ON THE CONVERSION OF BEET-ROOT INTO SUGAR.

At the commencement of the war of the French revolution, a scarcity of sugar was experienced in France, on account of the difficulty of importing this article into that country from the West India colonies, every sea swarming with British Cruisers, and whole fleets of French merchantmen falling monthly into the hands of the English. Under these circumstances it became necessary to procure a substitute for this most necessary article, and it is thought that some account of the eminent chemist who was applied to on this occasion would not be unacceptable to the readers of the *Saturday Evening Magazine.*

FRANÇOIS CHARLES ACHARD, a chemist and experimental philosopher, supposed to have been of French extraction, was born at Berlin in 1753 or 1754, and died in 1821. He was the author of various works, written in the German language, on experimental physics, chemistry and agriculture; and he was long an active contributor to different scientific journals, particularly the Memoirs of the Academy of Berlin. In 1780 he published at Berlin, a work entitled *Chymisch-Physiche Schriften*, which contains a great number of experiments on the subject of the adhesion of different bodies to each other. Tables containing the results of these experiments, which seem to have been conducted with great care, may be seen in the *Encyclopédie Methodique—Chimie*, tom. I, p. 469.

Achard is, however, chiefly known for his proposal to extract sugar from beet-root. Another Prussian chemist, Margraff, had discovered the existence of a certain portion of sugar in this root, as early as 1747. He communicated his discovery to the Scientific Scociety at Berlin; but he himself thought it of little practical importance, as he declared he could not produce sugar under 100 francs the pound.—Achard, who in this particular appears to have been somewhat of a visionary, on the contrary, described the beet-root as 'one of the most bountiful gifts which the divine munificence had awarded to man upon the earth. He affirmed that not only sugar could be produced from beet-root, but tobacco, molasses, coffee, rum, arrack, vinegar and beer. 'The Institute of Paris,' in 1800, gave Achard the honour of a vote of thanks; but after a series of careful experiments they reported that the results were so unsatisfactory, that it would be unwise to establish any manufacture of sugar from beet. But Napoleon, in 1812, succeeded in forming an imperial manufactory of sugar at Rambouillet, when his decrees had deprived France of the produce of the West Indies. The sugar made at home was sold at a great price; and, consequently, after the peace, when foreign sugar was once more introduced, its cheapness put an end to the beet-root establishments. The government of France, however, chose to levy high duties upon the sugars of English colonies to protect those of Martiniqne, Guadaloupe and Bourbon; and the tax upon English colonial sugar, being now 95 francs the 100 kilogrammes, or about half a franc per pound, amounts to a prohibition. The beet-root manufacture, therefore, was revived and is now flourishing, for the sugar so produced pays no duty whatever. In plain words, the manufacture is flourishing, because the people of France are compelled to buy dear sugar instead of cheap. Sugar in that country is only consumed by the wealthy. The average yearly consumption of sugar in France is 4 lbs, for each individual of the population; in the United Kingdom it is 30 lbs. The expectations which Achard formed of the blessings which the beet-root was to produce have not therefore been realized. His plan, like all other plans for raising an article at home which could be obtained better and cheaper by exchange, has only had the effect of keeping the great body of consumers ill supplied, that a few might thrive by monopoly.

FACTS.

The sea is to the land, in round millions of square miles, as 160 to 40, or as 4 to 1.

Fraimhoifer, in his optical experiments, made a machine in which he could draw 32,900 lines in an inch breadth.

There are 7,700 veins in an inch of colored mother-of-pearl. Iris ornaments of all colors are made by lines of steel from 200 to the $\frac{1}{1000}$ part of an inch.

The coal mines, which in Staffordshire have been burning for 200 years, consist of pyrites, subject to spontaneous combustion. Water will not extinguish them because when drawn off or absorbed, the pyrites burns more than before.

Botanists record 56,000 species of various plants; and 38,000 are to be found in the catalogues.

The height of mountains in the moon is considerable; ten or five miles or nearly; and eight are from 3 to 4 miles. Three of the hollows are from 3 to 4 miles; ten are from 2 to 3 miles, and as many are nearly two miles.

Teeth are phosphate of lime and cartilage, but the enamel is without cartilage.

The muscles of the human jaw exert a force of 534 pounds, and those of mastiffs, wolves, &c. far more. The force is produced by the swelling of the muscles in the middle and dilating again.

The number of ribs vary, being twelve or thirteen on a side.

SALT IN INDIA.—The soil of Hindostan is so much impregnated with salt, that a saline effervescence is seen in almost every low spot.

Bishop Heber observes that the tendency of the soil in Bengal to produce Saltpetre is so great, that it encroaches upon walls and floors of the houses to an extent often rendering them uninhabitable in a few years. The saltpetre corrodes the best of bricks and crumbles them.

MUD IN RIVERS.—The weight of mud daily carried down the river Ganges is calculated at 74 times the weight of the great pyramid of Egypt.

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