FOSSIL PATENTS.

BY T. GRAHAM GRIBBLE.

The origin of patents was a royal grant conveying a monopoly. The word patent or open now exactly expresses the stipulation on the part of the government in guaranteeing protection to an inventor, but it did not originally convey that idea. Now the inventor discloses all his secret, even to the most minute detail, so that "any one skilled in the art" may be able to manufacture or operate the same from the model drawing and specification If he can be proved to have designedly withheld any essential feature, his patent is void.

In the first patents, on the other hand, we find no detailed specification, and for a long while after specifications were made there were no drawings. The inventor was at first protected as fully as now, but was also able to preserve to a great extent his secret. The patents were monopolies bestowed upon royal favorites for a consideration, and sometimes were possessed of scarcely any original features.

The term letters patent is more ancient than the patent system. Letters of nobility were also granted under letters patent. These open letters were in contradistinction to "*lettres de cachet*" or "*lettres closes*." Both were royal mandates, but the latter were usually given to ambassadors, generals, governors, and such like, to convey instructions for their guidance when arriving at their destination. Letters patent, on the contrary, were capable of being produced at any time and exhibited anywhere as royal authority for the enforcement of claims, the protection of rights, and so forth. There was always in olden time an element of uncertainty about "*lettres de cachet*" from the fickleness of princes. Despite the high honor of receiving them, there were many cases on record of the bearers of the secret letters finding out on arrival at their destination that they contained subject matter of an unexpected nature, such as the curtailment of their stature at its most effective extremity. Consequently letters patent were more popular under despotic governments. It is a curious survival of ancient customs that letters of introduction are still left open in order that the bearer may assure himself of fair play.

Patents themselves originated in royal perquisites, but *patent law* arose out of a parliamentary protest to the abuse of the prerogative. King James the First was remarkable for initiating many things which turned out of much greater value than he had any idea of. He was the first to grant patents, and he did it as a kind of very mild boodle. He carried on the first patent bureau to the mutual satisfaction of his royal self and his ingenious lieges until the people were so squeezed by it that they forced a law out of him, declaring all such patents as were "grevious and inconvenient to the subject to be void," with the exception of those granted for the "sole working or making of any manner of new manufactures," and which were not "contrary to law or mischievous to the state." This is the pith and marrow of patent law.

The first patent of which there is any record bears date "the eleaventh daie of March, 1617." It is granted by "James, by the grace of God Kinge of Englande, Scotland, France and Irelande, Defender of the Faith, etc., to his lovinge subiecte, Aron Rathborne, gentleman, practicioner in the mathematiques," and conveyed to him the exclusive right to make "a perfecte survaie as well of the said cittie of London as of divers other places within this our Kingdome of England hereafter mentioned, and to make such exacte plotte, mappes, and descripcions thereof as hath not been hitherto performed by anie." The royal mind had been stirred to emulation by the rumor that "amongste forraine nations there are faire curious and artificiall descriptions, plotte and mappes made and sett forth of their principall citties and townes of greatest noat, which beinge exactlie drawne out in metall and printed of, are dispersed and sent abroad into all partes to the greate honor and renowne of those princes in whose domynions they are, whereas in our cittie of London, being the chiefe and principall in this our Kingdome of England, there hath never been made or taken any true or perfecte description, but false and meane draughts cutt out in wood and soe dispersed abroade to the greate disparagement and disgrace of soe famous and worthie a state."

This "royall licence and priviledge" granted to Rathborne power to forcibly restrain any other person "duringe the terme of twentie and one yeares from presuminge, attemptinge, or takeinge in hande to make, grave, carve, describe, imprinte, sett forthe or counterfeit or sell, utter or dispose of within this our realme anie other the like mappes, plottes, descripcions, or bookes or anie of them, other than such as shall be made, graven, printed, perfected and sett forth by the saide Aron Rathborne and Roger Burges, their executors, administrators, deputies or assignees or some of them; nor shall make, erecte, sett upp, or frame anie engines or devises or counterfeicte or vse anie tooles or instruments for the makeinge, gravinge or imprintinge thereof vpon paine of forfeiture of the same, and further vpon paine of our heavy indignation and displeasure, and of suche paines, penalties and imprisonments as by the lawes or statutes of this realme can or maie bee inflicted vpon the offendors for their contempt or disobedience in breakinge and contemninge our comaundment and prerogative royall."

The royal benefit from this transaction was not in cash, but in kind. Half the proceeds of the loot upon the illicit mapmakers was to go to majesty and the other half to the "lovinge subiecte."

Rathborne's survey is not extant with his name attached, though in all probability it is represented by the map in the illustration. The oldest description, termed a survey, but unaccompanied by a map, is a large work entitled "The Survey of London, contayning the originall increase, modern estate and government of that city, methodically set down, begonne first by the paines and industry of Johnston in the yeare 1598. Afterwards inlarged by the care and diligence of A. M. in the yeare 1618. And now completely finished by the study and labour of A. M. H. D. and others, this present yeare 1633.

