USAN *and the USP dictionary of drug names*

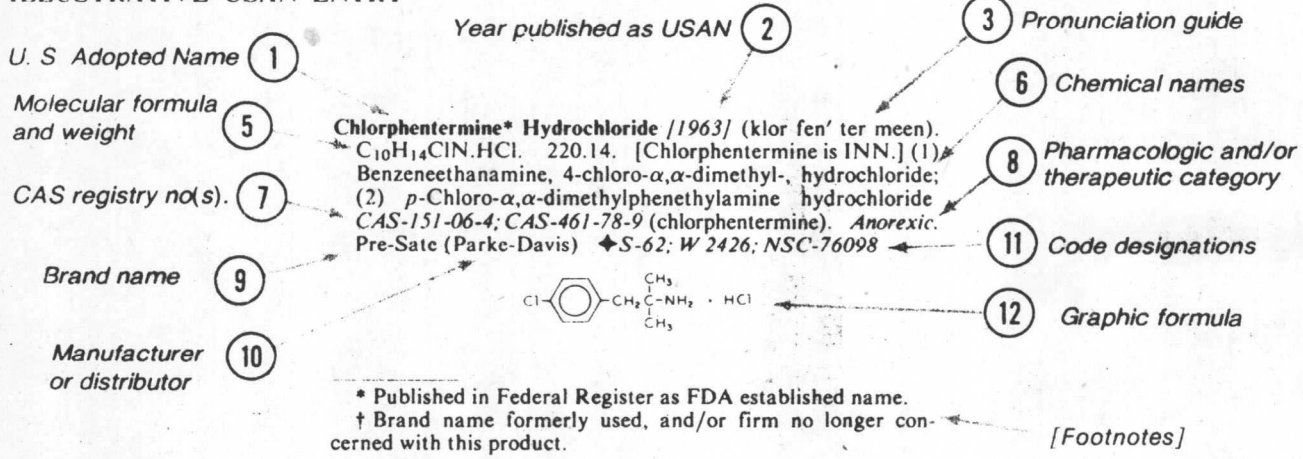
HOW TO USE THIS BOOK

For the most effective use of this book, the reader is urged to read the *Preface* and to consult the list of *Abbreviations* as needed. In addition, the following notes and examples are provided as pointers on how to use the book.

Each U. S. Adopted Name is shown in **boldface** type. The USAN entry typically includes:

(1) U. S. Adopted Name
(2) Year of publication as a USAN, in brackets and italicized
(3) Pronunciation guide
(4) Designation of official compendium in which title occurs; e.g., boldface USP if current, or "USP XIX" if not current
(5) Molecular formula and weight
(6) Chemical name(s)
(7) CAS registry number(s)
(8) Pharmacologic and/or therapeutic activity claim (italicized), based largely on representations from the sponsor of the USAN and subject to possible change as additional information becomes available [NOTE—The pharmacologic and/or therapeutic activity claim in entries on USP and NF names that have appeared in the compendia since 1970 is italicized also; however, the claimed activity is not italicized in the remainder of the entries]
(9) Brand name(s)
(10) Name(s) of manufacturer(s) or distributor(s) [a † symbol appears if the firm is no longer concerned with the product]
(11) Code designation(s), insofar as these have been ascertained, preceded by the symbol ✦
(12) Graphic formula

ILLUSTRATIVE USAN ENTRY

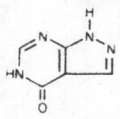


Chlorphentermine* Hydrochloride */1963/* (klor fen' ter meen). $C_{10}H_{14}ClN.HCl$. 220.14. [Chlorphentermine is INN.] (1) Benzeneethanamine, 4-chloro-α,α-dimethyl-, hydrochloride; (2) *p*-Chloro-α,α-dimethylphenethylamine hydrochloride *CAS-151-06-4; CAS-461-78-9* (chlorphentermine). *Anorexic.* Pre-Sate (Parke-Davis) ✦*S-62; W 2426; NSC-76098*

* Published in Federal Register as FDA established name.
† Brand name formerly used, and/or firm no longer concerned with this product.

