopy (jointly sponsored by the American Chemical Society and the Spectrographic Society of Pittsburgh), Pittsburgh, Pennsylvania
February 27–March 3	American Society for Testing Materials, Pittsburgh, Pennsylvania
March 26–30	American Chemical Society, Houston, Texas
April 9–13	American Chemical Society, Philadelphia, Pennsylvania
April 16–20	American Chemical Society, Detroit, Michigan

ERRATUM: The Winter meeting of the American Society of X-Ray and Electron Diffraction was wrongly listed in previous Calendars as taking place in December in Columbus, Ohio. The correct dates are November 30th through December 3rd, at the Franklin Institute in Philadelphia, Pennsylvania, as listed above.