It is nothing more than a detailed description or guide to the city. The labors of Rathborne and Burgess protected by royal decree doubtless produced the first survey of London, although rough perspectives of much more ancient date exist. It is a strange commentary on the schemes of princes that this first patent of King James should be the means of producing a map by which 25 years afterward a revolted parliament should make fortifications to keep his son Charles out of London.

These fortifications were ordered by Act of Parliament of 7th March, 1642, and were very rapidly constructed by means of a general tax.

Besides paying a lump sum of sixpence if their house rent reached the yearly rental of five pounds, the whole city—men, women and children—turned out with pick and shovel to make earthen ramparts, and did so in an amazingly short time.

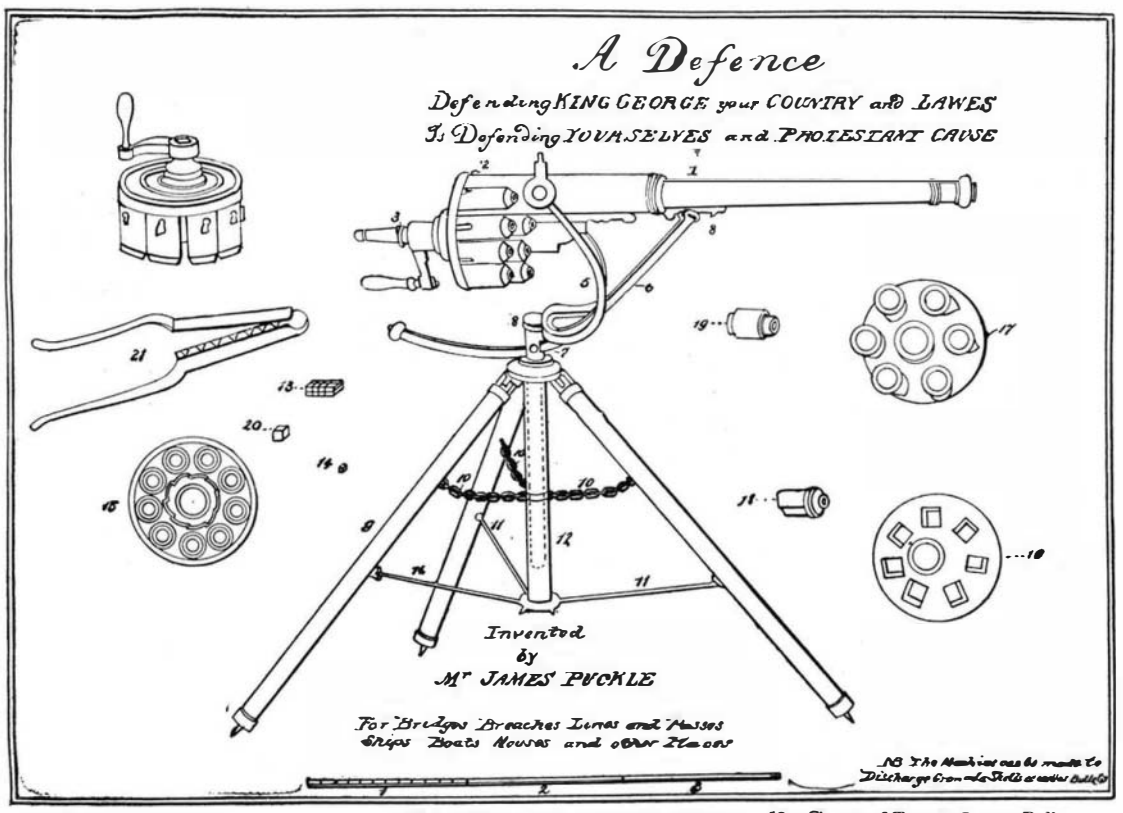
The second patent granted by King James was a protection of his royal dignity against caricaturists. It was granted to his "well-beloved servaunt, Nicholas Hillyard, Gent.," for the modest "yearely rent or some of thirteene shillings and fower pence of lawfull (?) money to be paide to Vs, our heires and successors att the Exchequer, at the Feast of Saint Michael the Archangell, or within forty days after." Whether the picture of the king, when padded out dagger-proof to go hunting, was a production of Mr. Hillyard's or one of those caricatures which the patent was meant to discourage, we are unfortunately unable to now ascertain.

The description of the exclusive right to portray the royal presence, and the pains and penalties to be visited upon lawless limners, is extremely lengthy, verbose and tedious.

