

"The general remark may be made with regard to the Ojibwa in the several localities where they are now found with the least amount of civilized influence, that they in a marked degree live a life of religious practices, and that their shamanistic societies have a wonderful influence over their sociologic and religious character. This is to so great an extent (before not appreciated), that, in my opinion, a careful study of these people will develop facts corresponding in interest with those which have recently surprised the world as reported by Mr. Cushing among the Zuñi. There is probably no body of Indians in the United States whose inner life can now be studied to greater advantage than the remoter bands of the Ojibwa. With reference to the subject with which this paper is more directly concerned, that is, pictographs in their various modes of representation, it is certain that the understanding of the mythology and religion of these people will furnish the best interpretation to their ancient drawings and etchings.

"It is desirable to explain the mode of using the Medé and other bark records of the Ojibwa. The devices are not only mnemonic, but are also ideographic and descriptive. They are not merely invented to express or memorize the subject, but are evolved therefrom. A general mode of explaining the so-called 'symbolism' is by a suggestion that the charts of the order, or the song of a myth, should be likened to the popular illustrated poems and songs lately published in *Harper's Magazine*; for instance, 'Sally in our Alley,' where every stanza has an appropriate illustration. Now, suppose that the text was obliterated forever, — indeed, the art of reading lost, — the illustrations remaining, as also the memory to many persons of the ballad: the illustrations, kept in order, would supply always the order of the stanzas, and also the general subject-matter of each particular stanza, and the latter would be a reminder of the words. This is what the rolls of birch-bark do to the initiated Ojibwa, and what Schoolcraft pretended, in some cases, to show, but what, for actual understanding, requires the obtaining of the literation of the actual songs and charges of the initiation ceremonies, or in other instances the literation in the aboriginal language of the non-esoteric songs and stories."

Yellow-Fever in Florida.

Dr. Jerome Cochran, of the State Board of Health of Alabama, in a recent report has stated that the late epidemic of yellow-fever in Florida was not introduced into the State by the usual trade channels, but by smugglers. This confirms unofficial statements received by Supervising Surgeon-General Hamilton, of the marine-hospital service, several weeks ago. Dr. Cochran says that the last case was discharged May 11, and the last death May 8, and that there have been active precautions taken to prevent the re-appearance of the disease.

Interesting Phenomenon.

Captain Friis, of the Norwegian steamship 'Viking,' reports to the Hydrographic Office that he observed at midnight, April 20, between Chatham and Davis South Shoal, when the moon was in its last quarter and about two hours above the horizon, two dark-looking narrow strata of clouds; the upper one extending across the face of the moon, the upper and lower limbs of the latter appearing above and below the cloud-stratum. The cloud was moving south-westerly. On the same line with the moon, and to the westward of it, was a nearly circular luminous spot, larger than the moon, which looked as the sun might when shining through a thick mist. The second stratum of cloud was about halfway between the first and the horizon. The phenomenon continued until the moon set at two o'clock, when there shot upwards from the upper limb fan-shaped rays of light.

HEALTH MATTERS.

Yellow-Fever.

IN a recent number of the *Medical Record* is published a letter from Dr. Charles Finlay of Havana, dated April 17, 1888, in which he says, —

"In your issue of April 7 there is a short paragraph stating that the microbe of yellow-fever described and cultivated by Dr. Do-

mingos Freire of Rio Janeiro 'has gone the way of many other specific germs,' your grounds for this assertion being that Dr. Gibier 'denies utterly the existence of the germ claimed to be specific.' This conclusion has evidently been come to under the impression that the Parisian bacteriologist just mentioned has had full opportunities for verifying in Havana, within the brief space of six weeks, the results previously obtained in Brazil by Dr. Freire, in such a manner as to warrant his abrupt denial of what he had so warmly approved while experimenting in Paris upon Dr. Freire's Brazilian cultures. That such has not been the case, I think you will admit after hearing the particulars of that investigation.

"Dr. Gibier saw his first yellow-fever case on Nov. 16, at the military hospital of this city. Between that date and Dec. 28, he examined altogether five patients, and performed four autopsies. He collected fresh blood from four of the patients, and urine from three, besides the pieces of viscera and secretions from the cadavers. In the urine of the first patient he thought at first that he had recognized Dr. Freire's micrococcus, but afterward changed his mind, having 'satisfied himself' that what he had seen were mere insignificant organic granulations. In the blood and secretions, as also in the sections of viscera, he failed to discover any micro-organisms, nor did he succeed in developing any colonies in his numerous attempts with the same pathological material. One of the tubes of agar-agar jelly inoculated by him with heart-blood, and presented to a military colleague, did, however, develop a yellow superficial colony, which Dr. Gibier attributed to an accidental atmospheric contamination, although the constituents of the colony turned out to be a tetragenous microbe quite distinct from the plain atmospheric micrococcus with which he had thought it could be identified.

