

ponents, color of components, their spectra, the "hypothetical parallax,"—for the process of computing reference should be made to Mr. Gore's article,—and the most recent parallax of the star as determined by observation. Mention is also made of the publication in which the elements first appeared. The notes following the catalogue are very complete, and will be found very useful to those interested in this particular branch of astronomy.

In another paper read before the same society, Mr. Gore gives his observations of the variable star  $\mu$  Cephei. He finds that the variation of light for this star does not exceed half a magnitude, and is very irregular, the star sometimes remains for several months with little or no change in its brightness. Mr. Gore, in a third paper, gives the orbit of the double star 35  $\epsilon$  Comae Berenices. The magnitudes of the components are 5 and 7.8 respectively. He has found for this pair of stars a period of 228.4 years. He has computed the elements, and from this has derived the position angles and distance between the stars from Struve's first measurement in 1829 to Burnham's last measurement, made in 1891. The residuals between the computed and observed position angles are quite small, and with one or two exceptions the computed and observed distances compare very favorably.

#### EXPERIMENTAL DIPHThERIA.<sup>1</sup>

PROFESSOR WELCH and Dr. Flexner present a preliminary account of the results of their study of experimental diphtheria in guinea-pigs, rabbits, and kittens. They employed in their experiments pure cultures of the Klebs-Löffler diphtheritic bacillus, which they inoculated into the trachea and under the skin of these animals. The study which they made was directed particularly to the changes in the tissues produced by these organisms. Previous observers had not confirmed fully the results obtained by Oertel in his study of the alterations in the tissues in human diphtheria, and hence an important factor in the causation of the disease was missing. Drs. Welch and Flexner found that the lesions described by Oertel in human diphtheria are also present in the tissues of animals dead of the experimental disease, and in addition they describe a number of lesions which have not been found up to this time in the disease in human beings. They produced at the seat of inoculation a false membrane, in which the bacilli multiplied. The bacilli remain in the local process; they never invade the blood and tissues of either animal or man, and the general effects are caused, not by the bacilli themselves, but by a poison which they produce.

As in human diphtheria the place of entrance of the poison and the contiguous parts show the greatest destruction, so also in animals the seat of inoculation and the neighboring lymphatic glands exhibit the gravest changes; and, further, as is the case in human diphtheria, distant organs are affected, so is it in the experimental form of the disease. These observers found lesions in the seat of inoculation and adjacent tissues of the most intense nature, in the heart, lungs, liver, kidneys, adrenals, thyroid gland, the epithelium and lymphatic apparatus of the intestinal tract, and in all of the lymphatic glands of the body. The lesions described consist of death of cells, shown by the extensive nuclear fragmentation that has taken place, the affected cells being converted often into a substance resembling fibrin; a

hyaline death of cells which occurs in the liver and adrenals especially, and the production of intense fatty degeneration of the muscle of the heart, the epithelium of the kidneys and liver. Hence, a valuable link is added to the chain of evidence that the cause of human diphtheria is a specific organism—the Klebs-Löffler diphtheritic bacillus.

#### NOTES AND NEWS.

A KIND of artificial honey which has lately been produced seems likely to become a formidable rival of natural honey. It is called "sugar honey," and consists of water, sugar, a small proportion of mineral salts, and a free acid; and the taste and smell resemble those of the genuine article. Herr T. Weigle brought the subject before a recent meeting of the Bavarian Association of the Representatives of Applied Chemistry, and there is a paragraph about it in a recent number of the *Board of Trade Journal*.

—It is stated in *Nature* that a cat born with only two legs (the fore-legs being absent from the shoulder-blades) has been recently described by Professor Leon of Jassy (Naturw. Rundsch.). It is healthy, and goes about easily, the body in normal position. When startled, or watching anything, it raises itself to the attitude of a kangaroo, using the tail as a support. This animal has twice borne kittens, in both cases two, one of which had four feet, the other only two.

—Hysteria in men is apparently not rare in other countries, but in England, according to the *British Medical Journal*, it is, relatively speaking, very uncommon. Not many years ago a Russian physician observed that true hysterical fits were common among young Circassian men, and the disease might reasonably be suspected to prevail where men of an imaginative and impressionable stock predominate. Judging by the evidence of French medical publications, Frenchmen are far more subject to hysteria in adult life than Englishmen. Occasionally certain cases recorded in French medical newspapers must cause us to reflect; are such cases hysterical at all, or are certain nervous affections common in England really forms of hysteria? The doctrine that hypochondria is in males the homologue of hysteria, must be accepted by the French on the evidence of what prevails in England. For hypochondria, low spirits, or "spleen," is proverbially common there, and the French hold exaggerated opinions on the subject. In a more excitable race, more acute nervous symptoms might be expected.