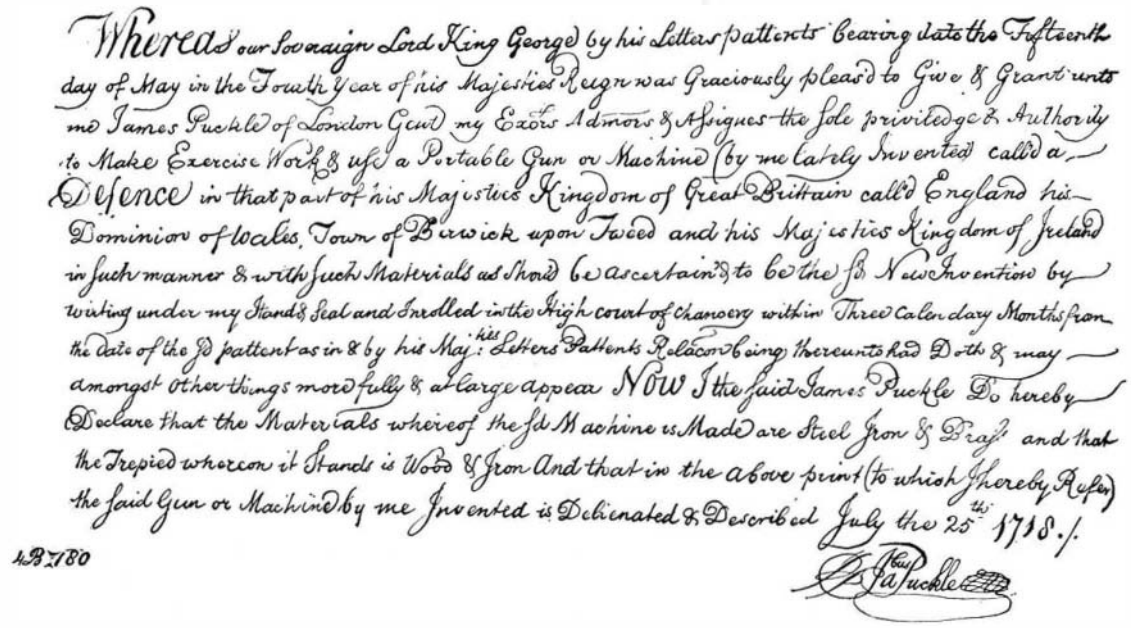
There are no patents by Cromwell, but during the Commonwealth the New England colonists availed themselves of the temporarily free institutions to grant protection to inventors without, however, extorting "a consideration." The first American patent is almost synchronous with the Commonwealth. A much later but very quaint patent is that of Dame Sybilla Masters, of Philadelphia, for corn shelling and preserving. She writes in German text, hard to decipher and very antiquated for that period.

It is granted by King George the 1st, and the official entry in Roman text is as follows: "Letters patent to Thomas Masters, of Pensilvania, Planter, his Execrs., Amrs. and Assignees, of the sole Vse and Benefit of 'A new Invention found out by Sybilla, his wife, for cleaning and curing the Indian Corn growing in the severall Colonies of America, within England, Wales and Town of Berwick upon Tweed, and the Colonies in America.'"

The accompanying drawing was enrolled instead of a specification, so that it is difficult to fully do justice



No. 1 The Barrel of the Gun
2 The Sett of Chambers Charg'd put on ready for Firing
3 The Screw upon which every Sett of Chambers play off and on
4 a Sett of Chambers ready charged to be Slip'd on when the first Sett are pull'd off to be recharg'd
5 The Crane to rise fall and Turn the Gun round
6 The Curb to Level and fix the Guns
7 The Screw to rise and fall it
8 The Screw to take out the Crane when the Gun with the Trepeid is to be folded up
9 The Trepied whereon it plays
10 The Chain to prevent the Trepieds extending too far out
11 The hooks to fix the Trepied and Unhook when the same is folded up in order to be carried with the Gun upon a Man's Shoulder
12 The Tube wherein the Pivot of the Crane turns
13 a Charge of Twenty Square Bullets
14 a single Bullet
15 The front of the Chambers of a Gun for a Boat
16 The plate of the Chambers of the Gun for a Ship shooting Square Bullets against Turks
17 For Round Bullets against Christians
18 a Single Square Chamber
19 a Single round Chamber
20 a single Bullet for a Boat
21 The Mould for Casting Single Bullets


Whereas our Soveraign Lord King George by his Letters patents bearing date the Fifteenth day of May in the Fourth Year of his Majesties Reign was Graciously pleas'd to Give & Grant unto me James Puckle of London Gent my Exors Admors & Assignes the Sole priviledge & Authority to Make Exercise Work & use a Portable Gun or Machine (by me Lately Invented call'd a Defence in that part of his Majesties Kingdom of Great Britain call'd England his Dominion of Wales, Town of Berwick upon Tweed and his Majesties Kingdom of Ireland in such manner & with such Materials as Should be Ascertain'd to be the Sd New Invention by writing under my Hand & Seal and Inrolled in the High court of Chancery within Three Calendar Monthes from the date of the Sd patent as in & by his Maj.: Letters Patents Relacon being thereunto had Doth & may amongst other things more fully & at Large appear NOW I the said James Puckle Do hereby Declare that the Materials whereof the Sd Machine is Made are Steel Iron & Brass and that the Trepied whereon it Stands is Wood & Iron And that in the above print (to which I Hereby Refer) the said Gun or Machine by me Invented is Delineated & Described July the 25th 1718./

No 1780

Jas Puckle

BREECH-LOADING MAGAZINE GUN PATENTED BY MR. JAMES PUCKLE IN 1718.

to the lady's scheme. Her inscription is as follows: "Phila., the 2nd mo. called August, 1716, Pursuant to his Majesty's grant for cleaning, curing and preparing the indian train [a clerical error for grain] fit for transportation, the which was never before done, these the draughts of part of the engine I carry on my projection with the witness my hand and seal.

