

of strength. The practice alluded to is most reprehensible; it has been attended by serious detriment to pharmacy in general, and has insidiously undermined and weakened the respect due to the national Pharmacopœia. It is the duty of every college of pharmacy to take a decided stand, and positive action against this great and growing evil.

It is well to inquire if the official processes may not be, to a certain extent, responsible for the indisposition of druggists to prepare fluid extracts; the difficulties in the way of their general employment are numerous, and certainly defeat in some measure, the very object of their adoption. In criticism of the official processes for this class of preparations, the following defects and objections may be mentioned:

It is impracticable to prepare powders of the degree of fineness indicated as essential to the proper execution of many processes, and a resort to commercial powders does not always meet the official requirement of division, and a powder of uncertain quality may be procured; while in many instances it is easy to decide the value of a crude drug by simple inspection, in a powdered state, this decision becomes usually utterly impossible. No less an authority than Dr. E. R. Squibb, reporting on rhubarb, selected and powdered in his establishment, acknowledged his inability to distinguish the inferior from the superior varieties by simple examination of them when pulverized.

There is a wasteful use of alcohol, unless recourse be had to distillation, which requires suitable apparatus, and the expenditure of time, and fuel.

The processes require much close attention during their various stages. The proper moistening of the powder and adjustment in the percolator; the gradual addition of menstruum, the watchfulness necessary to guard against the entire disappearance of the fluid from the surface of the powder, the reservation of a measured quantity of the percolate; the evaporation of the remainder at various prescribed temperatures to a definite measure; the admixture of this with the reserved portion, and the subsequent filtration, all unite to render the preparation of fluid extracts laborious and difficult. It is a duty which even the accomplished apothecary, in the press of urgent business, is prone to neglect.

If there be any method by which the processes may be simplified, without depreciating the quality of the products, it is worthy of most serious consideration.

In this connection a brief review of the literature of this subject seems desirable, and the modifications suggested will be mentioned, with the more prominent advantages and defects pertaining to each.

N. Spencer Thomas patented a method consisting in moistening the powder with a fraction of its weight of a suitable menstruum, and, after an interval of maceration, expression of the liquid by a powerful hydrostatic press, the residue to be repeatedly subjected to the same treatment, until the expressed liquids, together, measure a pint for each sixteen ounces of the drug employed. The utility of this process has never been practically demonstrated, as far as the knowledge of the writer extends, and there are certain theoretical objections which practice might or might not remove; aside from this consideration, however, the requirement of a

press of the most perfect and expensive pattern, in itself worth some hundreds of dollars, would condemn its general adoption.

Dr. E. R. Squibb demonstrated, beyond reasonable doubt, that the process of percolation would yield, when carefully and skillfully executed, from sixteen troy ounces of powdered drug, twelve fluid ounces of percolate, representing at least three-fourths of the medicinal properties of the drug employed. Without recommending it for adoption, he suggested it as one means of securing economy in the use of alcohol, and facility in the preparation of fluid extracts. This method, of course, dispenses with all application of heat and evaporation, is easy of execution, and when properly conducted, yields excellent results. The process requires the utmost attention to certain details; as the fineness of the powder, and proper adjustment in the percolator, and, indeed, actual skill and experience are needed to obtain uniform and satisfactory results. On this account the process cannot be recommended for adoption in the Pharmacopœia.

Subsequently Dr. Squibb presented an admirable paper in continuation of the same subject, and brought forward the process of repercolation. This affords excellent products, and avoids the use of heat, and waste of menstruum. A fatal objection to its general employment, in the opinion of the writer, is the complication of the process, the increased attention necessary to secure the several fractional percolates, and the time and labor required to make, with the attending details, three distinct percolations, where at present, but one is required. These considerations alone would discourage most apothecaries from attempting the preparation of fluid extracts, for, while this method would result in saving much alcohol, in comparison with the official processes, it would entail even more labor, and at the present time the latter commodity is relatively more valuable than the former.

