SOME MEMBERS OF THE LIZARD FAMILY.

We published, on page 295 of our volume XXXIII. and page 311 of volume XXXV., some engravings of typical members of the family of iguanas, a very numerous species of the genus of lizards. The name iguana (says the Rev. J. G. Wood, from the pages of whose admirable "Illustrated Natural History" we select the annexed engravings) is employed loosely to many species of lizards, such as the monitors and varans, which in reality have little in common with the true iguanas. These reptiles can mostly be distinguished from the rest of their tribe by the formation of their teeth, which are round at the roots, swollen, and rather compressed at the tip, and notched on the edge. There are generally some teeth on the palate. All the true iguanas, moreover, are natives of the New World.

Our first illustration shows the marine oreocephale, an animal first discovered by Mr. Darwin on the turtle-haunted coasts of the Galapagos Islands. It is amphibious, and passes a considerable portion of its time in the water. Mr. Darwin says: "It is a hideous-looking creature, of a dirty black color, stupid and sluggish in its movements. The usual length of a full grown one is about a yard, but there are some even four feet long. I have seen a large one which weighed 20 lbs. These lizards are occasionally seen some hundreds of yards from the shore, swimming about, and Captain Collnett says that they go out to sea in shoals, to catch fish. With respect to the object, I believe he is mistaken, but the facts stated on such good authority cannot be doubted.

"When in the water, the animal swims with perfect ease and quickness by a serpentine movement of its body and flattened tail, the legs during this time being perfectly motionless and closely collapsed on its sides. A seaman on board sunk one with a heavy weight attached to it, thinking thus to kill it directly; but when, an hour afterward, he drew up the line, the lizard was quite active. The limbs and strong claws of the lizard are admirably adapted for crawling over the rugged and fissured masses of lava which everywhere form the coast. In such situations, a group of six or seven of these hideous reptiles may oftentimes be seen on the black rocks, a few feet above the surf, basking in the sun with outstretched legs."

The throat of the marine oreocephale is not formed into a pouch, but the skin is loose, and the animal can dilate it at will. The body is covered with sharp, tubercular scales; a crest of longer scales runs along the back. The teeth are sharp and three-lobed, and although, when the mouth is opened, they present a very formidable array of weapons, the creature is quite harmless, and feeds on vegetable diet, seaweeds forming the chief part of its subsistence. The middle toes are united by a strong web, and the claws are large. There is some difference in the aspect of the young and the adult, which is most obvious in the head, where the scales are rather convex in the young, but in the adult are enlarged into unequal and rather high tubercular shields.

Our second engraving is one of a basilisk, an animal mentioned in Scripture and known to heraldry, but whose existence was long regarded as apocryphal. Its name (from the Greek *basileus*, a king) was bestowed on it on account of its supposed authority over other reptiles, which perished, according to ancient writers, in the glance of the basilisk's eye. "This poyson," says Topsel, "infecteth the air, and the air so infected killeth all living things, and likewise all green things, fruits and plants of the earth, it burneth up the grasse whereupon it goeth or creepeth, and the fowls of the air fall down dead when they come near his den or lodging." Other writers state that the crowing of a cock would so alarm the reptile that, on hearing the sound, it would fly into the depths of the desert and there conceal itself. Travelers in the deserts of Libya were recommended to carry with them a supply of roosters, to drive away the basilisks from the routes. In all probability, a basilisk, as shown in our engraving, was once found in the East; and its ugliness being exaggerated by successive writers, these fables became generally believed. The basilisk is a good climber of trees and can swim well; and its food consists apparently of insects and various little creatures which frequent the water and its banks. Its greatest length is three feet; and along the back, in place of the row of pointed spines usually found on an iguana, runs one crest-like membrane, another occupying the upper surface of the tail. There is a slight pouch on the throat, and the palate is toothed.