"Certio die Novem. Annon, Georg ii."

The two upper illustrations show the cleaning and the lower the curing. The top view represents the sheller, worked by animal power, probably a donkey (*Asinus vulgaris*). The gearing and shaft are of wood, and a reciprocating motion is produced by a series of detents upon a revolving cylinder something after the manner of a musical box.

In the middle view the reciprocating motion is also present, but the motive power is from a stream acting upon an undershot wheel.

The lower view represents the shelled corn laid out to bake upon wooden trays.

It is to be feared that Dame Sybilla's invention did not attain to as wide a field of application as was covered by the letters patent. It is more than probable that the obtuse agriculturist continued to shell corn sitting on a pine plank with a spade edge to scrape them off by, in spite of the "paines and industrie" of the dame.

Another patent of King George's, two years later than Mrs. Masters', is both amusing and highly suggestive. It is for the first breech-loading magazine machine gun, and is 173 years old. The drawing is self-explanatory, but a few words of comment may be added.

The magazine contained chambers which were loaded, in the usual manner of the period, with powder and ball, cartridges not being then invented. The magazine was detached from the gun for the purpose of loading, two or more being supplied with each gun. The inventor does not seem to have troubled his head much about the question of recoil, but, in view of the date, we must not be too critical.

The name alone of "Defense" is suggestive in the extreme. Did Puckle foresee the peculiar advantage of his gun to defensive rather than to aggressive warfare?

The year 1521 is generally accepted as the date of the introduction of matchlocks into regular warfare, when they were used at the siege of Berwick. Fifty years previously Edward IV. imported 300 Flemings armed with hand guns into England, but it was not until the middle of the 16th century that the small firearm became the recognized weapon for the foot soldier. The close of the 16th century also saw the first attempts at a magazine flintlock and a breech-loading cannon, which we illustrate. They were crude attempts, and the smooth-bore muzzle loader remained the only weapon in regular use until the beginning of the present century. It is the extent to which the inventions were prophetic which makes them more or less interesting, and among them all Puckle's breech-loading machine gun, with removable magazine, is one of the most suggestive and entertaining. We are not aware whether Messrs. Gatling, Nordenfelt, Maxim & Co. have ever dipped their flag to Mr. Jacobus Puckle, but we offer them the opportunity by a very brief description of the "Defense."

The old idea of defense for warriors had recently changed when Puckle invented his weapon, and the defense of fortresses was on the eve of change. In the time of King James I. knights still clad themselves in coat of mail, but the disadvantages of it were naively stated by that pusillanimous monarch when endeavoring to recommend it. He said that heavy armor afforded "a double protection, preventing the wearer at the same time from being injured and from injuring others." This was true, because, as projectiles were made heavier, armor was made thicker, until an unhorsed knight could not possibly regain his feet, but lay like a lobster that could only be got at for killing by breaking him up with a battle ax. Finally the armor became so weighty that the horses could not stand it, and it, was entirely abandoned for the principle of quick firing and quick maneuvers.