"This scanty material, collected at a time when yellow-fever was sporadic in Havana, almost the only cases signalled being those present at the military hospital, constitutes the sole foundation for the abrupt retraction of Dr. Gibier from his former enthusiastic advocacy of Dr. Freire's views; never considering that the sporadic and epidemic forms of the disease might not be identical, any more than the equivalent forms of cholera have turned out to be, notwithstanding their clinical resemblance. Other observers had previously noticed that the same yellow-fever products which, in their hands, had given colonies when collected from epidemic cases, failed to do so with the sporadic. In collecting blood from yellow-fever patients, Dr. Gibier was noticed to disinfect the skin with bichloride solution, but took no pains to remove any excess of the germicide which might remain and sterilize the drop of blood as it would ooze out on the surface. Neither does it appear that he varied his culture-media as to acidity, alkalinity, etc., nor that he kept his tubes at a uniform summer temperature. Yet, in spite of such obvious deficiencies, Dr. Gibier does not hesitate to condemn as erroneous the results of Dr. Freire's patient and laborious investigations, and likewise all others that might claim to have obtained successful cultures from similar yellow-fever products.

"Dr. Gibier had brought over some cultures proceeding from Dr. Freire's own tubes, inoculated at Rio Janeiro; and shortly after his arrival in Havana, full of faith in their prophylactic virtue, he inoculated himself, and thought he had gone through the phenomena of an experimental attack of yellow-fever. In this, I fancied at the time, and he now acknowledges, that he was mistaken; but after examining my own cultures from yellow-fever blood and urine, obtained by me last summer in Havana, and cultivated in sub-acid agar-agar jelly, he has repeatedly declared that both macroscopically and microscopically they were identical to Dr. Freire's. This coincidence, one would think, should have checked his precipitancy, and induced him, at any rate, to wait until the epidemic season before formulating his conclusions.

"The only excuse, if so it can be called, for such haste in a practised bacteriologist, must lie in his unacquaintance with the disease, and in his anxiety to proclaim a new bacillus of his own, isolated from the intestinal contents of yellow-fever cadavers, and which he believes better entitled than its fellow claimants to be considered as the true yellow-fever germ.

"My object in bringing forward these facts is to guard the American medical public against hasty deductions, and to show that Dr. Gibier's researches have not in any way altered the previ-

ous state of the question, except in so far that he has added another microbe to the list of the possible specific germs of the disease."

This would seem to make it very doubtful whether Dr. Gibier of Paris has added any thing to our knowledge of the cause of yellow-fever.

ELECTRICAL SCIENCE.

Novel Current-Registering Instrument.

A NEW instrument for measuring the quantity of current supplied to consumers has been recently brought out by Prof. Elihu Thomson, although it seems probable that the principle on which it works was originally due to Tavenor. Two bulbs are connected by a U-shaped tube, and the whole is partly filled with liquid; alcohol, for instance. The arrangement is pivoted, so that, if more of the liquid is forced into one of the bulbs, the difference of weight will cant the apparatus, and its movement is communicated through a ratchet to the hands of a registering-dial. To make this measure the current, two spirals of wire are introduced into the liquid, one in each bulb. If we suppose the instrument has been canted, the spiral in the lower bulb has its circuit made, while that of the upper spiral is broken. The consequence is, that the liquid in the lower bulb is heated, its vapor-tension increases, and part of it is driven through the U-tube. The section of the latter is very small, so that the liquid passes slowly, but in a time, depending upon this section and on the rate of heating, the upper bulb becomes the heavier, and the apparatus cants, breaking the circuit of the spiral that was previously made, and making the other. By a suitable registering system the readings may be made proportional to the current which is flowing. The current, then, is measured by its heating effect, and the instrument may be used for both direct and alternating currents. In the latter case the readings would be fairly correct if lamps only were used; but, if motors were to be run, the readings would not be proportional to the power consumed. This objection holds with all of the instruments that have yet been proposed for the measurement of the consumption of alternating currents.

THE SHORT SERIES ELECTRIC RAILWAY SYSTEM.—The Short system of electric traction differs from those ordinarily used in that the current is distributed in series, the same current passing through all of the cars on the line. Both overhead and conduit wires are used. In the latter case the wires are contained in an iron conduit, from which they are insulated by porcelain brackets. The overhead wires are supported from iron bracket-poles that arch gracefully over the track. The motors and generators used are of the Brush system. The motor is usually in a front compartment, and is geared to the front car-axle. There is a pinion on the motor-shaft, a gear on the axle, and an intermediate gear and pinion that further reduces the number of revolutions. The gears are made of steel, the pinions of rawhide held between steel plates, making an efficient and noiseless transmitting system. The front compartment (in which the driver stands), with the motor and front truck, can be made separately, and attached to any ordinary car by removing the front platform. Taken altogether, the system seems a simple and efficient one.