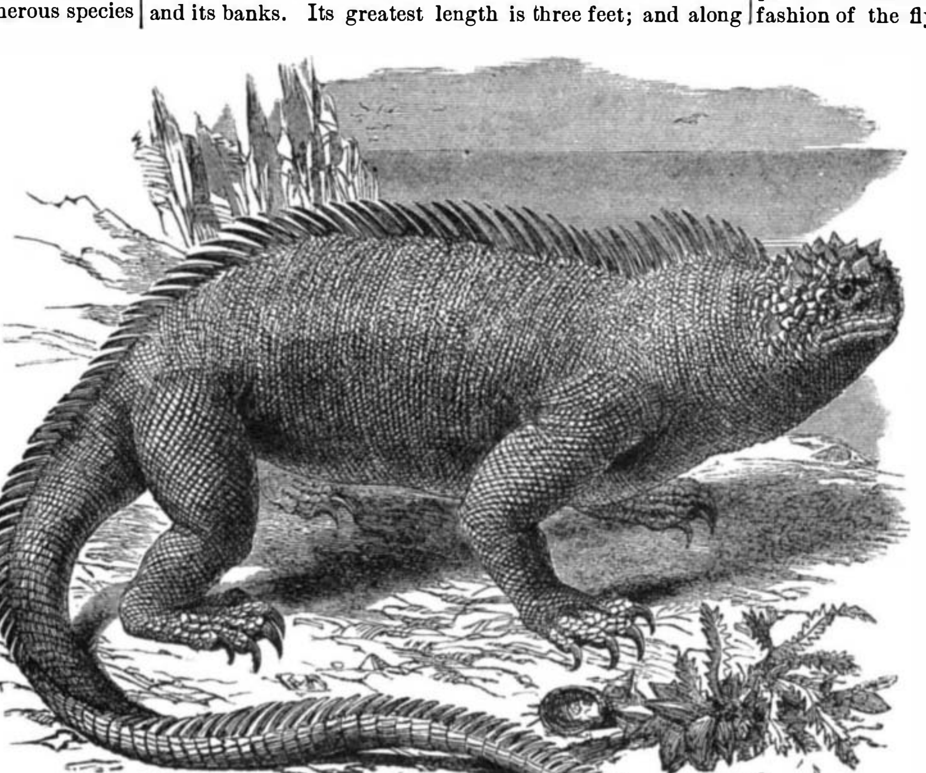

Fig. 1.—THE MARINE OREOCEPHALE.

Our third engraving is a fringed tree gecko (*ptychozoön homalocephala*), one of the sub-order of lizards termed *pachyglossa*, or thick-tongued. It is a native of Java, and is worthy of notice on account of the broad membranous expansions which fringe the sides of the head, back, limbs, and tail. On the body this membrane is covered with scales, and waved on its edges; but on the tail, the waves become suddenly deepened, so as to form bold scollops. The toes are webbed to the tips, and, with the exception of the thumb joint, are furnished with claws at the swollen extremity. The scales of the back are smooth and flat, and even the membranous fringes are covered with scales. Formerly this animal was thought to be aquatic in its habits; but it is now known to live on trees, and to employ the membranous expansions to aid its passage from branch to branch, after the fashion of the flying squirrel. Its color is brown above, with a yellowish tinge on the spine, crossed with dark brown lines. Below it is of a whitish gray color.