OTHER ILLUSTRATIVE ENTRIES

Allopurinol* */1964/* (al oh pure' i nole). **USP.** $C_5H_4N_4O$. 136.11. (1) 4*H*-Pyrazolo[3,4-*d*]pyrimidin-4-one, 1,5-dihydro-; (2) 1,5-Dihydro-4*H*-pyrazolo[3,4-*d*]pyrimidin-4-one; (3) 1*H*-Pyrazolo[3,4-*d*]pyrimidin-4-ol. *CAS-315-30-0.* INN. *Xanthine oxidase inhibitor.* / Zyloprim (Burroughs Wellcome) ✦*BW 56-158; NSC-1390*

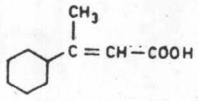


(4) *Official compendium in which title occurs*

Identification as international nonproprietary name

Cicrotoic Acid (si kroe toe' ik). $C_{10}H_{16}O_2$. 168.24. β-Methylcyclohexaneacrylic acid. *CAS-25229-42-9.* INN; DCF; NFN; M19. ✦*AD 106*

Literature reference



TYPES OF ENTRIES IN THE BOOK

USAN
Current USP and NF names
International and other nonproprietary names
Brand names
Code designations
CAS registry numbers and NSC numbers (*See* tabulations at end of main list)
Cross-references
Categories of pharmacologic and/or therapeutic activity (*See* list by categories)

APPENDIXES

I—Guiding Principles for Coining U. S. Adopted Names for Drugs
II—Molecular Formulas
III—Names and Addresses of Domestic Firms Concerned with Compounds for Which USAN Have Been Selected

USAN *and the* *USP dictionary of drug names*

A compilation of the United States Adopted Names (USAN) selected and released from June 15, 1961, through June 15, 1982, and other names for drugs, both current and retrospective

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Contents

Foreword

In its way it was impressive from the start: this dictionary of drug names first appeared in 1963 as a small, 56-page booklet presenting the first 132 U. S. Adopted Names (USAN) and including the earliest versions of the appendix material appearing in this Twentieth Anniversary edition of *USAN and the USP Dictionary of Drug Names.* Not only did it set out to disseminate and promote the use of good nonproprietary names for drugs, especially those newly introduced, but also it showed foresight in providing useful ancillary information on principles of coining names for drugs, pharmacologic-therapeutic categories, brand names, and names of the research-oriented firms that had participated in the selection of the U. S. Adopted Names. Its preface was prophetic in attributing to the U. S. Adopted Names program "a degree of success that at first seemed remote indeed."

The United States Pharmacopeial Convention published the first edition at 20 cents per copy, of which a whopping eight cents went for third-class postage, as a deliberate commitment to the encouragement of wide dissemination and use of U. S. Adopted Names for drugs. It was a labor of love fully in keeping with USPC's own founding principles of 1820, not the least of which was the cultivation of the use of standard names for drugs.

Of those who contributed to the compilation and production of the 1963 edition, three have remained a part of the working team continuously throughout these past two decades. They are cited here with renewed gratitude and appreciation for their faithful and exemplary service:

MARY C. GRIFFITHS, who as editor of the book has ably coordinated the numerous improvements and expansion of scope that led to this comprehensive, computerized dictionary of drug names.

LLOYD C. MILLER, PH.D., a founding member and current member of the USAN Council, and USP Director of Revision from 1950 to 1970, who earned an international reputation as an unparalleled expert in both drug standardization and drug nomenclature and whose extraordinary scientific and professional talents are a continuing legacy.

H. LESLIE VARLEY, a gifted typographic designer and graphic artist who has prepared the graphic formula drawings for all editions and has drawn anew most of them, and who is mainly responsible for the design of the format of this Twentieth Anniversary volume and of its predecessors since 1965, and whose dedicated work and creativity have commended him as not only a valued business associate but also as virtually one of our own in the USPC family.

Poignant by its absence from the foregoing honor roll is the name of the late CLARENCE T. VAN METER, PH.D. [1905–1981]. His last achievement in providing information on graphic formulas, chemical names, and CAS registry numbers, and especially with regard to the International Nonproprietary Name entries for the years 1953 through 1966, is introduced in this Twentieth Anniversary edition. He contributed as a volunteer chemical expert to both USP and the USAN program over a period totaling some 46 years.

Past and present thus combine in the making of this dictionary and in our ongoing aim of fostering and disseminating appropriate and useful nonproprietary names for drugs and providing essential chemical and other practical information relating to drug nomenclature in general.

