Scientific Museum.

Anatomy of the Teeth.

A nerve, an artery, and a vein, enter the root of every tooth; "and all through an opening just large enough to admit a human hair."

The dental pulp is the termination of the nerve in the crown of the tooth. In the molar teeth it is about the size of a small shot. Some anatomists call the whole of the nerve the dental pulp.

The ivory of the tooth (that part which lies under the enamel) is composed of an immense number of little pipes, or tubuli, which make that part of the tooth porous. This accounts for the rapid decay of a tooth when the enamel is gone. The acids of the saliva, heat and cold, penetrate these numerous cells and cause a sudden destruction of the tooth. Filling the cavity solid with some metal is the only cure.

The nerve from one tooth connects with the nerve to every tooth in either jaw. This is the reason why the pain is so often felt on the opposite side from where the cause exists. Pain is often felt in the upper jaw, when the cause exists in the lower.

The superior (upper) molar teeth have three roots. They sometimes (not frequently) have four and even five roots, while the inferior (lower) have but two.

The bicuspids usually have but one root, or two united, so as to have the appearance of but one. They sometimes, however, occur with two distinct roots.

The incisors and eye teeth never have more than one root.

Constitution of Butter.

Heintz has communicated an elaborate paper on the constitution of butter, the results of which are as follows:

The margaric acid prepared by Bromeis from butter is a mixture of stearic and palmitic acids.

The fixed fluid acid which is contained among the products of the saponification of butter consists chiefly of common oleic acid, and not as Bromeis believed, of a different acid. There is no butter-oleic acid. Butter therefore contains common olein.

Among the products of the saponification of butter there is found a fatty acid, the hydrate of which contains more than 38 equivalents of carbon to 4 equivalents of oxygen. This acid, butic acid, has very probably the formula $C_{40}H_{40}O_4$. It is with great difficulty soluble in cold alcohol, and corresponds to a fat contained in butter which may be called butin.

Stearic acid is also contained among the products of the saponification of butter, though not in predominating quantity. Butter therefore contains stearin.

The largest proportion of the solid fatty acids in butter consist of palmitic acid. The largest proportion of the solid fats consists therefore of palmitin.

Concinic acid cannot be detected in butter.

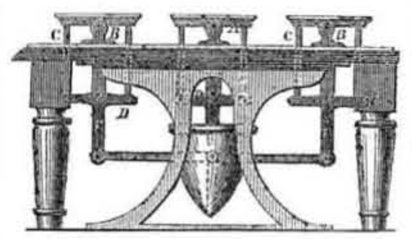
The portion of the solid fatty acids most soluble in alchohol consist of myristic acid. The presence of myristin in butter is therefore to be inferred.

Heintz points out the remarkable fact that in all the acids contained in butter, the number of equivalents of carbon and of hydrogen is divisible by 4. The same law holds good with respect to cocoanut oil. Heintz considers it therefore probable that the cetic and cocinic acids which he detected in small quantity in spermaceti are mixtures, since the numbers of equivalents of carbon which they contain are not divisible by 4 like those of the other acids in spermaceti: he proposes to resume the subject, operating upon 10 lbs. of spermaceti.

Separation of Nickel from Cobalt.

Liebig has found that when a current of chlorine is passed into a cold solution of the double cyanides of cobalt and potassium, the liquid being kept alkaline by the addition of caustic soda or potash, the nickel is completely converted into sesquioxyd and precipitated, while the cobalt remains in solution as unaltered double cyanid. The sesquioxyd of nickle may be washed and ignited, and the nickel weighed in the form of protoxyd; it is perfectly free from cobalt. The solution after passing the chlorine must still be alkaline. The smallest trace of nickel gives an inky black color when dissolved in cyanid of potassium, and treated with chlorine. This method of separating cobalt and nickel has perhaps some advantages over Liebig's second method which, it will be remembered, consists in boiling the mixed double cyanids with oxyd of mercury, which precipitates the nickel but not the cobalt.

