On the fermentation of sugar of milk

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precipitates the nitrate of lead, whilst the sesquichloride and pernitrate of iron are only partially precipitated by the sulphuret of lead.—*Journal de Pharmacie*, October 1837.

ON THE FERMENTATION OF SUGAR OF MILK. BY M. HESS.

It has generally been admitted by chemists as an indisputable fact, that sugar of milk is incapable of fermentation. Pallas endeavoured, but in vain, in his collection of historical facts respecting the people of Mogol, (St. Petersburg, 1776, vol. i. p. 33), to controvert this generally received opinion, by objecting that the people of Asia prepared an intoxicating liquor from milk; although this fact was known to many persons, and has often been quoted respecting milk, the idea has nevertheless remained, that sugar of milk is not susceptible of the alcoholic fermentation, and it has been proposed to expunge it from the list of sugars, and to give the name of *lactin*.

In order to elucidate this subject by some experiments, M. Hess fermented cow's milk in wooden vessels; the fermentation occurred spontaneously and without any addition; it is necessary only that the vessels should be sufficiently deep and exposed to a sufficiently high temperature; it is of no consequence whether the milk be previously skimmed or not. The fermentation continues for a long period; it is accompanied with a disengagement of gas, perceptible even by the ear. The gas collected was examined by solution of potash, which absorbed it within $\frac{1}{100}$ part, which could be nothing but atmospheric air; the fermented liquor was passed through a flannel, to separate the ferment, and afterwards distilled. The product of the distillation was acid; it was saturated with carbonate of lime, and several times redistilled, taking care to receive each time only one-fourth of the liquid. The liquor thus obtained was mixed with excess of dry carbonate of potash, which combined with the water, and an alcoholic liquor floated on the saline one; it was separated by repeated distillations from the salts which it contained; then, in order to have it pure, it was rectified from lime; it always possessed a peculiar odour. By analysing 0.48 of this liquid there were obtained 0.827 of carbonic acid, and 0.561 of water, which gives for 100 parts:

Carbon	47.64
Hydrogen	12.96
Oxygen	39.40
	———— 100.

and as 47.64 of carbon indicate 90.46 of alcohol, which are equal to

Carbon	47.64
Hydrogen	11.66
Oxygen	31.16
	———— 90.46

there remain 1.3 of hydrogen, which indicate 11.81 of water, from which there results an excess of 2.27 in 100. As M. Hess performed this analysis with care, and believed he was sufficiently guarded from the usual source of error, that is, of hygrometric moisture, he pre-

sumed that there was present in the liquor some combination containing more hydrogen than alcohol does; and it is proved by the experiments of Döbereiner that ammonia is formed during fermentation. A solution of chloride of platina produced so abundant a precipitate in the liquor of ammonio-chloride of platina, that the author almost suspected an accidental error. The experiment was then repeated with a certain quantity of alcohol recently prepared from milk; the precipitate was collected on a filter, dried and then heated to redness in a glass tube. The large quantity of muriate of ammonia obtained, left no doubt on the subject in question. M. Hess also determined that the peculiar odour was derived from an admixture of ammonia. Then in order to obtain pure alcohol, he first separated the water by lime and then distilled it with a salt water bath, at a very low temperature, with a few drops of sulphuric acid. The liquor obtained had however a weak æthereal odour; 0.513 gave 0.993 of carbonic acid and 0.596 of water, which give for 100 parts: Carbon .. 53.43 but alcohol contains 52.66

Hydrogen	12.90	..	..	12.90
Oxygen..	33.67	..	..	34.44

100.

100.

The æthereal odour sufficiently explains the cause of the slight excess of carbon, and it appears, in fact, that the alcohol obtained is identical with common alcohol, but in order to be quite certain of this, M. Hess mixed it with an equal weight of sulphuric acid, and he obtained by distilling the mixture common sulphuric æther. As all kinds of milk are susceptible of fermentation, and as no other kind of sugar but sugar of milk has been discovered in them, these facts prove that it must be fermentable. The author is of opinion that two facts have especially contributed to lead observers into error; first, it is quite possible that the usual ferment (yeast) is not sufficiently powerful to decompose sugar of milk, which requires for its decomposition the action of its natural ferment (caseum); secondly, the extreme slowness of the fermentation.—*Journal de Pharmacie*, October 1837.

FORMATION OF NITRE IN EXTRACT OF QUASSIA. BY M. PLANÇHE.

The ashes of quassia are slightly alkaline and cold water dissolves about 25 per cent. of them, composed of potash, lime, carbonate of potash, carbonate of lime, chloride of sodium, nitrate of potash, and traces of sulphate. The insoluble residue yielded a little sulphate of potash and of lime to boiling water; the remainder consisted principally of carbonate and sulphate of lime. There are few vegetable ashes which contain so small a quantity of alkali, and the existence of nitre in a product which has been subjected to a red heat is also remarkable.

Not only is nitre contained in the ashes of quassia, but it exists in the extract, and the quantity increases by exposing it to the action of air and moisture. An ounce of extract of quassia (A) recently prepared, and of a consistence fit for pills was put into an earthen