THE ATMOSPHERES OF THE PLANETS

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Two ways are open to the retiring president of this association, when he makes what small return he can for the honor of his election. By a sound and time-honored custom, it is his duty and privilege to speak of some topic, within his own technical field, but of general interest. He may therefore either report on his own researches—if he is fortunate enough to have recent or unpublished results good enough to measure up to the standard of a presidential address—or he may survey some section of his part of the field of science in which important gains have lately been made, though his own contribution to this advance may be small. Only the latter course is open to the present speaker: and so, this evening, we may devote a little time to the atmospheres of the planets.

As soon as telescopes became good enough to give a tolerable view of details on the planets, evidence began to accumulate that some of them, at least, possessed atmospheres. Doubtless the first to be noticed were the changes in the markings on Jupiter, which differ radically from one year to the next, and often appear suddenly and last but a few weeks, though thousands of miles in diameter. Only clouds, forming and dissolving in a Jovian atmosphere, can account for such rapid and capricious changes.

Evidence for an atmosphere on Mars is afforded by the polar caps. The steady shrinkage of these during the summer, accompanied by the growth of the opposite cap during the long, cold polar night, is explicable only by the melting or evaporation of deposits of some snow-like substance, which is carried as invisible vapor to the opposite pole, and there deposited. A permanent, non-condensible atmosphere is required for the transport of this vapor.

Venus, when she is considerably nearer to the sun, reveals some nodules of visible snow, which are said to melt and re-form semi-annually. These changes may be caused by the evaporation of a non-condensible vapor, transported by the wind, but the phenomenon is not well understood. Finally, the effects of the storms of Saturn have been followed with intense interest, though the observations have been so difficult that only fragmentary results have been obtained so far. Saturn is the only planet whose atmosphere has been studied by means of photography.

1 Address of the retiring president of the American Association for the Advancement of Science, Pittsburgh, December 31, 1934.
Editor's Summary

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