

tion that the result is not commensurate with the reward of merit, and rather generates a sense of pain, as such deserving efforts have been so uselessly exerted. It is therefore evident, which has been too often reiterated, that an accurate and practical formula yet remains on the list of pharmaceutical desiderata.

As a preliminary it may be briefly stated that no process, however simple, is more complete in every sense, than dissolving a definite quantity of the crystallized dry perchloride of iron in a measured quantity of alcohol, or mixture of water and alcohol, to conform with the requirements of the official product, of which every fluid ounce represents nearly one hundred grains of the dry chloride, containing twelve equivalents of water.

But as, however, this process is too indirect and expensive to meet with general approval when the dry chloride has to be prepared by the pharmacist, the question remains, Can this be derived from the manufacturer at a sufficiently moderate price to justify its employment? and if so, let it be transferred to the *Materia Medica* list, thereby, at probably a small advance on the present cost, a uniform standard is obtained of un doubted reliability.

The old process, based upon the very indelicate and unstable sub-carbonate, is not scientific, and entirely unworthy the advanced state of pharmacy of the present day, and no especial "revelation" is requisite to elucidate the very tangible fact that it must be discarded if a reliable product is the aim of the operator.

The objectionable feature of this process is the transition property of the hydrated oxide by which it readily passes from the amorphous to the crystalline variety at slightly elevated temperatures, and even by exposure to the atmosphere when spontaneously dried. Hence this instability renders it very indefinite regarding behavior to acids, as the modified variety is either not at all or very difficultly soluble.

It has been recently ascertained that this transformation in structure is greatly augmented by the presence of sulphates, even traces, and by complete removal of these, or their exclusion altogether, invariability is secured. This may be affected by the method proposed, or perhaps to advantage by first obtaining protochloride by double decomposition between moderately dilute solutions of protosulphate of iron and chloride of calcium, washing the crystalline precipitate of sulphate of lime on a funnel by displacement or better by straining through muslin, and either precipitating the iron from the filtrate at once with carbonate of soda, or after oxidation by means of chlorate of potassa and chlorhydric acid with ammonia or carbonate of soda. The latter method yields the hydrated oxide immediately. The precipitates are best dried on porous tiles at ordinary temperature. Thus obtained, the hydrated oxide is always soluble in the necessary quantity of chlorhydric acid to form sesquichloride.

*The vague assertion that the official sub-carbonate, when recently precipitated, dissolves readily enough in the prescribed quantity of acid, admits of ambiguity, and is entirely erroneous. By the term "recently precipitated" may be understood the moist,

fresh precipitate of protocarbonate of iron, of which six ounces would indeed dissolve in one pint of chlorhydric acid, with yet 2831.49 grains of the acid in excess, as one pint of it weighs 8457.79 grains, and only 5626.3 grains can be neutralized by the protocarbonate.

But the recent precipitate is not the official sub-carbonate which when finished has lost all or nearly all its carbonate, acid, and is therefore hydrated oxide enveloping quantities of proto-carbonate only sufficient to produce feeble effervescence in contact with the acid. But again: Six ounces of pure hydrated oxide can not dissolve in one pint of the acid, since 9989.3 grains, equal to 20 ounces, and 389.3 grains of the same will be necessary.

In regard to the present official process, it has been stated (through misinterpretation) that it directs to simply heat the iron with the acid to the boiling point, and then decant. This is again fallacious, as an inspection of the official formula will testify.

The mixture of iron and acid is directed to stand (at ordinary temperature) until effervescence has ceased. This will depend, in a great measure, on the division, and more so on the quality of the iron used, and to some extent on the concentration of the acid. The effervescence ceases when all, or nearly all, of the acid has been decomposed. This will always be the case when the mixture is permitted to stand some considerable time; otherwise the decomposition of the last portions of the acid must be hastened by the final application of heat. The action progresses most favorably when the acid is moderately diluted; this also prevents a considerable loss that is otherwise incurred by fuming.

