

## THE PHYSICAL CONSTITUENTS OF THE ATMOSPHERE OF VENUS.

BY CHAS. E. ST. JOHN AND SETH B. NICHOLSON.

THE literature on planetary atmospheres is permeated with the assumption that the atmosphere of Venus is similar to our own, in particular as to the presence of oxygen and water vapor. This assumption rests upon spectrographic observations with low dispersion in which an increased intensity of the terrestrial lines was thought to be seen in spectra of Venus. Spectrograms of Venus with a dispersion of 3 Å. per mm. when the relative velocity was sufficient to separate lines due to atmospheric absorption in Venus from the corresponding terrestrial lines show, however, no trace of lines in the positions in which the Venus components should appear. From comparison with laboratory observations it is deduced that companions to the terrestrial lines should have been detected, if the light had penetrated a layer of oxygen on Venus equivalent in radial depth to 3 meters of oxygen under normal conditions.

In the depth penetrated in the planet's atmosphere there was then less than one five-hundredth part of the amount of oxygen in the earth's atmosphere.

As to water vapor it is deduced that if the solar beam had traversed, in and out, one millimeter of precipitable water, the water-vapor lines would have been doubled.

According to Jewell's observations the water vapor in the atmosphere over Baltimore is equivalent to 40 mm. of water. Moore gives it as about 50 mm. for the ordinary American climate.

MOUNT WILSON SOLAR OBSERVATORY.

## THE SEPARATION OF MERCURY INTO ISOTOPES.

BY WILLIAM D. HARKINS AND R. S. MULLIKEN.

THE paper reports the details of the apparatus used in a separation of the isotopes of mercury amounting to 127 parts per million. It is found that the separation attained varies as the logarithm of the cut and as the square of the difference of atomic weight (when there are only two isotopes), and inversely as the mean atomic weight.

UNIVERSITY OF CHICAGO.

## THE CRYSTAL STRUCTURE OF MERCURY.

BY L. W. MCKEEHAN AND P. P. CIOFFI.

THE crystal structure was determined by the "powder" method developed by A. W. Hull,<sup>1</sup> and with standard equipment for the use of molybdenum x-rays obtained from the General Electric Company. The low temperature required to keep the mercury frozen was obtained by boiling liquid air by an electric heater in a small vacuum flask and allowing the vapor to escape through

<sup>1</sup> PHYS. REV. (2), 10, 661 (1917).