

Correspondence.

The Editors are not responsible for the opinions expressed by their Correspondents.

Crystallization of Antimony.

To the Editor of the Scientific American:

In your issue of June 22d, 1872, the interesting article on "Metallic Crystals" induces a small contribution on the part of one who, though not a deep or scientific student, has seen much to admire and venerate in the wonderful effects of laws originated and maintained, constant in power and truthfulness, by the Ruler of the Universe.

On one occasion, I was exhibiting to a friend the peculiar and wonderful action of antimony in a state of fusion cast on a plane surface; this is well known as an interesting chemical experiment, but it is not generally known that, just before fusion, the fragment of antimony is in a condition to deposit crystals of exquisite beauty and variety; some little skill in manipulation is requisite, but I have found results invariably under the following conditions: Take a small bit of the metal (in condition usually obtained from any extensive dealer in metals), weighing about two or three scruples, place it on a bit of charcoal with the broadest surface away from the flame of the blowpipe; heat it by commencing at the side nearest the lamp, and gradually working over to the broad side, getting the whole into a state of red heat; do not allow fusion. After it has been maintained at a red heat for two or three seconds, a dense, yellowish smoke will be observed to emanate from the broad side of the fragment; keep the metal hot for about one or two seconds after this smoke has made its appearance; then discontinue the heat and allow the fragment to thoroughly cool, when the broad surface will be found covered with a coating of the most delicate crystallization, which, examined under moderate microscopic power (75 to 100), will show an array of beauty and variety seldom equalled. The formation of the crystals may be clearly seen by the naked eye while the metal is cooling, but only as a dense forest of brilliant, diamond like points; under the microscope, they are seen to be transparent and somewhat polariscopic, having the shape of crosses, spears, peculiar shaped flowers, fans, etc. What the substance is that forms the crystals I cannot say, but a chemical friend suggests that it may be antimonious acid.

Another beautiful object for the polariscope is saturated aqueous solution of chloride of mercury (corrosive sublimate). About one dram may be put into a small vial (those used by homœopaths are best, say a two dram vial) and fill with water (distilled water is best). It is immaterial whether the water takes up all the chemical or not; indeed the shortest way to obtain a saturated solution is to have more of the chemical than the water will dissolve. Put a drop of this solution on a glass slide, and pass it a few times through the flame of a spirit lamp to facilitate evaporation, and the crystals resulting will be found, under the polariscope, gorgeous in color and beautiful in shape. Too much heat will result in disappointment.

I would add, in reference to the antimonious crystals, that they may be produced by making a small cavity in the charcoal and laying a flat piece of the metal over it, directing the flame from the blowpipe down on to it, as nearly perpendicular as possible; this gives a copious deposit both in the cavity and on the under surface of the metal; but I have not found them so interesting nor quite so pure in color as those produced in the mode first described. In breaking up a lump of the metal some of the pieces will assume a somewhat triangular form; these are the best to use without an excavation in the charcoal. Do not allow the metal to fuse, and watch carefully for the peculiar smoke.

J. DE WALDEN CHURCHILL.

Buffalo, N. Y.

Sea Sickness in Railroad Cars.

To the Editor of the Scientific American:

In your paper of June 15th, there is an article on sea sickness from riding in railroad cars, in which the writer says he cannot tell why he with others "was made sick, when there was no pitching or rolling motion to the cars." My theory of sea sickness is, not that we are made sick from the pitching and rolling motion alone, but from a combination of both, together with the sudden stopping of either motion. When we rise on to the crest of a wave, we take an upward motion, and when we sink into the trough of the wave, we take a downward motion, and there is a moment in each case when there is a sudden stop or almost a dead point (as in the case of the engine), reversing the mechanical action of the stomach and other viscera, causing a whirl of the brain, thus affecting the whole system.

Windsorville, Conn.

C. LEAVITT.

An Invention Wanted.

To the Editor of the Scientific American:

It must be admitted by all persons who have given the matter serious thought that a great desideratum of the age is a clean and durable material for covering floors of dwellings. Carpets are certainly far from meeting the want, as they collect dust and impurities which are exceedingly injurious to the lungs of those sweeping them.

Some material susceptible of being manufactured in pleasing designs, which will be agreeable to the tread, durable, and not too expensive, would meet with very extended sale.

San Francisco, Cal.

GEORGE TASHEIRA.

RED ANTS, if made angry, discharge a very pungent acid substance, called formic acid, "formica" being the word for ant. If these ants are distilled, a substance is produced so burning that, if it is dropped on the skin, it eats into it like fire. It is also derived from the stinging nettle.