WILLIAM M. HELLER

Rockville, Maryland
August, 1982

Preface

This, the Twentieth Anniversary edition of *USAN and the USP Dictionary of Drug Names*, is a dictionary of nonproprietary names, brand names, code designations, and Chemical Abstracts Service registry numbers for drugs and includes the twentieth annual compilation of United States Adopted Names (for which the abbreviation, USAN, generally is used). It is cumulative from June 15, 1961, when the U. S. Adopted Names program began, through June 15, 1982, and thus provides the complete list of USAN released through the latter date. It supersedes the 1982 edition and all earlier editions.

Publication of this annual volume in mid-year means that the book is current for half of the year of issuance and half of the following year. Beginning with the 1980 edition, the policy was changed so that the latter year is designated, whereas previous editions had designated the former year.

Included herein are 60 new U. S. Adopted Names released since publication of the previous edition of this book, as well as additions of other names for drugs. This edition reflects also relevant changes affecting information given in previously published entries.

The need for such compilations grows ever greater as the lists lengthen. The body of compounds in active use as drugs does not increase greatly, because new and better drugs tend to displace older drugs intended for the same purposes. However, the number of nonproprietary names increases steadily because, once assigned, a name remains on record and may not be reassigned even though the compound that it designates has been abandoned.

This book lists more than 18,000 entries, exclusive of cross-references and the appendixes. Of these entries, more than 5100 are brand names; 2650 are code designations (including 363 NSC numbers); and more than 6900 are CAS registry numbers. The total number of U. S. Adopted Names herein is 2104.

All international nonproprietary names (INN) published by the World Health Organization in the form of Lists from the start of the INN program in 1953 through the year 1981 are included in this volume. Succeeding editions of the dictionary will include also the INN published from 1982 onward, so that all INN will continue to be represented. This edition includes 4197 INN. More than 2300 graphic formulas, many of them published by the WHO, are in this edition as a complement to the policy of having all INN represented. As is stated in this preface under *Procedure*, there is increasing emphasis on the worldwide adoption of the same name for each therapeutic substance in view of the manifest advantages it offers to better communication and world trade. It is perhaps possible that the policy of including *all* INN in this dictionary may lend added perspective and eventually serve to reinforce that aim for more uniformity.

USAN and the USP Dictionary of Drug Names is essentially a composite alphabetic list; the aim is to make the book truly useful and convenient for identifying names, both current and retrospective, for drugs.

The main alphabetic list is followed by a listing of CAS registry numbers (see page 597) and NSC code designations (see page 644) and a section on USAN and USP and NF names listed by pharmacologic categories (see page 646).

Appendixes are included on (I) guiding principles for coining U. S. Adopted Names for drugs; (II) molecular formulas; and (III) names and addresses of domestic firms concerned with compounds for which USAN have been selected.

With respect to the legal status of trademarks cited as brand names herein, inquiries should be directed to the U. S. Patent Office.

Older names, established prior to the start of the USAN program in 1961, are included in this volume primarily as an aid to identification of many nonproprietary names. Alternative names shown as cross-references to these older names are given simply as useful information, and not as a sanction to their continued use in place of the more acceptable of the older names.

Completeness and accuracy are of course paramount objectives in a compilation such as this.

However, it is recognized that improvement is always possible, and suggestions of corrections or additions to the text will be welcomed for future consideration.

The text of this 21-year cumulation of drug names has been composed by computer, with storage and retrieval capabilities designed to facilitate future revisions and additions to the text as needed. Printing from computer-generated text has involved some adjustments in style, notably with respect to word-breaks at ends of lines; i.e., conventional hyphenation is not always feasible and some concession to automation is obligatory.

The Purpose of USAN

Despite the increasing manifestation of the need for order in assigning nonproprietary names to new drugs as they are developed, action to fill the need had been delayed for various reasons. In addition to long-standing prejudices that work against instituting an orderly and effectual system of name selection, there also is widespread misunderstanding with respect to what constitutes good nonproprietary names and what purposes they serve. However, the need is being met by the USAN Council, which is committed to following established principles for coining nonproprietary names and to enlisting the cooperation of the pharmaceutical industry in this country and of nomenclature groups abroad with a view to selecting a single, good nonproprietary name for each promising new drug. That this program is very much in the public interest should be patently self-evident; that it has willing support from many quarters amply assures its continued success.

