

FOOD AND ITS CONSTITUENTS.

The food best adapted for one man is not always the most suitable for another. In a recent number of *Blackwood's Magazine*, the following cases are given as exceptions to general rules regarding food:—

"In 1844 a French soldier was forced to quit the service because he could not overcome his violent repugnance and disgust towards animal food. Dr. Prout knew a person on whom mutton acted as poison. 'He could not eat mutton in any form. The peculiarity was supposed to be owing to caprice, but the mutton was repeatedly disguised, and given to him unknown, and uniformly with the same result of producing violent vomiting and diarrhœa. And from the severity of the effects, which were, in fact, those of a virulent poison, there can be little doubt that, if the use of mutton had been persisted in, it would soon have destroyed the life of the individual.' Dr. Pereira, who quotes this passage, adds: 'I know a gentleman who has repeatedly had an attack of indigestion after the use of roast mutton.' Some persons, it is known, cannot take coffee without vomiting; others are thrown into a general inflammation if they eat cherries or gooseberries. Hahn relates of himself that seven or eight strawberries would produce convulsions in him. Tissot says that he could never swallow sugar without vomiting. Many persons are unable to eat eggs; and cakes or puddings, having eggs in their composition, produce serious disturbances in such persons, if they are induced to eat them under false assurances."

These statements may be perfectly reliable, but they are exceptional cases; the following general information, by Dr. Lankester, of London, is of universal application:—

Flesh-producing food, like every organ in the human body, contains three out of the five known gaseous elements of nature, namely, oxygen, hydrogen and nitrogen, together with one only of the many solid elements of chemistry, namely, carbon, which may be said to be the only solid basis of all organisms, vegetable as well as animal (bones excepted, the basis of which is calcium or lime). Without these four elements of flesh-producing food—oxygen, hydrogen, nitrogen and carbon—no ingredients of food can be of use in building up the wasted parts of the body. The nutritive or flesh-forming ingredients, or proximate elements of food are called fibrin, albumen and casein; they contain the four elements just named in exactly the same proportions, and are found both in vegetable and in animal food. The nutritive value of food depends upon its richness in flesh-forming matter. An adult man, in vigor, wastes five ounces of dry flesh daily, and requires the same amount of flesh-formers in his food.

The flesh-formers of the vegetable world are most abundant in those plants which yield the most substantive food of man; such as wheat, oats, barley, rice, Indian corn, &c.; and leguminous plants, such as peas, beans and lentils, or pulse. Wheat is the most important of these yielders, although the pea and bean tribe are so highly nutritious that they, in fact, require, or at least ought to be mixed with other food, to prevent them from being too heavy or indigestible.

Flesh-formers are indispensable to the very existence of the body, which is now believed to waste so fast that every forty days we may be said to possess a new body. This is certainly fast living, compared with the slow ideas of the last generation of chemical physiologists, who estimated the time for such waste and renewal at seven years; but such is the modern idea, as we have stated, and perhaps the truth lies somewhere in the rather wide interval between forty days and seven years. But although flesh-forming food is thus indispensable, fuel-yielding food is no less indispensable, as the natural heat of the system is kept up by the latter, and not by the former.

Fuel-yielding or heat-giving food must consist essentially of three of the four elements of flesh-yielding food, namely, carbon, hydrogen and oxygen, the nitrogen not being essential to it as a heat-giver, though often still contained, to some extent, in heat-giving food; and indeed, neither is the oxygen of use as a heat-giver in the composition of the food, although it is essential as the evolver of heat when it combines, from the breathed air, with the elaborated heat-giving food of the blood, in the lungs, or burns that food as fuel, in so combining with its hydrogen and carbon or its hydrocarbonaceous

forms, thus converting these into carbonic acid gas and watery vapor, which are sent up the windpipe by the expiratory act of breathing, and so expelled, like so much smoke from a furnace, through a locomotive funnel or a chimney.

The proximate elements or ingredients of heat-giving food are mainly starch, gum, sugar and fat, each of these containing more or less of the three elements of heat-giving food. Thus fat, sugar, gum and starch are of little or no use in building up the structure of the body, or in repairing its waste. The natural heat of the body is 98° Fah. This must be kept up by the heat-giving food—easy work for such food in tropical climes or in summer, but somewhat hard labor in the arctic regions, and in winter of the temperate climates.

Among heat-giving food are potatoes, carrots and other vegetables, rice, sugar, and the fat of animal food, the butter of milk, the oils of vegetables, &c.

Five ounces of flesh-formers, being the amount required to restore the daily waste of the body, are contained in the quantities given of each of the following vegetable substances:—

	lbs.	oz.		lbs.	oz.
Wheat flour.....	2	1	Potatoes.....	20	12
Barley meal.....	2	6	Carrots.....	31	4
Oatmeal.....	1	13	Parsnips.....	15	10
Maize.....	2	9	Turnips.....	17	13
Rye.....	2	3	Cabbages.....	10	6
Rice.....	4	13	Tea (dry).....	1	11
Buckwheat.....	3	10	Coffee (dry).....	2	2
Lentils.....	1	3	Cocoa (nibs).....	3	3
Peas (dry).....	1	5	Bread.....	3	13
Beans (dry).....	1	5			

MAGNETISM APPLIED TO LOCOMOTIVE DRIVING-WHEELS.

