BETTER THAN DIME NOVELS.

It may seem a poor compliment to pay this excellent paper, but to me the Scientific American is more interesting than any dime novel. The truth is, however, that I have never read one, but have heard enough about them and seen enough of their effects to know something in regard to them. Trashy, sensational stories, filled with incredible adventures of desperadoes who would think no more of taking a human life than killing a deer or buffalo, undermine the natural horror of such scenes.

The dissipated conduct of men and women in large cities is the basis of another class of stories still more injurious. By these exaggerated and rose-tinted tales many young persons have been drawn away from pursuits for which they were fitted, and almost or quite ruined. Not long ago I knew a boy of fourteen whose mind was so much injured by reading dime novels and story papers that he finally ran away to New Orleans and shipped for Liverpool. After a voyage there and back, realizing none of his pleasant dreams, but on the contrary enduring extreme hardships, he arrived at home with health and spirits much impaired.

Another boy did not run away and become a brigand, as he tried to, but read so many novels, in school and out, that although he was a bright lad he lost his place in class and became so restless that he could not work. Almost any day he could be found roaming through the woods, with a hatchet fastened inside his coat, a revolver in one pocket, and several yellow-covered novels in another. He even went so far as to write one, but never found a publisher.

A boy myself, sixteen years old, I enjoy reading the best scientific paper in the world, and recommend it to other lads for its large, clear type and important and interesting descriptions of new discoveries and inventions. When I first subscribed for the paper, four or five years ago, the articles and accounts in it were not as entertaining to me as they soon came to be, yet the day of its coming was looked forward to with eager expectation. Now I had rather give up any other paper than it.

Every week, as soon as it arrives, it is the first thing thought of as a means of profitably employihg an hour. On the title page is found a well executed engraving of some invention, or illustrating some manufacture of general interest. Within the paper we find numerous pictures of other inventions, with interesting descriptions of all; and in every number some topic of natural history is illustrated and described. Upon the first two or three pages are found editorials on various subjects, edifying and valuable to the general as well as the scientific reader. I have been very much interested in the discussion which is going on about the proposed change in the manner of obtaining and keeping patents, expecting some day, perhaps, to join the great army of inventors.

Looking on through its columns we find articles for every class of boys. Those interested in engineering and mechanics here find accounts of achievements in bridge building and road making, the relative values of different woods and metals as building materials, and new improvements in boiler making and ship building. For those who care for the natural sciences, articles are written concerning new combinations and discoveries in chemistry and physics. The accounts of the electric light are very curious and novel, as are also those of recent feats with the telescope and microscope. Boys who take an interest in the progress of our country will now see in your columns descriptions of various American industries, explaining the manner of making or preparing our many staple and fancy articles for the home and foreign markets. While for those who love flowers, horticultnre is discussed in nearly every number, illustrated by pictures of new plants or fine specimens of an old variety.

Thus this paper is both interesting and instructive to all youth, and especially to those who care for the improvement of their minds and for increasing their stock of general information by the addition of valuable thoughts on a great many subjects. The railroad, telegraph, telephone, and all the other grand inventions which have made our nation so famous, are the heritage which will soon fall to the boys of America, and it would be well for them to be thinking what is to be done with it. No real knowledge of the world can be gained from dime novels and story papers. The Scientific American is just the paper for informing the boys of whatever of importance is taking place in the world, and for teaching them how to make use of their great inheritance.

E. O. H.

Self-Luminous Clock Dials.

[By Henry Morton, Ph.D., President of the Stevens Institute of Technology]

