

have already been made, and I am sure there will be added some changes in these regulations. You must bear in mind that the Commissioner of Internal Revenue, more than likely, never heard of these drugs until a month or so ago. We must be reasonable with him. The law has been enacted because of the need of humanity and because of the need of this country. I ask of you to give it your kindly and whole-hearted support, even though it may seem at first to infringe upon your rights and privileges. Let us consider it an essential thing for the good of this country, Let us accept it in the proper spirit, to the honor and credit of the professions.

SOME THOUGHTS ON AN EFFECTIVE PHARMACY LAW.*

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The object of a pharmacy law is to regulate the practice of pharmacy by protecting the public from ignorant and incompetent persons attempting to practice the art. An act usually begins by creating a Board to enforce its provisions; orders examinations to be held and fixes fees; states the qualifications required of the applicants; provides sometimes for registration of pharmacists from other states; defines drugs and poisons; provides penalties for violations, etc.

Only those who have been charged with the enforcement of such a law as is usually enacted, can realize how difficult it is to carry out its provisions,—advantage is taken of every technicality to defeat its purpose and by none more than by pharmacists themselves. On one occasion, in recent years, the Minnesota Board of Pharmacy failed to get a conviction against an unregistered druggist who sold tincture of iodine. At the trial it was deliberately sworn to by a witness that the only use he knew of for tincture of iodine was the purely technical one of *cleaning cuspidors* and that was what the Iodine was to be used for. On another occasion, after an expenditure of several hundred dollars, the board failed to convict a general store-keeper for selling Strychnine, the defense being that the employee who sold the poison was *forbidden to sell it*, although strychnine was regularly stocked and kept for sale.

Most of our pharmacy laws are very defective. A pharmacy law to be effective, should be carefully worded and should specifically state what may be done and what is forbidden, with the fewest possible exceptions and the least superfluous verbiage. It should clearly define the duties of the Board charged with its enforcement and should make the penalties for violations clear and concise and should prescribe the most effective method of legal procedure that can be defined for its enforcement. Then as to what such a law should embody. If the same principles were applied to pharmacy that are embodied in the laws regulating the practice of medicine, dentistry or veterinary medicine, it would do away with one of the greatest troubles in regulating the practice of pharmacy, viz., that none but an individual or individuals duly licensed should be allowed to own or conduct a pharmacy. I mean that unlicensed individuals, co-partners and stock companies

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have no moral right to engage in pharmacy by merely hiring one or more registered persons to conduct it for them. How long do you suppose a stock company of farmers, mechanics or pharmacists, would be allowed to practice law or open an office or offices as physicians or dentists? Why should not pharmacy be regulated along precisely the same or similar lines as the professions of law, medicine and dentistry?

It may be said in reply that there is a commercial side to pharmacy. So there is, but if the commercial side be the greater or more important, it should be divorced from the scientific or professional side, and those who wish to conduct a drug store and sell all the side lines that are now connected with the drug business, should be allowed to do so, and sell drugs, but they should not be allowed to compound any medicinal preparations or prescriptions. The qualifications for such a person should be not less than three years' practical experience and they should be required to pass a very simple examination covering the identification, nomenclature and physical properties of the various drugs and simple preparations commonly sold in a drug store. The man who can weigh out and wrap up a quantity of powdered rhubarb or gentian from a labeled bottle, the quality of which he is unable to determine, or pump from a can, glycerine, the specific gravity and purity of which he is ignorant and has no means of testing, is in no sense a pharmacist but a mere vendor of drugs.

The public has a right to expect that any person who is a licentiate of pharmacy should be competent to compound prescriptions and medicinal preparations carefully and accurately, and to manufacture pharmaceuticals conforming to official standards. This can only be obtained by raising the standard of requirements for pharmacists. For registration as a pharmacist, the applicant should have the necessary training and experience to enable him to compound prescriptions carefully and accurately, and to make all the U. S. P. and N. F. preparations that can be properly prepared on a small scale. He should be able to test and assay his chemicals and such drugs as are capable of assay, and to apply the necessary tests for the identity and purity of official substances and to conduct volumetric and gravimetric analysis.

A minimum of five years' experience should be required of every candidate before he is eligible for examination as a pharmacist, two years of which might be spent in school of pharmacy and he should have been registered as an assistant for at least two years. For an assistant pharmacist a minimum of three years' experience should be required, two of which might be spent in a school of pharmacy, and the candidate should be registered as an assistant for at least two years before he should be eligible to take the examination for pharmacist. There should also be an apprenticeship system, apprentices to be registered on passing an examination such as is now given by the Minnesota State Board of Pharmacy or else present a high school diploma, when they would be registered as an apprentice, and all experience should count from date of such registration.

The law should contain a provision that the keeping open to the public by an unregistered person of any store, shop or place for the sale of drugs, medicines or poisons, should be considered as *prima facie* evidence of a violation of the law. In this state drug stores are conducted by unregistered owners, often in the same towns with registered proprietors, the former of whom never employ registered

help and refuse to sell to strangers. They go on unmolested because the board cannot get evidence on which to begin a prosecution. This feature was embodied in the draft of the amendment to our pharmacy law passed in the last session of our legislature, but I believe it was opposed by some of the members of this association and probably for that reason was omitted from the bill.

