All of us are familiar with the efforts that have been made by others to solve the problems of the retailer—and await with interest the announcement of a comprehensive plan by means of which the retailer shall solve his problems for himself. A committee of this ASSOCIATION should be at work upon those problems during the ensuing year and to that committee, and to the individual druggists of the United States, I respectfully refer the seven suggestions that I have made concerning ways and means of meeting increasing competition in the drug field.

It is my firm belief that the independent retailer in the drug field will find a way not only to hold his own, but to strengthen his position in the present scheme of things.

PHARMACEUTICAL TRAINING VERSUS THE MODERN PHARMACIST.*

BY WILLIAM F. REINDOLLAR.

The recent years are characterized by the advancements they have recorded in pharmaceutical education. An increased prerequisite standard for matriculation in accredited colleges of pharmacy was but an initiatory step to attainments more significant. The scope of the pharmacy course has been extended by the addition of another year, has been rendered more comprehensive by the presentation of general educational subjects, and more pragmatic by the consideration of commercial, as well as professional problems. State boards of pharmacy have coöperated with the colleges to assure the public that none but rigidly trained and thoroughly qualified individuals are permitted to practice. The registered pharmacist of to-day is not only an individual of demonstrated competency but one who compares quite favorably with his contemporaries in the allied professions.

With this very efficient training together with the high sense of responsibility supposedly instilled during its acquirement, as antecedents, one might expect work of a superior quality, characterized by accuracy and precision. Such, however, is not entirely the case, as the investigation herein will reveal. While the objection may be raised that this report is somewhat premature when applied to the recent graduate, and that older pharmacists are of a necessity included, let it be borne in mind that in the state wherein these data were collected, prerequisite requirements have been a reality for a decade, and the three-year course in pharmacy, for five years.

A part of the work of the Food and Drug Control Laboratory of the Maryland State Health Department consists in the routine examination of samples of drug products collected from the various pharmacies throughout the state. For the purpose of this study a list of the simpler galenicals of the U. S. P. and N. F. together with several extemporaneous preparations, were selected and their analytical results compiled and examined. The selection comprises those products which are, or should be, prepared by the retail pharmacist; the period of collection embraces the years 1925–1929, inclusive. In order to eliminate as far as practicable the "machine-made" product, and thoroughly realizing that not all galenicals that should be, are compounded by the retailer, the following precautions were entertained:

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* Section on Practical Pharmacy and Dispensing, A. PH. A., Baltimore meeting, 1930.

(*a*) No products purchased from wholesale establishments, confectionery or general merchandise stores were included.

(*b*) Any article that was definitely known to have been purchased by the retailer from a manufacturer was excluded.

(*c*) Where trade conditions indicated clearly that an article was more likely to have been purchased than prepared, few samples of that article were collected from retailers.

(*d*) Only those phases of the analysis that throw light on the skill of the compounder were considered.

(*e*) An attempt was made not only to include the preparations most likely to be made in the store but also those for which there is a fairly consistent demand.

(*f*) The quantity of sample purchased, and types ordered were such that extemporaneous preparations were favored.

Even with these precautions it is not believed that an ideal selection was obtained, although a fair approximation may be assumed.

