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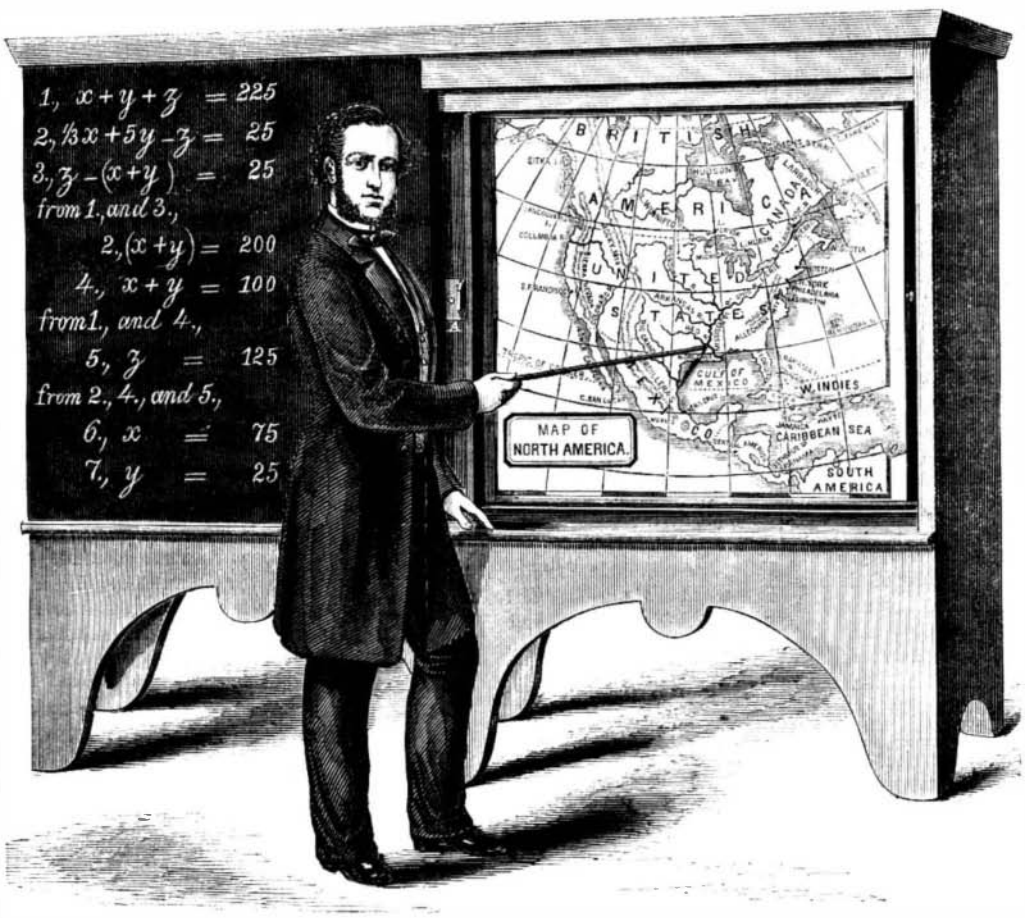
Combined Atlas and Blackboard.

The apparatus usually employed for instructing youths in the elementary branches of education is costly in character and liable to damage from want of proper protection. The colors of maps fade out and lose their freshness, mischievous little fingers remove whole continents bodily from the face of the earth, and more malicious youths destroy the apparatus entirely by throwing ink, &c., upon them. These troubles, which are well known to all who have ever had the care of a school, are obviated by the use of this combined map case and blackboard, in which the maps are framed as neatly as pictures and remain as bright and pleasing, externally, as when first printed, for as soon as the instructor has finished the lesson they are all inclosed until they are again required. In this engraving the door, A, which usually covers the maps, is shown withdrawn to one side, disclosing the maps behind. The maps are framed and slide back and forth in grooves at the bottom of the case; and as each one is required, the one immediately in front is pushed back until the desired one is reached; in this way a large number of maps are compactly stored, always ready for use and within easy vision. This latter feature is a very important one, since, by reason of it, children are not obliged to twist their necks all round the room several times in the course of a lesson to find different parts of the globe. On the left there is a blackboard placed upon which our artist has depicted a simple algebraic sum, and he has also shown the instructor in the act of pointing out some precise spot upon the map—doubtless the scene of one of our recent victories.



HERIDER'S COMBINED ATLAS AND BLACKBOARD.

The features embraced in this piece of school-room furniture are novel, and such as to render it useful; in other respects the case is handsomely finished and quite ornamental.

The invention was patented through the Scientific American Patent Agency on the 22d of Sept., 1863, by Wm. C. Herider, of Miamitown, Ohio. For further information address the inventor at that place.

Ventilating Ships.

