MISCELLANEOUS.

Food and Digestion.

The aliments or nutritious principles of food are divided into two great classes: the one is distinguished by the absence of the element nitrogen, and is termed non-nitrogenized; the other containing that element, and called nitrogenized aliments. The first or non-nitrogenized, contain the elements carbon, hydrogen, and oxygen, and are divided into three groups, depending upon the relative proportion of these elements. Sugar and starch are distinguished by possessing an identical proportion of carbon, and by having an equal number of hydrogen and oxygen atoms, these elements being in the exact proportion to form water. Starch consists of 12 atoms of carbon or charcoal, and 10 of water. Vegetable acids—those substances which impart sourness to fruits—contain variable proportions of carbon, a very small amount of hydrogen, and an excess of oxygen. Fats and oils are found to be composed almost entirely of carbon and hydrogen, with but a very small amount of oxygen. Albumen, fibrine, caseine, whether derived from the animal or vegetable world, are identical in composition. Thus we have vegetable and animal albumen, vegetable and animal fibrine, and vegetable and animal caseine, accordingly as they are obtained from either animals or plants. None of these substances will sustain life alone; this has been often proved. They must be mingled together. Man requires a mixed diet, but how shall it be mixed. Here, fortunately, nature comes to our aid—she has prepared a recipe. We find it in the composition of milk, the true type of all diet. Here the alimentary ingredients are so judiciously mingled, as to furnish the elements for forming the entire human body. The true philosophy of dietetics is to be found in a milk pail. Heat, the agent used in cooking, is very powerful to alter and destroy all organized compounds. It is variously applied, as in boiling, roasting, frying, and with different results, both in kind and degree. Many of these changes are not yet well understood—they have not been sufficiently studied. Of all the alimentary principles, albumen is the most promptly altered by heat. It exists in vegetables and also in animals—in their blood, and also diffused throughout the flesh in a liquid form, in which it dissolves in water. A small amount of heat converts it into a hard, brittle solid, insoluble in water, forming coagulated albumen, as in the boiled white of eggs. If, therefore, a piece of fresh meat is placed in cold water, the albumen tends to dissolve out—it is withdrawn from the flesh. If the meat is put in boiling water, the albumen, on the contrary, coagulates all over the surface, forming a crust which cuts off the solvent action of the water.

To retain the albuminous juices in substances to be boiled, they should be added to the boiling water; if, on the contrary, we wish to extract these juices, as in making soup, an opposite proceeding is admissible—we add the solids to cold water and gradually raise the temperature. Prof. Leibig says, that in salting meat, the brine which is formed contains a large proportion of the most nutritious juices of the flesh. By salting, therefore, the normal composition of meat is essentially altered. The necessity of food arises from the waste and wear of all parts of the system. As the body is used its atoms die and are carried away. As the dead atoms perish, new ones must be constantly supplied of different kinds, as the various parts of the body may require. The body, therefore, analyses the food that is taken into it. It separates it into its elements, withdrawing one part here and another there, as it needs them for different purposes and in different places. But before these constituents of food can be separated, it must first be dissolved, just as a chemist must first dissolve a mineral before he can separate its elements or analyze it. This solution of food is called digestion. It begins mechanically in the mouth by mastication, just as the chemist first crushes his mineral with pestle and mortar. It is then carried into the stomach, which pours from its wells a liquid known as gastric juice, with which it is mingled by a peculiar agitating motion of that organ. The active principles of the gastric juice are acids, chiefly muriatic with perhaps lactic and phosphoric, and a peculiar organic principle termed pepsin. It is always distinctly acid: this liquid attacks and dissolves the nitrogenized alimentary principles, the other class remains unchanged and untouched in the stomach. Stomach digestion by no means completes the process. It dissolves only albuminous substances, a portion of which is immediately absorbed by the veins of the stomach and carried at once into the circulating system. The residue of the food now passes forward into the first portion of the intestine called the duodenum. Into the duodenum there is poured from the liver a liquid called bile, and from the pancreas another liquid called pancreatic juice, both alkaline from the presence of soda in considerable quantities. These alkaline juices now seize upon the undissolved alimentary compounds, starch, sugar and the oily bodies, dissolve and transform them, thus completing the act of digestion. It is but recently that Bernard of France has demonstrated that the office of the pancreatic juice is to dissolve the fatty substances, and for this demonstration he lately received the prize of the Paris Academy of Sciences. The dissolved portions of the food which are to become blood are now taken up from the intestine by innumerable little vessels termed lacteals, which carry forward their contents and deliver them into a large vein in which they are swept along into the great current of the circulation. It may be regarded as a physiological fact, settled beyond reasonable doubt, that the destination of the non-nitrogenized alimentary principles is to be burned throughout the body by oxygen introduced in respiration for the maintenance of animal temperature. These substances evidently cannot be converted into the tissue of the fabric, for they do not contain the materials to form that tissue. They are of various degrees of combustility, giving rise to unequal amounts of heat by burning, and are therefore adapted to different climatic and seasonal conditions of temperature. In the colder regions, foods rich in hydrogen and carbon are instinctively sought. In the warmer climates, the less combustible starches and vegetable acids are prized. On the other hand, nitrogenized elements minister to the true nourishing process—they are transformed into muscle and tissue; they build up the fabric. All these organized substances are designed to be decomposed in the production and evolution of power. Now, if there be a limit to the power of vegetable construction upon a given area of land, there is also a limit to the number of animals that can live upon that area. The agricultural or grain-consuming races are by far the most powerful and are rapidly driving the hunting or flesh-eating races from the face of the earth.