AN IMPROVEMENT IN SECONDARY BATTERIES.—A seemingly slight improvement in the construction of secondary batteries, and yet one that in certain cases will be of considerable value, has recently been patented by Mr. J. S. Sellon. A great difficulty and expense in the use of accumulators arises from the fact that the plates cannot be separately and easily removed. Usually, if we wish to connect a number of cells in series, all of the positive plates in each cell are connected together by lead strips, which are taken to similar strips connecting the negative plates of the next cell. The terminals of each plate are burned to the connecting-strip; and when one of the plates gives out, and we wish to renew it, we must take out the complete set of plates, cut off the one we wish to renew, and solder on another. Besides being difficult, this takes a good deal of time, and increases the cost of maintenance of the battery; it is obvious, too, that it interrupts its use. Mr. Sellon's idea is to have plates made in pairs, a positive and negative, so connected that when one of them is in one cell the other will be in another. The first and last cells have one set of single plates con-

nected with the terminals of the external circuit. The advantages of this arrangement are, that plates can be removed and renewed without interfering with the action of the battery, and much more easily than if one of a number of connected plates had to be removed. Any improvement in storage-batteries is important at this time, when its advantages, especially for tramway-work, hang in the balance. A slight increase in efficiency will cause their adoption for street-car work, and the invention of Mr. Sellon is in the right direction.

INFLUENCE OF TEMPERATURE ON THE MAGNETIZATION OF IRON.—M. C. Ledebor has made some interesting experiments on the magnetic properties of iron at high temperatures. Many experiments have been made on the same subject; and it has been found that up to three or four hundred degrees there is no great change in the magnetic permeability of iron, while at a red heat its magnetic properties almost entirely disappear. The necessary temperature of the iron bar used in the experiment was obtained by a spiral of platinum wire wrapped around it, separated from it by a layer of mica. Between the platinum and the iron was a small thermo-electric couple, which was used to measure the temperature of the bar. A heavy electric current sent through the platinum spiral could be regulated to give any desired temperature. The bar used was thick as compared with its length, which fact prevented any useful results as to residual magnetism being obtained. M. Ledebor arrives at the following results: up to a temperature of about 680° the magnetic permeability remains nearly constant, after 680° the diminution is very rapid, and the iron ceases to be magnetic at 760°. This range of temperature is about that in which several curious phenomena occur,—an abrupt change in the specific heat, a change in the torsional co-efficient, etc.; and it is probable that a more complete study of iron in this region of temperature will help us to connect phenomena which seem now so different in character.

THE MORDEY ALTERNATING-CURRENT DYNAMO.—This dynamo has revolving magnets and a fixed armature. The latter consists of a number of coils of narrow copper ribbon wound on insulating-cores: they are fixed to project from the inner circumference of a metal ring which is fastened firmly to the bed-plate of the dynamo. The magnet consists of a short iron core, whose axis is the axle of the machine, and which is wound with wire supplied with current from the small dynamo used as an exciter. From each end of the magnet extend arms, which are bent until they are opposite one another, leaving only enough space between for the flat coils of the armature to pass. We thus have a number of poles of the same sign, opposite to which are poles of the opposite sign, while between the poles are vacant spaces. The action of the machine is now easily understood: as the magnet revolves, the armature coils are first opposite pole-pieces, where a number of lines of force pass through them; then in vacant spaces, where there are no lines of force. The variation, of course, produces the electro-motive force of the machine.

INCANDESCENT LAMPS IN EXPLOSIVE GASES.—Lieutenant Hutchins, U.S.N., has been experimenting on the effect of breaking incandescent lamps in explosive gases. The filament of the lamp breaks almost immediately that the glass is broken, and as soon as it breaks, of course, and cools down, the danger is over. The question was whether the breaking and cooling were so rapid that the gases would not be brought to a sufficiently high temperature to explode. With a Swan 16-candle power lamp, in a mixture of hydrogen and oxygen, the gas exploded immediately the bulb was pierced: the filament was not broken. The same result was obtained with marsh-gas. A Maxim lamp was tried in a mixture of coal-gas and air, with a similar result. Lieutenant Hutchins concludes, that, where explosive gases are allowed to collect on board ship, incandescent electric lights are dangerous.

BOOK—REVIEWS.

A Text-Book of Biology. By J. R. AINSWORTH DAVIS. Philadelphia, Blakiston. \$4.

THE number of text-books of biology which have been published within recent years has been, it would seem, sufficiently great to meet all reasonable demands; and yet, after perusing this new one