—Rats at Aden appear to have a vigorous appetite, and to adopt remarkable ways of gratifying it. Captain R. Light, writing on the subject from Aden to the *Journal of the Bombay Natural History Society* (from which *Nature* quotes), says the rats in his house—which is overrun with them—demolish skins, braces, whips, etc.; and one night he awoke, feeling a rat gnawing at his toes. This happened in spite of a dog (a good ratter) being in the room. Captain Light was lately watching his pony being shod, and noticed the hoof apparently cut away all round the coronet, wherever it was soft. He accused the "nalband" of doing this in addition to the usual rasping of the hoof to suit the shoe. The "syce" said that the rats had done it, and that they came at night and ate away not only the pony's hoofs but those of the goat and kid, and that these animals were greatly tormented by the rats. Captain Light examined the hoofs, and found beyond doubt that such was the case, the marks of the teeth being plain; moreover, he found that the horns of the kid, which had been about half an inch high, were eaten flush with the head. Next morning, too, a large rat was discovered in the bedding under the horse. It had evidently been killed by a kick from him.

—The mareograph in the harbor of Pola, according to Lieut. Gratzl (Met. Zeitsch.), often shows, in addition to the ordinary tidal curve, certain more or less regular oscillations, generally with a period of about fifteen minutes (some with one of seven minutes). According to *Nature*, these appear to be of the nature of *seiches*, and to be caused by squalls, which drive water from the open sea into the partly inclosed basin of the harbor, where it rises as a wave, retires, rises again to a less height (as only part of

<sup>1</sup> The Histological Changes in Experimental Diphtheria. Preliminary communication. By William H. Welch, M.D., professor of pathology and Simon Flexner, M.D., fellow in pathology. The Johns Hospital Bulletin, No. 15, August, 1891.

the surplus water escapes), and so on. Thus, in the evening of July 6, 1890, after a stiff west-north-west squall, there were eight pronounced oscillations, the strongest showing about 1.4 inches difference of level in sixteen minutes. In another case, the harbor level rose higher than it had done for fifteen years. The latter squall (a strong south-west one) affected also the Trieste mareograph, which showed nine wide oscillations with a mean period of one hour forty-six minutes. Lieut. Gratzl suggests observations as to whether sudden impulses of "bora" against the Italian coast might not heap up the water there, so that a return wave might affect the Austrian mareographs; also whether certain sudden currents which injure fishermen's nets in the Dalmatian canals may not be connected with those waves.

— Last winter there were some reports, says *Nature*, that sunset phenomena had greatly increased in brilliancy, as if something similar to the optical disturbance following the Krakatoa eruption had occurred. Herr Busch has remarked (*Met. Zeit.*) how difficult it is to recognize gradual variations in such phenomena, or to say where they pass beyond the normal. Even the brown-red Bishop's ring may be regarded as quite normal in winter. A much more sure method of finding an optical disturbance of the atmosphere is measurement of the polarization of light. Herr Busch has carried this on systematically for some years with a Savart polariscope, and a simple instrument for measuring angles, determining the height of the two neutral points (Babinet's and Arago's) at sunset. Now, the values for this height, in February and May last, considerably exceed those obtained in the three previous years, and come near those in 1886, when the last traces of the great atmospheric disturbance were still everywhere perceptible. It would seem, then, that some optical disturbance has been really present, the beginning, extent, and cause of which, however, are in obscurity. The desirability of systematic observations in different places is pointed out.

— For the prevention of sea sickness, a curious notion seems to be common that the stomach should be kept as full as possible. Thus have we seen stout old men and women take with praiseworthy persistence — had the result been satisfactory — biscuits, brandy and soda, apples, a pint of porter, a red herring, and various other edibles and potables, says the *Lancet*, with an entire want of success in retaining them, a course of procedure peculiarly trying to those who happen to be standing, or rather lying, on the verge of the act of vomiting. Were we to counsel those who are liable to this affection, we should recommend as follows. Take a moderate meal two hours before going on board. Remain on deck amidships, well protected against cold, as long as possible. As soon as the premonitory symptoms appear, retire to the berth, undress as quickly as possible, and lie flat on the back for the first twelve or even twenty-four hours without food. Then take a small portion of dry bread and roast beef without fluid; this the stomach will probably retain. If there is much movement of the vessel, lie quiet again, or even go upon deck, and in the course of thirty-six or forty-eight hours the system will have recovered itself, and no further trouble will be experienced. It is a mistake to introduce a quantity of fluid, even of strong coffee, into the flaccid stomach, but if sickness persist, a glass of champagne will probably prove serviceable. In some few persons quinine or antipyrin, chloral or potassium bromide, may act well, but as a rule medicine of all kinds should be eschewed by those who do not wish to aggravate what is already hard to bear.

