

Martindale: The Extra Pharmacopoeia (28th Edition). Edited by J. E. F. Reynolds. London, The Pharmaceutical Press, 1982

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The Extra Pharmacopoeia is 100 years old. The first edition was produced by William Martindale in July 1883, and the latest edition, the 28th, in December 1982. New editions now emerge at approximately 5-year intervals. The title perpetuates the name of the original editor of the book, a London pharmacist who in 1899–1900 was president of The Pharmaceutical Society of Great Britain. Martindale had a collaborator, Dr W. Wynn Westcott, who was a coroner in Middlesex, and who initiated the concise clinical abstracts that have always been an essential feature of the book. Perhaps we should credit William Martindale with the honour of being the first clinical pharmacist. William Martindale died in 1902, having produced 10 editions, sometimes, presumably, at quite short intervals. The editorial work was then continued by Martindale's son, William Harrison Martindale, in collaboration with Westcott until 1925, and then alone until 1933. In its fiftieth year, the copyright was acquired by The Pharmaceutical Society, in 1933. This organization has held the responsibility for production of the book for the fifty years which have followed.

Martindale is of course not a book of 'official standards.' It is a compilation of useful information of lasting and proven value. The aim of the Pharmacopoeia is to provide a concise summary of the properties, actions and uses of drugs and medicines for the practising pharmacist and the medical practitioner. The book has grown progressively, such that it now covers most of the drugs in clinical use throughout the world. Its production is a major function of the Department of Pharmaceutical Sciences of The Pharmaceutical Society of Great Britain. The task of compiling the 28th edition of The Extra Pharmacopoeia was entrusted to its editor, aided by an Assistant Editor (Anne Prasad) and an editorial team.

The feature of The Extra Pharmacopoeia which has the greatest initial impact is the sheer size of the book. William Martindale's pocket-size edition of 313 pages has grown to a lectern-sized edition of over 2000 pages. More than 900 new monographs have been added, with only 97 deletions of obsolete monographs. Most of the book is printed three columns to a page, on fine quality light-weight paper, so that a pleasant change from the 27th edition is in going from a relatively small surface area (per page) in a rather fat book, to a pleasantly slimmer book with a larger surface area per page. The second feature which strikes the perceptive reader

immediately is the modest enhancement of the claim on the cover, from being: 'A comprehensive source of information on drugs and medicines in current use throughout the world' (27th edition), to: 'The world's most comprehensive source of drug information in a single volume' (28th edition). There is no doubt as to the validity of this last claim.

Changes Since the Previous Edition

The Preface reminds us of the continued escalation in the quantity of information available about drugs, and this is reflected by the fact that the new edition is about 25% larger than its predecessor. The rearrangement of the text and choice of paper was made in order to accommodate this increase within a single volume. All of the material (it is said) has been revised and much of it rewritten. Increased effort has been made to provide guidance on the administration of drugs to infants, children, pregnant women, the elderly, and patients with hepatic and renal impairment. These areas comprise a group for which there has been an explosion of information, principally pharmacokinetic data, during the last ten years.

Another development is increased concern to provide comprehensive details of some of the unresolved controversies concerning individual drugs. This would of course be a mammoth task, perhaps one of infinite size. However, a realistic attempt to present more than one side of each argument is a feature of the book. A further feature of the revised edition, and one where controversies are rampant, is an enhancement of information on modes of action of drugs.

One of the characteristics of Martindale is its widespread use throughout the world. This is recognized in the listings of proprietary and other names for particular drugs as used in particular countries. The importance of this is obvious. In our increasingly mobile world, the most commonly asked question is: 'What is this drug?' 'This drug' is identified by name, usually a name used in another country, or by a collection of incomplete information. In my present position, the drugs usually come from Central America. In London, the drug names for identification come in large numbers from the Middle East and North Africa. The Extra Pharmacopoeia is the first reference point for every one of these questions. Indeed, generally speaking, if the problem cannot be solved by the use of this book, it cannot be solved locally at all.

Another change for the 28th edition has been some rearrangement of monographs, reflecting trends in categories of disease and drug treatment requiring attention. There are new chapters on Anthelmintics and Schistosomicides, Electrolytes, Metoclopramide and other Anti-Emetics, Metronidazole and other Antiprotozoal Agents, and Sodium Cromoglycate and related Anti-Allergic Agents. Some chapters have been renamed including those concerned with Antidepressants, Antihypertensives, and Idoxuridine and other Antiviral Agents.

Martindale Online

A major development in production of the 28th edition was the introduction of computer techniques for storage and retrieval of information. This is important to more than just the production staff. Martindale Online is a databank. Each monograph in the book has a Martindale Identity Number, and readers with access to the system will be able, through their own terminals or through various information services, to extract from the databank sections of monographs which answer particular questions. This, we are told, will enable 'some imaginary reader (anywhere in the world) to answer questions as if he had memorised comprehensively the whole (book).' My own view is, that no reader, imaginary or real, could systematically read all of this book through, let alone remember it. Martindale Online will be updated regularly throughout the currency of the 28th edition. This is truly a remarkable and exciting development in drug information. Martindale Online is described on the dust cover of the book, and details are available from Martindale Online, 1 Lambeth High Street, London SE1 7JN, U.K.