A nonproprietary name of a drug serves numerous and varied purposes. Its principal functions are to identify the substance to which it applies and to serve as a designation that may be used without restriction by the public at large, both lay and professional. The importance of the latter function is enhanced by the restrictions necessarily imposed upon the nature and use of a trademark, particularly in the pharmaceutical field. Teaching in pharmacy and medicine requires a common designation especially for a drug that is available from several sources, and for combinations of two or more drugs. Nonproprietary names greatly facilitate communication between physicians, and most journals demand their use. State formularies and hospital formularies generally use nonproprietary names as the titles of the articles recognized. A nonproprietary name is essential to the pharmaceutical manufacturer as a means of preserving his trademark rights in his brand name for the article concerned. Finally, federal law obliges the manufacturer to use the "established" nonproprietary name in his advertising, labels, and brochures.

It is this wide variety of function that makes difficult the task of expressing very exactly the criteria for judging simplicity and usefulness in drug names, attributes generally conceded to be desirable. Actually, the criteria differ according to the drug and the manner in which it is distributed, i.e., whether it is dispensed only on prescription, and whether alone or solely in combination with other drugs.

USAN Council

The three organizations that sponsor the USAN program, i.e., the American Medical Association, the U. S. Pharmacopeial Convention, and the American Pharmaceutical Association, do so through representation on the USAN Council. During 1967, negotiations were completed to provide for participation by the U. S. Food and Drug Administration in the program as a means of consolidating the work of selecting suitable nonproprietary names for drugs on the part of the federal government and the existing Council. Thus, a liaison representative of the FDA sits on the Council. The roster of the Council for 1982 includes:

John Andrako, Ph.D., *Chairman*
Charles S. Kumkumian, Ph.D.
Lloyd C. Miller, Ph.D.
Donn L. Smith, M.D., Ph.D.
Lauren A. Woods, M.D., Ph.D.

The USAN Council was formed January 2, 1964, to succeed the AMA–USP Nomenclature Committee. It works mainly by correspondence, although consultation by telephone is frequent and Council meetings generally are held twice a year.

The USAN Council secretariat is supported by the American Medical Association, and is housed in the AMA headquarters. Donald O. Schiffman, Ph.D., serves the Council as Secretary, and Ruta Freimanis serves as Associate Secretary. Inquiries and proposals on USAN should be addressed to Dr. Schiffman.[1]

USAN Review Board

Short of resort to the courts, there existed prior to 1961 no effective means of settling controversy stemming from differences of opinion. The gap was filled by the establishment of a formal mechanism by which disputes may be settled.

To give effect to the procedure, a six-member board has been established and is known as the USAN Review Board. Members are appointed for one-year terms, subject to indefinite renewal.

Recourse to the Review Board in settling disputes over selection of the names has been relatively rare; in fact, its services have been employed in only four cases to date. Participants agree at the outset that the determination of the USAN Review Board is final and beyond appeal.

[1] 535 North Dearborn Street, Chicago, Illinois 60610.

The USAN Review Board for 1982 comprises:

Raymond D. McMurray, *Chairman*
Durward F. Dodgen
Harry F. Dowling, M.D.
Joseph B. Kirsner, M.D.
August P. Lemberger, Ph.D.
Joseph V. Swintosky, Ph.D.

Legal Status of USAN

The USAN program is the specifically organized effort in the United States directed to producing simple and useful nonproprietary names for drugs. The USAN Council chooses each U. S. Adopted Name with the expectation that it will be suitable for subsequent designation as the title of the monograph, should the article be recognized in the official United States Pharmacopeia or National Formulary, and designation by the Food and Drug Administration as the "established name" for the article concerned as set forth in the New Drug Amendments of 1962 to the Food, Drug, and Cosmetic Act. The USAN program has earned a measure of prestige and world-wide recognition as an undertaking in the public interest.

It must be kept in mind that the adoption of a name is independent of clinical evaluation or acceptance by the medical profession of the article to which the name applies.

FDA Established Names

Under the terms of the Drug Amendments of 1962 to the Federal Food, Drug, and Cosmetic Act, which became law October 10, 1962, the Secretary of Health and Human Services [formerly Health, Education, and Welfare] is authorized to designate an official name for any drug wherever deemed "necessary or desirable in the interest of usefulness and simplicity."[2] Pursuant to this authority, the Commissioner of Food and Drugs of the Food and Drug Administration has ordered publication of official names in the *Federal Register*, beginning April 20, 1967.

