

Further and numerous observations of British practitioners on this remedy may be found in Bardsley's Hospital Reports, and the Transactions of the Midland Association, vols. i. and ii., to which the nature of the present work does not allow me to do more than refer the reader.

The French practitioners do not appear to have gone beyond paralysis in their application of nux vomica.

Long ago, Linnæus conjectured the highly tonic powers of the strychnos nux vomica, from the intense bitterness of its aqueous solution.—*Tr.*]

BRUCIA.

This organic salifiable base was discovered in 1819, by Pelletier and Caventou, in the bark of the spurious angustura (*brucea antidysenterica*,) in which it is combined with gallic acid. They subsequently found it in combination with strychnia in the nux vomica. In the St. Ignatius's bean and the upas tieuté, the brucia bears the same relation to the strychnia, which cinchonia does to quinia; the more active cinchonas containing the most quinia, just as the bean and the upas tieuté, which are much more active than the nux vomica, contain only a small proportion of brucia, and a large quantity of strychnia, which, in the upas, is nearly pure.

Preparation of Brucea.

It is obtained from the bark of the angustura, by a process resembling that for the extraction of strychnia, only, that in the case of brucia the magnesian precipitate is to be much more sparingly washed with water, the brucia being more soluble in that fluid than strychnia. By evaporating the alcoholic liquors in which

the magnesian precipitate has been treated, brucia is obtained in an impure, non-crystallized form. To purify it, combine it with oxalic acid, and digest the oxalate in a mixture of alcohol, at 40°, and ether at 60°, by which the colouring matter is dissolved, and the oxalate of brucia will remain in the form of a white powder. This may be decomposed by magnesia, and the brucia taken up by alcohol. In evaporating the alcoholic solution in the open air, brucia in crystals will be obtained; if the evaporation is made with heat the brucia will be fused, but is not on that account less pure.

It may be also easily obtained by boiling the bark of the brucia antidysenterica in acidulated water, decomposing the fluid by an excess of quick lime, and treating the deposit with alcohol. This distilled, leaves brucia, which is then easily combined with sulphuric and hydrochloric acids to form salts.

Properties of Brucia.

It is intensely bitter, is sparingly soluble in water, though more so than strychnia. It dissolves in 500 times its weight of boiling water, and 850 times of cold water. When a regular crystallization takes place, it is in the shape of oblique prisms with parallelogrammic bases. Brucia in crystals is a true hydrate; its affinity for water is considerable, whereas pure strychnia never passes into a hydrate. By fusion brucia loses a considerable quantity of water.

Two hundred parts of brucia crystallized from water yield,

Residue	163 parts.
Water	37 parts.

One hundred and sixty one parts crystallized from alcohol, yield,

Residue	154 parts.
Water	27 parts.

by which the constitution of the hydrate, taking the mean of these numbers, is made to be,

Brucia 100 parts.
Water 21.165 parts.

Brucia fuses at a temperature nearly approaching that of boiling water, and on cooling looks like wax. Exposed to moist air, it swells, whitens, and becomes pulverulent. It combines with acids, and forms neutral salts, most of which are regularly crystallizable. Nitric acid causes it to take on an intensely blood-red colour, which, on the application of heat, turns to yellow. If in this state a solution of proto-hydrochlorate of tin be added, a magnificent violet-coloured precipitate is formed; this is peculiar to brucia. Hence when strychnia from nux vomica takes on a violet colour by a similar treatment, we may be certain that it is mixed with brucia, for the phenomenon in question never occurs in the pure strychnia got from the St. Ignatius's bean. Moreover, pure strychnia does not redden with nitric acid.

M. Liebig's analysis of brucia, which agrees with its capacity for saturation, and with its atomic number 3485.23, is as follows:

Carbon 70.88 = C. 32
Azote..... 5.07 = A. 2
Hydrogen..... 6.66 = H. 36
Oxygen 17.39 = O. 6

Action on the Animal System.

This is similar to, though less violent than that of strychnia, being perhaps in energy as one to twelve of pure strychnia. Four grains of brucia were required to kill a rabbit; and a middle-sized dog had strong tetanic attacks from the same dose, but did not die.

