# Pharmaceutical Department.

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## ESERINE.

Compiled from various sources by

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In 1863, it was discovered that the poisonous nature of calabar bean depended upon an alkaloid to which the name physostigmine was given. Jobst and Hesse, the discoverers, produced it in the form of an amorphous mass, alkaline, soluble in much water, and on exposure its aqueous solution became red.

In 1865, Hesse obtained it perfectly colorless and *tasteless*, and gave its chemical formula.

In 1867 Vée and Leven prepared an alkaloid from the bean which they named Eserine. This alkaloid differs from Hesse's in forming rhomboidal tabular crystals of a *bitter taste*, melting at 90°C., and combining with acids to form soluble salts, which are hygroscopic and non-crystalline as a rule. It is assumed by most writers that Eserine is only the pure form of what Jobst and Hesse called physostigmine, but in Flückiger & Hanbury's Pharmacographia it is stated that "we feel hardly warranted in admitting the identity of the two substances."

The following is the method of preparing the alkaloid of calabar bean, as recommended by a Commission on "Standard Formulas" appointed by the Pharmaceutical Society of Paris.

Exhaust powdered calabar beans mixed with 1 per cent of tartaric acid by means of repeated digestion and percolation, with hot alcohol (about three times the weight of powder for each digestion). Distil most of the alcohol off, filter the remainder, and heat on a water bath until all the alcohol has been dissipated. When cold, add a small quantity of distilled water and filter to separate resinous matter. Shake the filtered liquid with several portions of washed ether, until the latter ceases to become colored. Now add to the aqueous liquid remaining a slight excess of bicarbonate of potassium, again shake several times with ether, unite the ethereal solutions, and allow to evaporate spontaneously, when the Eseria will be left behind in crystals, which are rendered pure by a second crystallization.

Bromhydrate of Eseria is prepared by dissolving the foregoing alkaloid in colorless bromhydric acid, and evaporating to a syrupy consistence. In a few days fibrous, slightly colored, but not deliquescent crystals make their appearance.

The bromhydrate being the only non-deliquescent crystalline salt of Eserine, and possessing equally with the others the power of contracting the pupil, will doubtless be the one most employed by oculists.

The neutral sulphate, which is the only salt obtainable commercially as yet, is prepared by *exactly* saturating a given quantity of Eserine with a solution of sulphuric acid (one part to nine), and immediately evaporating to dryness. This salt, although it is generally said to be amorphous, may with considerable difficulty be obtained crystalline. It is generally in the form of yellowish and sometimes reddish brown masses. A sample before the writer from Merck is in a dark colored mass, about the color of pale socotrine aloes and only slightly deliquescent. Another, freshly opened from I. Darrasse & Co., Paris, resembles the above, but is nearly as dark as gum guaiacum, and is slightly more deliquescent than Merck's, while a sample from the pharmacy of Dr. Vée, of Paris, made by his successor H. Dusquenel, and freshly opened, resembles amber rosin when reduced to coarse powder, the small particles having a shining fracture, and although examined during very damp weather appears very slightly hygroscopic. Its solution is colorless while the other samples are of a pale straw tint and even darker in the case of Darrasse's.

The position in the list of therapeutic agents to be assigned to the Salts of Eserine is hardly as yet determined. That they possess invaluable properties when administered hypodermically in tetanus has been demonstrated, but whether they can claim any advantage over the very efficient extract of the Pharmacopœia, which may perhaps contain other active principles of the bean, remains to be proved.

The dose of the sulphate is 1-64 of a grain internally.

Dr. Desjardins, oculist to the Hôtel Dieu, and Dr. Buller, oculist to the Montreal General Hospital, both speak in the highest terms of the great value of Eserine in eye diseases. Dr. Buller uses the sulphate in the proportion of 4 grains to one ounce of distilled water, and states "that there are several important diseases of the eye in which its action is very beneficial."

Dr. Desjardins is of opinion, from an extended experience of this remedy, that it is not only valuable as *myotique*, but it is one of the best remedies for deep-seated ulcers and large abscesses on the cornea; he also adds that it possesses great advantages over atropine after operations for cataract.

The great drawback to an extended use of this valuable therapeutic agent is its great price. As the demand increases this objection will gradually disappear.

* The writer is indebted to the "Proceedings of the American Pharmaceutical Association for 1877;" *Chemist and Druggist*, London; *New Remedies*, New York, and Flückiger & Hanbury's "Pharmacographia."