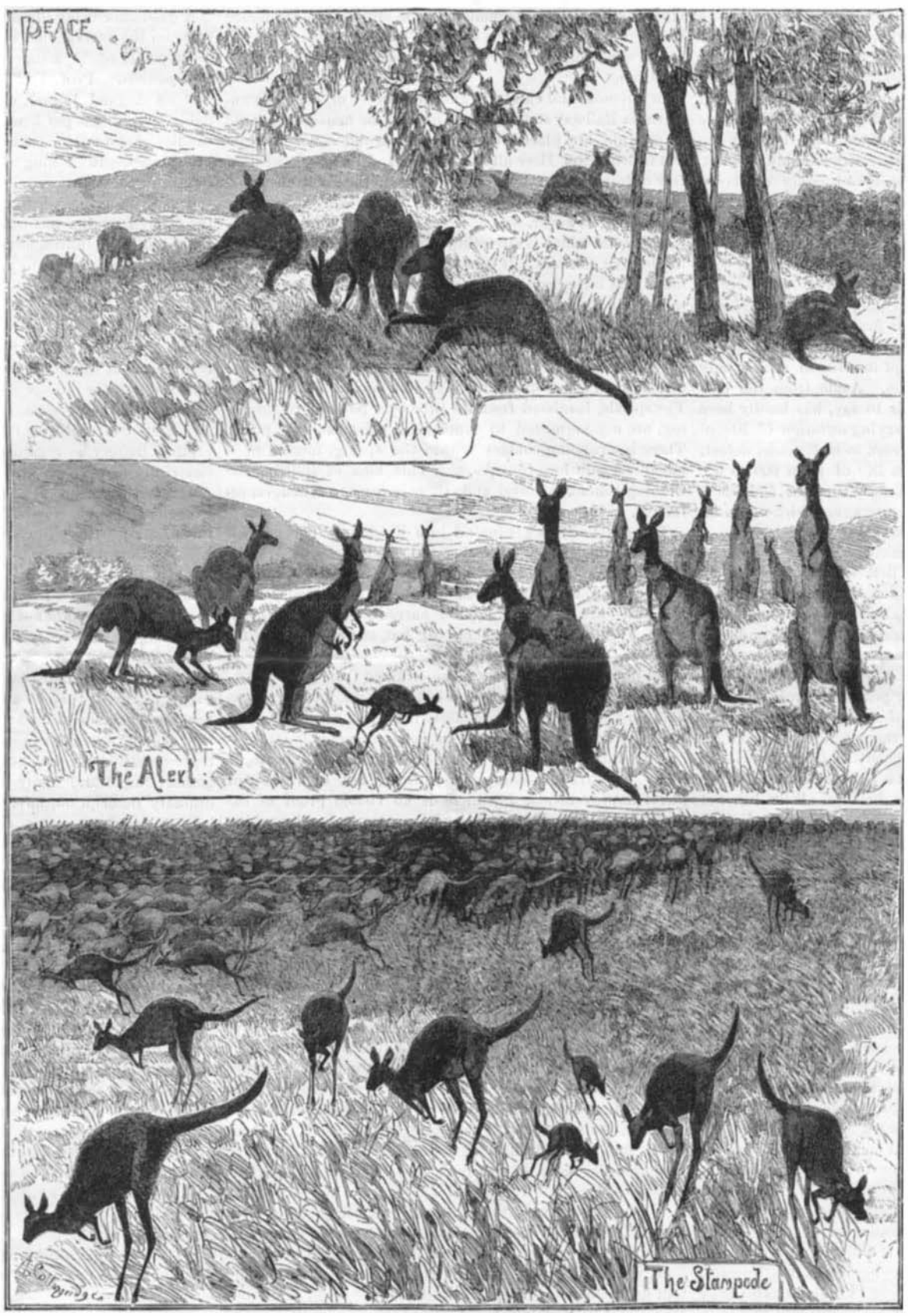
PHASES OF KANGAROO LIFE.

