For the Scientific American.

Theories of Electricity.

Many theories have been, in the course of time, proposed to explain the ordinary phenomena of electricity.

1. A. C. 600. THALES of Miletus, perceiving the attractive power exhibited by amber, ascribed to it the functions of an animated being. Apulius affirms that, he discovered the "wonderful cause of thunder."

2. A. D. 1599. WILLIAM GILBERT of Colchester, Eng., physician to James I., has been styled the father of modern electricity. In his time, the phenomena of magnetism were accounted for by means of emanating effluvia, and he applied the same theory to the explanation of electrical attraction, which he considers similar to the attraction of cohesion.

3. A. D. 1605. the Jesuit CABEUS supposed that the steams which issue from amber, when heated by friction, "discuss and expel the neighboring air; which, after it has been driven off a little way, makes, as it were, a small whirlwind, because of the resistance it finds from the remoter air, which has not been wrought on by the electric steams, and that these shrinking back swiftly enough to the amber, do, in their returns, bring along with them such light bodies as they meet with in the way."

4. A. D. 1629. According to the hypothesis of Sir KENELM DIGBY, "electrical attraction is made by tenuous emanation or continued effluvium, which after some distance extracteth into itself, as is observable in drops of syrups, oil and seminal viscosities, which spurn at length, retire to their dimensions. Now these effluviums advancing from the body of an electric, in their sphere or circle of their continuities; and these they do not only attract, but with their viscous arms, hold fast a good while after. The amber is made to emit these effluviums or files of unctuous steams by being chafed or heated. The reason they do not impel and protrude straw before they can bring it back, is that the effluvium, passing out in a smaller thread, and more enlengthened filament, stirreth not the bodies interposed; but returning into its original, falls into a closer substance and carrieth them back into itself. "This theory was embraced by Dr. Thomas Browne, who says, "flame is not attracted, for fire consumes the effluxions." "The motion of the attracted particles is performed by the breath of the effluvium issuing with agility; for as the electric cooleth, the projection of the atoms ceaseth.

5. A. D. 1630. PETER GASSENDI, the French philosopher adopted the same crude hypothesis, and supposed that "these electrical rays being emitted several ways, and consequently crossing each other, get into the pores of straw, and by means of their decussation, takes the faster hold of it, and have the greater force to carry it along with them, when they shrink back to the amber whence they are emitted.

6. A. D. 1645. As the preceding theories are unapplicable to glass, the great RENEDES CARTES attempted to account for eleetrical attractions, by supposing certain particles, shaped like small pieces of ribbon, to be harbored in the pores or crevices of glass, and to be emitted by friction, like the effluvia of amber.

7. A. D. 1680. The ingenious ROBERT BOYLE supported the hypothesis of emitted and extracted effluvia, and replied to the objection of Cartes, by remarking that "a stinking odor" is actually emitted by glass, when two pieces of it are dexterously rubbed together.

The effluvial theory ended with the seventeenth century. "Let him also tell me," says Newton in his 27th query, "how an electric body can by friction emit an exhalation so rare and subtle, and yet so potent, as by its emission to cause no sensible diminution of the weight of the electric body, and to be expanded through a sphere whose diameter is above two feet, and yet to be able to agitate and carry up leaf copper or leaf gold, at the distance of above a foot from the electric body?" Previous to 1700, all effluvia were supposed to return to the bodies whence they had been emitted; because they could not otherwise account for the fact, that such substance were not sensibly wasted by emitting effluvia. But when the subtility of light was demonstrated, and that of the effluvia of many bodies was better understood, philosophers gave up the docrine of the return of effluvia, both with regard to electricity and other subjects.

J. W. O.

An American Prime Meridian.

Mr. G. W. Blunt, has in the Journal of Commerce taken sides against the proposed change of the Prime Meridian—reckoning from Greenwich London—suggested by Lieut. Davis, as noticed by us before, at the late convention of the American Scientific Association. The merchants and shipmasters of Boston have also come out against the proposed change. The arguments of Mr. Blunt are unanswerable. He says "if the change is adopted all communications between English and American vessels, and for a long time between American vessels with each other—as the common practice now is for navigators at sea to communicate to each other their longitude, an exceedingly useful practice, often leading to the correction of otherwise fatal errors, under the new order of things, "the failure to give the reckoning as from Greenwich or New Orleans, or to hear or understand it rightly when given, may involve ship, cargo and navigators in one common ruin." A portion of the charts used by U. S. navigaters are and must continue to be of English construction, and consequently marked with the longitude of Greenwith. To reduce this to an American standard, upon a sudden emergency, is here held to be pregnant with present evils, if not absolute danger.