The suggestion to heat the iron and acid until effervescence ceases, would cause the loss of much of the latter, or say nothing of the ordeal the operator would be subjected to, unless the process was conducted in an open air. No pharmacist can fail to see the inapplicability of such a method.

In the present official formula nitric acid is added to peroxidize the iron. The process throughout is elegant in theory, and beautiful in design, but exceedingly difficult and circumstantial in practice, especially when moderately large quantities are operated upon, and therefore will invariably be avoided in preference to any other less laborious and tedious.

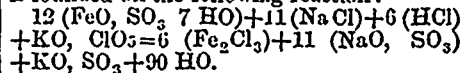
The use of nitric acid is very objectionable, since the iron solution must first be brought to the boiling point before its addition. This gives rise to dense and disagreeable fumes of chlorhydric acid gas first, and again to equally obnoxious vapors of hyponitric acid; moreover, the subsequent boiling to expel any remaining binoxide of nitrogen is apt to produce heavy crusts of peroxide on the sides of the vessel, which are very difficult to remove.

Now, the nitric acid can be substituted to great advantage by chlorate of potassa; this does away with boiling temperatures and loss of material incurred thereby. One equivalent of iron as protochloride requires but a twelfth of one equivalent of the chlorate for peroxidation. $12(\text{FeCl}) + 6(\text{HCl}) + \text{KClO}_5 = 6(\text{Fe}_2\text{Cl}_3) + \text{KCl} + 6\text{HO}$, with the employment of a very moderate heat, or none at all, if left in contact for some time previous to dilution. No effervescence occurs, and the green color of the solution changes instantly to red, as the oxidation is complete

at the moment of adding the chlorate. A twelfth of an equivalent of chloride of potassium is simultaneously formed (equal to 288.84 grains in four pints of the tincture), which is in part deposited after the addition of the alcohol; but, should its presence be any objection, the chlorate of potassa could be replaced by chlorate of soda, as the chloride of sodium generated will be insoluble in alcoholic liquids, and consequently removed. The necessary amount of chlorate of potassa requisite to replace the nitric acid of the formula will be 474.44 grains with chlorate of soda 411.8 grains.

Another process equally practical, or perhaps more so, than the above modification, is based upon the method of double decomposition, or eminently adapted to pharmacy in numerous instances. Protosulphate of iron is decomposed by chloride of sodium; chlorhydric acid added to the mixture, slightly warmed and treated with chlorate of potassa or soda; alcohol is then added, and the whole allowed to stand for some time, then filtered, and the residue washed with alcohol to bring the filtrate to the required measure.

The addition of alcohol produces a voluminous precipitate in the iron solution, which is sulphate of soda, probably in combination with water. This precipitate rapidly loses its bulkiness, and a heavy granular deposit remains. This is evidently anhydrous sulphate of soda, which can be easily separated and washed. The principle of this process is founded on the following reaction:



It is expected that any pharmaceutical chemist who wishes to try these processes will be sufficiently competent to calculate his own formula from this data. But for the benefit of the tyro it has been deemed advisable to submit the following formula, which when properly executed as above described, will yield a result in every respect identical with the official requirements:

Take of Crystallized protosulphate of iron,.....	6449.6 grains.
Chloride sodium,.....	2388.2 "
Chlorate potassa, 474.4 grs. or chlor. sod.....	411.8 "
Chlorhydric acid, sp. gr. 1.16.....	6½ Troy oz.
Alcohol.....	3 pints or q s
Water.....	10 fluid oz.
Chicago, June 24th, 1869.	

Peroxide of Hydrogen, the New Remedy for Diabetis.*

BY C. GILBERT WHEELER, PH. D.

Within the last few months several notices have appeared in the medical journals of Europe, and the eastern portion of our own country, with regard to the employment of peroxide of hydrogen in the treatment of diabetic patients. Remarkable success seems to have accompanied its use to such an extent as to awaken a very considerable interest among medical men with regard to this hitherto little known compound. At the recent annual meeting in this city of the State Medical Association, this remedy was brought to the notice of that body by Dr. N. S. Davis, in the able report of the committee on drugs and medicines. This report will be