Sample.	Official limits or implied limits.	D.C.T. limits.	% Total Samples beyond D.C.T.	% Samples below D.C.T.	% Samples above D.C.T.	Extreme variations.
Lin. Camph.	Camph. 19–21%	18–22%	12.1	5.9	6.2	7.72–25.62%
Lin. Chlorof.	Camph. 3.15 Gm. per 100 cc.	2.83–3.47 Gm.	18.5	11.3	7.2	1.59–4.01 Gm.
	Chlorof. 30% vol.	27–33%	26.2	24.6	2.6	6.15–37.00 cc.
Liq. Calc. Hydrox.	0.14–0.17 Gm. per 100 cc.	Same as U. S. P.	12.9	8.9	4	None–0.19%
Tr. Ferr. Chlor.	Not less than 4.48% Iron	Not less than 4.03% Not more than 4.93%	28.3	6.1	22.2	0.20%–6.71%
Syr. Ferr. Iod.	U. S. P. IX 4.75–5.25% U. S. P. X 6.5–7.5 Gm. per 100 cc.	6.3 Gm.–7.7 Gm.	23.9	22.6	1.6	1.72–13.7 Gm.
Sp. Ammon. Arom.	1.054 Gm. NH_3 as Carb. 0.862 Gm. NH_3 as NH_4OH per 100 cc.	0.94–1.16	25.8	19.4	6.4	0.21–1.32
		0.78–0.95	64.6	53.3	11.3	0.48–2.50 Gm.
Sp. Menth. Pip.	1X 10.6% v. implied 10% v. implied	9.54–11.66% 9–11%	38.8	13.5	25.3	1.60–12.52
Liq. Pot. Ars.	0.975–1.025 Gm. As_2O_3 per 100 cc.	0.9–1.1 Gm.	11.7	11.7	..	0.68–1.10 Gm.
Liq. Mag. Cit.	Magnesium Citrate—not less than 1.5 Gm. MgO per 100 cc.	1.35–1.65 Gm.	43.8	17.5	26.3	1.00–2.11 Gm.
Tr. Iodi	6.5–7.5 Gm. I per 100 cc.	6.3–7.7 Gm.	4.8	4.8	..	5.90–7.27
	4.5–5.5 Gm. KI	4.5–5.5 Gm.	..	..	..	4 63–5.49
Acid. Hydrochl. Dil.	9.5–10.5% HCl	9%–10%	37.5	31.2	6.3	2.97–12.00
Ung. Hydrarg. Oxid. Flav.	1% HgO yellow	0.9%–1.1%	64	8	56	0.82–3.04
Ung. Zinc. Ox.	20% ZnO implied	18%–22%	37	12	25	17.32–26.95 (Small no. examined)
Sat. Sol. Pot. Iodid.	97–103 Gm. KI per 100 cc. N. F.	90–110 Gm.	80	80	..	48.85–97.54
Argyrol Solution	25%	22.5–27.5 Gm.	52.6	42.1	10.5	11.15–37.88 Gm.
	10%	9–11 Gm. per 100 cc.	54.5	36.3	18.2	6.61–19.59 Gm.
Sat. Sol. Boric Acid	5.14 Gm. per 100 cc.	Not less than 4.63 Gm.	75	75	..	0.96–5.10 Gm.
Quinine Capsules	5 grains	4.5–5.5 Grs.	55.8	34.9	20.9	1.92–6.35 Grs.
	3 grains	2.7–3.3 Grs.	35.7	28.6	7.1	2.39–3.52 Grs.

The several series of samples examined are: Camphor Liniment, Chloroform Liniment, Lime Water, Tincture of Ferric Chloride, Syrup of Ferrous Iodide, Aromatic Spirit of Ammonia, Spirit of Peppermint, Fowler's Solution, Solution of Magnesium Citrate, Tincture of Iodine, Dilute Hydrochloric Acid, Yellow Mercuric Oxide Ointment, Ointment of Oxide Zinc, Saturated Solution of Potassium Iodide Argyrol Solution, Saturated Solution Boric Acid, Quinine Capsules—which to-

gether with their collected data are listed in the table. The succeeding columns record: Name of sample, official or implied standard, "D.C." Tolerance, total per cent falling outside the tolerance, per cent below T, per cent above T, extreme variations. For the purpose of this study it was thought well to establish an extreme standard ranging from ten per cent below to ten per cent above the mean official or implied standard and arbitrarily called the D.C. or Drug Control Tolerance. This limit is expressed in Column III as the D.C.T., while Columns IV and V and VI give, respectively, the percentage of samples examined which occur beyond that tolerance, below it, and above it. The last column enumerates the extreme variations encountered.

A general consideration of the results *in toto*, with particularized comments in certain cases, will be less time consuming than a complete review and yet will be sufficiently explanatory.

It will be noted that quite a large percentage of the results fail to meet the generous limits set by the empirical tolerance. These range from 11.7 per cent in the case of Fowler's Solution to eighty per cent for the Saturated Solution of Potassium Iodide. In no case do all the samples of one class comply with the standard.

The extreme variations are extreme in the strongest interpretation of the word, the lower limits approaching zero, the upper, saturation. These extremes, however, represent isolated cases and their presence is consistent with the law of probability, and is to be expected when a large number of samples of a class are examined.