Mr. C. Lewis Diehl has also made some practical observations on the process of repercolation (PHARMACEUT, March and June, 1859); his experience coincided closely with that of Dr. Squibb, and his conclusions were favorable to the adaptability of the method to general use. Mr. Diehl made a suggestion in this paper which will be again referred to, namely, to reduce the strength of fluid extracts to one-half the present standard of a fluid ounce from a troy ounce of the drug. Mr. Campbell has brought forward a modified method of percolation, resembling, in certain particulars, that employed in the early days of the displacement process. The writer's first acquaintance with this pharmaceutical operation is associated with a tapering percolator, terminated with a stop-cock. In this instrument the drug, reduced to powder by grinding, was placed, and the menstruum was gradually poured on the surface until it appeared at the open cock; the latter was then closed and after a maceration of several days percolation was allowed. Mr. Campbell's modifications of this process, and its adaptation to the preparation of fluid extracts are valuable contributions to our stock of knowledge, and they will exert a considerable influence toward a revision of the official formulas. The method, in general terms, may be described as follows.

*First.*—The use of glycerin as a solvent, associated with alcohol or water, or both, is almost invariable.

*Secondly.*—The drug, in moderately coarse powder, is moistened with a measured quantity of menstruum (usually four fluid ounces for sixteen troy ounces of the powder), and properly adjusted in the percolator. The menstruum, which should measure, with the quantity used for moistening, a pint for sixteen troy ounces of the drug, is then poured on the powder; when the liquid begins to escape from the powder, the orifice of the instrument is closed, and maceration for three or four days allowed. Percolation is then re-commenced, and continued by the addition of more menstruum, until the percolate measures a pint for every sixteen troy ounces of the drug employed. The advantages pertaining to this method will be hereafter referred to.

Mr. A. B. Taylor has highly commended this process, while offering a few suggestions for its improvement. In a paper presented to the American Pharmaceutical Association he detailed experiments, with results highly favorable to the process of Mr. Campbell.

Mr. R. P. Reynolds, in his experiment with this method, failed to completely exhaust the drug with the prescribed quantity of menstruum.—*American Journal of Pharm.* Nov. 1860.

Mr. James T. King has made similar observations: sixteen troy ounces of rhubarb requiring twenty-two ounces of percolate.—*Ibid.*, Jan. 1870.

Mr. Geo. Kennedy reports very satisfactory results, obtained while operating upon large quantities of powder; 20 to 40 pounds.—*Ibid.*

In the opinion of the writer, such a process for fluid extracts should be made official as will secure, first, a thorough exhaustion of the drug, without excessive expenditure of time or the exercise of the highest degree of skill; secondly, an economical use of the menstruum with no necessity for special apparatus; thirdly, the use of such powders as can be prepared by the apothecary.

These objects being attained, it cannot be doubted that fluid extracts would be generally made by a large class of druggists, who, with the recognized processes of to-day, would regard such a course as impracticable or impossible. The present official requirements are like obsolete laws, existing but ignored—their very presence weakening the moral force of every other statute; theoretically useful, practically worse than useless, and better dropped from the pharmacopœia entirely than perpetuated in their present impracticable form.

A radical change is needed: Let processes be adopted, which, while securing excellent products, will be simple of execution and involve no pecuniary loss, then it may be reasonably hoped that apothecaries will regain their lost prerogative, and be inspired with new confidence in, and respect for, the national pharmacopœia.

The means for securing these results are at hand. Mr. Diehl struck the key-note to reform, in his suggestion to reduce the strength of fluid extracts to one-half the present standard, making, as a rule, a pint of fluid extract from eight troy ounces of the drug. Mr. Campbell has ably assisted in the work of reformation, and the combined ideas of these gentlemen will furnish a process fulfilling every requirement. With the proposed reduction of strength, there can be no doubt that the method of Mr. Campbell would