



THE PHARMACEUTICAL POCKET BOOK

Seventeenth Edition

Published by the direction of the Council
of the Pharmaceutical Society of Great Britain



LONDON
THE PHARMACEUTICAL PRESS
17 BLOOMSBURY SQUARE, W.C.1
1960

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P R E F A C E

The first edition of this book was published in 1906 with the title of the *Pharmacy Students' Pocket Note-book*. A second edition appeared a year later with the title of the *Pharmacy Students' Guide* and further editions, in various forms and with varying titles, appeared at irregular intervals between the years 1907 and 1923. As its earlier titles implied, it was primarily designed for the assistance and guidance of pharmaceutical students. The contents were mainly restricted to the essential information required by students entering pharmacy and studying for the Pharmaceutical Society's examinations and the book served as a useful introduction to the fundamental principles on which the practice of pharmacy is based. Gradually, its character and contents changed as more and more emphasis came to be placed on the needs of the pharmacist in practice. In 1923, the Council of the Pharmaceutical Society decided that the book should be thoroughly revised so that if possible it should become a work of a more permanent character than its predecessors. The task of revision was entrusted to the British Pharmaceutical Codex Committee and under the direction of that Committee a completely revised edition, embracing many new features of direct interest to the practising pharmacist, was published in 1925. Since then, while the needs of the pharmaceutical student have not been neglected, the principal aim in subsequent revisions has been to increase the book's value as a work of reference for the practising pharmacist. In 1948, the task of revision was transferred to the Editor of the Society's Scientific Publications Department. In 1959, that department was incorporated in the newly formed Department of Pharmaceutical Sciences which has been responsible for the production of this new edition.

In this edition new sections have been added on Milliequivalents, Poisonous Plants, Bites and Stings, Pharmacological Terms, Radiological Terms, Foreign Terms, and Approved Names and Their Synonyms, and it is hoped that these additions will increase the usefulness of the book as an aid to pharmacists in the day-to-day practice of their profession. Most of the information contained in the last edition has been retained, but brought up to date and re-arranged. Many of the old sections have been rewritten, notably the introductory section dealing with the functions and activities of the Pharmaceutical Society, the sections on the preparation and dispensing of ointments and emulsions, the Table of Solubilities, and the sections on Hydrogen Ion Concentration, Isotonic Solutions, the Endocrine Organs, Biochemical Analysis, and Materia Medica. The Forensic section has been carefully revised and summarises all pharmaceutical and related legislation as it pertained at the 1st January 1960.

The practice of including summarised and tabulated information on

PREFACE

the preparations and doses of the British Pharmacopœia has been continued, but the section on Equivalent B.P. Formulæ has been restricted to such preparations as it is thought might still be prepared on a small scale in some dispensaries in Imperial rather than in metric quantities. The posological section has been extended by the inclusion of a table of doses of the drugs particular to the British Pharmaceutical Codex as well as the usual table of doses of the British Pharmacopœia and additional dosage conversion tables have been added. The Veterinary Posological Table has been revised and extended by the inclusion of the substances and preparations of the British Veterinary Codex Supplement 1959.

The Glossary of Synonyms has been thoroughly revised and many more synonyms have been added. This glossary not only serves as a useful repository for antiquated terms and formulæ that are still occasionally encountered in pharmacy but it provides information on an extensive range of synonyms in current general and local use.

To an increasing extent medical practitioners look to pharmacists to provide information on the new drugs that are continually being introduced and several of the new sections have been added with the object of assisting pharmacists in performing this function. The section on pharmacological terms has been designed to assist pharmacists in the better understanding of medical literature. The section on Approved Names, which covers all the Approved Names that have been issued by the General Medical Council up to the end of February 1960, has been compiled as a guide to these names and the various synonyms by which they are known, including both proprietary trade names and trivial names. With the increasing use of radioisotopes in medicine, it has been thought helpful to include a short section giving definitions of common radiological terms that are frequently associated with descriptions of such isotopes. The Glossary of Foreign Terms is intended as an aid to pharmacists in dealing with the requirements of foreign visitors. It includes a selection of common medical terms and names for chemists' sundries. Owing to the limitations of space it has only been possible to include a short glossary in five languages, and terms that closely resemble their English equivalents have been omitted.

