New Measures May Reveal Bigger Stars

Astronomy

AFTER eight years of preparation, the fifty-foot interferometer at the Mt. Wilson Observatory in California has been completed. Francis G. Pease, who used the smaller one, twenty feet in length, designed the new instrument and supervised its construction. The smaller one was attached to the 100-inch reflecting telescope at the observatory, and with it the first star diameters were measured, using a principle worked out originally by Prof. A. A. Michelson, University of Chicago physicist.

Antares, the bright red star in Scorpio, the scorpion, was found to have a diameter of 390,000,000 miles, and is the largest yet measured. The new instrument can be used for a number of stars beyond the reach of the old instrument, and it is possible that even larger stars may now be found.

Mr. Pease is shown in our cover illustration as he was recently making final adjustments to the instrument. To his right appears one of the flat mirrors, set at an angle of 45 degrees, which slides along the track. A similar mirror slides along another track that was beside the photographer. These mirrors reflect the light from the star to two other mirrors in the center, thence it is reflected to a 36-inch concave mirror below, which brings the light to a focus.

Under proper conditions, when looking through the eyepiece, the image shows a series of light and dark bands, called "interference fringes." If the star is sufficiently large, these can be made to disappear by moving the outer mirrors, and from their distance when this happens the star's diameter can be computed. All the motions of the instrument are done by electric motors, controlled from the switchboard seen below the flat mirror.

Science News-Letter, September 27, 1930

Chemical Meeting—*Continued*

associated with the production of these bald spots." In some cases, he explained, the patient becomes completely bald, not only on the head, but on all parts of the body.

Dr. Myers announced that they had found the cause to be a retention in the body of arsenic and lead. These metals get into the body, he declared as a result of their use as sprays for fruit and vegetables, from drinking or using water that is supplied through lead pipes, or from the exhaust of automobiles using gasoline containing lead compounds as an anti-knock. Dr. Thomas Midgley, chemist with the General Motors Corp., however, questioned this latter statement, and said that the only hazard in connection with the use of tetraetnyl lead in ethyl gas is among the men who manufacture it, and that its use does not appreciably increase the amount of lead in the city air.

Improving on Castor Oil

Dr. E. Emmet Reid, of Johns Hopkins University, told of a study that he and Dr. Warren M. Cox, Jr., have made of the Japanese "castor oil fish." This fish, zoologically known as Ruvettus pretiosus, is caught at a depth of a half mile. Drinking an oil extracted from it, or even eating its flesh or chewing on its bones, produces a physiological effect similar to, but even more prompt than, that produced by castor oil. The analysis has shown it to consist of fatty acids, chiefly oleic acid, and higher alcohols.

Helping Conquer Tuberculosis

Another paper presented before the medicinal chemists was seen as a further step toward the eventual conquest of tuberculosis. Dr. R. J. Anderson, of Yale University, told of the work of himself and Dr. E. Gilman Roberts in analyzing the tuberculosis bacillus chemically. Several years ago they found that a compound could be extracted from the dead "bugs" that could produce all the symptoms of tuberculosis when injected into the body, and that this contained a very peculiar sugar, the first poisonous sugar to be discovered. Now they have found another new carbohydrate, which they call maninositose. It is what is called a polysaccharide and is said to be the first compound of this kind ever to be found in nature.

"Its discovery will open a new chapter in the study of cell metabolism," Dr. Anderson declared.

Science News-Letter, September 27, 1930

Photo on Copper

PRINTING a photograph on copper from a negative almost as easily as printing it on ordinary photographic paper can be accomplished by a method described in a report to *Nature* by C. J. Smithells, of the General Electric Company's British research laboratory at Wembley. It depends on the fact that cuprous chloride, or chloride of copper, is sensitive to light.

"The process affords a simple and rapid method of obtaining a sharp photographic image on the surface of plates of copper and copper alloys, including white alloys like German silver," states Mr. Smithells.

He gives the following directions:

"The copper or brass surface is polished and cleaned as for engraving, and dipped for ten seconds into a ten per cent. solution of cupric chloride or copper ammonium chloride. A very thin white film, which X-ray examination shows to be cuprous chloride, forms on the surface of the plate. The plate is washed in running water, rinsed in methylated spirit, and dried in the air. The methylated spirit not only accelerates drying, but also makes the film much more adherent, and the wet plate can be wiped with a cloth without the film being destroyed.

"The plate is now light sensitive. On exposure for a few seconds to the direct light from an arc lamp the surface turns black, owing to the conversion of cuprous chloride into cuprous oxide. For contact prints from ordinary negatives an exposure of about one minute to the light of an arc lamp is required. The image (positive) so obtained is about equal in definition and contrast to that obtained in the ordinary three-color and photogravure processes. The image can be 'fixed' by washing in dilute hypo or salt solution, but since this also reduces the intensity of the image the plate should be over-exposed during printing. For many purposes, such as engraving, fogging by diffuse daylight is so slow that fixing is unnecessary."

Photography

Science News-Letter, September 27, 1930