[For the Scientific American.]

THE GATLING GUN. DOES HISTORY REPEAT ITSELF?

A writer, over the signature "S." under the head of "Notes and Queries," in the SCIENTIFIC AMERICAN of June the 18th, says: "In Littell's Diary, under date of January, 1690, mention is made of an expedition being fitted out against Ireland, and amongst the munitions taken are four of the new invented wheel engines which discharge 150 musket balls at once, and, turning the wheel, as many more; they are very serviceable to guard a passe." And the writer asks the question; "Does history repeat itself in this instance, and is this the forerunner of the Gatling and mitrailleur guns of all kinds?"

Many persons write upon subjects they do not understand. But this does not account for the habit some writers get into of depreciating the value of the labors of modern inventors by hunting up some ancient and obscure allusion to something that the writer (with the modern invention before his eyes to give him the idea) supposes may have been like what that he now sees. As to the case in point, it may be truly said the Gatling gun is not a "wheel engine," nor does it discharge 150, nor even 10, balls "at once." If it did, it would already have become a gun of the past, like your correspondent's antiquity, instead of promising to be the weapon of the future, as it now does.

The Gatling gun was designed expressly to secure continuity of fire. It loads itself, and fires one shot at a time, but it delivers its fire in rapid succession, at the rate of over 400 shots in a minute. Persons who are well acquainted with the history of firearms do not need to be informed that in past ages many engines of warfare have been invented which discharged a number of balls in a volley, or "at once."

Connoisseurs of the subject well know that none of these crude old ideas developed any of the essential features of the Gatling gun, which differs in principle, in method of operation, and in construction, from anything which has preceded it.

The Gatling gun is a repeating firearm, consisting of a cluster of barrels, or rather of breech loading guns, grouped about a central shaft to which they are attached and together with which they all revolve; each barrel is furnished with its own appropriate lock which revolves with the inner breech and barrels; moreover, each lock not only revolves, but moves forward and back at each and every revolution of the gun. A single stationary cam provided with inclined planes, contained within the casing of the gun, operates the breech mechanism of all the barrels, opening and closing their breeches as they successively come within its range so as to allow the cartridges to drop one at a time into line with the barrels and then be forced into their rear open ends. A single stationary cocking device effects the firing of each barrel in turn. In fact, the main characteristic of the Gatling gun is that it consists of sets of three parts, namely: locks, inner breech and barrels, all revolving at the same time; and a remarkable feature of the arm is that it cannot be loaded or fired when either of these three parts is at rest. The gun is supplied with metallic cartridges, which are of modern origin, from "feed cases" or "feed drums" through a kind of hopper in the same way and about as fast as corn is supplied to a mill. The gun also has a traversing arrangement which permits of a wide sweep of its shots during the very process of firing.

What person, previously to this invention, ever saw, heard of, or wrote about, a firearm of this kind?

Laboring Men and Men of Leisure.

One of the prominent speakers, at the meeting of employers in this city the other day, stated very distinctly that there were in the late strikes some very marked traces of communism, and that the question had been frequently heard among the strikers "Why should we, too, not live in brown stone houses?" Twenty years ago, the sole object of a strike was to obtain a slight increase in wages; today most of the leaders, at least, look on themselves as doing something to hasten a social reorganization, in which there shall be no class exempt from manual labor. Professional men, clerks, and all others whose work is mainly of the mental kind, or is at all events clean work which may be done without disfigurement of any kind, have become in their eyes nearly as obnoxious as the regular loungers. In short, the ideal society of the labor reformers, everywhere, though more vaguely held in some places than others, is one in which all shall be in a greater or less degree manual laborers, so that the social distinction now created by a man's not laboring with his hands shall disappear.

The effect of such a revolution as this on civilization—that is, of the disappearance from society of everybody who did not settle down every morning to some distasteful physical task and work at it as long as his nervous energy enabled him, and of everybody who owed anything in the way of greater social freedom, or the greater freedom in the choice of pursuits which wealth gives, to his father's accumulations or his own rapid success—would form a curious subject of speculation. It is well to remember, when we talk about "civilization" and glory in the difference it has made between us and our skin-clad forefathers, that ninety-nine hundredths of it are the result of the work of what we may call the "leisured class," that is, the class whom our social arrangements permit to live in what to the manual laborer seems idleness. In fact, the first step in civilization is not made until some portion of the community is released from the necessity of toiling with its hands and allowed to occupy itself with thinking, speculating, or in other words, following the train of abstract reasoning and playing with the imagination; and the rapidity of the rise of every people into civilization has been in the ratio of the number of those whom it was able to release in this way from the common drudgery

of life. A great majority of these have always, will always, to all outward appearance, think and imagine in vain, as if it were an essential feature in the moral order of the universe that there should be this seeming waste of effort in every department of human activity. But the number of those who have tried to make such contributions without succeeding, and the number of those who have made trifling contributions not great enough to rescue their names from oblivion but good enough to help the others, the Keplers, Newtons, Davys, and Harveys, to their discoveries, has doubtless been almost beyond count. But they could not have shown themselves at all, in a society of manual laborers such as some working men dream of.