Vancouver's Island.

A return made by the Hudson's Bay Company to the British House of Commons, communicates some interesting particulars respecting Vancouver's Island. One thousand four hundred and seventy-eight acres of land have been sold to eleven persons; the fur trade of the Company were in possession of 3,084 acres, part of which they have sold to their retired servants. The Puget Sound Company have provided four farms to employ emigrants on their first arrival. The Hudson's Bay and Puget's Sound Companies have, at their own expense, sent out 271 males, 80 women and 84 children, since 1848. These emigrants were mostly agricultural laborers under engagement. One thousand, three hundred and fifteen tons of coal have been collected by the Indians, from the surface seams, and had been exported by the Company. The Company had incurred considerable expense in boring for coal without success, until lately, when promising appearances had been discovered about eighty miles north of Fort Victoria, on the east coast of the Island, nearly opposite the mouth of Fraser's river. Measures had been taken to follow out the search and work the coal if found practicable. The high rates of wages in Oregon and California had tended to the detriment of the Island. Flour had still to be imported for the use of the settlers.

Improved Pump.

John A. Burnap, of Albany, N. Y., has taken measures to secure a patent for an improved double suction and force-acting pump. The improvement consists in employing two pistons within one cylinder, each united to a separate rod, which are made to rise and descend alternately so that a continuous flow of water is obtained, each piston performing the two operations of suction and force at the same time. The upper parts of the piston rods terminate in racks, between which a cog wheel is placed, having an alternate movement imparted to it by a lever attached to its axis and which causes the pistons, as abovementioned, to rise and descend alternately thus serving the purpose of a pump with two separate cylinders. The other improvement consists in the peculiar arrangement of the air chamber, which is formed by encircling the pump cylinder in whole or in part by another hollow cylinder, the communication between the two being made by a passage leading through the top of the latter.

Groove Cutting Machine.

Measures to secure a patent for the above have been taken by James Campbell, of Macon, Ga. Carpenters and cabinet-makers will appreciate the advantages of this machine, which performs its work with great rapidity and correctness. It is intended to cut cross and other grooves in wood by employing an S-shaped cutter in combination with two circular saws, these three tools being fixed on a horizontal revolving mandrel, which can be adjusted to suit whatever depth it may be requisite to cut the groove. The saws make the incisions and the cutter completes the recess by removing the wood, and makes the groove square, perfectly smooth and true. The operation of grooving at different angles and widths is facilitated by indices marked on the sliding carriage, which moves transversely, and therefore feeds the stuff in that direction, but is susceptible of alterations for feeding at any angle.

New Paper Cutter.

Measures to secure a patent for the above have been taken by Frederick Hesse, of Bethlehem, Pa. This invention greatly facilitates the manipulations of the artisan who works on such fabrics as paper paste broad, and other like materials. To a platform is secured by set screws an adjustable bed, on which works a sliding stock, whose motion is facilitated by small rollers. The knife or cutter is attached to a vertical rack which is raised or lowered by a pinion, this latter together with the rack and knife being carried by the sliding stock and so placed on it that the handles which are grasped to move the stock on being turned, cause the ascent or descent of the knife. There is, moreover, a gauge that can be set either parallel or obliquely to the bed.