As this subject has been very lately brought before the public through our columns, it will no doubt interest many of our readers to know what opinion the *London Engineer*—good authority—expresses on the subject. In the number of that paper of the 16th September, after describing Mr. Serrell's method (which has appeared in our columns) of applying electro-magnetism for giving greater adhesion to the wheels, it says: "A similar plan was proposed many years ago, and it may now attain to useful practical results." Again in the subsequent week, (Sept. 23d), it says:

"Certain speculations have appeared in America with reference to means for increasing the adhesion of locomotives. It is proposed to magnetize the tires of the driving wheels so as to increase their hold upon the rails. It has been stated that, assuming the adhesion to be thereby doubled, an engine of 20 tons weight would be enabled to do the work of one weighing 40 tons. A more complete *non sequitur* could hardly be found. The power of a locomotive depends upon two elements; one, the force with which its driving-wheels may be made to revolve; the other, the bite of these wheels upon the rails. Under ordinary circumstances, the necessary weight of boiler, frames and machinery required to generate and exert a steam tractive force, at the periphery of the driving-wheels of, say, three tons, is nearly 30 tons; while the weight necessary to obtain an effective adhesion of three tons need hardly exceed 18 or 20 tons. Most passenger-engines have but one half—sometimes a less proportion—of their weight employed in adhesion, the rest of the engine being carried upon bearing wheels merely, which in no way add to the power. In goods engines, in consequence of the much slower speed, the average pressure upon the piston throughout the stroke is greater, and the smaller driving-wheels employed afford more leverage for the exertion of the steam tractive power which is sometimes as much as five tons. But the whole of the necessary weight of the engine—or the weight which, upon the ordinary modes of construction, is inevitable in supplying sufficient heating surface, water and steam-room, and sufficient strength of parts—the whole of which is brought into effective adhesion through coupled wheels, is sufficient to render all the steam-power available. The power of the engine is not, under ordinary circumstances, limited by its adhesion, which there is generally a surplus, but by its steam traction, or the power with which it may be able to turn its wheels, and all adhesion beyond what is requisite to render this steam traction available, produces no useful effect whatever. Upon the present construction of locomotives, it is doubtful if any signal advantages would result from means, however simple, for increasing the adhesion, although cases may occasionally arise where such an increase would be convenient. The ordinary adhesion is much greater than is generally supposed."

A COLUMN OF INTERESTING VARIETIES.

Wallace & Sons, of Ansonia, Conn., have invented and patented a little brass silver-plated clasp, for fastening the hoops of ladies' skirts to the supporting tape. They inform us that their mill for making these clasps, which is driven by a large water-power, is running constantly night and day, from midnight of Sunday till midnight of Saturday; that they use 1,000 pounds of brass and make more than a million of these clasps every 24 hours.....The largest bar of gold ever brought to this country was received recently by the American Exchange Bank, from California, by the steamship *Star of the West*. It weighed 2,227 ounces, was 12 inches long, 5½ inches deep, 4 inches wide, and worth \$41,226.....The bricks used in constructing the beautiful block, called Trinity Building, just above Trinity Church, in Broadway, New York, were made in Wisconsin.....We are glad to know that the grasshoppers are to be destroyed in some way. The *Port Hope (Canada) Guide* says, they are falling a prey to a grub, very similar in appearance to the weevil. On examination they are found covered with these small but formidable enemies, the strength gradually departs from the joints of the strongest, and they die. It is said the grasshoppers may be seen in myriads, stark and stiff, in the fields, while those alive are so dull and inactive that they can do but little mischief to the green crops. Some farmers assert, with all sincerity, that the weevil, appearing too late to successfully attack the fall wheat, pounced upon the grasshoppers, then young and tender, and will destroy them instead of the grain. If this should prove to be the case, it will be one of the most extraordinary circumstances on record.....There have been found in England, in rocks which were deposited long before the creation of man, a frog's bones of such size, as to indicate clearly, that the animal when alive must have weighed from 800 to 1,500 pounds.....A little tool has been invented for threading a needle. It is made with two blades, which hold the needle with its eye opposite a little funnel-shaped opening, into which it is perfectly easy for a person of weak sight to pass the thread, and the thread inevitably passes through the eye.....A penny was deposited in the corner-stone of a church at Jackson, Mich., last week, that had been taken from the corner-stone of a temple in Rome, built during the reign of the first Cæsar.....The Post-office Department has ordered 1,000,000 of the ruled self-sealing envelopes, such as were illustrated on page 96 of the present volume of the *SCIENTIFIC AMERICAN*.....We have just received a copy of the *Commercial Advertiser*, published at Honolulu, Sandwich Islands, and one its items says: "The *Yankee* ought to bring news from the seat of war to May 20th, and accounts of the first battle.....In England, from 1845 to 1857—both included—13 years, 7,312,287 children were born in wedlock, and 520,704 out of wedlock.....The assessors returns from 51 counties in Indiana, show an increase, this year, of 161,354 hogs over the aggregate of last year.....The height of the highest mountains on the earth, would be represented on an 18-inch globe, by less than half the thickness of one of the leaves of this paper.....It is said that the great oyster bed in Long Island Sound originated in a schooner being sunk at the place in 1841, loaded with small oysters, which were being transplanted to a bed, where they were to be planted to grow for market.....The last perilous ascent of La Mountain proves conclusively that the elevated current in the atmosphere, flowing from West to East, is not to be relied upon.....The Emperor of Japan has ordered that the cities of Jeddo, Nagasaki, Simoda and Hakodaï shall be united by telegraph, and a line is being built from Jeddo to his summer residence. All the vessels in the imperial fleet are to be turned into steam propellers. and one of them, the *Nippon*, had already left on a voyage of discovery, manned by a native crew and engineers. An American having discovered a copper mine, was permitted to work it on promising to divide the proceeds with the government.....The strength of iron has been found to be increased by being extended under a heavy strain when heated to about 500°. In one case, the original strength of a bar being 60 tons, its strength after being stretched about six and a half per cent in length, was 72 tons, making a total gain of 26-51 per cent in strength and length.....There are upwards of 1,000 miles of railroads in construction in Spain.