The *Mechanics' Magazine* says:—"An important part of Dr. Edmonds' ventilating apparatus has been fitted to the *Royal Sovereign* cupola-ship, in which, by a simple arrangement, from 300 to 350 channels actually existing in every ship have been made available for the ventilation of the bilges and timber spaces. This is done by converting the latter into branch channels of one long air-shaft, constructed along each side of the ship. Through this air-trap a draft is created by communicating it into the funnel or ash-pit in steam-ships, or into ordinary ventilators in sailing-ships—in either case revolving fans, worked by hand or machinery, may be used in connection with this system if any extraordinary amount of ventilation is required, and from its diffused action injurious draughts, which are inseparable from all other plans in use, are entirely avoided. Ship-owners are interested in the success of this system, as it promises to prevent dry rot by the free circulation of air which it creates through the whole frame-work of the ship; but it serves another equally important object—that of the removal of all the foul smells usually prevailing between decks, which are engendered by dampness in the timber spaces, and decaying matter lodged in them. This is a very important result to obtain, particularly in troop or emigrant ships, as these are often causes of disease in hot climates. To perfect the ventilation, deep air channels are provided, which form part of the deck itself, and act immediately below it, but even without these a very efficient ventilation can be obtained. In the *Royal Sovereign* the efficacy of the plan has been already tested, so far as her present state of equipment admits of it, a very slight increase of temperature in the funnel being sufficient to draw a current of air through the air-shafts, and necessarily through the whole framework of the ship, which passing into the funnel is carried high into the open air."

THE military authorities at St. Louis have closed all the gambling houses in that city and confiscated their contents.

Artificial Hoofs for Horses.

It is important to calculate the various useful purposes to which gutta-percha may be applied. One of the most ingenious applications recently made of this valuable substance is that of making artificial hoofs for horses' feet. Many ingenious devices have been resorted to, to attain this result, but the adoption of gutta-percha will, doubtless, supersede all others as soon as its efficacy becomes recognized. What is required by the veterinary surgeon is a substance possessing the consistence of horn, to retain the nails of the shoe; that will readily soften by heat so as to mold itself to the required form; that it be indissoluble in water, seeing that the horse's hoof is generally in contact with moisture; and, lastly, that it be capable of uniting perfectly with the hoof. No known substance possesses all these qualities except gutta-percha. For the purpose under consideration it is prepared by being cut into fragments the size of a nut and softened in hot water; the pieces are then mixed with half their weight of powdered sal ammoniac and melted together in a tinned saucepan over a gentle fire, keeping the mass well stirred; the mixture must assume a chocolate color. When required for use it should be melted in a glue-pot; the surface of the hoof must be scraped clean and the gutta-percha applied as required. The application may be facilitated by the use of a glazier's knife warmed, by which the surface of the artificial hoof may be smoothed and polished. In this manner many a valuable horse may be rendered useful which otherwise would only remain fit for slaughter. On the score of humanity, also, this application of gutta-percha is to be welcomed.

Copper.

The whole earth appears to be more or less impregnated with this beautiful and useful metal, and the sea contains a notable quantity of it. Copper is in great abundance in various parts of the British isles, in Hungary, in Siberia, in Cyprus, from which island it derives its name, and whence, no doubt, on account of the geographical position of that island, it was principally procured by the Romans. It is also found in China, in Australia, and in Brazil—in fact, almost everywhere. It appears, however, certain that gold and silver were known to the ancients prior to copper. According to Ezra viii. 27, "Copper was as precious as gold." Paul, in 2 Timothy iv. 14, lays a complaint against one Alexander, a coppersmith. These are the only instances in which mention is made of this metal in the Holy Scriptures. Copper takes a

rank among metals from its peculiar color, which, when pure, is of a rose-like hue. Most metals when thep become rusty lose their beauty; not so, however, with copper, for it changes into various shades, from pink to a beautiful crimson, as in copper bronze powder, to blue, to green; hence the artist takes it as a pigment to produce upon his canvas "the fields and the forest." In the metallic state copper possesses so many useful qualities that various metal-workers find it of great service. It bears such "wear and tear" that it was adopted as money at a very early period, and retains its good name to the present time. Copper is one of the best conductors of lightning; hence it will be employed to transmit "the flash" below the restless Atlantic, in forming the submarine telegraph between England and America. This metal is so sonorous that few musical instruments can be made without it. The Handel organ and "Big Ben" of Westminster alike owe their tone to copper. Musicians, electricians, artists, and money-makers are not the only persons whose "occupation would be gone" were it not for copper. Color-makers and dyers are much indebted to it, as well as a host of others who follow the same trade as "Alexander the coppersmith."—*Piesse's Laboratory of Chemical Wonders.*

New Engine by Californian Mechanics.