— Caoutchouc, or india-rubber, is produced in Dutch Guiana under different species, the most important of which is "balata" or "milk of the bullet tree," the export of which, says Consul Wyndham of Paramaribo, is attaining considerable proportions, and will, it is believed, be very productive for a time only, as there is no forest conservancy law in the colony. Persons who are granted tracts of land for the gathering of this product are uncontrolled in their method of drawing the milk, which results in trees being totally destroyed to get the greatest amount of milk by the quickest and most inexpensive method. The district where the largest quantity of balata trees are known to exist in the colony is that bordering on the Correntyne River, known in Dutch Guiana as the "Nickerie district." Balata is treated by

the manufacturers simply as a superior kind of gutta-percha, and therefore its name disappears when manufactured; nevertheless balata is distinctly different from gutta-percha, and this is manifested in some of its physical characters; for instance, it is somewhat softer at ordinary temperatures and not so rigid in the cold. Besides the bullet tree, there are trees or plants known as the *Tonekpong*, which give a valuable rubber, and again *Bartaballi* and *Bushrope*, to which collectors do not appear to have given a name. The india-rubber balata industry, although carried on in Dutch Guiana in a desultory way for a long time, has never until quite recently assumed sufficient importance to cause the local government to legislate upon it. As yet the law only lays down the regulations under which concessions are granted, and does not deal with the supervision or treatment of the trees, or the method of extracting the milk. Caoutchouc is yielded both by trees and vines. Those already mentioned are, as far as it is known, the principal ones in the colony, and the method of collecting the milk is by cutting down trees, by incisions, and by circling the tree. In each case there is no protective law, and the trees are generally ruined. The chief port of export is Demerara, and as yet no export duty exists, but as the production increases it is expected that it will not escape taxation. Nothing has been done to cultivate the plant, neither does the soil seem to favor its growth except in some peculiar circumstances.

— The comet found by Professor Barnard of the Lick Observatory on Sept. 27 proves to be the long-looked-for Tempel-Swift comet. It was first discovered by Tempel in 1867, and by Swift in 1880. It was not until the latter date that it was settled that a new short-period comet had been added to the list. Mr. Bossart, one of the computers connected with the Paris Observatory, had computed the perturbations from 1880 to date, and had also prepared an ephemeris. The date of perihelion as determined by Mr. Bossart appears about 2.4 days late. With that correction, the following ephemeris has been computed. The epoch is for Berlin, midnight.

1891.	R. A.		Dec.
	h. m. s.		deg. min.
Oct. 30	21 21 13	+	6 19 8
Nov. 1	26 2		7 3.4
" 3	31 17		7 48.9

The following are the positions for Wolf's comet for the next ten days. The epoch is for Greenwich, midnight.

1891.	R. A.		Dec.
	h. m. s.		deg. min.
Nov. 8	4 28 30	—	5 59.4
" 9	38 1		6 26.1
" 10	37 32		6 52.2
" 11	37 0		7 17.7
" 12	36 23		7 42.7
" 13	35 55		8 6.9
" 14	35 20		8 30.5
" 15	34 45		8 53.4
" 16	34 8		9 15.7
" 17	33 31		9 37.2
" 18	4 32 53		9 58.1

The comet discovered by Professor Barnard on Oct. 3 is passing very rapidly southward, and can only be seen in the southern hemisphere. An ephemeris for following dates is not at hand.

— Dr. Kirkwood, professor of astronomy in the University of Indiana, has been appointed to lecture on astronomy at Stanford University, California.

— The regents of the University of California have elected Dr. Henry Crew, instructor in physics at Haverford College, as an astronomer at the Lick Observatory.

— It is hinted in the October number of the *Observatory* that Dr. Huid, who has been for many years the superintendent of the English Nautical Almanac, will soon retire from that position.

— Professor Asaph Hall, the eminent astronomer, who has been for many years in charge of the large telescope at the United States Naval Observatory, has been placed on the retired list of the navy.