The Pharmaceutical Society gratefully acknowledges the assistance received from various experts who have contributed to the revision and from the many pharmacists who have submitted suggestions for improving the book. Especial thanks are due to the General Medical Council for permission to incorporate information from the British Pharmacopœia 1958 and to the Secretary of the British Pharmacopœia Commission for assistance in the preparation of the section on Approved Names and Their Synonyms.

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ABBREVIATIONS

| | | | |
|----------|--|-------------|---|
| B.N.F. | British National Formulary 1960, unless otherwise stated | n. | minim |
| B.P. | British Pharmacopoeia 1958, unless otherwise stated | μ | micron |
| B.P.C. | British Pharmaceutical Codex 1959, unless otherwise stated | mEq. | milliequivalent |
| B.S. | British Standard | MeV | million electron volt (<i>see</i> page 411) |
| B.T.U. | Board of Trade Unit (<i>see</i> page 558) | mg. | milligram |
| B.Th.U. | British Thermal Unit (<i>see</i> page 558) | mg./kg. | milligram(s) per kilogram |
| B.Vet.C. | British Veterinary Codex 1953 and Supplement 1959 | μ g. | microgram |
| °C. | degrees Centigrade* | $\mu\mu$ g. | micromicrogram |
| c. | curie (<i>see</i> page 410) | ml. | millilitre |
| c μ | cubic micron | mm. | millimetre |
| c.c. | cubic centimetre | m μ | millimicron |
| C.G.S. | centimetre-gramme-second | O.P. | over proof |
| cm. | centimetre | o/w | oil-in-water |
| cu.mm. | cubic millimetre | oz. | ounce |
| cwt | hundredweight | pH | hydrogen ion concentration |
| dr. | drachm | p.p.m. | parts per million |
| e.g. | <i>exempli gratia</i> , 'for example' | q.s. | <i>quantum sufficiat</i> , 'a sufficient quantity' |
| e.m.f. | electromotive force | q.v. | <i>quod vide</i> , 'which see' |
| Edn | Edition | r. | roentgen (<i>see</i> page 412) |
| eV | electron volt (<i>see</i> page 410) | rep | roentgen - equivalent - physical (<i>see</i> page 412) |
| °F. | degrees Fahrenheit* | r.p.m. | revolutions per minute |
| fl.dr. | fluid drachm | S.I. | Statutory Instrument |
| fl.oz. | fluid ounce | sp.gr. | specific gravity |
| ft | foot | U.P. | under proof |
| g. | gramme | U.S.N.F. | United States National Formulary 1955 |
| gal. | gallon | U.S.P. | United States Pharmacopeia 1955 |
| gr. | grain | v/v | volume in volume |
| i.e. | <i>id est</i> , 'that is' | v/w | volume in weight |
| in. | inch | vol. | volume |
| kg. | kilogram | w/o | water-in-oil |
| km. | kilometre | w/v | weight in volume |
| l. | litre | w/w | weight in weight |
| lb. | pound | wt | weight |
| | | yd | yard |

*Unless otherwise indicated in the text, temperatures are expressed in the Centigrade thermometric scale.

THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN

The Society was founded in 1841 at a meeting of some of the most prominent chemists and druggists of that time who realised the importance and usefulness of a central organisation having as its objects the union of the practitioners of pharmacy into one body, the protection of their general interests and improvement and advancement of pharmaceutical knowledge. In 1843, less than two years after its formation, the Society was granted a Royal Charter of Incorporation and thereby acquired a permanent status. The Charter gave no legal power to the Society which it did not possess without it but it greatly increased its influence by showing that its objects, and the means by which they were to be attained, were approved and sanctioned by the Government.

Up to the end of 1933 it was a voluntary association, membership being restricted to registered Pharmaceutical Chemists and Chemists and Druggists. Evidence that its activities met with loyal support is to be found in the fact that out of some 23,000 registered persons at that time approximately 16,000 were Members.