My attention having been drawn to the luminous clocks which have recently been offered for sale in several places, I made an analysis of the substance with which their dials are coated, and found it to consist of nothing but the well known phosphorescent compound, sulphide of calcium, attached by means of some resinous medium, like varnish. But while the material in its composition is far from novel, something or other in its method of manufacture and consequent condition gives it such intensity of properties as has never been approached before. The light given out by these clocks is a violet blue, like that which Becquerel produced with aragonite, but Becquerel makes no mention of anything whose duration of luminosity approaches that of these clock dials. In making up some of these preparations I have noticed that out of the same batch some portions will glow by phosphorescence much more brightly than others, so that evidently this difference depends upon some very small structural or molecular variation, and there can be little doubt that it is by some method of securing a desirable condition of this sort that the remarkable efficiency in these clock dials is attained. If still further advances should be made in this direction it is easy to imagine some very wonderful results, before which even Mr. Edison's new electric burner will fade into insignificance. Thus, if our walls were painted with such a substance, they would absorb light enough during the day to continue luminous all night, and thus render all sources of artificial light useless, superseding even the new electric burners, no matter how little they might cost, for it would then only be necessary to provide curtains, which could be drawn over the walls, like shades over windows, when darkness was desired. The coloring of houses on the outside with a like material would also evidently obviate the need of street lamps. I do not, like some of Mr. Edison's friends, in reference to his new electric burner, expect that this still more remarkable and economical source of light is certain very shortly to displace gas and all other sources of artificial illumination, but if conjectures are to be the order of the day, I do not see why this conjecture is not as good as many others which have been made. Seriously, this new form of the phosphorescent sulphide of calcium, made of the cheap materials, sulphur and lime, is a truly wonderful substance, which may well suggest strange possibilities for the future. In the cabinet of the Stevens Institute are numerous specimens of phosphorescent powders—sulphides of calcium, bar um, and strontium—which represent the best products heretofore obtained. These, if exposed to strong sunlight or to an electric discharge, or the like, will glow for many minutes in the dark. One of these clocks, however, I found would continue to glow with sufficient brightness to be visible across a room all night, and could be read at any time if approached closely. After being shut up in a box for five days, this clock was still visible in total darkness, when the eyes had been rendered sensitive by remaining in the dark for a few minutes. This clock dial is also readily "excited" by lamplight or gaslight, or indeed by any source of light containing rays above the yellow of the spectrum. The light from a Bunsen burner with soda in the flame, if filtered through yellow glass, will not excite it, however, but if the yellow glass is omitted, the blue rays of the Bunsen burner flame will serve to excite the phosphorescence of this remarkable material. The cause of this action is believed to be somewhat as follows: When light falls on certain bodies its vibrations cause molecular changes which are not permanent, but are only maintained by the action of the "exciting" vibrations, somewhat as a mass of plastic substance can be kept in a soft condition by constant stirring. When the exciting cause is removed, the molecules return to their normal positions, and in so doing, set up vibrations which are the cause of light, very much as the solidifying of water evolves heat. Thus these bodies, when exposed to daylight, absorb as it were the light energy, and re-emit the same afterwards. The phosphorescent property of sulphide of calcium has been known since 1768, when Canton prepared it by heating together intensely for an hour three parts of calcined oyster shells with one part of sulphur. Its properties in this relation have been elaborately studied by Becquerel, who published his researches in the "Annales de Chimie et de Physique," and has also devoted a large part of the first volume of his book, "La Lumiere," to this subject. He found that by employing lime in different forms, such as Iceland spar, marble, oyster shells, aragonite, etc., products emitting different colors by phosphorescence, such as orange, yellow, green, blue, and violet, were obtained.

Common Sense.

The *U. S. Economist* tells its readers that common sense is paradoxically an uncommon gift. It is symmetry of mind, of character, and of purpose in the individual combined. It represents man in completeness, harmony, and equipoise. It clothes him with dignity, invests him with power, and stamps him with superiority. That it is not genius, for that is often erratic; nor cunning, in its sinuous course; nor tact, with its decline into trickery. Common sense is the embodiment of true manhood. It confers a patent of royalty, though birth be plebeian, and exalts men from lowliest spheres to the highest stations. Not by sudden freaks of fortune or a train of adventitious circumstances are they thus dignified, but step by step, through obstacle and hinderance, they overcome by the force of character and the proper direction of the will power. Common sense is a tremendous force in this lower world. Its power is felt and acknowledged through all the ramifications of governments, society, business, finance, science, and commerce. In fact it is the history as well as the true philosophy of the ages. It is the salt that has saved humanity from barbarism, and the moving power that has propelled the race onward in its march of progress and civilization. Rulers who have possessed this gift have governed with moderation, firmness, and justice, and their reign has proved a blessing. Merchants upon whom this talent rested have worked their way up from narrow fields and small beginnings to circuits of trade as wide as the continents of the globe. It gave them the true conservatism needful to successfully accomplish their plans, and bestowed upon them the caution that kept them from too hazardous ventures. It has made more money kings than were ever crowned at lottery schemes, and gave bankers a wealth that speculation could never furnish. It is the only architect of abiding fortunes, and the true test of all financial skill. It promotes commerce, fosters trade, builds up industries, and is the conservator of public peace and morals. In the realm of business it produces no panics, in governments no disorder, and in society no tumults.