The accompanying series of sketches serve to illustrate three particular phases of marsupial life, so to term them. In its wild state there is perhaps no animal more timid than the kangaroo, and in proportion to its natural timidity it possesses the acute sense of hearing. When grazing in mobs, they are constantly on the alert against surprise from their greatest natural enemies, the dingo and the Australian black, whose cunning in stalking them is marvelous. What means they possess of communicating approaching danger to one another is of course a mystery, but apparently the alarm usually is given by the warning animal striking the ground violently with its hind foot. The mob at once rear themselves up, and sniff for the source whence danger is supposed to be approaching. The "joeys," as the young ones are called, cling to the backs of their mothers, and, if very young, secrete themselves in the pouches, and, led by some "old man" warrior, a stampede takes place such as is portrayed by our artist.—*Illustrated Sydney News.*



PHASES OF KANGAROO LIFE.

The Mad Stone.

A writer in the *Journal American Medical Association* acknowledges his indebtedness to Dr. Samuel Lewis, President of the College of Physicians of Philadelphia, for securing for him access to the collection of unpublished correspondence of Dr. Rush, which is preserved in the Ridgeway Branch of the Philadelphia (Penn.) Library, the following interesting account of the mad stone, and the early belief in its efficacy for removing poison:

In 1789 Dr. Percival suggested the application of fresh gastric juice, or the saliva of a healthy young person, obtained by chewing rennet, to the bite of a mad dog, after the wound had been thoroughly washed in the manner recommended by Dr. Haygarth. He also gave an interesting account, taken from Abbe Grosier's "Description of the Chinese," of a species of porous stone, used in "Tang-King," and called a "serpent stone." This stone was applied to the wounds of serpents and mad dogs, whereupon it adhered, drew to itself the virus, dropped off, and the patient was saved. This stone, after washing in lime water, could be used over and over again. This is the earliest allusion to the so-called "mad stone" which I have found.

The next reference to the "mad stone" which I have found is contained in an unpublished letter to Dr. Rush from a Mr. Samuel Davis, of Petersburg, Virginia, dated October 2, 1801. In this the writer endeavors to avert the hydrophobia from a son who had been bitten by a suspected dog. The boy, after some domestic applications, was, by the advice of a physician, cauterized and blistered almost to the bone of his arm. He was then almost wild, and was taken to a person reputed to have a "mad stone." With the performance of this stone the father was not satisfied, because, contrary to his expectation, and the popular belief about such stones, he could see no evidence of the poison boiling out of it after its removal. He therefore took his son to a second person owning a "mad stone." The application of this he graphically describes, and his seeing, after it had remained on for periods of twelve hours and was taken off and put into water, some bubbles arise from one corner of it, which the owner of the stone told him was the poison coming out. An investigation of the history of this stone revealed the fact that it had been given by a stranger who had been hospitably cared for when sick. It was wrapped in a piece of paper dated Charleston, South Carolina, 1740, and having printed on it the following:

"Francis Torres, a native of France, is in possession of a chymical preparation, called a Chinese snake stone, which will extract the poison of the bite of snakes, spiders, and of a mad dog, and will cure cancers, which are sold at half a guinea for the small and a guinea for the large ones."

Something about Elephants.

On the Queen's birthday and the day following it the khedda party in the Duars, conducted by Mr. J. Shillingford, were fortunate enough to succeed in catching seven wild elephants by the noosing process. This makes the total number now captured twenty-eight. On the former day the noosing party, mounted on their kunkies (fast tame elephants trained to the work), proceeded up the Joitee River, near Buxa, at gray dawn, and soon espied a herd feeding along the bank of that river. Approaching stealthily from different directions to within a short distance, by a sudden movement the kunkies were amid the unsuspecting quarry, and had secured four before the terrified herd rushed headlong and disappeared into the adjoining forest. Among the captives was a fine young tusker about five and a half feet high. They were all lashed between the tame ones and conveyed to camp, a long distance off, and there tethered for the night. Toward the small hours of the morning a great commotion where the elephants were encamped aroused every one, and a large female elephant could be just discerned moving about restlessly among the trees where the captured ones were tied. Being too dark at the time to attempt noosing, some of the kunkies were equipped with the rope gear and kept in readiness, silence was enforced, and the appearance of daylight anxiously watched.

