

illustrating preparations such as the three already mentioned: let each set be practically worked out, reasoned upon and annotated with scrupulous care.

This is what Professor Green means by "cultivating the talent of observation."

II. The chemistry of dispensing.

Apart from chemistry one-half of the dispensing art is guess-work corrected by laborious experience; experience which might have been anticipated by the direct application of the laws on which chemistry depends.

Running throughout medical treatment as far as a prescription may indicate its scope, we find a long list of remedial agents, the presence of which makes it difficult to determine the boundary lines which exist between chemistry and pharmacy.

There is a line of demarcation, because these substances are placed in combinations and under influences favouring or disturbing, unknown to pure chemistry. It is the business of the dispenser to present them in the form and under the conditions ordered, so as best to conserve their therapeutic power and to fulfil the intention of the prescriber.

I hold without reservation that a dispenser who simply mixes or compounds, without observation of chemical reactions that possibly may, or are certain to occur, does not know his business, and of his professional status, the less said the better.

Until this is fully recognized, the unfortunate dispenser has to consider each preparation as an isolated example, not as belonging to a class; and is eternally distressing himself and his teacher as to how he should make this or that particular recipe.

In confirmation, let me point to the British Pharmacopœia *passim*, with its array of chemical substances, with preparations made therefrom and used daily in dispensing, to the exclusion of those derived from *Materia Medica* and *galenicals*.

As a practical illustration of this point, I have taken forty autograph prescriptions from my own collection, not selected, but the set which happened to be used at the last reading lesson. [Exhibited].

Here is the list, arranged in alphabetical order, of chemical substances, or distinct chemical preparations made therefrom, which they contain.

Acidum Gallicum, A. Tannicum, Aluminis Sulphas, Ammonii bromidum, carbonas, chloridum, Amyl nitras, Argenti nitras, oxidum, Bismuthi carbonas, sub-nitras, Chloral, Cupri sulphas, Ferri et Ammonii Citras, Ferri et Quinina Citras, Ferri Sulphas, Ferri Sulphas exsiccatus, Ferrum redactum, Hydrargyri chloridum, iodidum rubrum, nitrico-oxidum, perchloridum, Hydrargyrum, ammoniatum, Hydrargyrum cum Creta, Iodoformum, Iodum, Lac Sulphuris, Magnesii carbonas, carbonas levis, sulphas, Manganisii oxidum, Menthol, Plumbi acetat, Potassa fusa, Potassii bicarbonas, bromidum, chlo-

ras, citras, iodidum, nitras Sodii biboras, bicarbonas, bromidum, chloridum, salicylas, sulphas, Sulphur precipitatum, Zinci sulphas, valerianas. A knowledge of the chemical behaviour of all these must be acquired if there is to be true and sure dispensing, and so we approach the question of systematic study. The characters and reactions of chemicals which have a prominent place in the dispensing art, as well as the changes which they undergo when in medical combination should be arranged for convenient reference, preferably by the student's own hand, in order to learn how to dispense with certainty and by rule. One illustration of the mode of executing this arrangement must suffice.

HYDRARGYRI PERCHLORIDUM.

HgCl₂. Dose $\frac{1}{16}$ to $\frac{1}{8}$ grain.
[Dispensing Note.]

Solubility—More soluble in alcohol, still more so in ether, than in water, B.P., bearing out Dr. Paris's remark that a few drops of rectified spirit greatly increase its solubility.

The figures given may be accepted as a safe dispensing guide.

One part soluble in				
Water.	Alcohol.	Alcohol.	Ether.	
(cold)	(boiling)	(S38)	(boiling)	
16-20	3	3 to 4	half	4
(Berlin)				

Proctor. Solubility in 100 parts.
5.0 30.0 - 30.0 - 60.0 - 25.0

Proctor also, commenting on *Liquor Hydrargyri Perchloridi*, points out that the ammonium chloride therein contained is not necessary for solution but is introduced to prevent decomposition by forming a stable double salt. Twenty grains, he observes, may be dissolved in an ounce of water without any such addition.