On December 31, 1933, in consequence of new legislation in the form of the Pharmacy and Poisons Act, 1933, the voluntary nature of the Society ended and every person registered as a Pharmaceutical Chemist or Chemist and Druggist became, by virtue of registration, a member of the Society, and a compulsory annual fee for registration took the place of the voluntary annual subscription for membership. On December 31, 1958, there were 27,614 members of the Society.

On January 1, 1954, a revised and modernised constitution for the Society came into effect, the change being made by the coming into operation of the Pharmacy Act, 1953, and the granting of a Supplemental Charter to the Society, both events taking place on December 31, 1953. The Privy Council confirmed on January 1, 1954, new byelaws made by the Society's Council earlier on the same day. The general effect of the coming into operation of the Pharmacy Act, 1953, and the granting of the Supplemental Charter on the Society's constitution was considerable. The original Charter has been retained solely as an instrument of incorporation. In future most changes in the Society's constitution will be capable of being effected either by amendments of the byelaws or by amendment of the Supplemental Charter in accordance with the special procedure laid down in that Charter.

The Society consists of fellows, members, and students. Every person who is registered as a Pharmaceutical Chemist is, by virtue of his registration, a member of the Pharmaceutical Society. Fellowship is restricted to members of the Society and has been granted to mark higher educational attainments. With the transfer under the Pharmacy Act, 1953, of all Chemists and Druggists to the Register of Pharmaceutical Chemists, fellowship has also been conferred on all Pharmaceutical Chemists who were registered as such when there were two different qualifying examinations.

The Society is governed by a Council of twenty-four, of whom twenty-one are elected and three appointed by the Privy Council; seven of the

elected members retire annually but are eligible for re-election. The supervision of the Society's affairs is in the hands of the Privy Council which confirms the Society's byelaws and examination regulations.

The Society's chief office is situated at 17 Bloomsbury Square, London, W.C.1. The affairs of the Society in Scotland are governed, under the direction of the Council, by the Executive of the Scottish Department; the office is at 36 York Place, Edinburgh, 1, where there is also a museum, a library, and examination laboratories.

THE ACTIVITIES OF THE SOCIETY

The original objects of the Society as contained in the Charter of Incorporation were modified by the Supplemental Charter granted in 1953. The present objects of the Society are as follows:

To advance chemistry and pharmacy.

To promote pharmaceutical education and the application of pharmaceutical knowledge.

To maintain the honour and safeguard and promote the interests of the members in their exercise of the profession of pharmacy.

To provide relief for distressed persons, being:

members;

persons who at any time have been members or have been registered as pharmaceutical chemists or as chemists and druggists;

widows, orphans or other dependants of deceased persons who were at any time members or registered as aforesaid; or students.

Although the Society's present constitution is almost entirely contained in or governed by provisions of the Supplemental Charter various statutes have conferred or imposed additional powers and duties which include:

1. The appointment of a Registrar to keep the Register of Pharmaceutical Chemists and the Register of Premises.
2. The appointment of examiners to conduct examinations for persons who wish to obtain registration as Pharmaceutical Chemists.
3. The making of byelaws governing the examinations.
4. The enforcement of legislation concerning the practice of pharmacy and the sale and distribution of poisons and medicines.
5. The exercise of disciplinary powers through a Statutory Committee.

Registration. A Register of Pharmaceutical Chemists was first set up under the Pharmacy Act, 1852, this Act being repealed by the Pharmacy Act, 1954. Every person who has obtained from the examiners appointed by the Council a certificate of competence to practise as a Pharmaceutical Chemist is entitled to be registered as such on payment of a fee prescribed by the byelaws. Every pharmacist is required to pay, in addition to the fees payable on registration, an annual retention fee for each year subsequent to that in which he was first registered. It is the duty of the Council to issue a certificate of registration signed by the Registrar and countersigned by either the President or two members of the Council to all registered pharmacists.

The Pharmacy and Poisons Act, 1933, requires every authorised seller of poisons to register all the sets of premises where his business, so far as it comprises the retail sale of drugs, is being conducted. The Registrar is under a duty to keep a Register of Premises for this purpose and upon

payment of the appropriate fees prescribed by byelaws must enter in the Register all sets of premises in respect of which an application for registration has been made. An annual retention fee is payable in respect of the retention of the premises on the Register.