The wild one very soon discovered the object of her search, when, with a cry of joy, she took up her position alongside the young tusker above referr ed to, and began caressing him all over with her trunk. The youngster made frantic efforts then to liberate himself, the mother encouraging all the while, and when panting he would fall to the ground exhausted, she would endeavor to assist him up. This excessive affection cost her her liberty. As soon as there was sufficient daylight for the purpose, within a few yards of her offspring she was noosed, as, on the approach of danger, she was reluctantly moving away. It was really wonderful how she managed to trace her young to the camp. The distance cannot be less than eight miles, while the track lay through dense forest, and the trail was mixed up with those of at least some fifteen other elephants, both tame and wild. She must have waited until it was dark, and then followed the track, reaching camp between 1 and 2 A.M. The sense of smell must be developed to a marvelous degree in elephants. On two occasions when mothers with calves have been captured and led away, their young have followed and been secured in camp, while another calf, a small suckling, is in camp with its mother, and is kept loose. If any one tries to approach, it runs up to the mother for protection, or else moves about among the captives without any fear or hesitation.

The usual style of feeding wild elephants, when first taken, is to lash them to the side of a tame one, and lead them out to graze. Some of the tame females here have taken a great fancy to calves intrusted to their care, and if by mistake a new one is brought up, she evinces her dislike to the change by kicking out at the unfortuate intruder. Elephants, it must be admitted, are curious animals, and the more you see of them the greater the interest generated regarding their habits. — *Bendigo and Tea Planters' Gazette.*

Electric Properties of Flames.

In Wiedemann's *Annalen,* Herr J. Collert describes the results of investigations on this subject, of which the following abstract appears in the Chemical Society's *Journal* for June: "This investigation is a continuation of Hankel's researches on the electrical properties of the Bunsen and alcohol flames. The method of experiment was as follows: A spiral of platinum was placed in the flame symmetrically with its axis, and connected with one pole of a Hankel electrometer, the other pole being in connection with the burner; the electrometer was also connected by a commutator with the poles of a zinc-copper pile conducting to earth. The principal results of the investigation are as follows:

"1. The difference of potential is dependent on the material and the temperature of the mouth of the burner; an electro-potential series of the materials of which the burners are constructed can be arranged, of which iron is the most negative. 2. The difference of potential is also conditioned by the position of the spiral; the point at which the greatest electromotive force is produced coincides probably with that of maximum temperature. This latter result probably represents the sum of several conflicting causes: first, by the rise of temperature the platinum is positively electrified; secondly, by contact with the hydrogen and carbonic oxide gas it is negatively electrified; and thirdly, in the cooler parts of the flame it is positively electrified by contact with steam and carbonic anhydride. As regards the second of these points, the experiments of Deville tend to show that the higher the temperature the greater proportion of free hydrogen and carbonic oxide present; while Grove has shown that platinum is negatively electrified when in contact with these gases. 3. The results obtained by the author agree with those of Elster and Geitl; the former finds for the E.M.F. of a platinum spiral in a Bunsen flame = 1·95 Daniells, in an alcohol flame = 1·43 Daniells; while the latter obtained the values 1·92 and 1·44 Daniells respectively.

A Barrel of Flour.

The cost of the barrel itself is 35 to 40 cents. It ordinarily requires from 30 to 40 pounds of coal to drive the machinery to make a barrel of flour. Four bushels and 40 pounds of wheat, or 275 pounds in all, are required to produce a barrel; or 196 pounds of good flour; bran and screenings, 69 pounds; loss not accounted for, 10 pounds.

Opening of the International Electrical Exposition, Philadelphia, Pa.

A little more than 130 years ago in Philadelphia, Dr. Franklin drew lightning from the clouds, and found it accompanied by the same phenomena as that often observed in his own laboratory. Near the same spot the International Electrical Exposition is now being held. It was opened last week with appropriate ceremonies, and by reason of its myriads of lamps, fed by electricity of the same nature as that which descended Franklin's kite-string, West Philadelphia wears a glow it never knew before. Electricity from a thousand lamps vies with the noonday sun, and night bids defiance to the day.