Against all this perplexity and mischief there is not a single countervailing advantage, but the proposed change "is suffered to rest upon a supposed scientific necessity and upon considerations in some way connected with our national honor, the change would be only nominal; that there is no good reason for abandoning the Greenwich meridian, or any other of the common property of civilization—and, in a word, goes dead against the whole project.

American Tea.

Mr. Smith, whose operations with the tea plant, we have noticed before in the Sci. Am., and who has planted his sprouts in S. Carolina, expects to raise good tea in this country. He estimates the annual consumption of tea in the United States to be eleven millions of pounds, in Europe, fifty; total sixty-one millions. China produces over nine hundred millions of pounds, of which the Chinese export only about seventy millions. An acre of land will produce 547 pounds; consequently the cultivation of 20,109 acres of land in the fourteen tea-growing States will supply the consumption of the United States. To supply Europe would require 91,411 acres of land. He supposes that there are fourteen of our States that would grow tea, and that 111,520 acres of land, cultivated as tea plantations, averaging 7,965 for each of the fourteen States, will supply the consumption of the article both for Europe and the United States. The experiment Mr. Smith is engaged in is a highly interesting one, and will be attended with vast benefits to the country if completely successful.

A few years ago, there was no tea grown but in China, and indeed this is the principal country where it is grown yet, and where we get all our supply; but there is no good reason to suppose that tea equally as good as the Chinese, may not be grown in many other countries, and pursuing this idea, some English capitalists, have established tea plantations in the East Indies, which are in successful operation, and are now supplying Thibet, and will soon supply Chinese Tartary herself with tea. The United States can supply herself with tea of home growth, at a much cheaper rate than to bring it from Canton.

Charleston Artesian Well.

The Artesian Well at Charleston is still pursued, notwithstanding the discouraging facts which were recently published. It is now 905 feet deep. The scientific men state some facts in the Charleston paper, which have revived their confidence in its eventual success.

To Separate Nickel and Cobalt from their Oxides.

The mixture of the oxides is submitted to the action of a solution of cyanide of potassium with the application of heat, taking care that the cyanide is free from cyanate. The solution is boiled to drive off the excess of acid; at the same time the cobalt-cyanide of potassium is changed into cobalted-cyanide with disengagement of hydrogen. If there be then added to the hot solution oxide of mercury in fine powder, the nickel will be promptly precipitated one part of it in the state of oxide, and the other part in the state of the nickel in the solution. This precipitate washed and calcined, leaves oxide of nickle perfectly free from cobalt. The cobalt remains in solution is then supersaturated by acetic acid, and the cobalt precipitated by the adition of sulphate of copper.—This precipitate is a cobalted-cyanide of copper, containing for three eqivalents of copper ten equivalents of cobalt; on treating it by potash, the cobalt is re-dissolved, and becomes a cobalted-cyanide of potassium, and there rests only the oxide of copper, the quantity of which enables us to calculate the proportion of cobalt. The quantity of cobalt may also be ascertained by taking the precipitate, re-dissolved in hydrochloric acid, with the adition of a few drops of nitric acid, and then precipitating the copper by sulphuretted hydrogen, and the cobalt by caustic potash. This method is much more simple, when the total weight of the two metals or the two oxides are known, and when we are satisfied to determine the exact quantity of nickel, and calculate the cobalt by the difference.

[The above is valuable to minerologist,

The Solubility of the Oxides of Iron, Copper and Cobalt by Caustic Potash.

The oxides of copper and of cobalt dissolve in large quantities in caustic potash, so much so that we can even employ the solution of this first-named oxide to determine small quantities of grape sugar mixed with cane sugar, which reduces the deutoxide of copper to the state of protoxide.

The solution of the oxide of copper in caustic potash may be diluted with water, without a separation of the oxide of copper. When it is evaporated to dryness, a deep blue mass is attained, which dissolves in water, communicating to the liquid a beautiful green color. When a current of chlorine is passed through a solution of oxide of copper, in caustic potash, the liquid assumes a deep green, but the moment that the alkali is completely saturated with chlorine, the combination which was formed is decomposed, the oxide of copper is precipitated, and chlorine disengaged. In making use of the apparatus invented by M. Liebig, for the determination of carbonic acid, M. Volker of Berlin found that the solution of caustic potash employed, which at first was quite clear, contained after the passage through it of carbonic acid, a brown floculent precipitate of oxide of iron. Some direct experiments made with a concentrated solution of caustic potash and oxide of iron, recently precipitated, confirmed the nature of this substance; consequently, M. Volker recommends, for the separation of alumina and oxide of iron, a solution of caustic potash, and moderately concentrated (if the solution be too diluted, the alumina will be but partially dissolved.)