In individual characters marked differences are discernible. The weak, timid, and irresolute are in contrast with the strong, daring, and energetic. The voluble are full of conceit and bluster, the sensible, silent and uncommunicative. A man possessing common sense knows how to govern his tongue and let his acts speak instead of words. The most profuse talkers are generally those possessing the least brains, while words seasoned with wisdom fall from the lips of those who are silent until the occasion demands their utterance. The wise merchant keeps his own counsel, the skillful financier conceals his plans, and prudent men of business conduct their affairs in steady grooves that run without noise or friction. Common sense makes no parade, has no holiday attire, struts in no peacock plumes, and comes out in no sham display. It needs no aids to have its worth discovered, no outside support upon which to lean. It forms its own groundwork, erects its own superstructure, and builds after its own model. It is substance without shadow, success without failure, and victory without defeat. In the outcome it wins, when trickery, cunning, and tact have failed. It is generally allied with truth and honesty, and on all great moral questions is found on the right side. History is full of brilliant men who, like comets, have blazed awhile in glory and then through lack of sound wisdom made shipwreck of their lives. It is seldom safe to write autobiographies, as a man's character is not complete until his death. The men who have died in the midst of their labors, full of years and full of honors, are those who possessed the great gift of sound practical wisdom. Common sense is the philosophy of life in harmonious action.

Alleged New Preserving Agent.

In the course of a series of experiments made by Mr. H. Jannarch for devising a method of separating the crystallizable sugar from the molasses, a double salt of borate of potassium and sodium was accidentally formed, which exerted an antiseptic influence on the sugar. Further experiment showed this salt to be a most powerful antiseptic agent. It is now being made in larger quantities by dissolving in water equal quantities of chloride of potassium, nitrate of sodium and boric acid, and evaporating to dryness after filtering. The salt obtained is, of course, not a pure borate, but a mixture of potassio-nitric borate, potassium nitrate, and sodium chloride. Its action is very prompt and continues undiminished for a very long time. It has no injurious effect either as regards taste or smell or healthiness of the substances impregnated with it. It is easily soluble in water and quite deliquescent, so that it has to be kept in closely stoppered bottles. It is at present sold for 25 cents a pound.

In Germany it has been extensively used already by butchers, sausage makers, tanners, etc.; but its most important use is at present in the manufacture of butter and cheese from sweet milk. When butter is made from sweet milk in the ordinary manner, the milk must be kept very cold; when the "preserving salt," as it is called in Germany, is used, the milk may be kept at ordinary temperature without souring the remaining sweet milk may be worked up into a superior quality of cheese. If 15 grs. of the salt are added for each quart of milk, the latter will keep sweet for at least a week Fresh meat, game, etc., may be prepared by dipping it into a solution of 1 pound of the salt in 6 pints of water. When the meat is intended to be kept for a very long period, the meat is rubbed in well with the powdered salt in the pro portion of 1½ drachm to each 2 pounds of meat. In twenty-four hours the impregnation is completed, and the meat only needs to be dried. A piece of meat prepared in this manner in January, 1877, was in perfectly good condition in January, 1879. For pickling the meat is prepared in the same manner and then placed between layers of a mixture of 2 lb. of common salt, ½ lb. preserving salt, and ¼ lb. of sugar. In this way the largest hams can be salted in four days. For preserving skins, from ½ to 2 lb. are used, according to size. Eggs are placed for 15 minutes into a solution of 1 oz. of the salt in a quart of water. To preserve beer, wine, etc., it is sufficient to rinse the bottles, previous to filling them, with a solution of the salt in the proportion of 1 : 10, and adding to the beverage itself 8 grs. per quart. For fish, lobsters, oysters, fruit, and vegetables the preparation has also been used with the best success.—*Deutsche Gewerbe-Zeitung.*

The Origin of Existing Floras.

In a report to the Royal Society, Baron Ettinghausen says that all the existing floras of the earth are the descendants of the plants which constitute the Tertiary flora. The Tertiary strata contain the original species of the recent floras and plant forms of all parts of the globe. Moreover, in each of the recent floras are to be perceived the elements of their common origin. They have, nowever, been more or less changed, and have developed into manifold forms. The fossil plants, according to the Baron, vary more than the living ones, the varieties of the fossil plants corresponding with what are now regarded as species. The varieties, for instance, of the fossil pine, called *Pinus palæostrobus*, so entirely correspond with many of the recent species of *Pinus*, that the former must be regarded as the original forms of the latter. The Eocene flora of Great Britain, to which the author has given special attention, is remarkable for a series of ferns of tropical character. These have been discovered at Bournemouth, Bovey Tracey, and elsewhere.