These names have been selected almost entirely from the U. S. Adopted Names (USAN) for the compounds concerned, although the FDA policy is generally to omit the word for the salt, ester, or other chemical combination in which a drug may be available; e.g., listing the name as Vincristine instead of Vincristine Sulfate. However, the full name of the compound is required to be shown in the drug labeling.

A total of 450 FDA "official names" were established during 1967–1981.

International Nonproprietary Names

Under its charter, the World Health Organization is empowered simply to *recommend* specific actions or procedures to its Member States. This limitation is incorporated into the WHO program concerned with the selection of international nonproprietary names for pharmaceutical substances, in that the WHO first publishes the selected names as proposals (PINN; i.e., "Proposed International Nonproprietary Names"). A period of four months from the date of publication in the *WHO Chronicle* is allowed for entering comments on, or objections to, any proposal on the part of Member States or other interested parties. In general, an objection reflects a belief that the proposal concerned is confusingly close to (i.e., conflicts with) a name already in use, perhaps in only a restricted area in which the party has a proprietary interest in the form of trademark rights. In the event that no objection is received, the WHO proceeds with listing and publishing the PINN as a RINN ("Recommended International Nonproprietary Name"), which many Member States then recognize as the sole or preferred nonproprietary name for use within their respective territories.

International nonproprietary names selected during 1953–1981 are included herein. Some are identical to, and identified with, USAN, USP, or NF entries; others are independent entries designated as INN. Where an INN is given in this volume as an independent entry, the chemical name and any graphic formula shown are generally those provided by the WHO.

Procedure

A proposal[3] for a USAN originates usually from a firm or an individual who has developed a substance of potential therapeutic utility to the point where there is a distinct possibility of its being marketed in the United States of America. Occasionally, the initiative is taken by the USAN Council in the form of a request to parties interested in a substance for which a nonproprietary name appears to be lacking.

In the case of a substance that is regarded as an "Investigational New Drug" within the terms of the Federal Food, Drug, and Cosmetic Act of 1938, the process of selecting a USAN should be initiated preferably during the period of investigation when the substance is under clinical study in human and animal subjects, so that the adoption of the USAN will be complete by the time the relevant New Drug Application is filed.

Proposals are expected to conform to the established Guiding Principles (see Appendix I) and to be reasonably free from conflict with other names, including both trademarks and nonproprietary names. An effort is made to discourage the occasional, undesirable practice of incorporating in trademarks the syllables used in an established nonproprietary name,

[2] F.D.&C. Act, Sec. 508 [358].

[3] Inquiries and proposals on USAN should be addressed to the Secretary, USAN Council, c/o American Medical Association, 535 North Dearborn Street, Chicago, Illinois 60610.

or syllables recommended for USAN. Such trademarks may act as a bar to the subsequent adoption of appropriate nonproprietary names for closely related drugs. Where the initial screening of the proposals suggests that they fail to conform or that they appear to conflict, the USAN Council Secretary offers suggestions with a view to expediting the selection process.

Each proposal should be accompanied by a statement covering as much as possible of the following information regarding the substance: the chemical structure; the chemical name (preferably the preferred *Chemical Abstracts* index name); any code designation(s) by which the substance may have been known in the course of its testing and development; the source (if it is a product of natural origin) or such other descriptive characteristics as will distinguish it adequately; the kind of pharmacologic activity or therapeutic utility claimed for it; and any trademark(s) that may have been applied to it or products containing it. This information, supplemented by the results of searches conducted by the Secretary, is referred to the Council members, whose views then are exchanged until a tentative decision can be submitted to the sponsor for comment. It should be emphasized that while the Council can ascertain the preferred chemical nomenclature for a structure claimed for any compound of definite composition, the Council is not in a position to confirm the structure or the claims for pharmacologic activity.

When general agreement has been reached on a name, the latter is published in the Trademark Bulletin of the Pharmaceutical Manufacturers Association as a "Proposed USAN." This informs those who have access to the Bulletin of the Council's intention to adopt the name and serves as an invitation for comments or protests within 30 days following its publication. No disclosure of the name of the sponsor or of the chemical nature of the substance appears in these Bulletin statements.