The name of the pharmacist conducting the store should be conspicuously displayed on its front and should be on all labels. Physicians, unless they are registered pharmacists, should not be allowed to compound medicines. A physician without any pharmaceutical training, who attempts to compound a prescription, is as much a fakir as a pharmacist, who pretends to diagnose disease and prescribe therefor. Owing, however, to the enormous political power wielded by the American Medical Association and similar bodies it seems to be impossible to keep physicians strictly to their own profession.

Private hospitals, which are alarmingly on the increase and for which there is no need unless to increase the bank account of their owners and provide a safe place to get their experience, should be under the supervision of the Board of Pharmacy, the same as drug stores, and should have a pharmacist in charge. The same regulation should apply to every public hospital and their stock of drugs should be subject to the same inspection and should be kept up to the same standard as the drugs in pharmacies.

The Board of Pharmacy should be supported as at present by renewal fees. This method of supporting a State Board of Pharmacy is much better than that of receiving state aid, as, in every state, politicians try to influence examining bodies, but more particularly every state-supported body. In some states such boards are entirely political which is much to be deplored.

The difficulties encountered in framing pharmacy laws in the past, have been principally on account of the general opposition that seems to be made by legislatures to everything pertaining to pharmacy, and the want of coöperation among pharmacists. The differences of opinion and petty quarrels in their own ranks, have prevented them from presenting the proper arguments in behalf of their requirements and from maintaining a united front against the vicious legislation which is frequently attempted to be forced upon them. In this respect they are much less a power in the various states than those in many other lines of business, which is not as it should be.

I think, however, and most sincerely hope, that we have turned the corner, and that the pharmacy of the next generation will be a distinct improvement on that of the last and that physicians will expect more of and coöperate more with pharmacists and that there will be fewer nostrums manufactured and prescribed and we will get back to the days of prescribing and dispensing U. S. P. and N. F. preparations, instead of the various fanciful mixtures at exorbitant prices and the humbugs with which the market has been flooded for the past twenty-five years.

If such conditions come about, it will be necessary to have better trained pharmacists than we have to-day and pharmacy laws will have to be made more effective or become dead letters, which would mean a retrograde step of half a century in the practice of pharmacy. If ever there was a time in the history of pharmacy when the public needs protection from unscrupulous, ignorant and incom-

petent persons, it is in this age. The old simples of our fore-fathers have given away to complex preparations, active and poisonous principles, heretofore unknown and now in daily use. The pharmacist of to-day must be a pharmacist, chemist, and analyst combined.

I am aware that these few thoughts will call forth a good deal of criticism. They are deliberately written for that purpose and hostile, as well as favorable criticism, will be welcome, as it is only by criticism of proposed or accepted methods that we can ever hope to arrive at even a partially successful conclusion.

BACTERIAL *v.* VEGETABLE TOXINS.

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In these days when the value of such products as antidiphtheria serum and antitetanus serum are recognized on all sides as being unique in their respective spheres, it is interesting to recall that it was as the result of the study of a product obtained from a purely vegetable source that these biological products assumed a practical form. The substance referred to is ricin, the tox-albuminoid principle found in castor-oil seeds, and a comparison of this and allied substances, both of vegetable and animal origin, with similar products elaborated by bacteria may not be without interest.

It is only comparatively recently that the existence of poisonous proteids or tox-albumins has been recognized. The idea that a proteid can produce dangerous or even fatal symptoms or act in any way except as a food dates only from 1884, but, according to Cushny, most of the animal poisons are now believed to be of proteid nature, and the toxins formed by micro-organisms of disease are almost certainly of the same class.

The most important toxins or toxalbumins of the vegetable kingdom are ricin, abrin, and crotin. The two latter are obtained respectively from the seeds of *Abrus precatorius* (jequirity) and *Croton Tiglium*, but they closely resemble ricin, and it will only be necessary here to refer at any length to this last-named substance.

Ricin is an intensely poisonous phytoalbuminose, which may be obtained from castor-oil seeds after the removal of the oil. It occurs only in the endosperm and embryo, where it is present to the extent of 2.8 to 3 *per cent.*, and may be obtained from fresh decorticated and strongly expressed seed by percolation with a 10 *per cent.* saline solution in which it is soluble. The percolate is filtered and saturated at 20° to 22° C. with magnesium sulphate, and the resulting white precipitate separated from the crystallized salts by dialysis. This preparation is not pure ricin, and probably contains a large proportion of albumins. As thus obtained, ricin is a white, odorless, strongly toxic, ash-yielding powder, insoluble in alcohol, ether, and chloroform.

The chemical nature of ricin appears to be analogous to that usually ascribed at the present time to the bacterial toxins and ferments, and the name toxalbumin, originally suggested by Kobert and Stillmark, who first investigated the substance,