The *Bulletin* of San Francisco makes mention of a new beam engine recently erected by Californian machinists :—

"The Vulcan Iron Works Company, on First street, have just finished one of the finest pieces of machinery ever built on this coast. It is a high-pressure beam engine for the Gould and Curry Silver Mining Company. This engine, which is said to be the largest high-pressure, and the second of its kind ever made in California, is of the following dimensions: A solid bed-plate, 21 feet long and 6 feet wide, forms its base, and will be bolted to a massive foundation of stonework 22 feet long, 8 feet wide, and 16 feet deep. On the bed-plate at one end is bolted the cylinder, which is 30 inches bore and 6 feet stroke, with the valve chests and valve gearing. At the other end is the main pillow-block, while in the centre are elegantly moulded columns and diagonal braces of Gothic style which stand on each side and support the beam centres. Other columns of the same style are at each end, and sustain an entablature extending around the whole of the upper part. Brackets are bolted to this entablature, and will receive a platform with light iron standards and a brass rail or guard. This platform is intended for the examination and oiling of the machinery, and will be reached by a light cast-iron spiral staircase.

"The beam is of the same shape as used on board our low-pressure steamboats, and is 15 feet long, and 7 feet deep. The connecting rod of wrought iron, with the usual braces, is 15½ feet long. It is a handsome piece of forging, and is finished in a perfect manner. The crank is of wrought iron, as is the shaft—the latter being 12 inches in diameter and 14 feet long. It is made from a spare piston-rod which belonged to the steamship *Golden Gate*. The fly-wheel, which is intended for a 3-feet belt, is 18 feet diameter, 38 inches face, and weighs 25,000 pounds. The total height of the engine from the floor is 21 feet.

"The valve motion which is claimed to be especially excellent, consists of piston balance valves operated by an eccentric. It distributes the steam by a reciprocating motion similar to that of an ordinary slide valve. The variable and self-adjusting expansion gear or cut-off is controlled by the governor, which will regulate the motion of the engine with perfect precision. The operation of the governor is through a peculiar mechanism transmitted to a cam, the stroke of which is advanced or retarded in proportion to the variations of the resistance or work done by the engine. This cam is attached to the piston valves, and has the effect of twisting them without interfering with their reciprocating motion. It is claimed that steam is suppressed by this twisting motion at any requisite point of the stroke of the engine, although the adjustment of the cut-off can be left wholly to the governor, which is perfectly automatic in this respect. It may also be adjusted by hand if desired, and whilst the engine is running, as an index shows, at all times, at what point of the stroke of the engine the suppression of steam occurs. This expansion gearing was invented and patented by MacNaught, of Glasgow.

"That our readers may be enabled to form some idea of the unusual size of this piece of machinery, by far the largest stationary engine ever built in California, we may state that the beam weighs 7,500 pounds, the bed-plate 14,000 pounds, the cylinder 4,200 pounds, the main shaft and crank 6,800 pounds —and the total weight of the engine complete is 160,000 pounds. When working at its intended speed of 25 revolutions, with 100 pounds steam pressure, and cutting off at an average of ¼ to ⅓ stroke, it will exert a net force of 260 to 300 horse-power. This engine is capable of running a mill of 120 stamps, and other machinery attached. By itself, without boilers, shafting, &c., it has cost about $30,000. It is now being taken down, preparatory to its being shipped to Nevada Territory, where its influence on the future dividends of the Gould and Curry Company is expected to be great."

Brainwork and Longevity.

The philosophers ought to have length of days for their portion, seeing how their pursuits ought to elevate them above the disturbances of life. And such is, in fact, the operation of their mode of life, by which their faculties are furnished with constant entertainment on subjects which would seem to lie outside the range of uneasy passions, while creating or exciting the noblest moral emotion. And an unusual amount of healthy longevity is, in fact, found among philosophers—whether mathematicians, naturalists, or speculative students. Such things have been heard of as strifes in those serene fields of thought; such sights have been seen as faces furrowed with fretfulness, or working with passion; but the old age of many philosophers is, at this moment, an honor to their vocation. Peter Barlow was, when he lately died at 82, the same Peter Barlow that he had been to two generations of friends and disciples. Sir David Brewster is still active and occupied at the same age. The late Mr. Tooke did not puzzle his brain about the currency too much to be still up to the subject at 86. Sir Roderick Murchison is past 70, and so is Sir J. Herschel. Literature ought to have the same operation as science; but it seems to have more room for agitations and anxieties, except in the case of authors who live in and with their work, exempt from self-regard. Jacob Grimm was a very perfect example of the philosophic serenity which a literary career can yield; and he lived to 78. There is something remarkable in the longevity of literary women in modern times, even if we look not beyond our own country. Mrs. Piozzi and Mrs. Delaney perhaps scarcely enter within the conditions; and the still lamented Jane Austen was under an early doom from consumption; but Miss Edgeworth was above 80 when she died; Joanna and Agnes Baillie were older still; and Mrs. Trollope died the other day at 84. The artists who have departed lately have been old. Biot was 87, and Vernet 74. Our Mulready was 77, and Cockerell, the architect, was 73.—*Once a Week.*

The Wrongs of the Stomach.

