The beauty of refined ſugar, when formed into loaves, conſiſts in whiteneſs, joined to a ſmallneſs of grain ; in being dry, hard, and ſomewhat tranſparent. The proceſs which we have deſcribed above refers to ſugar once refined ; but ſome more labour is neceſſary to produce double refined ſugar. The principal difference in the operation is this, the latter is clarified by white of eggs instead of blood, and freſh water in place of lime-water.

*Sugar-candy* is the true eſſence of the cane formed into large cryſtals by a flow proceſs. When the ſyrup is well clarified, it is boiled a little, but not ſo much as is done for the proof mentioned in the proceſs for making common ſu­gar. It is then placed in old moulds, having their lower ends stopped with linen, and crossed at little diſtances with ſmall twigs to retain the ſugar as it crystallizes. The moulds are then laid in a cool place. In proportion as the ſyrup cools cryſtals are formed. In about nine or ten days the moulds are carried to the stove, and placed in a pot ; but the linen is not removed entirely, ſo that the ſyrup falls down slowly in drops. When the ſyrup has dropped away, and the cryſtals of the ſugar-candy are become dry, the moulds are taken from the stove and broken in pieces, to diſengage the ſugar, which adheres strongly to the ſides of the moulds. If the ſyrup has been coloured with cochineal, the cryſtals take a slight taint of red ; if indigo has been mixed, they affirme a bluiſh colour. If it be deſired to have the candy perfumed, the eſſence of flowers or amber may be dropped into the moulds along with the ſyrup.

Having now given ſome account of the method uſually employed for refining ſugar, it will not be improper to ſay **a** few things concerning its nature and its uſes.

Sugar is ſoluble in water, and in a ſmall degree in alcohol. When united with a ſmall portion of water, it becomes fusible ; from which quality the art of preſerving is indebt­**ed** for many of its preparations. It is phoſphoric and combustible ; when expoſed to fire emitting a blue flame if the combuſtion be flow, and a white flame if the combustion be rapid. By diſtillation it produces a quantity of phlegm, acid, oil, gas, and charcoal. Bergman, in treating ſugar with the nitrous acid, obtained a new acid now known by the name of the *oxalic add :* but he has omitted to mention the principles of which ſugar is compoſed. Lavoiſier, how­ever, has supplied this omission; and after many experiments has aſſigned three principles in ſugar, hydrogene, oxygene, and carbone. If the juice expreſſed from the ſugar-cane be left to itſelf, it passes into the acetous fermentation ; and during the decomposition of the ſugar, which is continued for three or four months, a great quantity of glutinous mat­ter is ſeparated. This matter when diſtilled gives a portion of ammoniac. If the juice be expoſed to the ſpirituous fer­mentation, a wine is obtained analogous to cyder. If this wine, after being kept in bottles a year, be diſtilled, we ob­tain a portion of eau *de vie.*

The uſes to which ſugar are applied are indeed numerous and important : It can be made ſo ſolid as in the art of preſerving to receive the moſt agreeable colours and the greateſt variety of forms. It can be made ſo fluid as to mix with any ſoluble ſubſtance.— It preſerves the juice and ſubstance of fruits in all countries and in all ſeaſons. It affords a delicious seaſoning to many kinds of food. It is uſeful in pharmacy, for it unites with medicines, and removes their diſagreeable flavour : it is the baſis of all ſyrups. M. Macquer has ſhown in a very ſatisfactory manner how uſeful ſugar would be if employed in fermenting wines. Sugar has alſo been found a remedy for the ſcurvy, and a valu­able article of food in cases of neceſſity. M. Imbert der Lennes, first surgeon to the late Duke of Orleans, publiſh the following story in the *Gazette de Sante,* which confirms this affection. A veſſel laden with ſugar bound from the Weft Indies was becalmed in its paſſage for several days, during which the stock of proviſions was exhauſted. Some of the crew were dying of the ſcurvy, and the rest were threatened with a still more terrible death. In this emer­gency recourſe was had to the ſugar. The conſequence was, the ſymptoms of the ſcurvy went off, the crew found it a wholeſome and ſubſtantial aliment, and returned in good health to France.

“ Sugar (ſays Dr Ruſh) affords the greateſt quantity of nourishment in a given quantity of matter of any ſubſtance in nature; of courſe it may be preſerved in leſs room in our houſes, and may be conſumed in leſs time, than more bulky and leſs nouriſhing aliment. It has this peculiar advantage over moſt kinds of aliment, that it is not liable to have its nutri­tious qualities affected by time or the weather ; hence it is preferred by the Indians in their excursions from home@@. They mix a certain quantity of maple ſugar, with an equal quantity of Indian corn, dried and powdered, in its milky ſtate. This mixture is packed in little baſkets, which are frequently wetted in travelling, without injuring the ſugar. A few ſpoonfuls of it mixed with half a pint of ſpring wa­ter afford them a pleaſant and strengthening meal. From the degrees of strength and nourishment which are convey­ed into animal bodies by a ſmall bulk of ſugar, it might probably be given to horſes with great advantage, when they are uſed in places or under circumstances which make it difficult or expenſive to ſupport them with more bulky or weighty aliment. A pound of ſugar with graſs or hay has ſupported the strength and ſpirits of an horse during a whole day’s labour in one of the West India Islands. A larger quantity given alone has fattened horſes and cattle, during the war before last in Hiſpaniola, for a period of ſeveral months, in which the exportation of ſugar, and the importation of grain, were prevented by the want of ſhips.

“ The plentiful uſe of ſugar in diet is one of the best preventives that has ever been diſcovered of the diſeaſes which are produced by worms. Nature seems to have im­planted a love for this aliment in all children, as if it were on purpoſe to defend them from thoſe diſeaſes. Dr Ruſh knew a gentleman in Philadelphia, who early adopted this opinion, and who, by indulging a large family of children in the uſe of ſugar, has preſerved them all from the diſeaſes uſually occaſioned by worms.

“ Sir John Pringle has remarked, that tire plague has never been known in any country where ſugar composes a material part of the diet of the inhabitants. Dr Ruſh thinks it pro­bable that the frequency of malignant fevers of all kinds has been leſſened by this diet, and that its more general uſe would defend that claſs of people who are moſt subject to malignant fevers from being ſo often affected by them,

“ In the numerous and frequent disorders of the breaft, which occur in all countries where the body is expoſed to a variable temperature of weather, ſugar affords the baſis of many agreeable remedies. It is uſeful in weaknctſes; and acrid defluxions upon other parts of the body. Many facts might be adduced in favour of this aſſertion. Dr Ruſh mentions only one, which, from the venerable name of the perſon whoſe caſe furniſhed it, cannot fail of command­ing attention and credit. Upon my inquiring of Dr Frank­lin, at the requeſt of a friend (says our reſpectable author), about a year before he died, whether he had found any relief from the pain of the stone from the blackberry jam, of which he took large quantities, he told me that he had, but that he believed the medicinal part of the jam reſided wholly in the ſugar ; and as a reaſon for thinking ſo, he added, that he often found the ſame relief by taking about half a pint of a

@@@[mu] Transactions of the American Philosophical Society, vol. iii.