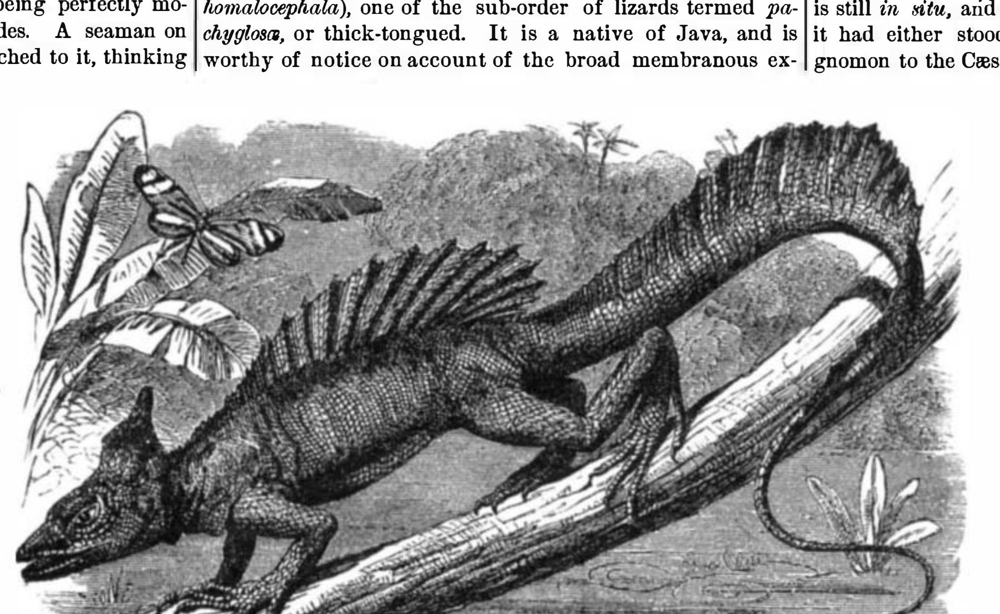

Fig. 2.—THE BASILISK.

Cleopatra's Needle.

Through the liberality of an eminent physician and scientist, Dr. Erasmus Wilson, of London, the plan for moving the obelisk—presented to the British Government some years since by Mehemet Ali—to England is about to be carried out. In our issue of March 25, 1876, we published an engraving of this celebrated relic, and stated that plans had been suggested for conveying it to London. The London *Times* gives the history of the obelisk, from which we extract the following:

It is to the period of Egypt's splendor, the summit of its power, and the reign of Thothmes III., the powerful monarch and conqueror, that the fallen obelisk of Alexandria belongs, and it was one of the triumphal columns raised by that monarch to record his victories over Asia and Ethiopia. The central line of hieroglyphs on each side the original dedication contains the name and titles of the monarch and records that it was erected to the god Ra, or the Rising Sun, and to Tum, or the Setting Sun, on the occasion of the festival of thirty years at On or Heliopolis The inscription states that it was capped with gold, but of course it has been stripped of that ornamental portion. How or when it fell is unknown; probably the effects of an earthquake or the undermining of the soil by the sea, to which it lies near, may have caused it to fall. The pedestal is still *in situ*, and at the base was found a dial showing that it had either stood in the Hippodrome or else served as a gnomon to the Cæsareum. In the days of Pliny both were erect, and he attributes them to Miphres or Moeris, the classical name of Thothmes III. It was, perhaps, not erected in his reign, for two lateral lines of hieroglyphs, one on each side of the central one, have been added by Rameses II., more familiarly known as Sesostris.

When the Emperors of Rome began to embellish the Eternal City with these spoils of vanquished Egypt, it is difficult to know why the two obelisks of Alexandria were left behind, except that, as they stood in the Cæsareum and were convenient landmarks, they might have been left as a monument to Cæsar and a guide to mariners. The last obelisk transported to Europe and set up in the Place de la Concorde, at Paris, was selected for its superior beauty and finer condition, the standing obelisk of Alexandria being rejected on account of its worn state, especially on that side which faces the sea. The idea of removing the fallen obelisk to England, as a memorial of the departure of the French from Egypt, was entertained at the beginning of the present century, but it was abandoned in consequence of orders from Lord Keith and General Fox, who held command of the naval and military forces in the Mediterranean; and a bronze plate, commemorating the principal events of the campaign, was inserted in the pedal of the obelisk. Mehemet Ali presented it to the Prince Regent, and the gift was accepted by the British Government. The question of its removal was seriously entertained, but the estimate of the expense deterred the government from the attempt. But the question was again brought forward in 1876 by General Sir J. E. Alexander, and there is now every prospect of its being removed and being placed on an appropriate site on the Thames Embankment. The removal is to be undertaken by Mr. John Dixon, civil engineer, who proposes the following means of transporting this shaft of granite: The sand is to be cleared away, and the obelisk set square, parallel with the existing sea wall. An iron cylinder, finished off to a chisel edge, with sufficient diaphragms to give it strength, is to be constructed round the obelisk, which is to lie in the long axis of the cylinder and to be wedged and caulked where it passes through the diaphragms so as to divide the cylinder into water-tight compartments. The cylinder is to be ninety-five feet

