PHARMACOPOEIAS AND FORMULARIES

THE NATIONAL FORMULARY OF THE UNITED STATES OF AMERICA, ELEVENTH EDITION, 1960*

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The National Formulary of the United States for over 50 years has provided standards for drugs and preparations of drugs additional to those in the United States Pharmacopeia. During this period it has become accepted internationally as well as nationally as an important book of standards. To an extent which has increased considerably during the last twenty years, those drugs which have achieved pharmacopoeial status in the major national pharmacopoeias are also those which are used in all countries. It is in secondary publications, such as the National Formulary and the British Pharmaceutical Codex, that there may still be found those medicines which have a regional popularity, and the National Formulary has always contained a fair number which have been little used in Great Britain. In recent editions those vegetable drugs and their preparations based on the indigenous flora of the United States, and which have seemed to us as characteristic of a picturesque era in American pharmacy, have largely disappeared from the N.F., and, of the few remaining in the N.F.X., Grindelia, Lobelia and Hydrastis are in the list of omissions from the eleventh edition. Amongst the 207 deleted monographs are those for all the hypophosphites and all the glycerophosphates; several barbiturates have been omitted, but as an example of differences in medical practice even with these drugs, cyclobarbitone, recently added to the B.P., has been dropped from the N.F., while barbitone, now little used in this country, has been retained.

More than 250 new monographs have been added, about half this number being for drugs and the remainder for their preparations. Of the drugs, half are those which have been omitted from the United States Pharmacopeia, while the other half, about 60 in all, are new in the sense that they have not previously been officially recognised in the United States. As a therapeutic list it is not impressive, as indeed it cannot be, because the U.S.P. and the N.F. are published more or less simultaneously and the Pharmacopeia has first choice. Thus, the only "new" antibiotics in the N.F. are Oleandomycin (as the phosphate and as the triacetyl derivative) and Gramicidin, whilst to the U.S.P. has been added Erythromycin, Novobiocin, Nystatin and Phenoxymethylpenicillin. Additions to other therapeutic groups in the National Formulary are similarly incomplete unless regarded as supplementary to the U.S.P. additions. Some of the additions are not yet in general use in Great Britain but most are. They include the hypnotics Glutethimide, Ethinamate and Methyprylon, the analgesics Paracetamol (under the title Acetaminophen), Salicylamide and Levorphanol Tartrate, the anticoagulant Diphenadione

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and the oestrogen Chlorotrianisene *inter alia.* In view of the comments which are made about the time which it takes in this country for a new drug to become official, it is interesting to be able to find out how long it takes in the United States. The publication New and Non-official Drugs gives dates for the introduction into the United States of the drugs it describes, and from these it can be seen that, in most instances, the drugs have been in use for more than five years, sometimes very much more, before obtaining official recognition in either book.

In general style, the monographs are similar to those in the previous edition but a two-column format has been adopted. This format is not uncommon in United States books, more so than in those published in this country, and it is probably a nationalist prejudice to say that one does not care for it very much. The type of specification and the information given is similar to that in B.P. monographs except that the therapeutic category of each drug is given. Anticipating the B.P., apothecaries' doses are omitted. The number of spectrophotometric assays has been increased, and these must be carried out using reference standards for comparison. The reference standards obtainable from the United States Pharmacopeia Authorities together with those obtainable from the American Pharmaceutical Association form an impressive list. The use of a reference standard is almost essential if consistent results are to be obtained in different laboratories and it seems likely that absolute methods now in the B.P. and B.P.C. will be replaced and that reference standards will have to be provided in this country. For a small number of drugs in the National Formulary, for example, Azacyclonol and Sitosterols, infrared absorption is used for identification. Assays based on titration in non-aqueous media are specified for a number of drugs, including Aminoacetic Acid, Noscapine Hydrochloride and Isoprenaline Sulphate, each of which is titrated against perchloric acid in glacial acetic acid, and for Barbitone and some other barbiturates which are titrated in dimethylformamide against lithium methoxide. Reserpine in rauwolfia is determined by a method similar to that recently recommended by a panel of the Joint Committee on Methods of Assay of Crude Drugs. A variation which may produce significant differences in the stated content of the drug, is in the method of extraction. In both methods a Soxhlet extraction with ethanol is used but the panel found that a 4-hr. extraction was not always adequate to remove the alkaloids completely and it recommended a preliminary maceration with ethanol acidified with dilute acetic acid. The National Formulary method does not include this.

From the point of view of pharmaceutical practice, there is an interesting extension of information in the recommended methods for preparing ophthalmic solutions. A general recommendation is that all eye-drops should be buffered by the addition of 2 per cent boric acid except where this is incompatible, e.g. with pilocarpine, sulphonamides and fluorescein sodium. The methods recommended for the extemporaneous preparation of eye-drops differ to some degree according to whether they are to be applied where the corneal epithelium has been damaged or where it is not damaged. Where there is damage the solutions should be distributed

in small containers which should be used for one patient only; the eye-drops in the closed container and an eye-dropper should be separately packed and autoclaved, and no preservative should be added. Where there is no damage, the eye-drops may be made with stock vehicles containing a suitable preservative and sterilised either by autoclaving or by boiling for at least 30 min. The final containers should be similarly sterilised and so should equipment used to make the eye-drops. Once the stock vehicle has been opened, the vehicle should either be discarded or re-sterilised if kept longer than 24 hr. It is pointed out that the criteria for the use of ophthalmic solutions in the home and in the surgery or clinic are very different as in the latter circumstances contaminated solutions have resulted in the transfer of organisms from one patient to another.

Dr. Justin Powers, Chairman of the National Formulary Committee, has for five editions carried a major responsibility for producing this book. The international repute of the National Formulary is a tribute to his success and one which it can be certain will be maintained by his successor. It is, however, not only as a very distinguished pharmacist that he is esteemed in many countries besides his own, but also as a most kindly, approachable, and helpful person.