

## Scientific Museum.

### Influence of Pressure upon the Formation of Chemical Compounds.

Hydrate of chlorine, which is immediately decomposed at ordinary temperatures and at the pressure of the atmosphere, remains for the most part undecomposed even at a summer heat when inclosed in hermetically-sealed tubes, under the pressure of the chlorine which is set free from a portion of it which undergoes decomposition. In such a tube, when plunged into water of a temperature of  $86^{\circ}$ - $104^{\circ}$  Fah., the hydrate of chlorine is decomposed, but becomes partially restored on its return to the ordinary temperatures.

This decomposition is not prevented by the exclusion of the air under the pressure of chlorine gas of the tension of the atmosphere; under these circumstances the decomposition takes place as usual at any temperature above  $32^{\circ}$  Fah.

A tube in which hydrate of chlorine was hermetically sealed was exposed to the sun for a whole summer's day. It became fluid, but did not indicate decomposition of the water by the setting free of oxygen.

The author had already observed, that during the preparation of liquid sulphuretted hydrogen from sulphur of hydrogen in hermetically-sealed tubes, colorless crystals are sometimes formed, which immediately disappear on the tube being opened.

In two tubes, in which sulphur, but no liquid sulphuretted hydrogen had separated, these crystals were found in large quantity; they did not however make their appearance in a third tube, in which the persulphuret of hydrogen was enclosed together with concentrated muriatic acid. Hence the author concludes, that the crystalline compound, which is no doubt a hydrate of sulphuretted hydrogen, must be produced when a small quantity of water is inclosed with hydrate free from acid; the water then combines with the sulphuretted hydrogen under the pressure of the condensing sulphuretted hydrogen (17 atmospheres). Under this pressure it is permanent at ordinary temperatures. If the tube be heated in water to  $86^{\circ}$  Fah., the compound dissolves, and rapidly becomes fluid, returning to a solid state again on being cooled to the ordinary temperature.—[Prof. Wohler Ann. der Chem. und Pharm.]

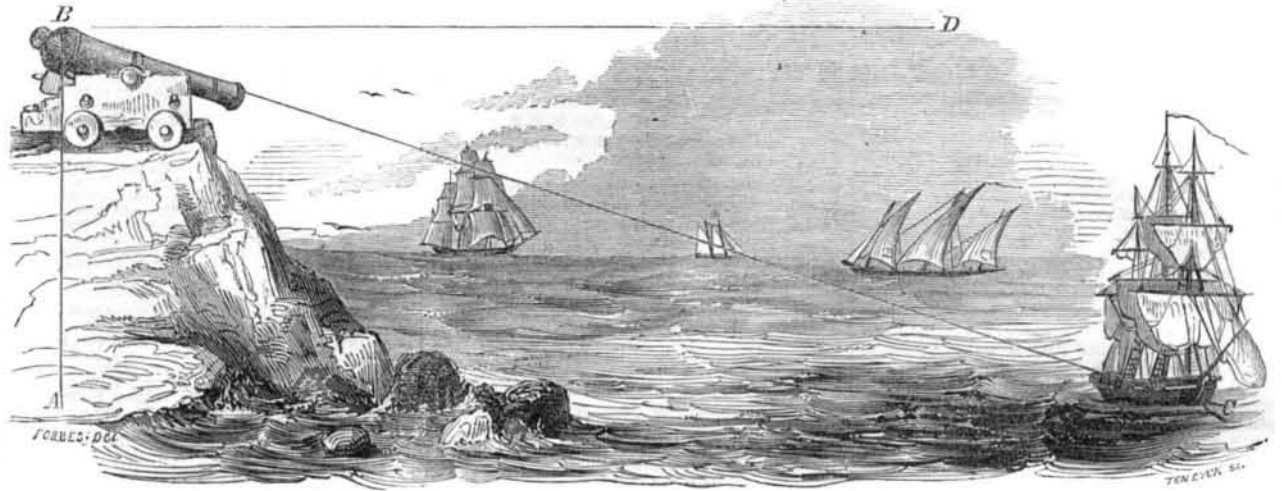
### National Hand-Writing.

At a recent sitting of the Paris Academy of Science, some papers were read relative to hand-writing. Among the facts stated, the most remarkable was, that no man can ever get rid of the style of hand-writing peculiar to his nation. If he be English, he always writes in English style; if French, in the French style; if German, Italian or Spanish, in the style peculiar to his nation. I am acquainted with a Frenchman who had passed all his life in England, and who is English in dress, habits, tastes, every thing, who speaks English like one of our countrymen, and writes English with ten times more correctness than ninety-nine in the hundred of us, but who cannot for the life of him, imitate our mode of writing. I have also heard speak of an English youth, who was carefully educated in this country, and for eighteen years of his life mixed exclusively with French writing-masters, and perhaps never saw anything but French writing in his life, but who always wrote in the same style as we all do; it was really national instinct. In Paris all the writing-masters profess to teach the English manner of writing, but with all their exertions they can never get their pupils to adopt any but the cramped hand of the French. Some person pretended that he could tell the character of individuals from their hand-writings. I know not whether he spoke truth or not, but assuredly he might have asserted, with the most perfect confidence, that he could distinguish a man's country by his handwriting. The difference between our writing and that of the French is immense—a school boy would distinguish it at a glance. Mix together a hundred sheets of manuscript written by a hundred of our own countrymen, and no one would fail to

say which was the British and which was the French, even though they should all be written in the same language and with the same pens, ink, and paper. The difference between Italian and Spanish and German styles of writing is equally as great.—[Edinburg Review.]

