

In charge of the expedition will be Dr. Donald H. Menzel of Harvard, assisted by Dr. Joseph C. Boyce of Technology. Other members of the party have not yet been announced.

Emphasis on Spectrograms

According to Dr. Menzel, the party's program will be chiefly spectrographic, with particular effort to be directed to obtaining spectrograms of the chromosphere and the corona over a wide range of wavelengths. Special emphasis will be placed on the infra-red region of the spectrum, where present knowledge is only fragmentary.

The chromosphere, technically the outer layers of the sun, is a rarefied atmosphere enveloping the shining surface. Due to the brilliance of the sun, observations of the chromosphere are best obtained during an eclipse when the sun is hidden and only the rarefied atmosphere protrudes from behind the moon. From the observations to be taken, scientists hope that its chemical composition, the source of its excitation, the nature of its structure and many other problems in connection with the chromosphere may be cleared up.

The solar corona which lies above the chromosphere presents additional mysteries. Although the chromosphere has been spectrographically found to consist of helium, hydrogen, calcium, iron and other elements in their gaseous form, not a single one of the many known coronal lines has been positively identified.

Need More Data

Some scientists believe that the predominant element is a well-known substance, hidden by peculiar conditions existing in the corona. Dr. Menzel and Dr. Boyce have provisionally suggested that oxygen might be responsible, but additional data which may be obtained from the contemplated study of the infra-red coronal spectra are required to settle the question.

The Harvard-Technology expedition will be the guests of Dr. Boris P. Gerasimovic, formerly associated with the Harvard Observatory and now director of Poulkova Observatory at Leningrad.

Observations will be made from a point near the town of Ak-Bulak in the southern Ural mountains. Although Tomsk is a more favorable location, since it lies close to the central totality line and since the sun will be higher in the sky there, collected weather reports indicate that the chances for clear weather are appreciably greater at Ak-Bulak.

Totality here will occur at 8 a. m., local time, when the sun is 36 degrees above the horizon.

Dr. Boyce sailed early in February and will spend two months at the Solar Physics Observatory at Cambridge, England, before proceeding to Russia. The rest of the party will sail sometime in April.

Another joint expedition to observe the total eclipse will be sent to Soviet Russia by Georgetown University and the National Geographic Society, it is announced by the two sponsoring organizations.

PHYSICS

Studies May Yield Knowledge Of Heavy Water's Effects

A NEW and more precise value than has ever been obtained for the viscosity, or flowing qualities, of "heavy" water has been calculated in research conducted at Harvard University by Prof. Grinnell Jones and Dr. H. J. Fornwalt. Better knowledge of what effect heavy water may have on the body is only one possibility of the research.

Using an automatic timing device instead of the hand-operated stop watch employed for timing in previous viscosity tests, the two scientists have found that deuterium oxide, as heavy water is technically known, has a viscosity 23 per cent. greater than that of ordinary distilled water.

Although this figure differs only slightly from the results of other experimenters, who found a value of 23.2 per cent., the new figure is considered of prime importance in view of the extreme precision necessary in the calculations of modern science.

This precise viscosity measurement, for example, may prove to be of considerable importance to physiologists studying the effect of heavy water, which constitutes two hundredths of one per cent. of ordinary water, as found in the human body.

Many of the other investigations which have been in progress since the discovery of heavy water in 1934, may also benefit from the more accurate measurements. Outstanding among these are investigations to determine how the fluid affects animals and plants and research seeking to determine the electrical conductivity of the new liquid

Dr. Paul A. McNally, S. J., director of the Georgetown College Observatory, will be leader of the expedition, accompanied by five others to be chosen from the staffs of the University and the Society. They will leave sometime in April and return in July.

Observations will be made from a point near Orenburg, Soviet Russia, because past weather records show that this region offers one of the best promises of clear weather along the whole path of the eclipse.

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The Harvard measurement is also expected to aid scientists checking the possibility that the double-weight hydrogen atom alters important calculations and assumptions made by scientists before heavy water's discovery.

Prof. Jones' viscosity tests are similar to others in that the speed of fall of the liquid in a glass capillary tube forms the basis of measurement. In early experiments on heavy water, however, observation of the speed of fall was made by the human eye, and the time recorded with a hand-operated stop watch. This method, of course, involves the possibility of inaccuracy on the part of the observer and does not give a satisfactory timing record, since even the best stop watches are accurate to only a tenth of a second.

The Harvard scientists in their experiments used an automatic timing device which replaces the human eye with the infallible photo-electric cell. Time records were made on a fast-moving chronograph tape which enabled measurements accurate to one hundredth of a second. Possible error, they estimate, cannot exceed three or four thousandths of one per cent.

The research was undertaken at the suggestion of Dr. Harold C. Urey, discoverer of the liquid, after he had seen Prof. Jones' equipment for precise viscosity measurement. Prof. Jones is now conducting experiments to determine the surface tension of heavy water, also at Dr. Urey's suggestion. The fluid for both experiments was supplied by Dr. Urey.

Science News Letter, March 21, 1936