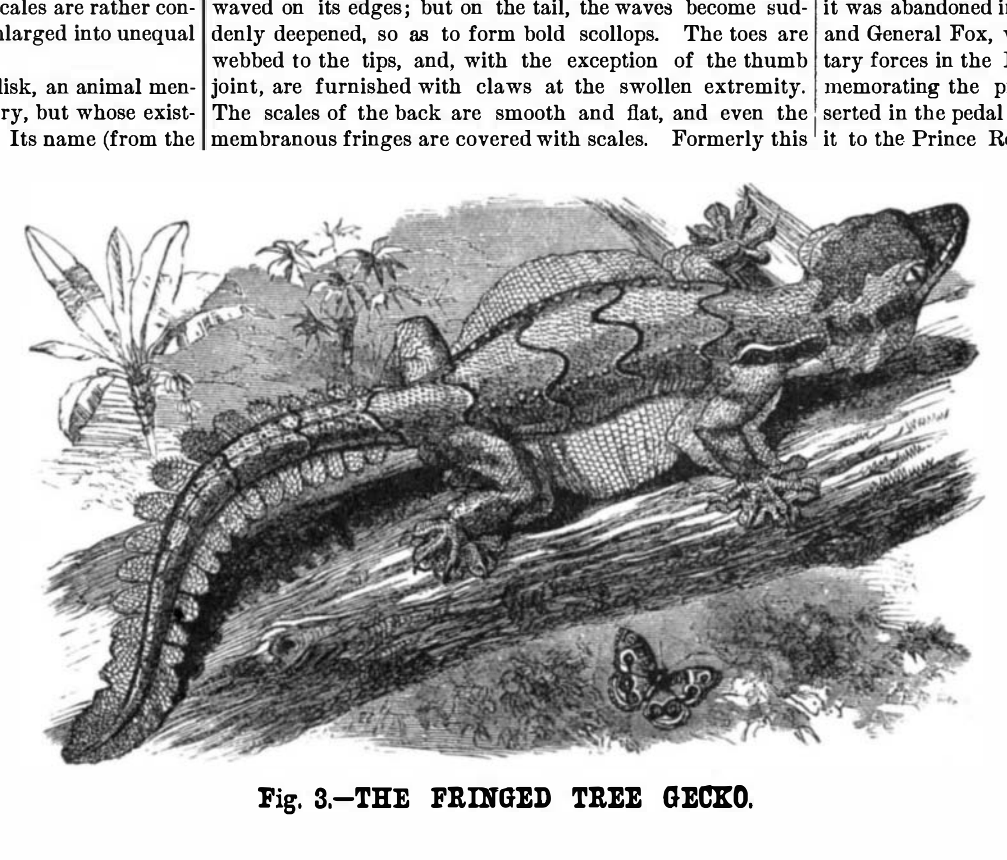

Fig. 3.—THE FRINGED TREE GECKO.

long by fifteen feet diameter, and will have a draught of nine feet of water when afloat. All being riveted water-tight, it will be rolled into the sea and across the sandy bed of the water until it floats. It will then be turned over and the manholes at the top opened, and about thirty tons of ballast will be put in to keep the ends vertical, so as to act like stem and stern. It will then have two keels, a rudder, spar deck, mast and lug sails attached, and be provided with an anchor and good chain cables, and, if necessary, a pump in case of leakage. The cylinder ship will then be fit to go to any port of the world with its freight, and in any weather.

The cost of this operation will amount to about $15,000. The obelisk in its case will be towed over during the summer months and laid aside the Thames Embankment on a platform properly prepared for the purpose and lifted high enough to clear the parapet, and the bilge keels and other additions being stripped off, the cylinder will be rolled to the proposed site and then stripped off the obelisk, which will lie ready to be elevated to its pedestal, an operation which will be simply effected by means of a few balks of timber and two small hydraulic rams. The whole cost is not to exceed $50,000, and that of the obelisk at Paris is said to have been $400,000.

ASTRONOMICAL NOTES.

OBSERVATORY OF VASSAR COLLEGE.

The computations and some of the observations in the following n:tes are from students in the astronomical department. The times of risings and settings of planets are approximate, but sufficiently accurate to enable an ordinary observer to find the object mentioned. M. M.

Positions of Planets for April, 1877.

Mercury.

