Book up to date? If there are objections to certain features, modify them so as to correct the objections. Please discuss the proposition. I appeal especially to the Branches and trust that the subject will be brought up promptly for discussion in each of them. Probably no action regarding such a radical change in the Year Book can be nor should be taken without the concurrence of the Association in annual session, therefore the 1914 Year Book should be pushed to completion and publication and be distributed if possible before the next annual meeting. Other plans for changing the present Year Book may be presented to the Association for discussion. Perhaps out of this discussion the Council can formulate and indorse some plan that will get us up to date and present it to the Association for adoption.

In case of the adoption of this installment plan, the Reporter should become in truth the Editor of the Year Book and should be alone responsible for its issue. He can organize a larger force of helpers—there are many capable members willing to serve—assigning each but one or a very few journals, and requiring prompt reports from each. His duties would be largely editing these reports rather than preparing the actual abstracts.

CONTRIBUTIONS OF THE CHEMIST TO THE MANUFACTURE OF PHARMACEUTICAL PRODUCTS.*

FRANK R. ELDRED.

The manufacture of medicines is not confined to pharmaceutical houses, since they do not produce many of the medicinal chemicals, volatile oils and other products which may be said to constitute a large portion of their raw materials. Many of these products, however, must pass through the hands of the pharmaceutical manufacturer in order that they may be put in a form suitable for use. It is not easy to draw the line between pharmaceutical manufacturing and the closely allied industries as their fields of activity will frequently be found to overlap; for instance, the study and manufacture of certain alkaloids have been left almost entirely to pharmaceutical chemists and manufacturers although most of the alkaloids have been produced by distinctively chemical manufacturers.

Few industries have been as dependent upon the work of the chemist as that of pharmaceutical manufacturing. Many industries have been developed up to a certain point without the direct assistance of the chemist, but the very beginnings of pharmacy and chemistry were closely linked together and pharmaceutical manufacturing was made possible by the work of the early chemists. It is true that pharmaceutical manufacturing has not always kept pace with the progress in chemistry, yet the chemist, although at times very imperfectly trained, has always been an indispensable factor in the development of the industry and today the successful manufacturers are those who are making use of the most recent

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discoveries in chemistry and medicine and to that end have built up organizations of well trained and highly specialized scientific workers.

The work of the chemist in the pharmaceutical industry has been characterized by the development of new products and improvement in the quality of products already established rather than by any reduction in manufacturing costs, although at the present time much attention is also being given to the latter problem. For many years it has been the custom of the more progressive pharmaceutical manufacturers to devote considerable sums of money to research along the various lines connected with their business, and for this reason much of the credit for the development of our present materia medica should be given to them. Chance and uncertainty in pharmaceutical manufacturing have been largely eliminated, and while ten or fifteen years ago much of the routine manufacturing could be carried on without the direct supervision of the chemist, it is now necessary to have every crude material thoroughly examined, every process controlled and every finished product assayed or inspected by competent chemists.

Among the earlier improvements, due entirely to the pharmaceutical chemist, the standardization of preparations made from vegetable drugs deserves especial mention. The crude drugs were found to vary enormously in strength and as their active principles became known and assay processes were developed, the manufacturers adjusted their preparations so that they were always of uniform strength. At that time the only pharmacopœial standard for such preparations was the fixed amount of drug used in their manufacture and the preparations when finished of course varied according to the strength of the drug from which they were made. The standards established by the manufacturers were based upon the strength of an average prime drug and the quantity of drug required varied inversely with its strength. Most of these standards were adopted by the Pharmacopœia many years later. This like many other improvements made by the chemist in this industry resulted in increased costs not only on account of the analytical work required, but also because of the greater care necessary to maintain these standards.

Thousands of different products are manufactured by every pharmaceutical house, and it has been the duty of the chemist during the past twenty-five years to study these products in order to discover their faults and improve them by modernizing the methods of manufacture. On account of the great number of products to be studied and the diverse problems involved, progress may seem slow, but if we look back even ten years we cannot fail to recognize the great improvement which has been made in the general line of pharmaceutical products. The keeping qualities of many products have been thoroughly studied, although only a few years ago very little was known in regard to the stability of medicines. Much remains to be done, and progressive manufacturers are sparing no effort to improve the quality and raise the standards of their products.

