THE POSSIBILITY OF SUBSTITUTING CANNABIS FOR OPIUM.

BY H. C. FULLER.*

The requirements of the Medical Department of our Army have caused an unusual demand for several important drugs. Among these are opium and some of the salts of the alkaloids derived therefrom. The importance of opium preparations for relieving pain is indisputable. A scarcity of the crude material exists and the importation of opium for manufacturing purposes is not sufficient to supply satisfactorily the normal legitimate consumption of the products used by the medical profession. The sudden abnormal demands for the Army have created a critical situation.

Opium for manufacturing purposes came chiefly from Turkey, but to some extent from India. Due to the fortunes of war the Turkish source is no longer available and the British authorities carefully supervise the Indian supply. The cultivation of the opium poppy in China was prohibited several years ago and while diplomatic negotiations might prevail upon the authorities to permit a resumption of the production of the drug for export it is only a possibility at present. The opium poppy will flourish in certain localities in the United States, but up to the present no recent attempts have been made to produce opium in a commercial way. To establish the cultivation of the plant and prepare a marketable drug would require considerable experimental work and it is doubtful if a material supply could be obtained during the coming year.

Opium and the salts of its alkaloids are used for the relief of pain, insomnia, inflammation and irritation, oversecretion and systemic strain. Now from a study of the physiological properties of other drugs it is possible that preparations of *Cannabis indica* might be substituted for those of opium, because Cannabis will do many of the things that opium will do. Hobart H. Hare[1] states that "Cannabis is very valuable for the relief of pain, particularly that depending on nerve disturbances; that it produces sleep; that it gives great relief in paralysis agitans to quiet tremors, and in spasm of the bladder due to cystitis or nervousness; that it is used in cough mixtures, and does not constipate or depress the system as does morphine."

H. C. Wood, Jr.,[2] states that "*Cannabis indica* is used chiefly for the relief of pain; especially of neuralgic character, although it sometimes will palliate even pain of organic origin. It is also at times of service for quieting conditions of restlessness and general discomfort—for instance in neurasthenia—and to relieve the distress of the latter stages of incurable diseases, especially advanced phthisis. More rarely it is used as a mild somnifacient."

Finley Ellingwood[3] states that:

"It is a remedy for disordered mental action. It is a remedy for disorders of motility, involuntary irregular muscular movements, especially if of a distressing character. It is a remedy to arrest or control pain, often acting advantageously in conjunction with other pain-quieting agents, intensifying, modifying or favorably influencing their action. It is a remedy for excitable and irritable hyperaesthetic

* In charge, Division of Food & Drug Products, The Institute of Industrial Research, Washington, D. C.

[1] Hobart H. Hare—"Practical Therapeutics."

[2] H. C. Wood, Jr.,—"Pharmacology and Therapeutics."

[3] Finley Ellingwood—"Materia Medica, Therapeutics & Pharmacognosy."

conditions of the genito-urinary organs, with increased functional activity and uterine disorders.

"This remedy has received a great deal of attention in its adaptability to cerebro-spinal meningitis, and with varying but encouraging results, especially in the earlier stages of irritation and congestion. It is useful also in hydrophobia, and in large doses it is certainly palliative to the distressing symptoms. Minute doses will cure some cases of tinnitus aurium.

"It is of much use in paralysis agitans, in relief of the lightning pains of locomotor ataxia, and especially in chorea and in general muscular tremblings. In chronic conditions accompanied by persistent pain, it ameliorates the pain.

"It cures many irritable states of the bladder. It is curative in strangury and painful urination with burning and scalding. In spasmodic stricture, with gelsemium or cimicifuga, it relieves quickly.

"It is soothing to irritable bronchial coughs and laryngeal spasm, and in coughs from tickling in the throat; also in whooping cough and in spasmodic coughs of whatever character. It is a common ingredient of cough syrups."

Cannabis is therefore a drug which is well established in the Materia Medica and its therapeutic usefulness has been demonstrated. No deaths from its use are on record, which is quite the contrast with opium.

Until recently all of our supply of Cannabis came from abroad but now it is cultivated in the United States. The drug is grown under carefully supervised conditions and its physiological activity is equal to, if not better than, the imported product. The Cannabis industry is now firmly established and sufficient quantities for extraordinary demands can be made available without difficulty.

The pharmacopoeia prescribes that the drug shall consist of the female tops, and a limit has been set on the amount of seed allowed, hence the specifications apply practically to tops which have not been fertilized by the male flowers. This necessitates the removal from the field, of the male plants as soon as the sex can be identified. It has been found that the leaves and tops of the male culls have equal or greater physiological activity than the drug from the female plants. Emphasis must be laid on the fact that this observation applies only to incompletely developed male plants, and whether or not ripe male tops would show less activity has not been determined, insofar as it applies to plants grown in this country. At the present time the important point is that the pharmacopoeia discriminates against the leaves and tops of undeveloped male culls which are just as good from a medicinal standpoint as the female tops.

While the physiological activity of the drug and its preparations will decrease to some extent after a lapse of time, permanent products can undoubtedly be evolved by a more careful study of the chemical properties of the active constituents. Little difficulty is now experienced in making permanent preparations of ergot, and the same results may be expected in the case of Cannabis. There is no reason why sterile, non-irritant, potent solutions of Cannabis analogous to Ergotin and other ergot products of the same type, should not be evolved, and be suitable for hypodermic injection, thereby rendering Cannabis an important remedy in surgical practice.

It is believed that the medical authorities might well consider seriously the possibility of using Cannabis preparations for some of the purposes for which those of opium are usually prescribed.