Enforcement of Legislation. The Society has the power and duty of enforcing certain provisions of the Pharmacy and Poisons Act, 1933, the Pharmacy and Medicines Act, 1941, the Pharmacy Act, 1954, and the Therapeutic Substances Act, 1956. To this end the Society employs inspectors whose duty it is to visit all pharmacies in Great Britain and any other shop where there is reason to believe that certain offences under the Acts may be committed. It has long been a matter of regret to pharmacists that Parliament has so closely linked pharmaceutical legislation with the control of poisons. Nevertheless, the public has for many years benefited from the control that the pharmacist has exercised over their distribution, while the Pharmaceutical Society has taken over large administrative responsibilities the cost of which would otherwise have fallen on public funds.

Statutory Committee. Disciplinary control of members of the Society is in the hands of a Statutory Committee consisting of five members appointed by the Council and a Chairman, appointed by the Privy Council, who is to be a person having practical legal experience. The Statutory Committee has the power of removing from the register the name of a pharmacist who has been convicted of any criminal offence or been guilty of any misconduct such as renders him unfit to be on the register. The Committee may similarly disqualify a corporate body if an employee or member of the board has been convicted or been guilty of misconduct. There is power of appeal to the High Court and application may be made to the Statutory Committee for revocation of any direction given by the Committee.

Branch Organisation. The association of members with the conduct of the Society's affairs was brought closer in 1922, when branches of the Society were set up throughout Great Britain. Members and students are automatically members of a branch of the Society and every person connected with the Society is thereby enabled to share in the activities of the parent body. There are 143 branches in England and Wales, nine in Scotland and two in the Channel Islands. The Society provides a fund for each branch, the amount being dependent upon the number of members and students attached to it, and also arranges for speakers to address the meetings. The branches in their individual and collective capacities are sources of strength and help to the Society which refers to them from time to time matters upon which the opinion of their members can be taken. Attendance at branch meetings and the social functions associated with them tend to provide that basis of good-fellowship so necessary for effective progress.

The Benevolent Fund. One of the chartered objects of the Society is to provide relief for distressed persons being members or former members of the Society, their widows, orphans or other dependants, and registered students of the Society. The fund is financed partly from the income of invested capital and partly from annual subscriptions and payments under deed of covenant. The amount received in annual subscriptions for the year 1958 was £7648 and from payment under deeds of covenant (including income tax recovered) £2062. The fund is administered by a Committee of the Council and no genuine cases of

necessity are refused assistance either temporarily or permanently. Since 1865 permanent assistance has been given by the granting of annuities.

War Aid Fund. In July 1940 the Council decided upon a special fund, the War Aid Fund, to aid any pharmacist seriously affected by the war, and appointed a committee to organise an appeal. Subsequently, the Council decided that the fund should be a section of the Benevolent Fund and that the scope of the former should be extended to permit it to be used to assist any member or former member of the Society or any of his dependants or any registered student of the Society who, by reason of the war, is in need of financial assistance. The fund is administered by the War Aid Committee which comprises members of the Benevolent Fund Committee.

The Orphan Fund. This fund which is dependent upon legacies, donations, and subscriptions, is applied at the discretion of the Council to assist or purchase the election of orphans to Orphan Schools.

Birdsgrove House. In 1946 a convalescent home was opened for members at Birdsgrove House, Mayfield, Nr. Ashbourne, Derbyshire. The Birdsgrove House Fund was created by the Council in 1949 to maintain the home which has been modernised and equipped to provide every comfort for visitors. It is situated on the Staffordshire bank of the river Dove and has extensive grounds with lawns and ornamental gardens.

A very substantial part of the furnishings has been provided by gifts from members, branches, and organisations. A token charge is made to visitors, the principal cost of day to day maintenance being supplied by annual subscriptions and donations.

All communications regarding a stay at Birdsgrove House should be addressed to the Secretary and Registrar, The Pharmaceutical Society of Great Britain, 17 Bloomsbury Square, London, W.C.1. (Telephone HOLborn 8967).