Though it cannot be said that its ample halls are replete with novelties, the Exposition possesses nevertheless so much of attractiveness as to well repay the intelligent visitor, let him come from centers the most scientific or lands the most remote. The committee of the Franklin Institute having the conduct of the enterprise, finding that novelties in large numbers, since they do not exist, were not to be had, wisely decided to exert themselves to the task of gathering together a complete collection of the best products of electrical science, pure and applied. How well they have succeeded may be judged from the fact that there are no really important electrical inventions, with possibly two notable exceptions, that may not be found either displayed upon the floors of their building or packed away in their store-rooms awaiting introduction. As in the case with most enterprises of this nature, the exhibitors have been dilatory, many of the most important exhibits having been "placed" only during the past few days. If there is wanted an excellent opportunity to observe the electric lighting systems on a large scale and in juxtaposition, it is to be had here. Their virtues as well as their defects are exposed to the public gaze, and any attempt to conceal a flaw only serves to attract the more attention. Aside from the economical status which, it is but fair to say, has hardly been decided as yet, the uncertain or varying duration of life of the incandescence lamp is readily seen to be its chief defect. Here and there a lamp for which a life of from 600 to 900 hours is claimed is seen to have suddenly dimmed, and others that have evidently served before are aglow with undiminished intensity.

Upon the opening day the committee of supervision were so much occupied with important details as to forget to set out cautionary notices regarding the approaches to the large dynamos and the big magnets, and they were surrounded by crowds, many of whom are no doubt by this time wondering what uncanny influence it is that makes their watches go too fast at one time and too slow at another.

The idea of giving no awards or prizes for excellence did not originate with the managers of this enterprise, but its adoption does credit to their discernment, and is a proof, if proof were wanting, that the element known vulgarly as "claptrap," forming so important a feature of most exhibitions, is to have absolutely no part in this. Who has not wondered, when looking over the advertisements in the public prints, that so many manufacturers got "first prizes" for the same article at the same exhibition? Indeed, the custom of giving everybody a prize has of late grown so common in some sections that the breach has come to be more highly honored than the observance. As an illustration of thus, it is recorded that at a recent English fair a man vending tobacco wandered through the halls exclaiming, "'Ere's yer prime smoking tobacco, h'only h'article in the b'exhibition what didn't get no prize!"

Official examinations will be made of everything of an important nature; the examiners being well known scientists with a special knowledge of the particular apparatus under inspection. Quantitative tests will, as far as possible, be made by methods which allow of a proper checking of results, and all codes or schemes for tests must be approved by the board of examiners. Moreover, all making applications for special tests must bind themselves to acquiesce, without appeal, in the results obtained.

This admirable plan, by which the deserving only will be rewarded, originated with the managers of the Vienna Electrical Exposition last fall. It is designed to prevent the adventurer and the quack from preying upon the unwary. The reports of the results of tests and examinations made by the several sections of the board of examiners will as far as possible include details of methods used and experiments made, and these reports will be signed by the majority of the members of the section. Hence, the promoters and projectors of any electrical apparatus examined will have in their possession an official paper stating in concise language, not what they claim for it, but just what it has shown its ability to do before a board of scientists who have no pecuniary interests in it whatever. Among the dynamo machines for lighting, plating, and miscellaneous purposes there may fairly be said to be nothing new, if we except an unusually large dynamo among the exhibits of an incandescence electric lighting company, and which is said to be capable of feeding 2,500 incandescence lights, each of 16 candle-power (equal to an ordinary gas jet).

Singularly enough, the electrical machines and apparatus required for the transmission of power from a distance are not among the exhibits, or rather are not to be seen; nor is there any project afoot, so far as a representative of the SCIENTIFIC AMERICAN could learn, to practically demonstrate the admirable system devised by M. Marcel Deprez, and carried out at Munich, in the shops of the *Chemin de Fer du Nord* in Paris, and still more recently at Grenoble. Yet this may, not unreasonably, be looked upon as by long odds the most important electrical problem of the day.

M. Deprez claims, and the French Academy, after examining his records, admit, that to a distance of ten miles he can transmit twenty horse power gathered from a running stream in the shape of electrical energy with the loss of not more than 60 per cent. He has recently averred that, with his improved apparatus, he can greatly reduce the loss of current while *in transitu*.