Content

Martindale has a preliminary section, following the Preface, which is concerned with Abbreviations, Abbreviated Names for Radicals and Groups, Weights and Measures, Dissociation Constants, Body Surface Area from Height and Weight, and Atomic Weights of Elements. The abbreviations comprise an extensive list, including such well known collections of letters as WHO (World Health Organization) and lesser known ones such as HLB (hydrophilic-lipophilic balance). Abbreviations are shown to be potentially part of a nightmare, illustrated by *min* (minute) and *min.* (minimum). The radicals and groups list generally facilitates reading of the main text. The weights and measures section explains S.I. units, millimoles and milliequivalents, radiation units etc. The dissociation constants are given as pKa values. There is a risk here that the original literature quoted may be in error, especially as pKa values are rarely recorded at controlled temperatures.

The main body of the text comprises monographs. Part I contains monographs on nearly 4000 substances arranged in 105 chapters. Martindale has, for many years, used a classification system which is a hybrid of

therapeutic category and chemical group. Some readers have, in the past, found this slightly annoying, in that the book is an encyclopaedia but with its entries not in alphabetical order. True, the chapters are in alphabetical order. True, the index is comprehensive. However, access to the information, if not through the index, requires knowledge of where, in the Editor's classification, the reader is likely to find his sought information. In this part of the book there is extensive cross-referencing, and the logic of a chapter system cannot be denied in a world in which no rigid classification system exists, and in which drugs move from category to category with changes in patterns of use.

Part 2 consists of a series of short monographs on approximately 1120 drugs and ancillary substances arranged in alphabetical order. These are mainly new drugs, drugs under investigation, drugs not classifiable in any other way, obsolescent drugs still of interest, and certain toxic substances which demand evaluation by pharmacological approaches, and for which drug therapy may be needed. Part 3 is a listing of some 900 proprietary medicines advertised to the public in Great Britain and supplied on demand. Herbal medicines are not included. The indices include a Directory of Manufacturers (world wide), an Index to Clinical Uses, an Index to Martindale Identity Numbers, and a General Index.

The Monographs

The monographs begin with Martindale Identity Numbers. Titles are in English, with preference being given to British Approved Names, United States Adopted Names, International Nonproprietary Names, and names used in the European Pharmacopoeia. Many synonyms are given, be they English, American, Latin, French, German, Spanish, Scandinavian etc. Botanical names are given, as are chemical names following the rules of the International Union of Pure and Applied Chemistry, 1979. The pharmacopoeias in which a particular drug appears are listed.

Each monograph, where relevant, contains atomic and/or molecular weight information, including comments on osmotic properties, solubility (in a surprisingly subjective way), and required storage conditions. As mentioned earlier, a feature of Martindale is the pharmacological and therapeutic information, concisely presented and well-referenced. It is of course essential that any reader using this section refers to the original papers or checks all but the most self-evident and non-controversial facts. The referencing is the key to this section. I find it remarkable how reading almost any monograph can lead to the development of a viable research project, since so many important questions remain unanswered.

The Extra Pharmacopoeia is not a formulary. In general, where a formula is needed, reference is made to one of the standard formularies which exist. The formulation role of the dispensing pharmacist has

declined in recent years, so that compounding is now a very minor component of each day's activity. This has occurred to such an extent that academic pharmacists are nowadays asked, from time to time, questions of the banality level of 'How do I make a solution of potassium permanganate?' Also, of course, nobody these days wants to prepare that butt of the eternal jokester, a batch of suppositories. Once the academic pharmacist has answered the 'how do you' question, it is often followed by a 'can you do it for me' question. Why mention this? Much of the *ad hoc* compounding done in the modern dispensary involves no more than dilution. In *The Extra Pharmacopoeia*, information on diluents suggested for liquid proprietary preparations for oral use in particular has been provided by the manufacturers or taken from the Diluent Directory of the National Pharmaceutical Association.

Putting The Extra Pharmacopoeia to Work

This book is clearly a reference work. It is best used

through its index when a question needs answering. However, a reading approach through the introductions to the chapters will lead to the accumulation of knowledge and insight. It is not bedside reading because of its weight, both in kilogrammes and metaphorically in content. It is, and should be, obligatory reading in intervals between prescriptions, consultations, sales, research experiments, completion of government forms etc. I consider that there is something in it for everyone concerned with drugs, including medical practitioners, pharmacists, nurses, other health care professionals, students, researchers, teachers and so on. Like a dictionary of language, or the Bible, you can place it on a table, allow it to fall open, read some lines, and learn something new, guaranteed, however many hours you have already spent studying other sections. The long established tradition of excellence has been maintained. I recommend that Martindale: the Extra Pharmacopoeia continue to be available throughout the world in any location where drug information is needed.