each additional £10,000 up to a maximum of 250 guineas. A provisional committee has been appointed, to hold office for three months and including: Dr. E. F. Armstrong (Messrs. Joseph Crosfield and Sons), Mr. F. W. Brock (Messrs. Brunner, Mond and Co.), Dr. Chas. Carpenter (South Metropolitan Gas Co.), Dr. M. O. Forster (British Dyes, Limited), Mr. John Gray (Messrs. Lever Brothers), Mr. Norman Hoden (Messrs. Hardman and Holden), Mr. C. A. Hill (British Drug Houses, Limited), Mr. C. P. Merriam (British Xylonite Company), Sir Alfred Mond, M.P. (Mond Nickel Company), Mr. Max Muspratt (United Alkali Company), Sir William Pearce, M.P. (Messrs. Spencer, Chapman and Messel), Mr. R. G. Perry (Messrs. Chance and Hunt), Mr. R. D. Pullar (Pullar's Dye Works), Dr. Alfred Ree (Society of Dyers and Colorists), Mr. A. T. Smith (Castner-Kellner Alkali Company), and Mr. John W. Wilson, M.P. (Messrs. Albright and Wilson).

IN an item published in SCIENCE for July 7, the cost of printing for the Cornell and Geneva Agricultural Experiment Stations was reported as $60,000 each, whereas this was probably the sum for the two institutions. We are informed that at the Geneva Station the cost of bulletins and reports for three years has been as follows: 1913, $11,978.85; 1914, $14,514.28; 1915, $14,944.81. These figures include the cost of both bulletins and the annual reports, with the exception of Part 2 of 1915, known as "The Cherries of New York." This cost $4,455 extra.

ACTION by congress has recently created six new scientific positions in the division of scientific inquiry of the Bureau of Fisheries. The positions comprise two assistants for the Washington office, two field assistants and a superintendent and scientific aid for the laboratory to be constructed at Key West, Florida. The bureau will be enabled to extend its scientific work particularly in relation to marine shellfish, fresh-water mussels and fishery problems of the Gulf of Mexico. A slight increase was made in the appropriations for miscellaneous expenses available for investigations. The Bureau of Fisheries has never before received in one year so substantial an increment to its scientific staff.

THE secretary of commerce announces the completion of the work at the Rio Grande to the westward of Brownsville, Texas, and Matamoras, Mexico, which connects the triangulation systems of the United States and of Mexico. In the United States the arc of primary triangulation extends from the northwestern part of Minnesota southward along the ninety-eighth meridian to the Rio Grande, and Mexico had extended an arc of primary triangulation along the ninety-eighth meridian from its Pacific coast to the Rio Grande. Mr. E. H. Pagenhart, of the Coast and Geodetic Survey, and Mr. Silverio Aleman, of the Mexican Geodetic Commission, in April and May, made the observations from towers erected on both sides of the river and the work was successfully completed. The length of the completed arc is 2,270 miles. This is a notable event in the history of geodesy and will make it possible to have the maps of the two countries harmonize at the border.

UNIVERSITY AND EDUCATIONAL NEWS

LAST December, the University of Illinois purchased for its School of Pharmacy, property at the corner of Wood and Flournoy Streets, with two substantial brick buildings. One of these is a four-story college building containing a large auditorium, several lecture and recitation rooms as well as offices, microscopical laboratory and several smaller laboratories. This building was formerly occupied by a medical college. The second building was constructed for a hospital and is now being remodeled as a laboratory building in which will be located the qualitative analytical laboratory, the laboratory for organic chemistry and the pharmaceutical laboratory. The college building was occupied by the school on June 1. The trustees of the university have appropriated $32,000 for refitting the buildings, providing new heating, lighting and plumbing, as well as new furniture and equipment for lecture halls and laboratories.

DR. J. W. SHIPLEY, who during the last two years has been assistant professor of analytical chemistry at the Ohio State University, is going to the Agricultural College of the University of Manitoba, Winnipeg, as assistant professor of chemistry.

MR. F. S. NOWLAN, of Columbia University, has been appointed instructor in mathematics at the Carnegie School of Technology, Pittsburgh, Pa.

AT Lehigh University, R. L. Spencer has been promoted to be assistant professor of mechanical engineering and S. J. Thomas to be assistant professor of biology.

DISCUSSION AND CORRESPONDENCE

ATMOSPHERIC TRANSMISSION

TO THE EDITOR OF SCIENCE: Replying to the first point in Mr. Abbot's communication in SCIENCE for February 18, 1916, page 240, in reference to the variability of atmospheric transmission of solar radiation during a single day, I have never denied that occasions may be found when the diurnal transmission is substantially constant, but have distinctly averred that such uniformity sometimes exists. What I must deny, however, is that the Mount Wilson observations of September 20 and September 21, 1914, are in the category of measurements unaffected by diurnal changes of transmissivity. The trifling variations from minute to minute on these dates may indeed have been small, but these are not now in question. They may be eliminated for our purpose by passing a mean curve through the plotted observations; but when thus smoothed, the mean curve shows peculiarities which can not be neglected. I have drawn such curves and find the following significant features:

Concerning ourselves simply with the transmission of solar radiation by a unit of atmospheric mass, equivalent to a single vertical transmission, if the rays presented for transmission were of unvarying quality, and if the transmissive properties of the atmosphere remained likewise unchanged through the day, we should have a perfect day for the purpose of the deduction of the solar constant from a comparison of high-sun with low-sun measures. But, in general, neither of these desiderata exist. For example, on September 20, 1914, between air masses 2 and 3, the radiation fell off from 1.437 to 1.311. Transmission by unit mass,

$$T_{(2-3)} = 1.311/1.437 = 0.9124.$$

Between air masses 7 and 8, the radiation diminished from 0.983 to 0.922.

$$T_{(7-8)} = 0.9378.$$

Here it is as if the air had become more transmissive, although this undoubtedly means that, for one thing, the rays which have penetrated more deeply have become more transmissible through the total loss of some of their more absorbable ingredients. Be this as it may, we can not discriminate between this source of variability and another one which is always present (and always potent except in times of extreme cold) and which comes from the evaporation of water at the earth's surface and the ascent of considerable masses of aqueous vapor into the convectional layer of air *in the middle of the day,* whereby the midday atmosphere becomes less transmissive, and the apparent transmission deduced from comparison of high-sun with low observations is illusory.

For air masses 14 and 15, the radiation was 0.680 and 0.648; $T_{(14-15)} = 0.9530$. That is, there was still a further increase of transmissivity of unit air mass with this larger departure from midday conditions. Similar results are found on September 21, 1914, namely,

$$T_{(2-3)} = 1.297/1.437 = 0.9028,$$
$$T_{(7-8)} = 0.889/0.947 = 0.9390,$$
$$T_{(14-15)} = 0.630/0.660 = 0.9545.$$

M. R. Savélief, observing in Russia in very cold weather, obtained between air masses 4.5 and 5.5 a transmission equivalent to that for Mount Wilson between air masses 2 and 3, and was able to match Mount Wilson $T_{(7-8)}$ with the interval between air masses 9 and 10. His observations represent a much closer approach to uniform transmission than those cited by Mr. Abbot; and this is doubtless due to the comparative absence of aqueous vapor whose pressure at the earth's surface was from 0.7 to 0.9 mm. in the Russian measures, whereas the Mount Wilson observations were made with