Mercury cannot be seen early in the month. On April 1, it rises at 5h. 42m. A. M., and sets at 5h. 52m. P. M. On the 5th, it is at its superior conjunction, that is, it ranges with the sun and on the side remote from the earth. On the 30th, Mercury rises at 5h. 49m. A. M., and sets at 8h. 47m. P. M. At this time it should be looked for in the twilight, some degrees north of the point of sunset.

Venus.

Venus cannot be seen. It is approaching superior conjunction, is apparently small, and ranges nearly with the sun.

On the 1st, Venus rises at 5h. 32m. A. M., and sets at 5h. 32m. P. M. On the 30th, Venus rises at 5h. 1m. A. M., and sets at 6h. 40m. P. M.

Mars.

Mars can be seen only in the morning. On April 1, it rises at 2h. 14m. A. M., and sets at 11h. 20m. A. M. On the 30th, Mars rises at 1h. 24m. A. M., and sets at 10h. 56m. A. M.

Mars can be recognized on April 30 by its position relatively to the double star a^2 *Capricorni*. It is south and east of this well known star.

Jupiter.

Jupiter is coming into better position. On April 1, Jupiter rises at 1h. 2m. A. M., and sets at 10h. 4m. A. M. On the 30th, Jupiter rises at 11h. 6m. P. M., and sets at 8h. 8m. the next morning. Jupiter is very low in the south, but can easily be known by its size. It is among the stars of *Sagittarius*, moving very little through the month, stationary on the 19th, and after that date is retrograde in its motion.

Saturn.

Saturn is visible for very few hours. It rises on April 1 at 4h. 53m. A. M., and sets at 3h. 57m. P. M. On the 30th, Saturn rises at 3h. 6m. A. M., and sets at 2h. 18m. P. M.

Uranus.

Uranus is the only planet in a good position for observations. On the 1st, Uranus rises at 1h. 56m. P. M., and sets at 3h. 48m. the next morning. On the 30th, Uranus rises at noon and sets at 1h. 53m. A. M. of the next day.

Uranus is occulted by the moon on the 21st a little after midnight. The moon passes directly between the earth and the planet, and hides the latter from our view. According to the *Nautical Almanac*, the planet disappears behind the moon at 12h. 31m. A. M. (Washington time), and reappears at 1h. 24m. A. M. of the 22d.

Uranus will be low in the northwest at this time, but it will not set until some twenty-five minutes after two; and as the moon will be just past its first quarter, the observation of the phenomena can be easily made, and cannot fail to be interesting. An ordinary opera glass will render Uranus visible as the moon approaches it, and the difference of color between moon and planet will be very noticeable.

Sun Spots.

The report is from February 19 to March 16 inclusive. The pictures of February 19 and February 21 show the sun's disk free from spots. From February 21 to March 1, photographing was prevented by clouds. The pictures of March 1 and March 3 show, near the center of the disk, a large group, consisting of a large spot surrounded by a chain of small ones, and above this a very small spot. On March 5 the small spot could not be found, and a change was observed in the number and arrangement of the spots in the group. On March 6 the small spots in the group were no longer seen, and only the large one remained, while near the center a pair of large spots was observed which had not been visible on March 5. The observation of March 8 showed the group still visible, but the single spot had passed off. On March 9 the disk was free from spots. On March 10 a very small spot in the midst of faculæ was seen on the western limb. From March 10 to March 16, whenever observations have been made, the disk has been uniformly free from these phenomena.

[For the Scientific American.]

THE SEPARATION OF COBALT FROM NICKEL BY COLORIMETRIC TEST.

BY LEONIDAS SCHUCH, PH.D., NEW YORK.