[For the Scientific American.]

**Measuring Inaccessible Distances by Inspection.**  
I perceive in your number for the 11th February, a method proposed for measuring inaccessible distances. I am induced to forward



to A B, so is radius to B C the inaccessible distance. Thus we obtain a common formula, namely, that the height of the piece above the horizontal plane divided by the sine of the angle of depression will in all cases give the distance of the inaccessible object from the gun.

Being quartered in the garrison of Gibraltar for some years, where batteries are to be found at various elevations from the horizontal plane to the rock mortar, which is about 1,296 feet above the sea, I proposed to calculate and construct tables for every battery on the foregoing data, as follows:—

### On Re-Vaccination—by Dr. Benedict.

A peculiarity in my own person, perhaps not remarkably uncommon in others, has led me to attentive thought and careful observation on this subject. I remember to have been vaccinated in childhood several times, before the presence of the virus manifested itself by the formation of a pustule. It did at length happen, and the cicatrix still remains. While at college, a few cases of variola and varioloid appearing among the students, I was again vaccinated, under the impression, that, as seven and even fourteen years had elapsed, I might now be subject to smallpox if exposed. Here again I received the infection, and had a pustule larger, and so far as memory serves me in regard to the first, more intense than that.—About four weeks from the time of re-vaccination, and after my arm had entirely recovered from its effect, I again vaccinated myself with lymph taken from the arm of a fellow student. Again, and so soon after the second vaccination, I had a large pustule, which went through a regular course, the scab adhering until about the twelfth day. Now here, after the re-vaccination, I would have been considered as safe as the vaccine disease could render me, and doubtless, had I suffered from variola, my case would have been set down as one of those in which vaccination had availed nothing. And yet was there any reason why I should not have suffered the full force of the disease, had I been exposed? Since that time I have repeatedly inserted the virus in different situations, with no other effect than the slight irritation which is known to follow the scratch of the lancet charged with the poison in those thoroughly vaccinated. My own experience has been partly confirmed by observation. I have re-vaccinated many children, and quite a number of those in whom I have watched the progress of the first pustule. I have seen the re-vaccination unequivocally successful in only eight cases, and in no instance have I been satisfied that true vaccinia was present the third time. Re-vaccination of adults has been successful in about the same proportion as in children.

My observations have not been sufficiently extensive to establish any new fact, but I make them known that others may observe also, and

you the following plan, which I proposed to be followed in large fortifications, some twenty-five years ago for determining with little more than inspection, the distances of objects on the horizontal plane, from any fortified position on an eminence. The principles upon which my plan was adopted are of course found in Geometry and Trigonometry. I only allude to their adaptation to the construction of tables, necessary to be calculated and kept in each battery for inspection.

Take a card in the form of a rectangle, and on the top horizontal line place all the angles within the capabilities of the piece, and on the left hand vertical side, place the several heights of the batteries, then draw cross lines, and under each angle and opposite each height, insert at the intersection the calculated ranges. Thus when you lay the gun for an object, and find the angle of depression, all that is necessary to do is to look down the column under the angle found, and opposite the corresponding height of the battery already known, and the distance will be found in yards. ALEXANDER ALCOCK.

see if they do not confirm the following proposition:—

That vaccination, properly performed, and repeated until the susceptibility to the vaccine disease is exhausted from the system, affords entire immunity from the variolous disease.

It may seem that, by including so much, my proposition is worthless, as it would extinguish not only the genuine disease, but its modification, varioloid. But we are to bear in mind that one, two or three successive pustules may still leave the system unprotected, at least in part. Vaccination should be repeated until nothing like a pustule can be obtained. Let each one observe himself, until evidence accumulates which shall sustain or overthrow the position; and let no one say that vaccination is not a protection for those in whom the susceptibility to variola is unusually strong, until they first ascertain whether there is not still left some susceptibility to vaccinia.—[New York Journal of Medicine.]

**GENERAL DIFFUSION OF GOLD.**—Since the discovery of gold in California and Australia has turned the attention of people in the direction of the noble metal, its presence has been discovered in many localities where people little dreamed of its existence. Dr. Percy, of the Museum of practical geology, London, has been, during the past year, devoting himself to an examination of lead, lead ores, and lead compounds, with the object of discovering the presence in all these of gold. Universally gold has been discovered in every specimen hitherto examined by Dr. Percy. In fact he states that hitherto he has been unable to meet with lead, or compounds of lead, altogether free from gold. His experiments have been attended with the result of extracting gold from all these bodies in a visible form; therefore its existence is not a matter of chemical hypothesis. Perhaps the most curious circumstances in connection with Dr. Percy's discovery is this—even soluble lead compounds are auriferous, though by what solvent the gold is held in solution it would be impossible to say. Finally, Dr. Percy hazards the speculation, that hereafter gold may possibly be discovered as an universal constituent of sea water.

Let B be the position of a gun on an eminence, whose height B A above the level of the sea is known, C the position of a ship or other object on the horizontal plane; suppose B D to be drawn parallel to A C. Lay the gun by the line of metal for the object at C, and with a quadrant determine the angle of depression D B C, which will be the measure of B C A, the alternate angle. Now in the right-angle triangle A B C, we have three quantities given to find all the rest. Then as the sine of A C B is

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