The most noteworthy fact observed is that the percentage of variation above the tolerance in most cases compares favorably with that below and in all cases, except where saturation is the maximum limit, is significant. Thus, for Camphor Liniment, 5.9 per cent fall below the tolerance while 6.2 per cent rise above it; Tincture of Ferric Chloride, 6.1 per cent below, 22.2 per cent above; Solution Magnesium Citrate, 17.5 per cent below, 26.3 per cent above; Lime water, which is almost a saturated solution, 8.9 per cent below, 4 per cent above; 25 per cent argyrol solution, in which lack of accuracy in preparation tends toward low concentration and in which cost is a considerable item, 42.1 per cent below, 10.5 per cent above. Fowler's Solution, Tincture of Iodine, and necessarily, the saturated solutions of Boric Acid and Potassium Iodide were groups that contained no individuals exceeding the tolerance.

The number of samples vary from less than a score in one or two groups to well over five hundred in others. Zinc Oxide Ointment and Tincture of Iodine, because of the difficulty of obtaining samples known to have been made in retail pharmacies, belong to the former group, while Lime Water and Camphor Liniment, are classed with the latter.

Several cases of gross and inexcusable errors may be mentioned, although the samples involved were not tabulated. On various occasions samples purchased as Camphor Liniment proved upon analysis to be Castor Oil, Chloroform Liniment to be Camphor Liniment, Lime Water to be Dobell's Solution, and again, plain water.

What is the explanation of these incongruous, not to say illegal products, most of which may be safely traced to the man behind the prescription counter?

It is most certainly not in his pharmaceutical education and training—they are more efficient to-day than ever. It cannot be assigned to laxity in the registration machinery as any candidate of recent years will attest. Furthermore, it is not due to a class of individuals whose moral fibre is so weakened that they are deliberately addicted to sophistication, for an inspection readily reveals the costliness of a large percentage of their mistakes. There is only one logical conclusion to be drawn. The pharmacists' errors are due to carelessness, pure and simple, to negligence gross and inexcusable. Unless he can be made to realize his responsibility to his community, to his profession and to himself, unless he can be induced seriously and conscientiously to practice his calling in the approved and time-honored manner, then the effort and expense of his training are wasted.

ABSTRACT OF DISCUSSION.

The author of the paper stated that accuracy and precision means very little if the pharmacist is going to forget his training. In the work reported there is evidently a display of negligence.

Frank S. Fuqua said that some druggists think they are too busy and cannot take the time to fill prescriptions. They would rather pour a preparation from a bottle to another and call it pharmacy. Some of the students fail to appreciate their responsibility to the public.

Clyde M. Snow said that every teacher in the schools of pharmacy endeavors to impress responsibilities upon the students, and if they cannot give due consideration to their responsibilities it is best for them to withdraw from the school. If the student cannot be interested in his work during the school years there is little chance of his becoming interested later. Inefficiency is the fault of the individual more than of the instructors who endeavor to guide him.

NARCOTIC CONTROL IN KOREA.

The Government-General of Chosen has revised its law prohibiting the cultivation of the poppy except by pharmacists. The period of the law was fixed at 1918, but the revision was made from the standpoint of encouraging home-made industries and self-sufficiency in the supply of medicines. The Opium Law promulgated on June 1, 1919, provided that poppies were to be turned over to the Government-General after receiving compensation therefor, and the poppies so purchased were turned over again to the Taisho Seiyaku Kaisha. This policy has been observed until the time when the control of opium passed from the hands of the Monopoly Bureau to the Police Bureau. With the expiration of the term of contract with the Taisho Seiyaku Kaisha in 1928 the change was again made by which the manufacture of medicinal opium and opium salts came to be placed under the jurisdiction of the Monopoly Bureau. The authorities expect to stop opium smoking within the next ten years. Curiously enough, the strict control of opium smoking enforced in the peninsula resulted in an increase in the number of morphine addicts; the number of addicts in 1922 was 1578 but it increased to 5370 by the end of 1927.

REVISED REGULATIONS.

The revised Opium Law of Korea was promulgated in the name of the Governor-General Viscount Admiral Makoto Saito on July 7th, this year. Article 5 was so revised that opium only for medicinal purposes can be sold by the Government, whereas in the old provision, opium could be sold for the manufacturing of drugs also. Article 6 was entirely struck off as it became unnecessary, since the supervision of the poppy industry was placed under the Monopoly Bureau. Article 7 was also struck off for the same reason. Revisions were also made in five other articles, thereby making the transfer of opium between individuals, including physicians, dentists and medical students more and more strict. The revised Article 5 runs as follows: Opium may be sold or transferred for medicinal purposes after being sealed. Article 6 provided that opium is to be transferred to a company specified by the Government-General when it is to be used for the manufacturing of medicines.