Provided the sponsor consents, and in any case if there has been publication of the name elsewhere, the tentatively adopted USAN is then submitted for consideration to several cooperating agencies. The latter agencies include the World Health Organization, the British Pharmacopoeia Commission, the French Codex Commission, and the Nordic Pharmacopoeia Council, as well as the United States Pharmacopeia and the National Formulary,[4] and the Food and Drug Administration. If no objections are raised by the cooperating agencies, adoption is considered final and the USAN is published in a "New Names" section such as in *Clinical Pharmacology and Therapeutics*.[5] Copies of the new USAN lists are distributed widely to the American pharmaceutical press, with the result that the USAN quickly receive wide publicity.

Despite the efforts to give notice of the proposed adoption of a USAN in the early stages and to exercise care in avoiding conflicts with established names, valid objections sometimes arise rather late. All such objections receive conscientious attention from the Council.

Occasionally, a USAN will be found unsuitable for adoption elsewhere, either internationally by the World Health Organization or by one or more national bodies. Sometimes a closely similar name proves acceptable to one or more of these agencies, as in the case of the British Approved Name "cyclobarbitone" and its U. S. counterpart "cyclobarbital." There is increasing emphasis, however, on the worldwide adoption of the same name for each therapeutic substance in view of the manifest advantages it offers to better communication and world trade.

Among the Guiding Principles for Coining U. S. Adopted Names for Drugs (see Appendix I) is the principle that for most organic compounds, the designation for the pharmacologically active portion should appear first in the name; e.g., oxacillin sodium. This principle is applied generally in the entries herein.

Chemical Nomenclature

A nonproprietary name (often referred to as a *generic* name) and a proprietary name (often referred to as a *brand name* or a *trademark*) serve different useful purposes, but neither is designed to provide precise information concerning the chemical structure of the drug substance. To describe the chemical structure, a third type of name, i.e., a *chemical name*, is needed.

Chemical names tend to be complex and cumbersome; thus, although they may provide, for scientific and technical personnel, a complete, precise, and unambiguous description of the substance, they fail to constitute a concise, convenient designation that meets the day-to-day needs of the pharmacist, the physician, the jurist, and others functioning in related activities that involve pharmaceuticals. These latter needs are more appropriately served by nonproprietary names, of which U. S. Adopted Names (USAN) are primary examples.

For USAN entries pertaining to drugs that are strictly definable chemical substances (and the vast majority of single-entity drugs are of this type), two *chemical names* are usually included in each entry to provide such definition. Of the many chemical names that could be used, the ones selected for this compilation are those that have been used as the American Chemical Society's *Chemical Abstracts* (CA) index names; thus, fundamentally and advantageously, they all stem from the same basic system of chemical nomenclature and they function, through CA, as keys to the world's chemical literature.

[4] The NF was acquired on January 2, 1975, by the USP Convention, Inc., which publishes the legally recognized compendia of standards for drugs in the United States of America.

[5] Published monthly by The C. V. Mosby Co., 11830 Westline Industrial Drive, St. Louis, Missouri 63141.

The first of these two names is the inverted form of the new systematic chemical name developed by Chemical Abstracts Service (CAS), in general accordance with the rules established over the years by the International Union of Pure and Applied Chemistry (IUPAC) and the International Union of Biochemistry (IUB), and employed in the current issues of CA. The second name is included in view of the general recognition that it is neither practical nor desirable to rely solely on the new CA index names for all purposes of identification and reference. The inverted form of the name is provided because it guides the user *directly* to the CA literature—since that is the style in which chemical substances are indexed in that literature. Conversion to the uninverted form of the name is readily accomplished:

Thus, Hydrazinecarboximidamide, 2-[2-(2,6-dichlorophenoxy)ethyl]-, sulfate, (2:1) becomes 2-[2-(2,6-Dichlorophenoxy)ethyl]hydrazinecarboximidamide sulfate (2:1). Similarly, 3-Pyridinecarboxylic acid, 2-[(3-chloro-2-methylphenyl)amino]-, 2,3-dihydroxypropyl ester becomes 2,3-Dihydroxypropyl 2-[(3-chloro-2-methylphenyl)amino]pyridinecarboxylate; Pregna-1,4-diene-3,20-dione, 11,17-dihydroxy-6-methyl-21-(phosphonooxy)-, (6α,17β)- becomes 11,17β-Dihydroxy-6α-methyl-21-(phosphonooxy)pregna-1,4-diene-3,20-dione; Benzeneacetic acid, α-(hydroxymethyl)-8-methyl-8-azabicyclo[3.2.1]oct-3-yl ester, 8-oxide, hydrochloride, *endo*-(±)- becomes (±)-*endo*-α-(Hydroxymethyl)-8-methyl-8-azabicyclo[3.2.1]oct-3-yl benzeneacetate 8-oxide hydrochloride.