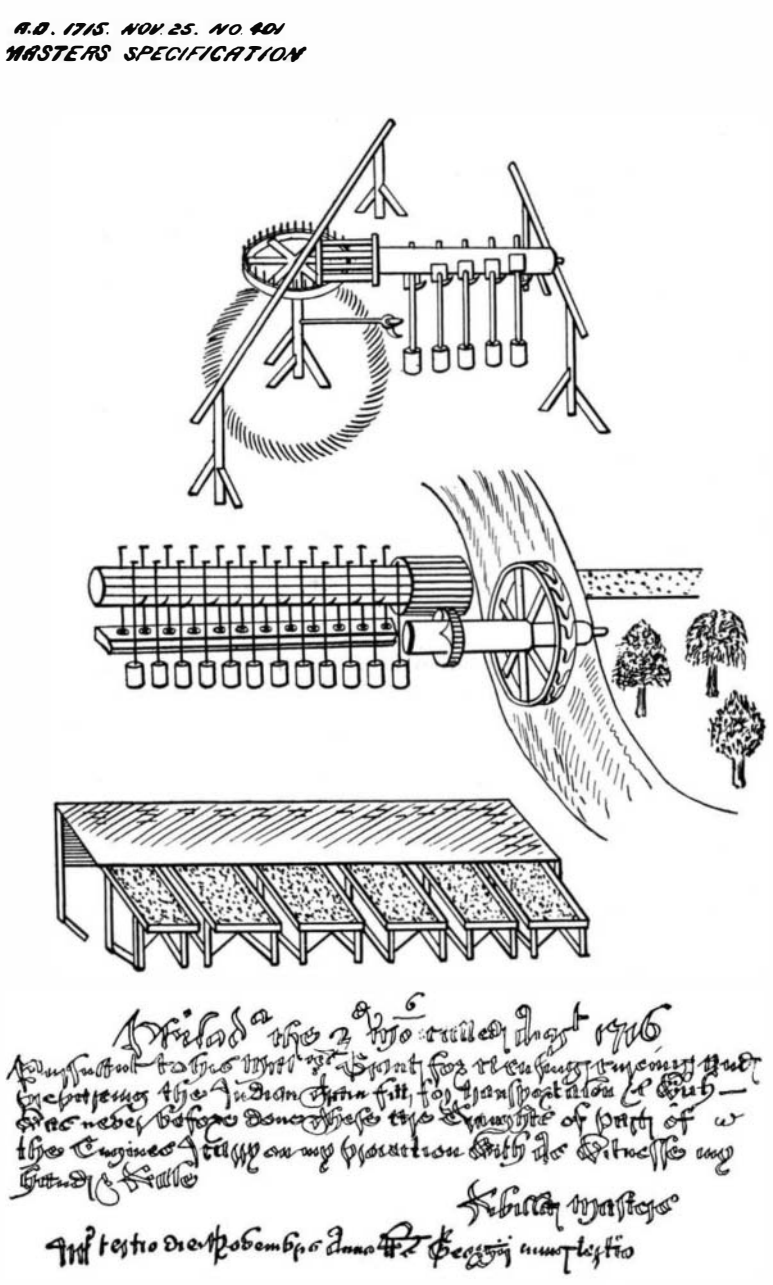
Similarly as regards fortress defense, it is the perfection of the magazine rifle which has displaced the massive towers of masonry and wide moats, because it has rendered the most hastily constructed defenses impregnable when manned by a handful of steady troops. The "unprotected zone," which has always been the crux of the besieging force, is not now represented by moats or outworks. It is simply the range of the besieged combatant's rifle. The martello towers of England are all going to decay, even the more modern fortifications of America's seaboard are more or less antiquated. The highest modern authorities are raising the question, not of the class of the fortification, but as to whether to build or not to build. The machine gun has, however, gone on in its development until it is the acknowledged arbiter of the fate of nations.

The religious aspect of "The Defense" is one of its quaintest features. Brer. Puckle no doubt intended his square bullet as a holy terror to the Turk, but modern science would have told him that he was really harder on his fellow Christian than on the Moslem. The round bullet will travel much farther under similar conditions than the square one. Sentiment no longer guides the designer of projectiles. First of all, electricity enables him to measure the velocity at any position of the flight by means of metallic screens which, when placed in an electrical circuit, are successively pierced by the shot which breaks the circuit and stops the recorder. The interval of time is measured by the vibrations of a tuning fork, the fall of metallic rods, the movements of a pendulum, the rotation of a cylinder with a smoked surface and otherwise. Col. Noble, of Woolwich Arsenal, Messrs. Schultz, of Germany, Le Boulange, of France, and Vignettie, of Italy, have all produced chronoscopes of more or less efficiency, but some of them actually register to the one-millionth part of a second. Next comes photography and makes a picture, not only of the bullet in its flight, but, which is more important, of the minute cloud of condensed air created by atmospheric resistance. It is from the configuration of this cloud that the section of least resistance is determined and the relative effect of different methods of rifling. The resistance of the air to an elongated bullet from a smooth bore always causes it to travel irregularly, because the air pressure acts unequally upon ii. Rifling a gun produces a rotation round the longer axis which steadies the bullet just as spinning does a top, and gives rise to its technical name of "polar projectile."

The ferocious intention of inflicting prolonged agony by the construction of the projectile is much older than Mr. Puckle. From the poisoned or barbed arrow head of the savage, or the cruciform arrow head of the Aztec, to the spreading or chain shot of more modern times, and so down to the present weapons of wholesale slaughter, the transition has been from the essentially cruel desire to produce suffering to the more humane object of putting an end to an inevitable struggle as rapidly as possible.

The loyalty and religious zeal displayed by Puckle in his weapon are quaint in the extreme, but it is even a more curious fact to record that one of the greatest modern designers of heavy artillery, himself a very devout man, always prays that he may get a sound casting when a monster gun is under construction.

Will the American of A. D. 2000 look upon the "Whitehead torpedo" or the "dynamite gun" and all other killing tools as objects of as much archaic interest as we now regard the "Defense" of Brother Puckle?



ROYAL PATENT GRANTED THOMAS MASTERS OF PHILADELPHIA IN 1716, FOR CLEANING AND CURING CORN.

Electric Welding.