When the more discriminating of the general public have feasted their eyes upon the electrical fountain, which is good but not new, they show an inclination to go to the other extreme, and examine the small things. Among the most interesting of these is a recently improved motophone, or sound motor, invented by Mr. Edison. In this, a ratchet wheel is made to turn by the vibration of a telephone plate acted upon by the human voice. A tuning fork kept in vibration by electro-magnetism and mounted on a resonance box is the source of the sound, which operates a working model of a similar contrivance, said to be the invention of an Austrian.

In a remote and carefully guarded corner of the old Pennsylvania Railway station, given over to the managers of the Exposition, are placed the photometric and other delicate test instruments. Here all measurement will be made without fear of interference by induction from the great electrical machines in the main building; the latter being electrically connected, however.

A rheostat which is attracting some little attention is among the foreign exhibits. If it shall be found to fulfill the promises that have been made for it, it may fairly be said to deserve even more notice than it is now receiving. It has, it is said, been employed by M. Trouve in connection with his polyscopes to regulate the strength of current supplied by a small Plante accumulator. Like most rheostats, it consists of a German silver spring inclosed in a nickel plated tube. The spirals, insulated from the tube by a pasteboard sheathing, are not permitted to touch each other at any point. There is a rubbing contact within the spring, formed of a metal rod split into four parts. This idea of splitting the rubbing contact is novel and, there is reason to believe, effective.

The rod itself is graduated into divisions. The current enters at one end of the spring and, having passed over it, continues through the rubbing contact and the graduated rod. The rod being sunk deep into the spiral coil, only a few turns are traversed by the current, and very little resistance is indicated in the circuit, but, the rod being withdrawn, a considerable number of turns is the result. The exact number of turns may be ascertained from the vernier.

Among the apparatus for high electro-motive force, such as lightning protectors, electrostatic induction machines, and induction coils and igniters, there is much that is interesting, but little that is new. The Voltaic-electric apparatus is likely to prove exceedingly interesting, not by reason of novel improvements, for there is no visible proof of the presence of these, but because of the practical and working exhibitions of Voltaic batteries and accessories and of polarization and storage batteries, that are to be given in the annex throughout the month. There are also to be seen working models of submarine cables—duplex, quadruplex, multiplex, and harmonic systems.

One of the most curious exhibits in all this large collection may fairly be said to be the instrument by which the personal error of an observer of scientific instruments may be established. All those who have had experience in the use of instruments of precision are aware that every observer has a "personal equation." In other words, few eyes are absolutely perfect, and hence no two observers, however careful, will see precisely alike. In the trigonometrical portion of the United States Coast and Geodetic Survey, for instance, the most skillful observers in the use of the theodolite find, upon comparing notes, that though they have measured the sides of a triangle under the same conditions of atmosphere, their results differ. Of course this difference is always very small, sometimes almost inappreciable. It comes from a difference between the "personal equation" of the observers; there is an error in the eye sight of one or both, amounting usually to tenths of seconds; and the custom has been, after each has computed the mean of his observations, to then take the mean of the two results as the final measurement. In the little instrument exhibited in the government display in Philadelphia, the personal equation may readily be ascertained in advance of observations, and hence each "sight" through a fine instrument may be corrected by adding or subtracting the error in the eyes of the observer.

The improved gas-engines work almost side by side with the steam-engines coupled up with the dynamo machines, and gas, even as an illuminant, refusing "to pale its ineffectual fires," presents itself through the powerful lenses of the new Siemens lamp. This may be regarded as an important feature of the exhibition, and give an opportunity for comparison which practical men will not be slow to avail themselves of.

As to whether gas as an illuminant is to give place to electricity is a question which has not yet been definitely decided; but that gas as a fuel is more economical and more easily handled than coal may be said to have been long since apparent. Expert tests with the gas-engines now on exhibition, intended by their projectors to usurp the place of the steam-engine in working dynamos, show that a greater intensity of light can be obtained through electricity from a dynamo worked by a gas-engine than could have been had, if the gas used as fuel had been turned directly into light. As is well known, by far the greater portion of the chemical energy of illuminating gas is turned into heat rather than light, whereas, in the case of the electric light, the converse is true; only a very small portion being turned into heat.