Many of the older classes of pharmaceutical products, however, are rapidly giving way to new medicinal agents which are established on a scientific foundation. This necessitates research with the object of developing new products to take the place of those which are falling into disuse, for the manufacturer who neglects this will see his business gradually going to his competitor who is awake to this necessity. Extracts and tinctures made from vegetable drugs can hardly

be considered scientific products even though standardized to a definite content of the active principles since they always contain many other substances which are either inert or possess undesirable physiological activity. Alkaloids and other definite principles isolated from vegetable drugs have already, to a large extent, taken the place of the various extracts and we may expect even greater progress in this direction during the next few years. The preparation of active extracts and definite principles from the ductless glands is one of the remarkable developments of the last fifteen years. Most of us have witnessed with interest the increase in synthetically prepared medicines from a very small beginning to a point where they are made to meet almost every therapeutic indication. The continued advance along the line of rational and exact medication has led the manufacturer to develop many of these new and improved therapeutic agents.

In one respect the position of the pharmaceutical manufacturer differs from that of manufacturers in other lines. The U. S. Pharmacopœia, a book of standards published under the authority of a convention whose members are appointed by various medical and pharmaceutical bodies, and the National Formulary, published by the American Pharmaceutical Association, have been made the legal standards for all preparations and substances described by them. It is evident that such legal standards are necessary and that the manufacture of medicinal products should be very carefully controlled. This being granted, it is very important that the standards be correct and the control judicious. The U. S. Pharmacopœia is revised decennially by a revision committee chosen by the convention already referred to. In making this revision the committee draws upon the published or privately communicated work of chemists and pharmacists and to some extent upon work carried on under its own direction. Much of the work of chemists for the manufacturing houses has been utilized in the compilation of the Pharmacopœia. Since the revision committee is a representative body in which all classes interested in the preparation and use of medicinal products have a voice, probably no better standards could be established, but it must be recognized that the progress which necessitates the revision of the book every ten years also renders many of the old standards obsolete long before the new edition appears. The National Formulary is a valuable book which was designed to serve as an unofficial guide in preparing commonly used preparations which were not described by the Pharmacopœia and its elevation to the rank of a legal standard seems to have been due to a misconception of its function.

While these two standards have been legalized by the Federal Food and Drugs Act, a very wise clause was inserted in the act which provides that preparations may differ from the standards so established if the standard be *plainly* stated on the label. This clause allows uninterrupted progress during the interval between revisions of the Pharmacopœia and insures new material and improved standards for the use of each revision committee. It is this clause which now enables the chemist to contribute actively to the manufacture of medicinal products.

In some quarters the repeal of this provision of the law has been advocated and since it has such an important bearing upon the relation of the chemist to pharmaceutical manufacturing, it should receive our careful consideration. The repeal of this clause would make it unlawful to market any product which differed in any way from the product described by the Pharmacopœia or National For-

mulary; manufacturers therefore could not profit by any improvement which they might make and all research tending toward the improvement of such products would be discontinued. When it is remembered that the most important medicines are described in the Pharmacopœia, that many are included in the National Formulary which afterward find their way to the Pharmacopœia, and that many of the articles dropped from the Pharmacopœia are subsequently inserted in the National Formulary, it will be seen that no more effective bar to progress in the production of medicinal products, than the elimination of this clause from the law, could be devised. It may be pointed out that the standardization of extracts and tinctures as well as many other improvements could never have been introduced by manufacturers if no variation from pharmacopœial standards had been allowed. Under such a law while manufacturers in every other line would be stimulated by competition to improve their products, the manufacturer of medicines would be legally prohibited from doing so. The contributions of the chemist to this industry would then be confined to routine analytical work and to the development of products which could be protected by patents; all improvements in medicinal substances now included in the National Formulary and Pharmacopœia would have to be made by the committees of revision with limited time and facilities and without manufacturing experience. It seems doubtful if such a law could be enforced, but if the matter is placed before our law-makers in the proper light, there can be no doubt that the federal law will remain unchanged and that the state laws will conform to it in this respect. If this course is followed, the progress in this industry, which has never been as rapid as at the present time, will be uninterrupted.

FEDERAL JUDGE HOLDS THAT MAIL ORDER DRUG HOUSES CANNOT SELL MEDICINES CONTAINING HABIT-FORMING DRUGS BY MAIL.

Medicines containing habit-forming narcotic drugs, traffic in which is forbidden by the Harrison law, cannot be sold through a mail order business, Judge J. E. Sater decided in Federal District Court at Columbus, Ohio, December 4. He dismissed a suit brought by the Dr. Nathan Tucker Asthma Specific Company of Mount Gilead, Ohio, to enjoin B. E. Williamson, Federal Internal Revenue Collector, from seizing the plant.

The court's decision declared medicines containing narcotic drugs may be prescribed by physicians only after a personal examination of the patient before each prescription. Diagnosis by mail is held illegal.

The decision is considered of far-reaching importance, since other proprietary remedies contain narcotic drugs or their derivatives and are sold by the mail order system.