This second name is given in uninverted form and is of a systematic type formerly used in CA; it is identical with, or closely resembles, the chemical name sanctioned and employed by the IUPAC and by the World Health Organization (WHO).

These two types of chemical names differ primarily in that while the IUPAC names make generous use of nonsystematic and semisystematic (often referred to as *trivial*) names and qualifying terms, all of which impede electro-mechanical manipulation, the new CAS names are fully systematic for most substances. It is primarily by virtue of this strict adherence to systematic nomenclature that the new CAS chemical names are readily amenable to the ever-increasing demand for automated processing by various means, including especially computers, thus greatly facilitating literature searches and the processing of other queries based on chemical composition described in terms of nomenclature.

A third chemical name is occasionally supplied in an entry herein, especially in instances where that name is of a type that has become firmly established through long-continued use, e.g., see under Bolasterone; Calcium Glubionate; Panthenol; and Taleranol. Also, a CAS chemical synonym is occasionally supplied as an additional name in the relatively rare instances where the CA index name for a chemical substance is not a chemical name, e.g., see under Cosyntropin; Pepstatin.

[NOTE—The foregoing does not apply to chemical names shown for entries other than U. S. Adopted Names and current compendial names established before the USAN program began. In those other entries, any chemical name shown, whether conforming to CAS nomenclature or otherwise, is given only for descriptive purposes to help identify the substance. The chemical name shown in an independent INN entry is usually that provided by the WHO.]

Identification of Names by Number

To meet the need for rapid handling of data on drugs for many purposes, compounds and preparations are being identified by number. This trend in no way minimizes the importance of adopting the best possible nonproprietary names for drugs; indeed, its success is related to the soundness of the names program, to the end that taken together the nonproprietary name and the number(s) assigned to it provide increasingly effective control of data and information on drugs.

In the system developed and being used by the Chemical Abstracts Service, registry numbers are assigned to compounds at random, and although unique, the numbers convey no compositional or other kinds of information. A data base developed by the American Society of Hospital Pharmacists, the *Drug Products Information File*, assigns numbers to drug products by brand and to the related information elements thereof; i.e., the nonproprietary name, dosage form, strength, brand name, size and type of package, manufacturer, etc. The Food and Drug Administration maintains the National Drug Code Directory, in which a three-part number is assigned to identify the manufacturer, the drug product, and the package. Other numerical classifications exist for literature searching. To judge from the degree of interest being shown in these systems for machine processing of data, there is a sound basis for predicting that names will be supplanted by numbers for many routine activities in dealing with drugs in the near future.

In this book, USAN entries, and other entries such as from current or former revisions of the USP and the NF, carry Chemical Abstracts Service (CAS) registry numbers. A given entry usually carries only one such number, but because of (a) variations in the way in which information is reported in the literature, and therefore stored in automated files, and (b) the variety of searches expected to be conducted on such files, sometimes two, or occasionally more, CAS numbers are pertinent to a single entry. For example, information on the pharmacology of ampicillin may be stored in a file under either anhydrous ampicillin or ampicillin trihydrate, depending on how it was reported in the literature, and each of these substances carries its own CAS registry number. Similarly, information on the synthesis of doxorubicin hydrochloride may be stored under that entry or under the parent substance, doxorubicin.

With entries carrying multiple CAS registry numbers, the one carrying no parenthetic annotation

(usually the first one) is the registry number assigned to that entry. Each additional number is followed by a parenthetic term which, as is apparent from the following examples, discloses its relationship to the assigned number. Prominent categories of entries carrying more than one CAS registry number are exemplified in the following:

Hydrated substances carry one registry number for the hydrate and another one for the anhydrous substance. Examples:
Theophylline 5967-84-0; 58-55-9 (anhydrous)
Ampicillin 69-53-4; 7177-48-2 (trihydrate)

Addition salts of organic bases carry one registry number for the salt and another one for the organic base. Examples:
Promethazine Hydrochloride 58-33-3; 60-87-7 (promethazine)
Acetophenazine Maleate 5714-00-1; 2751-68-0 (acetophenazine)