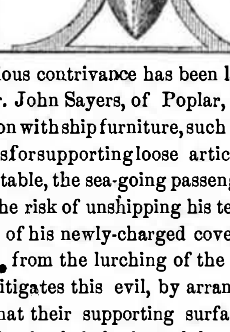
Equilibrated Ship's Tables.



A curious contrivance has been lately patented by Mr. John Sayers, of Poplar, England, in connection with ship furniture, such as tables and apparatus for supporting loose articles. With an ordinary table, the sea-going passenger constantly runs the risk of unshipping his teacup, or losing sight of his newly-charged cover at the dinner-table, from the lurching of the vessel, Mr. Sayers mitigates this evil, by arranging his tables so that their supporting surfaces shall always maintain their horizontal level.

The accompanying engraving represents an end view of a ship's dining-table thus fitted, and placed fore-and-aft. At A are small tables, or platforms, supported at each end on hinge joints, B, attached to the table framing; and to the under sides of these tables, A, are attached the vertical pieces, C, sliding freely through the holes in the fixed top of the table framing, and resting on the ends of the angular suspension pieces, D, beneath. These suspension pieces are carried on hinge pieces, E, fast to the underside of the ordinary table top. From the centre of the suspension pieces, D, arms, F, project downwards to carry the weight, G. It is evident that the surfaces, A, which are the supporting platforms for the loose articles in use, are thus kept at their exact level under all circumstances of the ship's motion, just as the common lamp or compass is sustained upon its universal joint.

Screw Stoppered Bottles.



This is a contrivance for improving upon the old, ineffective, and very inconvenient system of closing bottles by corking. A screw-thread is moulded on the inner surface of the bottle-neck, or opening, at the time of moulding the neck; and into this screwed neck is fitted a correspondingly screwed stopper of wood, glass, earthenware, or other convenient material. This stopper is formed with a suitable head to facilitate adjustment, and its entering portion is screwed externally, to correspond with the internal screw in the neck—whilst beneath the expanded head is a groove, containing an annular jointing piece of some soft or elastic material, as gutta percha, india-rubber, canvas, or other substance. In this way, when the stopper is screwed into the bottle, this elastic surface bears down on the end surface of the neck, and preserves a light junction. Such stoppers are easily screwed in and out, whilst they are always present for use, and will last as long as the bottle.

The figure is a longitudinal section of the neck of the bottle, with the stopper in its place. The bottle, having been blown in the usual way, and being separated from the punty, a small quantity of semifluid glass is taken upon the neck to form the mouth, the bottle being held by its bottom end. The workman there introduces the screw, into the neck, and when entered up to the shoulder, he closes the shears, and turns the bottle round rapidly on his knee, the rotation forming the smooth outside of the mouth, whilst the pressure forces the glass into the thread of the screw. The stopper, A, in this view, is formed with an external screw-thread, corresponding to the internal one in the mouth of the bottle, B; and beneath the expanded head is a ring, C, of india-rubber, gutta percha, or other elastic substance, let into an annular groove in the head, and forming a tight joint. Quite an ingenious invention. It is patented in England by Joseph Scott.

Gold Assaying in South America.