The Department of Pharmaceutical Sciences

In March 1959 the Council, after having made a detailed review of the Society's scientific activities, decided to establish a Department of Pharmaceutical Sciences.

The Department is intended to be the instrument for giving effect in the broadest sense to the objects of the Society relating to the advancement of pharmacy and chemistry and the application of pharmaceutical knowledge.

Amongst the functions of the Department of Pharmaceutical Sciences are the following:

To collect information on materials used in pharmacy and in particular on the sources, composition, chemical and physical properties, formulation, action and uses, and analysis of drugs and related substances.

To make available the above information through the various publications of the Society and by any other suitable methods.

To provide standards and standard methods of assay for drugs and pharmaceutical materials where these are not available in the British Pharmacopœia or elsewhere and to publish these standards and standard methods in suitable form.

To develop and publish standard formulæ.

To undertake in the laboratory research where this is required for the various purposes set out above.

To establish and maintain connexion with those engaged in pharmaceutical research and to encourage research by pharmacists in whatever capacity they may be engaged.

To maintain and expand as necessary the collection of materia medica and the herbarium.*

To arrange or assist in arranging exhibitions.

To arrange (a) meetings of the Society on scientific, technical, and professional subjects, (b) refresher courses and other forms of post-graduate education, and to assist branches of the Society in making similar arrangements.

To provide the Council with reports on scientific subjects as requested.

An important function of the Department of Pharmaceutical Sciences is the preparation of the scientific publications which were formerly the responsibility of the Society's Scientific Publications Department. There are two editorial sections concerned respectively with:

1. The *Extra Pharmacopœia* (Mactindale), Volumes I and II, a general pharmaceutical reference book dealing with most aspects of pharmaceuticals and relevant aspects of the allied sciences. It provides detailed information on the actions and uses of drugs and proprietary medicines in current use and is a useful guide to the drugs and preparations included in most foreign pharmacopœias.

This editorial section is also responsible for the *Pharmaceutical Pocket Book* and books dealing with special aspects of the pharmaceutical sciences.

2. The *British Pharmaceutical Codex* and the *British Veterinary Codex* which are prepared in collaboration with expert committees. These books specify standards for a wide variety of drugs and their preparations, surgical dressings, and biological products in current use in human and veterinary medicine, and provide authoritative information on the general properties and actions and uses of these substances.

This editorial section is also responsible, in collaboration with the British Medical Association and the Joint Formulary Committee, for the compilation of the *British National Formulary* and the *Dental Practitioners' Formulary*.

The Library

The Library contains about 30,000 volumes comprising works of pharmacy, materia medica, pharmacology, chemistry, botany and allied scientific subjects together with a collection of about 6000 pamphlets and manuscripts. In addition the Library contains over three hundred sets of periodical publications of which two hundred are received currently; these include over eighty foreign pharmaceutical journals in

*The Society has a comprehensive collection of materia medica which is available for reference by members and students of the Society and by other persons interested in drugs. The type specimens are well arranged and are of exceptional value in enabling a decision to be reached in regard to the authenticity of drugs of doubtful origin.

more than twenty different languages. These may be consulted in the Library or, subject to the Library regulations, may be sent by post to members and students. The Librarian receives enquiries for assistance in the tracing of references on widely different subjects and freely advises on the most useful books to consult. Arrangements have been made with other libraries whereby the Society can obtain almost any book of scientific interest not included in the Library, and in this way an efficient and up-to-date service is provided. Approximately 12,000 books are borrowed by members annually and about 4000 persons visit the Library in the course of a normal year.

HISTORICAL COLLECTION. The Historical Collection covers a wide range of material relating to pharmacy of the past. In addition to the early printed works, manuscripts, prints, and engravings housed in the Library, a number of prints and paintings are on view in various parts of the Society's House. The Collection also contains many drug jars and bell-metal mortars, together with examples of dispensing apparatus, medicine chests, microscopes, etc., and seventeenth-century drugs, the last presented by the Royal College of Physicians. The nucleus of the Society's English delft collection was formed in 1938 when Mr. J. T. Appleton presented to the Society three eighteenth-century syrup jars. Since then many items have been added by both gift and purchase. Of these the most important is the Howard collection of English delft drug jars which was acquired in 1957. The ceramic collection now includes about 150 English delft drug jars, many with seventeenth- and eighteenth-century dates. The polychrome armorial drug jars and pill-tiles are believed to be the earliest dated specimens of their kind in existence. The nineteenth century finds expression in leech jars, infant feeders, and bear's-grease lids, pewter castor oil spoons, and other interesting by-gones.