Vibrations of the Plate of a Bell Telephone.

Experiments have been made by M. Henri Dufour to determine the vibrations of this plate. The first method employed consisted in transmitting the vibrations to a gas flame. For this purpose the wide-mouthed bell of the telephone was replaced by a cylindrical one of small capacity. A cork, pierced with two holes through which passed two kneed tubes of glass, bounded within the cylinder a sort of little chamber comprised between the front face of the vibrating plate and the hind face of the cork. The illuminating gas entered through the first tube, and issued, forming a small flame, at the extremity of the tapering second tube, so that the whole constituted something analogous to the manometric capsules which M. König places upon the pipes. Every vibration of the plate was betrayed by a movement of the flame when the induced currents employed were those produced by a small Dubois-Reymond coil, even when the exterior coil was at two centimeters from the extremity of the inducing coil. The currents produced by the voice in a second telephone caused no variation in the height of the flame. The result was equally negative when a small mirror was borne on a kneed lever with its end resting on the vibrating plate. A ray of light reflected by the mirror did not appear to be displaced under the influence of the vibrations produced by the voice. Finally, M. Dufour tried to produce colored rings between the vibrating plate and a lens placed upon it. For this a very thin piece of glass was placed upon the vibrating plate, in contact with the slightly convex lower face of a lens. The sounds were transmitted by the instrument, although weakened. The colored rings were observed through a telescope furnished with a reticule. The displacement of a bright ring to the following dark one was produced by a difference in the thickness of the stratum of air equal to a quarter of a wave-length; that is to say, a change in the position of a yellow ring will be ascertained for about 0 000143 millim. displacement of the plate. This displacement is manifested by a diminution in the distinctness of the rings, which oscillate about their normal position. The displacements are observed very distinctly by employing the induced currents of a Dubois-Reymond coil, but it has not been possible to verify them for the currents produced by the voice.

Having heard it said that two telephones, the localities of which have very different temperatures, do not work well, the author desired to put the matter to the test by direct experiment. One of the instruments was left during several hours exposed to a temperature of — 18°, while the other passed the same time in an inclosure heated to 40° C. The two instruments put in communication transmitted speech perfectly. As soon as the telephone was employed on the telegraph lines the action was remarked which is exerted upon the instrument by the currents used to work the Morse apparatus, and passing in wires near that which connects the two telephones. This action is attributable to induction phenomenon. M. Dufour tried to ascertain the distance at which an intermittent current can produce an appreciable current in the telephone. Two copper wires, perfectly insulated, were stretched parallel over a length of 15·2 meters, and at distances varying between 15, 35, and 45 centimeters. One of the wires joined the battery and the manipulator with the receiver of a Morse apparatus; the earth line was formed by the gas pipes. The two extremities of the other wire communicated directly with the telephone. The current employed produced a deflection of 60° on a telegraph needle. Under these conditions all the motions of the manipulator were distinctly perceived, and the author is persuaded that a telegraphist would have understood the signs produced by the manipulator, even when the distance between the two wires was 45 centimeters. It may hence be concluded, therefore, that on telegraph lines the noise heard in the telephone when a message traverses a neighboring wire may be attributed, at least in part, to induced currents.

This experiment may have a certain interest in the lecture room, to show at what distance an induced current can be produced. In this respect the telephone is much more sensitive than the galvanometer.—*Electricien.*

Ground Honey.