The handbooks of chemistry give methods for the separation of cobalt from nickel which could only be practically used when operated on a large scale, and with a considerable expenditure of time and money. Induced some time ago to seek a practicable method, I herewith give the results of my experiments to the public. The ore used was iron pyrites carrying cobalt and nickel free from arsenic, dispersed in green or black hornblende. This ore is found at Stony Point, Rockland county, N. Y., where a vein of it appears almost on the surface. The mat produced by cupola furnaces consists especially of sulphuret of iron, about 1 per cent of cobalt and nickel, and 3 per cent of copper. The mat is nearly all dissolved by diluted sulphuric acid, copiously evolving sulphureted hydrogen. Iron vitriol stays in solution, and this is crystallized and brought to market, and the remainder is a muddy, black deposit in the form of carbureted iron, bisulphureted iron, and the sulphurets of cobalt, nickel, and copper, slowly and only partially soluble in concentrated acids. The black residuum is separated from the mother liquor by strong pressure, and mixed to a pulp with English sulphuric acid in ample stone jars, and soda saltpeter added (with occasional stirring) as long as red vapors rise. Very remarkable heating of the mixture takes place, and nitrous acid is evolved. The end of the operation is at hand when the pulp begins to solidify, and the whole mass appears of a rather brown color. The mass is then emptied into vats, and cold water under agitation added. The undissolved part, consisting mostly of sandy particles, is deposited there.

The clear supernatant liquid which holds in solution (besides the salts of iron) the salts of cobalt, nickel, and copper, is mixed with a thin pulp of hypochloride of lime, until ferrocyanide of potassa fails to produce a blue color. Finally the iron salts are thrown down with chalk. The liquid separated from the iron salt contains now cobalt, nickel, and copper. After passing sulphureted hydrogen gas through the solution (by which operation the copper is taken out), the liquid, holding considerable quantities of lime salts, is treated with sulphuret of soda (which latter is prepared by boiling together soda, slaked lime, and sulphur). The deposit of the sulphureted metals is washed as much as possible, pressed, and, by additions of concentrated sulphuric acid and soda saltpeter, dissolved. The liquid, brought to the boiling point, is neutralized with soda until metallic carbonates begin to separate, and then treated with a solution of hypochloride of soda (made of hypochloride of lime and soda); and after each addition, a small portion of the precipitated hyperoxyd of cobalt is separated by filtration to observe the change of color.

By the first precipitation, there is a pink-colored solution produced, which gradually, by continued additions of the precipitating medium, turns to a grayish green. When the filtrated liquid stays at a pure green, the point is at hand where all the cobalt is separated. A solution of a pure nickel salt, kept in a test tube of the same diameter as that used for filtration, can serve as a guide.

To ascertain when the separation of the two salts is perfect, it is necessary to make a quick test. A small portion, neutralized with an excess of ammonia until a light blue nickel salt solution is obtained, is filtered through a small paper filter. Change of the color (by the formation of oxycobalt salt) of the filtrate is a proof that the separation is not entirely effected; in which case an additional quantity of the hypochloride of soda is carefully added till no change of color takes place after filtration; the separation is then completed. The liquid now is left undisturbed until the clear supernatant part can be drawn off, the hyperoxyd of cobalt filtered, and the adherent liquid finally separated from the deposit by pressure. The solution of the nickel is now brought to the boiling point and the metal precipitated by a solution of hypochloride of soda, as hyperoxyd of nickel.

Finally, I have to state that, by the presence of cobalt in nickel salts, or *vice versa*, the color of either one of the salts is rendered grayish green or reddish green, the phenomenon of which explains itself by the complementary action of red and green.

How to Use a Galvanic Battery in Medicine.

Dr. Herbert Tibbits recently delivered an important lecture on the above subject before the Hunterian Society of Edinburgh, Scotland. After discussing the various modes of applying electricity, he explained that, the dry skin being a non-conductor of electricity, dry metallic conductors from an electrical instrument in moderate action when applied to it produced only sparks and crackling, but no physiological phenomena, the electricity not penetrating the skin; but that, if these metallic conductors were replaced with well moistened sponges, very variable phenomena of contractility or sensibility were produced, according as the electricity acted upon a nerve, a muscle, or an osseous surface. That the voltaic current was applied as an interrupted and as a constant current; in the former case, the current being interrupted by gliding over the skin one or both of the conductors, or keeping one stationary and lifting and re-applying the second at intervals; in the latter, by maintaining both conductors immovable, or by the feet or hands of the patient being immersed in tepid water with which the conducting wires of the battery were in contact. Radcliffe's "positive charge" was then explained, and it was shown that by connecting the negative pole of the battery with the earth, and carefully insulating the patient, the negative electricity passed away, and that the patient remained charged with positive electricity only. Direct muscular electrization, by placing the conductors upon points of the skin corresponding to the muscle, was then contrasted with indirect muscular electrization, consisting in causing muscular contraction by acting upon the special nerve-trunk and branches, instead of placing the conductors upon the muscle itself, and the methods of electrizing the brain, spinal cord, internal organs, and organs of the senses were shown.