The process of gold assaying amongst the native miners of South America is very simple.—A fragment of quartz is pounded, and rubbed to powder between two pieces of granite. A bullock's horn, of black color, is the only assay instrument. It is cut longitudinally into two equal pieces, partly on the curve, so that one half forms a kind of long spoon, the inside of which being polished. The powder being placed in the spoon, the water is poured in it and shaken, and then poured off. A second and a third water being applied, nothing is left but the coarser particles at the bottom, and at one edge of them, conspicuous on the black horn, is seen a fringe of gold powder, if gold be present. With a keg of water at his back, and his spoon in his wallet, and a little parched meal, the mine hunter wanders among the barren rocks in search of a treasure, which he sells when discovered, and seeks another; the claims of labor being practically regulated by natural aptitudes. The man who buys the mine, digs the ore, breaks it up into the size of walnuts, loads it into hide sacks, borne on mules, and sells it to the "beneficiador," or benefitter, in the valley below, who passes it through his mill. Having settled upon a small stream, with a fall from four to five feet, he builds up two walls to enclose it on each side, and a back wall to form a small reservoir, with a spout and plug to let out the water at his plaesure. Over the side walls, with considerable labor, he contrives to lay a flat circular granite stone, some five feet in diameter, with a hole of some fifteen inches through the middle. The middle of the stone is hooped round with staves, which stand up eighteen inches in the form of a tube. The outside is surrounded with similar staves, so that a water-tight circular trench is formed, with a granite bottom. Through the central hole is passed the straight stem of a tree, shod with an iron pivot, standing on an iron shoe, fast to a block below. The upper part of the tree is steadied in a beam above, supported by two upright posts. Through the middle of the vertical shaft is a horizontal hole, with a horizontal shaft projecting on each side. In this horizontal shaft, at nearly the level of the foot below, are affixed in a circle, like the spokes of a wheel, a number of wooden spoons, about three feet in length. To the horizontal arms above are tied, by raw hide cordage, a sort of large flag paving stones, with their faces bearing on the flat granite below. The water being turned on the spoons, the paving stones are drawn round by the motion of the shaft, and grind the quartz.—An improvement on this is to use two vertical roller stones, eighteen inches thick and five feet in diameter, with a circular hole in the centre, through which the horizontal shaft or arm passes, and forces them round. As the stones vary in their speed on the inner and outer edges, there is a grinding as well as a crushing process. When the machine is at work, a quantity of quicksilver is thrown into the trench, and the quartz with it. A small stream of water runs in, and at one portion of the rim there is a hole for it to run over, which it does, carrying the floating mud with it. As it runs over, it falls into a goat-skin, with quicksilver at the bottom. Out of this goat-skin it falls into a second, with more quicksilver, and so on from one to another, according to the amount of fall. When the quicksilver is supposed to be saturated, the mill is stopped, the quicksilver is taken out of all the receptacles, and poured into a linen bag of fine texture, and three or four thicknesses. The quicksilver is squeezed through this bag, and the thickening amalgam is finally rammed down with a sort of rolling pin.

A Steep Railroad Grade.

The steepest railroad grade in Europe, is up on the Piedmontese Railroad, between Turin and Genoa. It is near the town of Gleni, and the ascent is 185 feet to a mile! Experiments which have been made have shown that two locomotives, drawing a train of six loaded gravel cars, weighing altogether 100 tons, ascended the grade at a time when the rails were exceedingly wet and slippery, at a speed of nineteen miles an hour.

A Spiritual Machine.

We learn that Mr. J. T. Pease, of Thompsonville, Connecticut, has succeeded in inventing a machine which he denominates the Spiritual Telegraph Dial. This apparatus is contrived with a dial face, on which are marked the letters of the alphabet, the Arabic numerals, the words Yes and No, and some other convenient signs. A moveable hand, or pointer, is fixed in the centre; and when a ghost wants to communicate with its pupils and friends in the body, all that is requisite is for it to give a gentle twitch to the pointer, and the revelation is accomplished. Mr. Pease states that with a good tipping medium to facilitate the movements of the pointer by agitating the table, letters will be indicated to the dial as fast as an amanuesis can write them down. There is also an arangement by which the dial may be concealed from the sight of the medium, so that he cannot know what it is that is being said by the ghost.—[Exchange.

[Will Mr. P. interrogate his machine respecting the future of the Ericsson, and send us the result of his observation. If he will foretell the destiny of this ship we are ready to endorse his invention, but until we see some such evidence of its skill we must remain chary of it.

Preparation of Ferrocyanhydric Acid.

Liebig gives the following simple method of preparing this acid. When a cold saturated solution of ferrocyanate of potash is mixed with its own volume of fuming muriatic acid added in small portions at a time, a snow-white precipitate of pure ferrocyanhydric acid is thrown down. These are to be washed with muriatic acid, dried upon a brick, and dissolved in alcohol; from the alcoholic solution the acid may be obtained in beautiful crystals.