New Galvanic Battery.

Proff. Stohrer of Leipsic, makes a powerful and compact battery as follows. He employs zinc, and charcoal cylinders. The cylinders are composed of coal and coke in powder, well mixed together, to which is added a sufficient quantity of coal-tar, to render the mass of a consistence suitable to be moulded. When dry, the cylinders are placed in a muffle and submitted to a white heat, every variety of shape may thus be obtained, and this substance would appear especially of service for sharp or pointed surfaces, as well on account of its durability as for the perfect homogeneousness of its grain. The zinc element in M. Stohrer's battery is amalgamated to prevent the rapid consumption of metal, which would otherwise take place. With a battery of 2 3-4 inches in height, and cylinders of about 5 inches in diameter, an iron wire of the thickness of an ordinary sewing-needle may be melted, as also a watch-spring; it will communicate a magnetic power capable of sustaining 220 pounds. M. Stohrer makes use of electro-magnets thus formed, to form the steel magnets of the electro-magnetic machines of his construction.

Social Importance of the Working Classes.

The three elements of the resources of the great commonwealth are labor, intelligenee, capital; the last is gathered and administered by the wealthy; the second is contributed by the gifted and studious; but the first great contribution of endless toil is supplied by the working classes. There are they in your fields and your mines, your factories and your ships, your warehouses and your workshops, giving an amount of manual and physical effort which no nature, no patience but that of men bred to labor, could sustain. Hardly less consumers than producers, they form that great elastic power in the community which endures privation and adjusts demand and supply. Amidst scarcity and high prices, their unavoidable privations diminish consumption; and amidst plenty and cheapness, their increased enjoyments restore the remuneration of capital and the profits of trade. In national policy their judgment, once enlightened, would have immense force and equal value—their voice raised in favor of religion, peace, rational liberty, and just government, irresistible.

Turkish Character.

It was said by Gibbon, most truly, that the Turks have, since the period of the Conquest, encamped, not settled in Europe. They amount to a fourth, or a third, at the utmost, of the population, of that part of the Sultan's dominions. They are scattered in very unequal proportions over its surface. In some parts they form a torably thick agricultural population. In others, as at Constantinople itself they are engaged in the trades and manufactures of a large city. But nowhere do they exercise those extended operations of skill and thought, which bring men together, cause them to rely on each other, give them the habit of combined peaceful action, and impart to them the intelligence and the energy on which alone a strong commonwealth is built up. The Armenians are their bakers; the Jews their dealers; the Greeks their merchants. The very organization of the people seems to have denied them those finer qualities, both metal and corporeal, which fit men for the superior branches of industry. A Turk's fingers, Dr. Walsh quaintly observes seems all to be thumbs; he has no manual deqterity for any delibate employment, and his mind is as unfit for subtile operations as his body. The Turks neither write nor print (with the exception of bombastic poetry, and more bombastic history.) They do not build, but destroy. They show no wish to adorn the soil which they inhabit, or to connect, in any way the existence of the present generations with posterity. Their object in this world seems to be mere animal existence, as completely as that of the beasts of the field. The religious sense is deep, enduring exalted, but it is a religion which deadens and stupifies intellectual facilities.

Botany of the Platte River.

Dr. Ormsby writing from the Platte River says "the whole valley of the Platte is rich in new and most interesting flowers. but very few of which had ever before been seen by the emigrants. Several species of the Cactus are found in great abundance. One in particular is truly beautiful, growing in the shape of a pear, surmounted with a beautiful large purple flower. The whole plain furnishes a most ample field for the speculations of the Botanist."

Ship Building in Newark, N. J.

The Oliver J. Haynes, a fine bark of 430 tons, built at C. C. Joralemon's shipyard at Belleville under the superintendence of Capt. Francis Scott, for the Buenos Ayres trade was launched at 10 o'clock Monday morning. She will be one of the finest vessels in the trade and is to be fitted up in a superior style for passengers. Her lenth is 120 feet; breadth of beam, 28 feet; depth of hold 14 feet and 9 inches.