God has somehow not organized society according to our notions of justice. He has made some men strong and healthy, others weak and sickly; some men wise and able, other men foolish and stupid; some women handsome, other women plain; He has imposed on one half of the human species the pains of reproduction, to the other half He has given only its pleasures, and on this inequality, human society is organized. Every man has his post, but there is an enormous difference in the comfort and dignity of the different posts.

The safety and progress of humanity, as a whole, depends on each man's serving faithfully and without murmuring. The rude fishermen of the Northern sea, as a great English writer has finely said, collect the oil which fills the scholar's lamp in the luxurious capital three thousand miles away. Should the day ever come when the fisherman will insist on the scholar's collecting his own oil, the day when there will be neither scholars, fishermen nor oil will not be far distant.

—Christian Union.

Replanting Teeth.

[Dental Cosmos.]

On the 24th of April, 1868, a young man C. W., called at my office to consult me in relation to three of his incisors. In a scuffle, the night before, he had these teeth knocked out by a blow,—the two central and left lateral incisors. He had replaced them as well as he was able at the time of the injury, but from the breaking of the alveolar border, the teeth did not stay in their places,—protruding about two lines. The gums were considerably lacerated and much inflamed. I administered the nitrous oxide, and with the aid of a pair of forceps, replaced the teeth. I then softened some gutta percha and molded the same over the loosened teeth, including two of the firm teeth upon either side of the loose ones, thus forming a dental splint which kept the teeth in their places until they became firm. I applied tincture of aconite and camphorated chloroform to the injured parts. At the expiration of five days, the gums were badly inflamed and the teeth sore. I continued the use of dilute aconite for one week longer, when the inflammation had subsided, and I removed the splint. At the expiration of four weeks, the teeth were sound and firm in their sockets; but from the effusion of lymph, the teeth protruded slightly from their sockets, and to avoid irritation I removed the cutting edges with a file.

Four years have intervened since the accident occurred, and the teeth remain perfectly firm, and have never given him the slightest trouble, nor have they changed their color.

Case 2.—In August, 1871, a young man, about seventeen years of age, came to me with alveolar abscess. I persuaded him to have the tooth extracted and replanted. He finally consented. I extracted the tooth, bringing away the sac at the apex of the root, containing pus. I cut three eighths of an inch from the end of the root, cleansed the socket by syringing it out by dilute carbolic acid, immersed the tooth in aconite and camphorated chloroform, and replanted it. In four days the tooth was a trifle sore, but he expressed himself as perfectly satisfied. About one month afterward I filled the tooth, which remains perfectly sound and firm until the present time.

I have replanted four others with like treatment, and with good results.

A Poor Boy's Victory.

An appointment to the United States Naval Academy having been placed within the gift of Colonel Wm. R. Roberts, member of Congress from New York city, he determined to award it to the applicant who should, in a competitive examination, prove himself to be best qualified therefor. This examination, recently took place in the hall of the Board of Education in this city. Twenty-six boys were present, thirteen from the public and thirteen from the private schools of the Fifth Congressional district. Sixteen of the number were rejected by Dr. Skiff, the medical examiner. The examination was conducted by Superintendent Kiddle and his assistant, Mr. Harrison. Master John O'Keefe, aged fifteen years, of 107 Washington street, stood first in the order of merit and is to be the nominee. His parents are in very humble circumstances, his father, Timothy O'Keefe, being an ordinary dock laborer. The announcement of the decision of the committee was received with applause, as the appearance of the lad denoted his condition in life. He was heartily congratulated by all present, but by none with so much pride and emotion as his principal teacher, Mr. Duffy. Master O'Keefe, it was remarked by all present, bore a striking resemblance to ex-President Lincoln. A subscription is to be immediately started in the First Ward for the purpose of securing his necessary outfit.

It is alleged that colored persons are never sunburned because the dark color of their skins absorbs the heat and conveys it into the system, so that it is converted into sensible heat, producing perspiration. But the white skin does not absorb the heat; the sun's rays therefore rest upon and burn it.