

and failed but Haber had every reason to hope for success.

So he put out to sea in a ship specifically fitted as a chemical factory. He got samples from the oceans of the world. The results were all disheartening. The seas contained only a thousandth of the gold that previous analyses had indicated. Inaccurate analytical methods and use of gold-containing chemicals in making the earlier analyses had led Haber on a wild gold chase. Haber found the average gold value of sea water to be only 24 hundred thousandths of a grain per gross ton.

Disappointed he wrote: "It is not probable that the precipitation of gold from sea water will ever be a commercial success."

Science News Letter, April 7, 1934

PSYCHOLOGY

Same Chord Produces Calm and Excitement

THE MUSICAL chord known to musically trained persons as the "chord of excitement" and more technically as the "diminished seventh chord," need not always produce a feeling of excitement in the listener, Dr. Christian Paul Heinlein, of the Florida State College for Women told the Southern Society for Philosophy and Psychology.

The chord is fitted admirably for exciting passages and this use is illustrated clearly in the music of Liszt, Wagner, and Tchaikowsky, but the chord is extremely versatile, Dr. Heinlein said. He presented musical passages in which the chord is conducive of calm and repose.

Science News Letter, April 7, 1934

ASTRONOMY-METEOROLOGY

Weather Cycles on Planets Revealed by Brightness Study

Colossal Examination of Records Since 1840 Shows Up Variations That German Astronomer Believes Atmospheric

OTHER planets in the solar system have their cycles of weather. Such is the conclusion arrived at by Dr. Wilhelm Becker of the Astrophysical Observatory at Potsdam from a long study of planetary light.

He collected all the observations that have been made on the brightness of the planets Mars, Jupiter, Saturn, and Neptune, from 1840 down to the present time, eliminated the effects of their varying distances from us and from the sun, reduced all the observations to a common scale and standard position of the planet—a colossal piece of work. When this was done, he found that there were still variations in brightness that could not be accounted for by any external cause, but must be due to changes that take place on the planet itself.

These changes, Dr. Becker believes, are atmospheric. They are comparable to the weather cycles that have been observed on the earth, such as the well-established Brückner cycle of 35 years. This cycle cannot be connected with sunspots because its period would then be 11 or some multiple of 11 years.

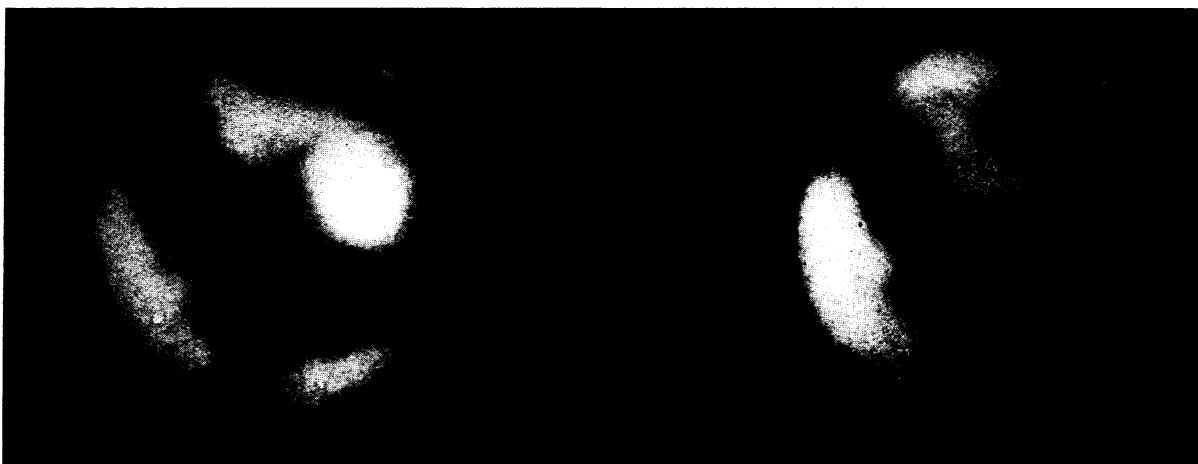
Dr. Becker's reasons for arriving at this conclusion are:

Some of the planetary variations in brightness found by him recur at equal intervals of time—are regularly periodic. Others, though irregular in period, have always the same character at each recurrence. The maxima and minima of brightness occur at different times on the different planets, and therefore can not be due to a single external cause such as a variation in the intensity or quality of the sun's radiation, which would affect all at the same time. Finally and most important, he finds that the brightness variations are correlated with certain changes in the appearance of the planet that can be and have been observed with the telescope.

Dr. Becker gives the following picture of the observational results in the scientific journal *Forschungen und Fortschritte* and in his report to the Prussian Academy of Sciences:

The brightness variations of Mars are characterized by long-lasting minima and short sharp maxima, the variation in the intensity of the light coming to us being about 35 per cent. There is no regular period.

Saturn, on the other hand, shows variations that are the mirror image of those of Mars. They have long-lasting



A PLANET CHANGES EXPRESSION

The differences between these two photographs of Mars which were taken about a month apart indicate how the appearance of the planet changes. The polar caps change conspicuously, being largest in Martian winter and smallest in summer. The general surface of the planet is reddish with sharply bounded areas of gray or dull green. It has an atmosphere, though not a dense one. The pictures were taken at the Mount Wilson Observatory of the Carnegie Institution of Washington with the 60-in. telescope.