According to Professor Elihu Thomson, it is not the extra resistance at the break that gives rise to the heating in electric welding. The imperfect contact there no doubt hastens the heating at the joint, but a solid bar placed between the clamps of an electric welding machine can also be raised to the welding temperature, and the bar may be upset there. The real cause of the concentration of the heating between the clamps is the relatively greater conductivity of other portions of the welding circuit, which is usually composed of massive copper conductors kept cool in the case of large work by the circulation of water. By keeping the conductors cool in this way their resistance is maintained constant, and there follows an accentuation of heating effect at the joint where the rise in temperature increases the resistance. In large works it has been found that hydraulic power can be advantageously employed both for clamping and making contact with the pieces to be welded or worked. In dealing with metals such as lead, tin, and zinc, the temperature required for welding is so low that the metal never glows, and the progress of the breaking cannot be watched with the eye. By properly shaping the ends leaden water pipes can easily be welded together end to end. The meeting edges should be thinned so as to reduce the surface of contact below the area of the pipe wall. Joints thus made are very good and sound. Most metals can be welded without the use of a flux, but for good work a flux is often desirable.

Electrical and Chemical Energy.

Of the various transmutations of energy, that of *chemical separation* into *electricity in motion* in the voltaic battery, and of the latter into the former in the case of decomposition by a battery, are among the most interesting. In the first case, the sources of electrical excitement are the points of contact, say the zinc and platinum when we have electrical separation produced; but this would not produce a current *per se*, for an electric current implies very considerable energy and must be fed by something. The supply is kept up and really produced by the oxidation and dissolution of the zinc, and the chemical separation of the metallic zinc is transmuted into the energy of the current. In the second case the energy of electricity in motion is transmuted into that of chemical separation when a current of electricity is made to decompose a compound substance; as, for example, when a battery is used to decompose water. Heat apparently disappears during this operation, but it is given back when the mixed gases, oxygen and hydrogen, which result from the decomposition, are exploded in a eudiometer.

Recently this interesting subject has been placed under investigation by E. Levay; he specially gave his attention to the study of the relation between electrical and chemical energy in galvanic cells, and the object of his experiments was to determine for certain of these cells the heat generated chemically and the heat equivalent of the current, so that he might be able to obtain an exact measure of the difference between the two.

The heat evolved in the cell was determined calorimetrically, and that of the circuit in like manner by means of a silver voltameter placed within the calorimeter along with the cell.

Two cells were examined, namely, the Daniell and the De la Rue, and three calorimetric determinations were made with each cell.

In the case of the Daniell cell, the heat equivalent of the current appears to be greater than that which is generated chemically, so that the net result is that the cell works with an absorption of heat.

The reverse is true in the case of the De la Rue cell; but in this case Levay observed that the relative amount of electrical energy increases with the concentration of the solution in the cell.

The results show a close agreement with those obtained formerly by Jahn. The original paper appeared in the *Ann. Chem. Phys.* [2], xlvii. 103.

FISH will drown if the action of their gills is disturbed or interfered with.

Obeah Poisons and Poisoners.

BY EUGENE MURRAY AARON, PH.D.

In a recent lecture before the London Institute, reported in the SCIENTIFIC AMERICAN of May 30, 1891, Dr. Tidy, in his attractive way, discusses the subject of poisons, and ends by claiming that science has done and is continuing to do much to check those forms of crude poisoning so prevalent a few decades ago. There is probably no locality where Anglo-Saxon civilization is now waging so active a warfare in this direction as in the British West Indies. There the colonial governments are brought face to face with the Obeahman, whose skill with native poisons is supplemented by a certain rude acquaintance with the pharmacopœia, and whose sway over his debased followers is practically absolute.

In Jamaica, the largest of these colonies, the greater extent of the interior affords ampler refuge for these impostors, who naturally desire to secrete themselves far from the ken of the police inspection. To offset this immunity from detection the officers of the law are necessarily more constant in their vigilance, and the good offices of an "island chemist" and his assistants are constantly before the public. The very presence of such an official, whose main duty it is to aid in the conviction of suspected poisoners, cannot fail of having a deterrent effect on those who have recourse to the poison cup and the envenomed poniard. Mr. John J. Bowrey, F.C.S., who has filled the position of chemist in chief for over twenty years, has made a special study of the ways of Obeah and the Obiman, and to him the science of toxicology is indebted for important discoveries.

Obeah, the worship and propitiation of the eternal snake as an emblem of evil, long ago degenerated into a series of obscene orgies among its West Indian followers. The original office of the priest of this superstition was the simple protection of his followers from evil. It afterward came to include the perpetration of secret crimes against the property and lives of their enemies. The poisoning of implements of warfare seems to have been the first step in this direction, as Dr. Tidy has pointed out. Following this came the poisoning of streams used by hostile tribes. From these collective forms of savagery it was an easy step to the use of poisons in individual cases. The earlier expedients probably are still in vogue in the tribal warfare of Africa, but in the West Indies the skill of the Obiman is only invoked to enable a follower to wreak his vengeance on the flocks, the family, or the person of a hated rival or secret foe. The Obiman is an acknowledged adept in the use of poisons, and while his skill may awaken suspicion, it too frequently defies detection, even with the aid of accurate chemical analysis.

