

Yerkes Observatories.

Probably no astronomer of the present day has added more to our knowledge of the nature of sunspots than Dr. George E. Hale, past director of the Mt. Wilson Observatory. As far back as 1908, Dr. Hale observed at Mt. Wilson the vertical motion in sunspots and showed them to be solar storms of a cyclonic nature. Shortly afterwards he confirmed the suspected existence of magnetic fields in sunspot. Now it is known that all sunspots act as magnets and occur generally in bipolar groups, the leading group whirling in one direction with polarity of one kind, the following group whirling in the opposite direction and carrying the opposite charge. The intensity of the magnetic field depends in general upon the size of the spot or spot group.

One of the strangest discoveries bearing on the nature of sunspots has been the discovery of the reversal of the polarity of sunspots with the sunspot minimum. Prior to 1912, a sunspot minimum year, it was observed at Mt. Wilson that to the preceding spots of a bipolar group in the northern hemisphere of the sun carried negative charges and the following spots positive charges, while the reverse was true of spots in the southern solar hemisphere. After the sunspot minimum was passed a reversal of polarity took place in all groups and this was maintained until the year 1922 when the sunspot minimum next occurred.

Waiting with interest to see what would take place at this time observers found that again a reversal of polarity took place. It is suspected that this change of polarity indicates a change in the direction of whirl of individual spots while the dominant charge of the entire group remains the same. Yet there still remains much of mystery to clear up regarding sunspots and the sunspot cycle of solar activity.

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Huntington, Ellsworth. The Earth and the Sun. New Haven, Yale University Press, 1923.

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#### SECOND BABIES YOUNGER IF THEY ARE GIRLS

Parents have to wait longer for their second child if it is a girl than if it is a boy.

This is the conclusion drawn from data reported to the Eugenics Research Association by Prof. H. D. Fish of the University of Pittsburgh as a result of an investigation into the control of sex of children before birth.

A study of 2,043 Hebrew families, tabulated from nurses' reports at the Irene Kaufmann, Settlement, Pittsburgh, Pa., indicated that the time interval between first and second children is measurably longer preceding the birth of a female second child than it is preceding the birth of a male second child.

"It seems to make no difference what the sex of the first child was," Prof. Fish declared, "More than 95 per cent of the families studied were Russian Jews,

the remainder Austrian and Rumanian Jews.

"The average time interval between first children and second female children was 35.10 months, but for second male children it was 31.85 months. The difference between these averages is 3.25 months. There is only one chance in more than five hundred million that this difference is due to random sampling. Comparison of all the birth intervals of the two groups rather than the averages shows there is only one chance in about eighty billion that the two differ in a purely chance manner.

"A similar study of 507 related families of an old New England stock tended to substantiate the above result indicating the phenomenon is not peculiar to Jews."

From the study of the mechanism of heredity that has been undertaken by scientists during the past twenty years, equality in numbers between sexes is expected, Prof. Fish explained. Inequality, however, is observed. More male than female children are born. Mixtures of different nationalities produce a greater percentage of male children than the pure parent stocks. There is an excess of male births among first children that is greater than the excess of male births which occur later in the family. These things point to influences outside and inside the reproductive cells which tend to modify the sex ratio.

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#### ASTRONOMICAL MIST CLEARED BY MATHEMATICS

The mystery of nebulium, the strange gas supposed to exist in comets, nebulae, and certain stars, is being dissipated. Prof. Harvey B. Lemon of the University of Chicago has made discoveries which indicate that there is probably no such element in the universe and what has been taken for it is merely helium in disguise.

Spectroscopists, who detect the make-up of stars and other things by analyzing the light which comes from them, have long been worried by lines in the nebular spectra, which did not agree with those of any substance known on earth. A bright green line was especially characteristic. These strange lines have been attributed to an unknown element of light atomic weight which was called "nebulium" after the nebulae in which they were found. Ideas about nebulium have, however, become even more nebulous; for modern work in physics and chemistry seem to indicate that there could be no light weight element not already known.

In addition to the so-called nebulium lines, most of the nebulae show the well known lines characteristic of hydrogen and helium. Thinking that one or both of these elements might possibly cause the lines of nebulium, Prof. Lemon applied to them the algebraic formulae which had been found to fit the lines of many other spectra. According to his mathematics, the unknown nebular lines attributed to nebulium lie on the same parabolic curves as the spectral lines of a helium atom which has had one electron knocked out of it. The reproduction of the nebulium lines has never yet been accomplished in the laboratory, but Prof. Lemon thinks his figures give a clue for experiments which may prove fruitful.

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READING REFERENCE - Gregory, Sir Richard. The Vault of Heaven. New York, E. P. Dutton & Co., 1924.

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