According to M. Andral's experience, it required six grains of brucia to produce the effects of one grain of pure strychnia. Brucia may therefore be

sometimes used instead of strychnia where less energy of action is required.

Mode of Administration.

Like strychnia, it may be given in pills or tincture, in graduated doses. In medical use that obtained from the spurious angustura is preferable, as that from the nux vomica is apt to be mixed with more or less strychnia, which prevents any accurate calculation of its effects.

Cases for the employment of Brucia.

As this substance possesses the properties of strychnia, though in a milder degree, it may be given in doses of 1, 2, or even 3 grains, without fear of the consequences, in the same circumstances where the preparations of nux vomica are indicated. The dose may be probably much greater, but must be increased with caution. M. Andral has given from half a grain to 5 grains of brucia with advantage, in several cases of paralysis; (See Journ. de Physiol. 1823;) and I have myself used it successfully in two cases of atrophy, one of the arm and the other of the leg. The patient took 6 pills daily, of the eighth of a grain each.

Brucia Pills.

Pure brucia..... 12 grains.
Conserve of roses $\frac{1}{2}$ gros.

Mix accurately, and divide into 24 equal pills.

Tincture of Brucia.

Alcohol at 36° 1 ounce.
Brucia 18 grains.

From 6 to 24 drops of this may be given in mixture or common drink.

Stimulating Mixture.

Distilled water.....	4 ounces.
Very pure brucia.....	6 grains.
White sugar	2 gros.

Five gros (7 drachms and a half) to be taken morning and evening.

Salts of Brucia.

Brucia forms both neutral and acid salts. *Sulphate of brucia* crystallizes in long needles resembling four-sided prisms terminated by extremely delicate pyramids. It is very soluble in water and alcohol, is excessively bitter, is decomposed by potass, soda, ammonia, baryta, strontia, lime, magnesia, morphia, and strychnia. The acid supersulphate more readily crystallizes than the neutral sulphate: it is formed of

Sulphuric acid	8.84
Brucia	91.16

Hydrochlorate of brucia.—This salt crystallizes in four-sided prisms terminated by an oblique surface; it does not change in the air, and is exceedingly soluble in water. Sulphuric acid decomposes it, and nitric acid even decomposes the brucia. The hydrochlorate consists of

	Atoms.
Acid.....	13.06 = 1
Brucia.....	100.00 = 1

The *phosphate* is also crystallizable, is very soluble, and slightly efflorescent. The acetate, tartrate, and oxalate may also be crystallized.

The *nitrate* is a mass resembling gum.

As the sulphate and muriate of brucia are more soluble than their base, some advantages in use may be derived from their probably greater activity, and they

may therefore be occasionally placed instead of brucia in the two foregoing formulæ.

MORPHIA, AND ITS SALTS.

It appears from the chemical researches of MM. Seguin, Sertuerner, Robiquet, Robinet, Pelletier, and Couerbe, that opium is composed of, 1, a fixed oil; 2, caoutchouc; 3, gum; 4, fecula; 5, resin; 6, ligneous matter; 7, morphia; 8, narcotine; 9, narceine; 10, meconine; 11, codeine; 12, meconic acid; 13, another brownish acid. Among these mention will only be made of such as refer to therapeutical employment.

M. Robiquet's late researches go to show that neither codeic acid nor codeate of morphia exist in opium: that which has been taken for them being in fact an acid salt, or the hydrochlorate of morphia. This salt will even vary with the nature of the saline solution to which the opium is submitted. Thus it may be a sulphate or a nitrate of morphia, according as the sulphate of soda or nitrate of potass be used to obtain the supposed codeate.

M. Robinet has, however, ascertained the fact that morphia has the property of producing a blue colour by the action of the per-salts of iron—a property by which morphia, when used for poisoning purposes, might possibly be detected.

Preparation of Morphia.

M. Robiquet employs the following method. A concentrated solution of opium is boiled with a small quantity of magnesia—10 grammes, or a little more than 2 drachms and a half, to a pound of opium—for a quarter of an hour. A greyish deposit forms, which is filtered and washed with cold water. Being well dried, the precipitate is then treated with weak alcohol, and