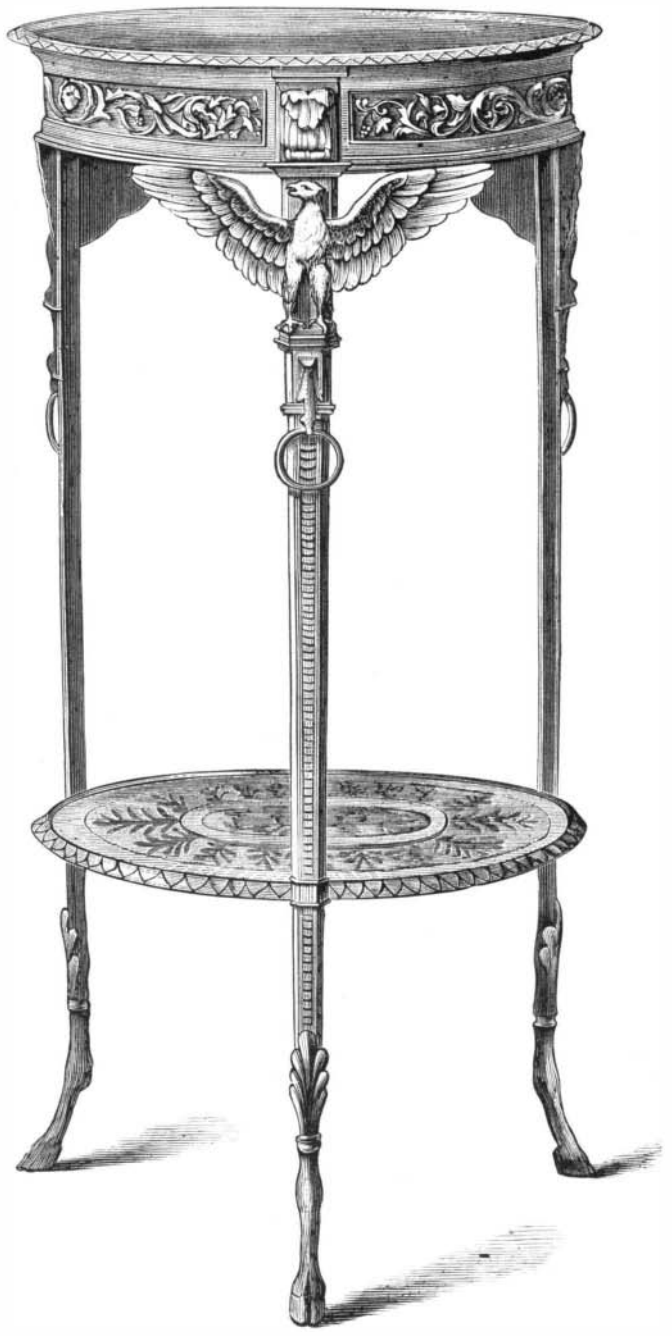
M. Pierre Arnoux, lately traveling in Abyssinia, discovered in small cavities in the soil a species of honey without wax, produced by an insect resembling a large gnat. Examined by M. Vielliers, this ground honey was found to have the following composition: Water, 25·5; fermentable sugar, 32; mannite, 3; dextrine, 27·9; ashes, 2·5; diverse matters, 9·1; total, 100. The undetermined matter contained a small proportion of some acid principle, the nature of which M. Vielliers had not been able to make out. The composition of this honey resembles that of the manna of Sinai and Kurdistan, formerly analyzed by M. Berthelot, that of the sugar found in the leaves of the plane tree by M. Boussingault, as well as that of ordinary honey. It is, however, distinguished from all those substances by the total absence of cane sugar. In Abyssinia this substance is collected by the natives, and used as a remedy for affections of the throat.

Morning Mirage.

A characteristic phenomenon in Dakota is the morning mirage, seen on the prairies just before sunrise in clear, cold, still weather. At such times wide reaches of country ordinarily cut off from the view by rising ground or belts of timber will be raised, as it were, above these obstacles. Towns and other prominent objects, 20 miles away, are no longer invisible, but are clearly revealed, with all that lies between them and the spectator. The windows may be counted in houses which at other times can no more be seen than if they were at the antipodes, and near objects, usually just within the range of vision, seem to be brought much closer. As the sun's orb rises above the horizon the vision sinks below it.

FINE CAST IRON WORK.

The annexed engraving shows a specimen of iron castings for a table. It has many details of ornament, and exhibits the application of the best style of modern art to such decorative objects.



ORNAMENTAL CAST IRON TABLE.

The design is founded upon classical types adapted to Renaissance ornament. This specimen is from a series of designs carried out in metal by the firm of E. G. Zimmermann, of Hanau (Hesse Nassau).

Preventing Seasickness.

Of the many annoyances to which the traveling public is subject at this particular season, seasickness is, perhaps, the most distressing. A perfect cure for this malady would rob ocean travel of half its terrors. No drug, however, has been discovered which acts as a specific. The cause of the sickness is largely, if not wholly, due to the involuntary and unexpected motions to which the passenger is subjected on board ship. These cause undue pressure upon the stomach and liver, and derange the action of those organs. To prevent this, attention has recently been called to an old plan, which is said to be very successful. It consists in regulating the act of breathing according to the pitching or rolling of the vessel, drawing in the breath as she rises, and breathing out as she falls into the trough of the waves. After a little experience the practice, it is said, becomes involuntary. When seasickness has fairly set it, the only thing to be done is to get rid of the extra bile thrown into the circulation, and to allay the irritation of the stomach. For the latter, brandy is the popular remedy, but cool, effervescing drinks are preferable. Champagne is recommended as the best medicine to subdue nausea, and give the necessary tone to the system.