Perfect solution in the cold should be effected by divided manipulation. Pour off the liquid containing some portion in solution, and treat the remainder with successive quantities of solvent at command. Glycerine is an invaluable dispensing agent either to promote its equal diffusion or to protect it from decomposition.

From the above we get the following well-known formulæ:—

1. Van Swieten's Solution.

Perchloride of mercury, gr. 15. Alcohol (80 p.c.) \mathfrak{Z} iiiss. Distilled water, to make \mathfrak{Z} xxxij.

Codex Formula [stronger] HgCl₂. 1 gramme.

Aq. Dest. 900 grammes. Alcohol (80 p.c.) 100 grammes.

2. *Liquor Hydrargyri Perchloridi* B.P.
Perchloride of Mercury, Chloride of Ammonium, aa gr. x. Distilled water, Oj. Dose $\frac{1}{2}$ fluid drachm. Strength $\frac{1}{2}$ gr. to \mathfrak{Z} j.

3. Carbasus Hydrargyri Perchloridi.

Corrosive sublimate Gauze.

Perchloride of Mercury, gr. ij. Glycerine, m 50.

Distilled water to make \mathfrak{Z} j.

We learn also how to dispense the following:

R Hydrargyri perchloridi..... 1 gr.
Pulv. Sacchari Lactis..... 6 gr.
Confect. Rosæ..... q. s.
M. ft. pil. viij. in folio argenti.

Do not trust to the sugar milk, but add first to the sublimate, one drop of glycerine to ensure complete diffusion; then (anticipating an incompatibility) varnish before silvering the finished pills, or the corrosive sublimate will justify its distinctive adjective.

R Hydrargyri perchloridi..... 1 gr.
Pulv. Glycyrrhizæ..... 6 gr.
Confect. Rosæ caninae..... q. s.
M. ft. pil viij. Add first one drop of glycerine.

I am not answerable for the construction of these or any formula quoted in this paper, they have been so prescribed.

Modern British pharmacy enjoins pilular masses which contain potent remedies to be made, as far as possible, into one-grain pills. Dissenting entirely from this instruction, I comply with semi-official expressed opinion.

The weight of the perchloride must be taken into consideration, and in instances like the one subjoined it should be recollected that it occurs in heavy colorless masses of prismatic crystals.

R Hydrargyri oxid. flav..... 15 gr.
Hydrargyri perchloridi..... $\frac{1}{2}$ gr.
Ol. Theobromatis..... 2 drs.
Ol. Olive..... 2 drs.
M. ft. ung.

Divide the olive oil between the two mercuric salts, and add to the cocoa butter just warmed (no more), else the heavy chemicals will fall to the bottom, and no amount of manipulation will secure equal distribution in this or any other analogous preparation.

INCOMPATIBLES.

Various substances are said to be incompatible with corrosive sublimate. The word is here used in a dispensing sense, meaning a chemical effect produced on HgCl₂, or the arrest of chemical action by something present in the recipe.

It depends on the nature of the prescription as to whether this action is to be prevented or secured. It by no means follows that a seeming incompatibility may not be therapeutically beneficial. Caustic potash, solution of soda (Hydrargyri oxidum flavum) and the solution of lime (*Lotio Hydrargyri flava*) throw down the yellow oxide, HgO. In other words, perchloride of mercury is decomposed by alkalis, and we must add to the list, borax, a sodium compound, and liquor arsenicalis, a potassium compound.

Acacia, albumin, and gelatin are notably incompatible, forming gelatinous, insoluble masses. Iodide of potassium precipitates red iodide of mercury HgI₂ (B.P.), a precipitate most carefully to be avoided in dispensing. No serious consequence, however, ensues when iodide of potassium, as is usually the case, is present in excess. Perchloride of mercury is decomposed by tartrate of antimony, Nitrate of silver, acetate of lead, sulphur, and soap. It acts on opium with thick precipitate; (Hager) on vegetable infu-