Market Gardening in England.

Within a radius of fifteen miles from London, there are two hundred thousand acres of land in the hands of market gardeners, all laboring for the London market. Ten thousand loads of turnips, 100,000 sacks of peas, 20,000,000 heads of celery, 40,000,000 cabbages, and 1,000 tons of water-cresses are said to be sold annually in Covent Garden market alone, to say nothing of the potatoes, carrots, beets, onions, herbs of all kinds, &c., which are sold in immense quantities.

Maple Sugar.

At a late meeting of the Farmers' Club, in this city, an article was read on the subject of maple sugar and of its great importance as one of the products of our country. By the late census it appears that the production of maple sugar in this country in 1850 was within a small fraction of thirty-four millions of pounds. An orchard of maple trees has been found almost equal, acre for acre, with the sugar cane in producing sugar and molasses.

The frequent use of asparagus is strongly recommended in affections of the chest and lungs.

It is stated that the Director of the Mint has purchased about half a million dollars in silver, at a premium of four or five per cent. to melt down for the new silver coins.

White Curd Soap.

This is made of tallow only, in the proportion of 16 cwt. of tallow to 200 gallons of ley, which is boiled with a moderate fire for about two hours, and the fire being withdrawn, is left to settle for another two hours, and then the ley pumped off. As the ley separates quickly from curd soap, two or three boils a day may be given with care, until the soap appears something like a curdy mass, and when pressed between the finger and thumb forms a thin, hard, clear scale, not sticking to the finger. Then withdraw the fire, add a few pails of cold ley, and when settled pump the ley clean off. The soap is purified by melting it over again with a fresh supply of water repeating the process until it has not the slightest blue cast. The moulds for white curd soap should be lined with coarse cloth, and covered with matting, after the soap has been put into the moulds, and well stirred, in order that it may cool slowly and uniformly. A cwt. of tallow is computed to make 3 cwt. of white curd soap, but it is seldom that so much can be obtained. The ley is usually made of 3 cwt. of potash with 3 cwt. of soda, but kelp is sometimes used, and as it contains much sulphuretted hydrogen and other impurities, the water pumped off will be of a dark bottle-green color.

White curd soap, scented by adding some oil of caraway seeds, just before it is poured into the moulds, makes Windsor soap.

Railroad to the Pacific.

Col. Benton has published his plan for a railroad to the Pacific. He advocates the Central route, for which Colonel Fremont has long expressed a preference. He is in favor of making this highway on a grand scale, reserving a tract a mile wide for all sorts of roads, rail and macadamized, and two margins one hundred feet wide for independent and rival telegraphic lines. He is opposed to making this highway by any mixture of public and private means, or by giving lands to companies, but holds that the United States should build the road and the fixtures, and let out the use of it for terms of seven or ten years to the lowest bidder. The present system of railways from the Mississippi to the Atlantic, he regards as an expanded fan. the spokes of which converge to St. Louis, the handle extending thence to San Francisco.

Grass and Hay for Cattle.

A correspondent inquires of us, "why it is that cattle thrive and get fat much faster on grass than they do on hay, and what it is that grass loses by becoming hay?" Chemical analysis never can give the answer. One kind of food may contain far more of the constituents of beef than another, and yet not be suitable for food. Cattle have their likes and dislikes of food, as well as human beings, and no animal will thrive on food that does not please the taste, however nutritive it may be, because it will not eat so much of it. The sweet juice of the grass, which is absent from the hay, makes it palatable, and affords the requisite amount of moisture to make it digest most easily.

The piers for the railroad bridge across the Great Pedee river, on the Wilmington and Manchester Railroad are composed of large hollow cylinders of cast iron, nineteen feet in circumference, their bases are sunk many feet into the bed of the river by exhausting the air from within them, by the method known as the pneumatic process, for forming foundations. The cylinders are filled with concrete and thus form piles of great strength and permanency.

A company is being organized at Cincinnati, Ohio, to pave the turnpike from the head of Western avenue, at Brighton, to Commonsville, Spring Grove, and Carthage, with iron plates. The sides of the road will be filled in with dirt, and ornamented with shade trees.

A law has recently gone into effect in Maine rendering pedlars and other persons who shall sell goods, wares, or merchandise, by sample or otherwise, within that State, liable to a fine of not less than fifty or more than two hundred dollars, unless they have been for five years residents of the State.