Quite recently Prof. Rowland, of the Johns Hopkins Institute, and Prof. Barker, of the University of Pennsylvania, both of whom are members of the committee having the conduct of the Exposition, computed the light that one horse-power yields in the Edison incandescence system, and found it to be in Carcel units (9 candles is equal to one Carcel) 11 to 21. Swan's incandescence lamp gives 16⅔. Recent measurements of the Voltaic arc light show that with distance of carbons 4 inches, and current generated by ordinary Gramme machine, a result of 585 units; distance of carbons, 1⅛ inches; ordinary running Gramme machine, 230 units.

A gas-motor using illuminating gas has been found to consume on the average one cubic meter, or 37 cubic feet, per horse-power of 75 kilogrammeters, or, in other words, 542 foot-pounds. Prof. Von Marx, of Wurtemberg, has found that an Argand burner, on the other hand, consumes five cubic feet of gas per hour, gives a light equal to eighteen candles, and a cubic meter of gas will give a light equal to 120 candles. Reckoning a Carcel burner as being equivalent to nine candles, this corresponds to 13⅓ carcels.

One of the principal, if not the most important exhibit of the foreign section has not yet been placed in the hall, though many inquiries have been made for it by electricians. This is a primary battery, the invention of an ingenious Frenchman. There is nothing new about the battery itself, and no claim for novelty of design is made for it. It is the elements that are used, or rather the combination of elements, for which a claim of novelty is made, and if the half of what is promised as the result of such a mixture may be strictly relied upon, the storage battery, so called, which has been held in such high esteem, must, so far as economy and efficiency are concerned, be relegated to second place, and the primary battery be regarded as the coming storehouse of electrical energy. A representative of the SCIENTIFIC AMERICAN succeeded after much trouble in finding the two French gentlemen, Messrs. Vigniboul and Breteche, who have this primary battery in charge. They are undecided as to whether they will carry out their original intention of placing it in the Exposition. It is difficult if not impossible, they say, to obtain a patent for a primary battery in this country, and they are not yet satisfied of the advisability of imparting their secret of the combination of elements until assured that a patent may be had.

If this primary battery will do what they promise for it, that is to say, if they do not deceive themselves, their battery may be made to feed incandescence lamps, each of sixteen candle power, for one cent the hour. As shown to the representative of the SCIENTIFIC AMERICAN, it is altogether simple and easily handled. The jars are of the ordinary description, having wires attached which may be led through the gas pipes of a dwelling or office. The design is to place such a battery in the cellar of a dwelling, for instance, and from it supply a complete incandescence lighting plant with electricity. To do this with the famous secondary battery, a steam engine and dynamo would be required, or else that the battery be taken out and recharged several times a week. It is claimed for this French primary battery that an ordinarily intelligent servant could recharge it, having only to pour in a new supply of liquids when exhausted.

It is easy to imagine, if the capability of this battery is not exaggerated, the innumerable other fields in which it might be made useful.

A section of the underground conduit for electric wires and mains, now being laid in certain parts of Philadelphia, viz., from Third to Fourteenth Streets and on Tenth from Chestnut to Market, has found a place in the main hall of the Exposition. It is composed wholly of iron, having many interior partitions for the various description of wires and electric mains. Manholes are arranged for street intersections. At these points, by means of a rope called a "pilot," new wires can be drawn through or old ones pulled out without any further disturbance of the road bed.

Painless Escharotics.

A painless caustic for the removal of warts and tumors may be made as follows:

Arsenious acid	1 part.
Sulphate of morphine	1 "
Calomel	8 parts.
Powdered gum arabic	48 "

This is to be sprinkled over the cuticle daily, the surface of which has been previously denuded by knife or blister.

Cauquoin's paste for the same purpose is composed of ten parts of chloride of zinc, two parts of alcohol (60°), and fifteen parts of wheat flour. The zinc in fine is added to the alcohol, then incorporated with the flour in a mortar, strongly pressing with the pestle. As soon as homogeneous it is spread with a roller into sheets an eighth of an inch thick, and after a few hours put into a well corked bottle.

Latour's nitrochloride of zinc paste is also an excellent preparation, and is made by dissolving fifty parts of the chlorida and one hundred parts of the nitrate of zinc in eighty parts of water. The solution is made by the aid of heat. When it cools, seventy-five parts of wheat flour is incorporated with one hundred parts of the solution, as with Cauquoin's paste.