In most of the early literature is to be found a dialogue between the Body and the Soul, in which each accuses the other of their mutual perdition, recapitulating the offences which have produced it. Something similar might be written, with good effect, dividing the imaginary conversation between, let us say, the Stomach and the Man, and making an attack of gout the subject of their recriminations. The man might accuse the stomach of having done its duty so badly that he is tormented with a burning fire in his extremities, which will neither let him eat, drink, walk, nor rest. The stomach might plead justification, and say that she had lighted the said fire as the only means of getting a moment's rest from an intolerable task-master. Again the man might complain that he had lost all enjoyment of life, that his spirits were depressed, his mind gloomy, his appetite gone, his once fine muscular system reduced to flabby indolence; that his food did him more harm than good, so that it had become a misery to eat, and that every meal was followed by a leaden oppression which rendered life an insupportable burden. The stomach, having listened to all this, delivered in a tone of angry accusation, would reply: "My case is just as bad as your own. Once upon a time, before you took to evil courses, I was as healthy a stomach as you could meet in a day's march; I went through my work regularly, and did it so cheerfully and so well that, like some unreasonable masters when they get hold of a willing servant, you seemed to think I could do without rest and didn't care even for an occasional holiday. Then you heaped burden after burden upon me. Before I had well digested your breakfast for you, you thrust a dinner upon me large enough for three stomachs. Not satisfied with that, you wound up the day with a supper, drenching me all the time with ale, wine, spirits, tea, coffee, rum, more wine, and more spirits, till I thought you had taken leave of your senses; and when I heard you groaning in your sleep, starting up every now and then as if apoplexy had broken into the house, and was going to carry you off, I said to myself: 'Serve him right if it did.' And in this way you went on year after year, treating all my remonstrances with contempt. I gave you headache after headache; I tried to call you to reason with half a dozen attacks of influenza; gave you a bilious fever; made you smart with rheumatism; twinged you with gout till you roared. But all to no purpose. You went on making me digest till the work broke my back, and now I can digest no longer." This reproach might be made even pathetic, by a description of the stomach watching its hard tasks come down to it from the regions above between dinner and bed-time. First comes a plate of soup and bread, and a glass of sherry; "I can manage that," says the stomach. Then a plate of fish, with more bread and more sherry; "and that," adds the stomach, "though these sauces don't quite agree with me." Then comes beef, or mutton, or both, and stout; then game and sherry; then a dish of tart. "Confound this pastry," says the stomach, "it gives me more trouble than any thing else; but if the master will only stop here, I think, if I put out all my powers, I can get even this rubbish out of the way." But she has hardly taken this hopeful view of the case, when down come cheese, celery, apples, oranges, nuts, figs, almonds, and raisins, port, sherry, claret, and a tumbler of hot Hollands and water. "Good gracious, was there ever such a mess?" exclaims the stomach; "what can the man mean? Does he think one pair of hands can manage all this?" Still the willing slave goes to work, when presently there is a rush of hot tea from above, with a thin slice of bread and butter. And when the stomach, with infinite labor, has got the hodge-podge into some sort of homogeneous shape, and is preparing to take a nap after her exhaustion, lo! a devilled drumstick rushes into its laboratory, two devilled kidneys, a bottle of stout, and three tumblers of hot brandy and water.—*London Review.*

Singular Detection of Poison.

Paris has recently been much excited by a supposed case of poisoning, and singular discovery of evidence of the crime. A woman died under the care of a homœopathic physician—Dr. Courty de Lapommerais. The Judge of Instruction—the officer charged with the investigations preliminary to the public trial—went to the house of the deceased woman to inspect the room in which she died, but with no fixed idea as to what he should discover there, nor as to whether he should discover anything at all. He perceived some faint spots on the floor, and found, on inquiry, that they were made by the dejections of the sick woman. He ordered the floor to be scraped at the places stained, he carefully collected the scrapings and submitted them to the examination of competent chemists, and these scrapings are going to condemn the prisoner. They contained *digitaline*, the active principle of the *digitalis purpurea*, or purple fox-glove, one of the most deadly poisons of the "Materia Medica," and which acts by diminishing the heart's action. To show the wonderful power of this medicament, the *digitaline*, as prepared by Homolle and Quevenne, the preparation now principally in use at Paris, is given in doses of one or two milligrammes, or say of one grain, for fifteen days' use.

The chemists commenced their investigations by giving small quantities of the scrapings to animals, all of which died in a way to suggest poisoning by *digitaline*. They then selected the frog for the test experiment, because the heart of this animal, when