The Collection was enriched in 1953 by the greater portion of the late E. Saville Peck's bell-metal mortars. While the English specimens, which Mr. Saville Peck amassed with such affection, predominate, the work of Italian, Flemish, French, and Spanish bellfounders are well represented and a selection of the mortars illustrating this variety is on permanent display.

The Collection is available for reference and research. The Keeper will gladly furnish information on pharmaceutical antiques and other material illustrating the history and documentation of the pharmaceutical sciences.

Publications

The Society's publications are varied and cover every aspect of pharmaceutical practice and training. In addition to the scientific publications which are the responsibility of the Department of Pharmaceutical Sciences (see page 5), a variety of other publications is produced by the Society. The more important are the *Pharmaceutical Journal*, the *Journal of Pharmacy and Pharmacology*, the *Index of New Products*, the *Calendar of the Pharmaceutical Society*, and the *Annual Registers of Pharmaceutical Chemists and Premises*.

The British Pharmaceutical Conference

The British Pharmaceutical Conference was founded in 1863 by a group of pharmacists who had been accustomed to attend the meetings of the British Association for the Advancement of Science.

The object was to encourage pharmaceutical research and promote friendly intercourse among those interested in pharmacy by holding annually a series of meetings, choosing a different centre each year.

In 1923, when the Society was developing a scheme of organisation of its members into branches, a change in the constitution of the Conference was made. It was agreed that the British Pharmaceutical Conference under the Society's auspices, should continue to be controlled by an independent Executive Committee elected by members of the Conference on which the Society should be represented by its President (who is ex-officio President of the Conference) and three members nominated by the Council. All members of the Pharmaceutical Society became members of the Conference and the Society undertook the responsibility for publishing the *Year Book of Pharmacy* which is now incorporated in the *Journal of Pharmacy and Pharmacology*. Persons who are not members of the Society are eligible for election by the Executive Committee to membership of the Conference on the written nomination of an existing member.

Until 1955 a meeting of branch representatives was held in connexion with the Conference to discuss professional matters. This was discontinued in 1956 and provision was made for the inclusion in the Conference programme of professional sessions. Arrangements were also made for branch representatives to attend the whole of the Conference in the same way as other visitors.

PHARMACEUTICAL EDUCATION

Under the supervision of the Privy Council the Society is responsible for the education and examination of persons wishing to become pharmacists. These activities are governed by examination regulations made under the appropriate byelaws. The examinations are conducted by two Boards of Examiners, one for England and Wales and the other for Scotland. Copies of the examination regulations can be obtained on application to the Secretary and Registrar, 17 Bloomsbury Square, London, W.C.1. It is particularly important that prospective entrants into pharmacy should be advised about the examination regulations and their education and they should consult the Society on the earliest possible occasion.

Registration as a Student. An entrant's first step is to register as a student of the Society, the requirement for this being a certificate of general education of a certain acceptable standard. In brief, entrants in England and Wales will comply with the requirement by obtaining passes in one of the recognised General Certificate of Education Examinations at ordinary level in English language, mathematics and a language other than English and at advanced level in chemistry, physics, and either biology or botany or zoology. Those who have attained the necessary ordinary level passes but have passed at advanced level in two only of the subjects named, or whose advanced level subjects are different from those named, may be qualified to take the outstanding subject or subjects in the Society's Entrance Examination. In all cases the prospective entrant should obtain clarification of his position by writing to the Secretary and Registrar, The Pharmaceutical Society of Great Britain, 17 Bloomsbury Square, London, W.C.1.

Those educated in Scotland should obtain a Leaving Certificate with passes at the higher standard at not more than two sittings of the