The Spanish and French West Indies afford a greater proportionate number of cases of these crimes among the negroes. In Haiti, especially, the practice undoubtedly reaches its highest development and is practiced with the greatest impunity. But as these countries do not employ official toxicologists to aid in the identification of such cases, we must still look to the British West Indies, and especially to Jamaica, for the best opportunities to study Obeah poisons and poisoners. This fact is well illustrated by the criminal statistics of the past decade. While in Barbadoes the convictions were about 5 per cent of the inhabitants, and in Trinidad over 6 per cent, they were only 1·65 per cent in Jamaica. On the other hand, the convictions ought to have borne a larger proportion in the last named island, because it is well known that the two former are under much better control of their white rulers. During the same period the arrests made for all crimes in Jamaica numbered 179,663, and the failures to establish a case 85,622, or over 47 per cent of the whole. It is well known that a very considerable number of these cases originate in Obeah practices, and that many of them have to do with actual or attempted poisoning.

Another feature in the government of Jamaica which does much to foster Obeah pharmacy is the mismanagement, as it appears to be to the disinterested onlooker, of what is termed the Island Medical Department. With eight heads of departments, drawing fat salaries, and a force of forty-one district medical officers, with a good salary guaranteed in each case, the patronage of the department has become of great value. Without going into particulars which would not interest the reader, it suffices to say that the result is to bring into great demand the services of "bush doctors," as those uneducated charlatans are called who brew simples from the wild herbs at hand. This is not to be wondered at when we find that there is but one educated physician to every 12,300 of inhabitants, by far the greatest proportion of whom are spread over stretches of wilderness, and what wonder that "bush physic" is all that these ignorant, neglected negroes ever receive?

In one parish, in which Obeah has a larger following than in any other, with a total population of over 35,000, only 4,500 of whom can read and write, scattered over an area of 280 square miles, there are but two medical officers and no non-official regularly qualified practitioners. Many in that parish live fifteen and more miles from a doctor and ten miles from the nearest drug shop, but in every little community may be found the bush doctor, usually also a priest of Obeah, who is coining money from his dupes.

Of over 14,000 deaths reported for the last fiscal year (an average of over 180 to each practitioner) in less than one-half is the cause of death known. Five days are allowed after burial before the death need be reported to the local register's office, but it is notorious that many deaths occur of which no report is ever made.

With these facts before us it is hardly necessary to go back, as Dr. Tidy does, to "ancient times" to find witchcraft "bound up with the practice of medicine and poisoning." It is quite safe to venture the opinion that some form of witchcraft requiring the use of poisons is called for as often as the more legitimate branch of bush pharmacy. The unlicensed black dispenser of medicines is too often a sorcerer and a poisoner, the latter perhaps through ignorance oftener than through intention.

Nature in the tropics lends herself readily to the uses of the poisoner. On every hand abound vegetable products from which the deadliest poisons may be extracted by easy processes. Lobelia, nux vomica, belladonna, prussic and oxalic acids, urichitine, manchioneal, and many other less well-known substances are all abundant. In the animal kingdom the potency of putrid blood, the venom of tarantulas, scorpions, centipedes, and more rarely serpents, are well understood. Although no poisonous snakes are now found in Jamaica, their venom is sometimes procured from elsewhere. Pere Labat is of the opinion that it is serpent venom which renders the scratch of the finger nail so deadly. But other poisons are employed in this way. A case of this kind came to my personal knowledge. The victim, on shaking hands with a supposed friend afterward found to be a rival, was slightly scratched by a sharply pointed finger nail. Death ensued within a few hours, and it was proved that the poison employed was of vegetable origin.

Cases in which a scorpion has been found to have been boiled in coffee or other beverages are not infrequent. Yet scorpions are so commonly found secreting themselves in household utensils that death from this cause is seldom attributed to anything but accident. Among the many forms of animal putridity employed by poisoners none is more highly prized than that taken from the intestines of the gecko lizard. This creature, stuffed, is a rare charm; its saliva forms an ingredient in many love potions, and its claws, worn on a string next to the skin, are reputed to ward off leprosy, syphilis, and other like ills.

Among the vegetable poisons a dilute prussic acid is obtained from the kernel of the rose apple, oxalic acid from various species of *Oxalis;* and the manchioneal poison, crudely distilled from the tree of that name, is one of the most deadly, both as a stomach and blood poison. Nux vomica and belladonna are well known to the Obeah pharmacists, and they are also familar with antidotes to these and other rapid poisons.

Urichitine, a potent toxic agent, extracted from the very common yellow Savannah weed, *Lobelia*, was recently discovered by Mr. Bowrey, and by him made known to science through the medium of the Royal Chemical Society of England. Yet there is reason to believe that this poison has long been employed by the Obimen. For some years the students of this science have been convinced that the Obiman was in possession of some cumulative poison whereby the death of a victim could be so timed as to take place after any stated interval—a poison the administration of which practically defied detection. In urichitine such a poison has at last been found. Mr. Bowrey's experiments therewith have been most thorough. A cat given but one one-thousandth of a grain per day regularly for six weeks, at the end of that time suddenly died in the most violent manner. The chances of detecting such an infinitesimal dose either by taste or sight are *nil;* the opportunities for the administration of such a dose in coffee, cocoa, or soup are legion. The chances that the chemist has for bringing the users of such a subtile poison to justice are almost too slight to be worthy of consideration. Its very action is described as least likely to awaken suspicion.

