

continued, "we assume that in the auroral region the atmospheric matter is brought to high altitudes through the effect of electrical forces, which result from the photoelectric action of sun's rays of short wavelength."

Singularly enough, there are no spectrographic lines indicating the presence of the light gases, helium and hydrogen, at these elevations; or at most they are exceedingly faint and feeble. This runs quite counter to the assumption often made that layers of these "balloon gases" float on the top of the earth's atmosphere. On the contrary, all the gases in the atmosphere seem to be thoroughly mixed.

By comparing spectra of auroral light with those of laboratory light sources at known temperatures, Prof. Vegard concluded that auroral light centers are active at temperatures about 22 degrees below zero Fahrenheit.

Science News Letter, May 6, 1933

ASTRONOMY-PHOTOGRAPHY

Planet Photographed Eclipsing Star

PHOTOGRAPHS showing the rare event of the eclipse, or occultation, of a star by a planet, which took place late on the night of April 20 and during the wee hours of the twenty-first, were made with the great forty-inch refracting telescope of the Yerkes Observatory, Williams Bay, Wis., by Otto Struve, C. T. Elvey and W. W. Morgan.

The star was of the ninth magnitude, far below the limit of naked-eye visibility, so that a powerful lens was required to get its photograph at all, especially as it approached and began to be lost in the brilliant light of the great planet. Being such an inconspicuous object the star has no name of its own, only a number in an astronomer's catalog: "BD plus 8 degrees 2456."

Describing the photographs, from which the drawing was made for SCIENCE NEWS LETTER, Director Struve of the Observatory said: "It will be noticed that on the first plate the star is quite far away, while on the last it nearly touched the limb (edge) of Jupiter. The four black spots on the other side of Jupiter are the four brightest satellites of the Jovian system.

"It is reasonable to expect that about one occultation (by Jupiter) in four or five years will be observable at any given observatory."

Science News Letter, May 6, 1933

EVOLUTION—MATHEMATICS

New Mathematical Method Charts Course of Evolution

A NEW mathematical method, which makes the course of evolution a measurable thing, was demonstrated to the National Academy of Sciences by Dr. Harry H. Laughlin of the department of genetics of the Carnegie Institution of Washington, located at Cold Spring Harbor, N. Y.

It takes cognizance of hereditary differences hitherto considered too small to be bothered with, and by charting the direction of their development with great exactitude will enable scientists to foretell, on the basis of measurements of a few generations, the present trend of evolution at the close of a great many generations.

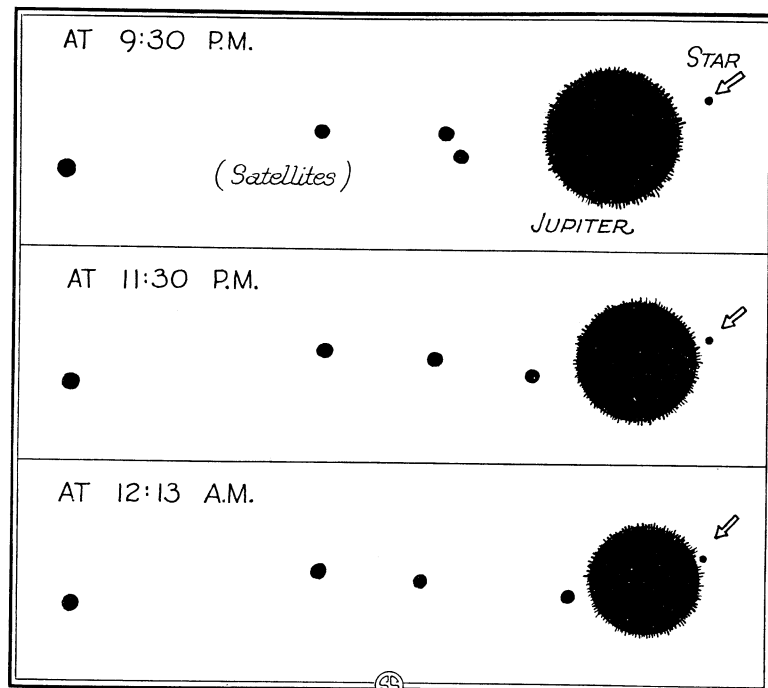
Since the application of the Mendelian principles to the science of genetics, students of that subject have been interested quite largely in characters determined by single "genes" or hereditary units, or at most by a small number of genes. But some of the hereditary traits of greatest practical and social importance, like running ability in thoroughbred horses or height in men, have defied analysis into separate genes. They are probably due to the in-

teraction of thousands of genes, and only their net results, as they show themselves in departures in offspring from average conditions in parental stocks, can be measured.

Dr. Laughlin's method takes such a departure from a parental average—say an increase of a fraction of an inch in height of offspring over height in parents—and maps its course through several generations. On the same graph he traces another line, representing the thing with which comparison is to be made. Neither line is straight, but in both a direction can be traced.

The two lines tend to converge, and the point where they intersect represents the culmination of the evolutionary development of that particular character—the genetic mean. This is the present evolutionary goal.

One line of development to which Dr. Laughlin applied his method had the advantage of being all finished and done with, so that he could make his prediction and then look to see whether it had been fulfilled. It had to do with the skull-length in titanotheres, monstrous beasts that ran their course dur-



ONCE IN FIVE YEARS