The general principles of electro-therapeutics were then considered: that the influence of faradaism in those cases in which it does not produce muscular contraction is chiefly stimulant; that where it does produce contraction it acts in addition as an artificial gymnast, imitating natural muscular action in a way quite impossible to any agency but electricity; that the interrupted voltaic current is similar in its action upon muscle to faradaism; but that this is complicated by chemical effects upon the animal tissues, and by special influences upon the central nervous system. That the constant voltaic current differs altogether from either of the above; that it consists not only of a current which is continuous, and which does not vary in power during the application, but of this current so applied to the patient by the operator that its flow through that part of the patient's body to which it is directed shall be as continuous as the stream of the current from the battery to the conductors; and it was strongly insisted upon that unless thus applied it is not a constant current at all, and that its therapeutic application will be unsatisfactory; that the effects of the current thus applied are chiefly sedative, restorative, or refreshing and absorbent; that it possesses great power, power sometimes unapproached by any other remedy, in relieving pain; that in its application for the relief of neuralgia the sponges should be so applied as to include the affected nerve in the circuit; that the strength of current should not be sufficiently great to produce pain; and that not only should the conductors be maintained quite immovable, but that care should be taken that the strength of the current should be so gradually increased that no shock is felt, and at the end of the application it must be as gradually decreased. Length of application from five to ten minutes, and frequently, usually, once or twice daily.

Dr. Tibbits believes that in severe and obstinate cases the full sedative effect of the current is only to be obtained by applying it as frequently as the paroxysms of pain recur. The use of electricity in muscular rheumatism and rheumatic gout was next considered, and cases quoted. In cerebral paralysis no support was given to cerebral galvanization, and it was advised that peripheral faradization should not be used until three or four months after the attack, and then only of a strength just sufficient to bring the muscles into full contraction, but that in cases in which the paralyzed muscles were cold, blue, flaccid, and ill-nourished, they should be well sponged with the voltaic current alternately with faradization. Applications to be made daily, or every other day, for from five minutes to fifteen minutes. In spinal paralysis the evidence in favor of direct electrization of the cord was said to be much greater than could be adduced in support of similar treatment of the brain, and when powerless to cure, it not unfrequently relieved some of the most distressing symptoms. Peripheral faradization should not be employed during the early periods of active mischief in the cord, but in the persisting localized paralysis following upon myelitis it is often of the greatest service, especially in relieving symptoms of paralysis of the bladder and rectum: the dribbling of urine, which is so troublesome in some paraplegic cases, being frequently relieved. In locomotor ataxy the constant current was recommended as often relieving many of the symptoms. Reference was made to Dr. Poore's successful treatment of writer's cramp by localizing the voltaic current in the nerves of the affected muscles, and exercising these muscles during the passage of the current by various gymnastic movements; and two successful cases were quoted in which faradization of the antagonists of the suffering muscles, united with the localization in the muscles themselves of Radcliffe's "positive charge" for fifteen minutes daily, had resulted in a cure. The subject of essential infantile paralysis was then discussed, the lecturer saying that the more his experience of this disease extended the more strongly did he feel how lamentable it is that the physiological treatment of the affected muscles in this affection has not yet become the routine treatment invariably directed by the practitioner in attendance, and that within a short time of the onset of the disease. Were it so, he added, an incalculable amount of helplessness and subsequent unhappiness would be spared to children; and if proper treatment is adopted in time, the greater number of cases admit of cure, and where perfect recovery cannot be obtained we have the great authority of Mr. William Adams for the statement that deformity ought never to result.

A case was then detailed which was first seen by Dr. Tibbits in 1869. The child was then suffering from a typical attack of infantile paralysis affecting the muscles of the left thigh and leg. Electrical treatment was recommended, but circumstances only allowed of its administration upon three or four occasions, and the child went to India, returning in June, 1875, with a useless leg measuring some inches less in circumference than the healthy limb. There being complete abolition of reaction to both currents in all the affected muscles, no hope of benefit was entertained; but at the earnest