A typical case, one that will be at once recognized as typical by all West Indians, may be related in conclusion. A mistress discovered that her well favored quadroon waitress was exerting an undue influence over the eldest heir to the paternal acres, and reproved her therefor. Reproof not sufficing, a case of *flagrante delictu* was punished by a whipping with a strap—unfortunately not applied to the youth but to the plump shoulders of the girl. The punishment was taken in grim silence, and at its termination some threat, indistinctly heard by others, was made in which "Obiman" and "work de Obeah" were phrases. The next morning the mistress and her daughter, who took breakfast alone together, were seized with convulsions, and before medical aid could arrive were dead. Here was quite enough of the circumstantial to warrant the arrest of the girl; but further than that the case never went. No very definite results came from the chemical analyses, no one knew of the girl having visited an Obiman or having held communication with any one between the time of her punishment and the death of her mistress, and no poison was to be found in the house. Finally the suspected servant had to be set free, and on every hand she was hailed by her ignorant fellow servants as possessed with great powers, and her "cuss-cuss" (imprecations) were sought by all who had vengeance to wreak. Thus she abruptly graduated from the regions of servantdom to the higher realms of Obi priestess. How had she won her triumph? What "bush" had been brought in to her aid? Even the keen insight of a Bowrey or the wide knowledge of a Tidy would fail to unravel her secret. The West Indies afford scores of such mysteries every year.

A Static Electro-motor.

The static electric machine usually consists of one or more glass disks, by rotation of which an electric current of small quantity but great intensity is produced. The form of machine of which Mr. James Wimshurst, of England, is the author is one of the latest and best of the static or influence machines. It was last illustrated in the SCIENTIFIC AMERICAN of June 20, 1891.

Mr. Wimshurst has lately produced a new static electro-motor, which he exhibited a few days ago at the evening *soirée* of the Royal Society, London. It is said to be the first motor ever operated by static electricity.

This motor is simplicity itself; it consists of a glass disk, mounted on a vertical spindle, and carrying on one face a number of tinfoil sectors. The upper face of the disk is touched at two places by brushes connected by wires to the poles of the influence machine, while at right angles to the diameter joining these brushes there are two other brushes connected by an equalizing rod. Below the rotating disk is a stationary one, having upon it two sectors of tinfoil extending about 90°. These sectors are also in communication with the poles of the influence machine. As soon as the latter is put in motion, the glass disk begins to rotate and rapidly attains a very considerable speed, turning with an amount of force which is quite remarkable. A similar effect is produced, but to a less extent, by presenting the knob of a Leyden jar to one pole of the motor. We believe that this is the first motor that has ever been constructed to be operated by static electricity, and it attracted a very large amount of attention. Mr. Wimshurst also showed some very pretty effects with Leyden jars. In these the outer coating of tinfoil only extended about an inch from the bottom, while the inside of the jar was blackened. At each sparking the outer surface was covered with mimic streaks of lightning, which showed exceedingly distinct on the dark background.

The Japanese Fan.

One of the necessities of life in Japan consists of the fan, of which there are two kinds, the folding and the non-folding fan. Paper enters largely into their composition. Bamboo forms a material very handy for the framework of the cheaper kinds. The paper is either decorated with paintings in all the different styles of Japanese art or else brightly colored and sprinkled over with silver and gold leaves. These fans are manufactured of all possible qualities and prices, the richest and largest being used for ceremonial dances, where they form accessories of great importance.

The place most noted for its production in fans is Nagoya, and superior ones are made at Kiyoto, while the inferior descriptions come from Fushimi and Tokio. Several millions of fans are exported annually from Japan to America and Europe.

The fan is an inseparable part of the Japanese dress. A native is rarely without a fan. It is his shelter from the sun, his notebook, and his plaything. The varieties of these paper fans would form a curious collection in respect to form as well as quality. The highest priced fan that was used in the days of seclusion from the outer world was not more than 5 yen, or 15s.; but now they have been made to order for foreigners as dear as £2 to £3. The general prices of ordinary fans range from 2s. to guineas per 100. There are many curious uses for fans in Japan. The umpire at wrestling and fencing matches uses a heavy one, shaped like a huge butterfly, the handle being the body, and rendered imposing by heavy cords of silk. The various motions of the fan constitute a language, which the wrestlers fully understand and appreciate. Formerly, in time of war, the Japanese commander used a large fan, having a frame of iron covered with thick paper. In case of danger it could be shut, and a blow from its iron bones was no light affair. One notable variety of fan is made of waterproof paper, which can be dipped in water, and creates great coolness by evaporation, without wetting the clothes. The flat fan made of rough paper is often used as a grain winnow, to blow the charcoal fires and as a dust pan. The Japanese gentleman of the old school, who never wears a hat, uses his fan to shield his eyes from the sun. His head, bare from childhood, hardly needs shade, and when it does he spreads an umbrella, and with his fan he directs his servants and saves talking.—*Paper Mill.*