The Argan Tree.

In his account of his recent travels in North Africa, Sir Joseph Hooker, the eminent English botanist, describes the argan tree as in many respects the most remarkable plant of South Morocco; and it attracts the more attention as it is the only tree that commonly attains a large size, and forms a conspicuous feature of the landscape in the low country near the coast. In structure and properties it is nearly allied to the tropical genus *Sideroxylon* (ironwood); but there is enough of general resemblance, both in its mode of growth and its economic uses, to the familiar olive tree of the Mediterranean region to make it the local representative of that plant. Its home is the sub-littoral zone of Southwestern Morocco, where it is common between the rivers Tensift and Sous. A few scattered trees only are said to be found north of the Tensift; but it seems to be not infrequent in the hilly district between the Sous and the river of Oued Noun, making the total length of its area about 200 miles. Extending from near the coast for a distance of 30 or 40 miles inland, it is absolutely unknown elsewhere in the world. The trunk always divides at a height of 8 or 10 feet from the ground, and sends out numerous spreading, nearly horizontal branches. The growth is apparently very slow, and the trees that attain a girth of 12 to 15 feet are probably of great antiquity. The minor branches and young shoots are beset with stiff thick spines, and the leaves are like those of the olive in shape, but of a fuller green, somewhat paler on the underside. Unlike the olive, the wood is of extreme hardness, and seemingly indestructible by insects. The fruit, much like a large olive in appearance, but varying much in size and shape, is greedily devoured by goats, sheep, camels, and cows, but refused by horses and mules; its hard kernel furnishes the oil which replaces that of the olive in the cookery of South Morocco, and is so unpleasant to the unaccustomed palate of Europeans. The argan averages about 25 feet in height, and covers a space of 60 or 70 feet in diameter. Sometimes goats were seen feeding on the fruit, much to the amusement of Sir Joseph, who had not been accustomed to consider the goat as an arboreal quadruped. Owing to the spreading habit of the branches, which in the older trees approach very near to the ground, no young seedlings are seen where the trees are near together, and but little vegetation, excepting small annuals; but in open places, and on the outer skirts of the forest, there grows in abundance a peculiar species of thyme (*T. Broussonnetii*), with broadly ovate leaves and bracts that are colored red or purple, and the characteristic strong scent of that tribe. It is interesting to the botanist as an endemic species, occupying almost exactly the same geographical area as the argan. It is replaced in the interior of the country by an allied, but quite distinct, species. Its penetrating odor seems to be noxious to moths, as the dried twigs and leaves are much used in Mogador, and found effectual for the preservation of woolen stuffs.

The First Experiences of the Japanese with Statical Electricity.

The following is from Mr. E. Clark's "Life and Adventure in Japan." The author lived in Japan from 1871 to 1875, and was in the service of the Japanese Government. He describes the Japanese as being very fond of anything practical, and as being delighted with anything in the shape of experiment, even, apparently, when practiced upon themselves: "I never witnessed a more ludicrous sight than the effects produced upon the Japanese by some of my experiments. The innocent manner in which they stepped up to the various electric machines, and did whatever they were told, was only excelled by the dumb astonishment or the frantic yell with which they received the electric shock. No visible effect, however great, upon the first who wanted to take hold was sufficient to restrain the intense curiosity of those who wished to follow. They wanted to feel for themselves, and their ambition was usually satisfied after one trial. Two of the governors took a 'spark' from one of the machines, but the third was very dignified, and would not deign to come up to the table, as it was contrary to strict etiquette. So I politely offered to bring him some electricity in a bottle. He doubted whether that could be done. In order to dispel his doubts, and also to bring him down to the level of ordinary mortals, I took a large Leyden jar, which I charged full of electricity, and brought it to him with good grace. He looked at the jar, and seeing nothing in it, concluded to touch the brass knob at the top. The effect may be better imagined than described, only he didn't show any more dignity or touch any more jars that day."

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PROTECTING POLISHED IRON SURFACES.—A correspondent states that a varnish, consisting of beeswax dissolved in benzine, is an excellent protector for polished iron surfaces. It is also a good varnish for patterns.