Quaternary salts carry one registry number for the salt and another one for the quaternary radical, if that radical has had a number assigned to it by CAS. Examples:
Bretylium Tosylate 61-75-6; 59-41-6 (bretylium)
Choline Chloride 67-48-1; 62-49-7 (choline)

Metal salts of uncommon organic acids and all salt-like substances carry one registry number for the salt and another one for the acid or acidic substance. Examples:
Sodium Edetate 64-02-8; 60-00-4 (edetic acid)
Hexobarbital Sodium 50-09-9; 56-29-1 (hexobarbital)

Entries for which CAS has replaced a registry number with another one carry both numbers, as recommended by CAS since the replaced number was in use prior to its replacement. Examples:
Aspartocin 4117-65-1; 1402-89-1 (replaced)
Phendimetrazine Tartrate 50-58-8; 21102-82-9 (replaced); 634-03-7 (phendimetrazine)
Methohexital Sodium 309-36-4; 60634-69-7 (±); 22151-68-4 (replaced); 151-83-7 (methohexital)

In general, when using CAS registry numbers as search terms, all numbers *deemed pertinent* to the search at hand should be used. To omit one or more of such numbers is to risk failing to retrieve all of the stored information pertinent to the search. This does not mean that all of the registry numbers associated with a substance in this book must always be used in searches involving that substance. According to the nature of the query that has prompted the search, one can decide whether one or more of the registry numbers are not pertinent and can therefore be omitted.

A tabulation of entries in the order of increasing CAS registry number is given at the end of the main section (see page 597). This is followed by a similar tabulation in the order of increasing NSC number; the corresponding NSC numbers are also in the respective individual entries.

Graphic Formulas

Consonant with the employment of Chemical Abstracts nomenclature, and also in the interest of uniformity of style, the orientation of ring systems and the depiction of stereoisomeric features in graphic formulas are generally consistent with CAS practices. A circle within a hexagon is used in graphic formulas to represent the bonding in benzene rings and all others that contain six atoms of any kind that are connected in conjugate (Kekulé) style in one or more of the individual resonant structures that contribute to the hybrid structure actually present in the molecule. The circle portrayal is applied to one-ring systems and to the individual rings in poly-ring systems. Aside from the circle portrayal where used, the graphic formula shown for an independent INN entry is usually that provided by the WHO.

Pronunciation Guide

Although to some extent the pronunciation is a subjective attribute and universal agreement would be but a vain hope, a simple guide, based on English-language spelling, on a limited scale is provided for most of the nonproprietary names herein. Inasmuch as slight differences in phonetics are regarded as relatively unimportant, no attempt is made to give a highly sophisticated system of diacritical marks. [NOTE—The pronunciation guide is not repeated if the guide has been given for the same word in a previous entry.] In any event, comments will be welcomed with respect to instances where an alternative pronunciation is preferred in a particular area.

Biologic Products

The U. S. Public Health Service name for a biologic product is included, in general, only where it differs from the USAN or the USP or NF name. Biologic products are licensed in accordance with the federal Public Health Service Act and comply with the regulations of the National Center for Drugs and Biologics of the Food and Drug Administration.

Radioactive Pharmaceuticals

Since the radioactive pharmaceuticals are specially packaged in distinctive containers, labeled with the internationally recognized symbols for radioactivity, and available only to specially trained personnel, the USAN Council has agreed on the general principle that for these drugs the nonproprietary name should include the name of the basic compound serving as the carrier for the radioactivity, the symbol for the rādioactive isotope, and the atomic weight (inasmuch as several radioactive isotopes of a given element may be in use).

Brand Names

Brand names in use in America for the compounds listed are generally shown. (The inclusion of trademarks herein is not to be regarded as indication that the marks necessarily have been registered with the U. S. Patent Office.)

The information on brand names for inclusion in this volume was made available principally from earlier editions; from current literature sources; and from the office of the Secretary of the USAN Council.

No attempt is made to be exhaustive with respect to the inclusion of brand names. As a general principle, emphasis is on listing brand names of those domestic firms that have participated in the USAN program by sponsoring one or more compounds for which USAN have been selected. The inclusion of various brand names bears no relationship to, and is not intended to affect, any brand interchange requirements.

It should be noted that the pharmacologic and/or therapeutic category stated in an entry may not necessarily apply to every brand name listed in that entry; e.g., the category may pertain to one or more dosage forms whereas a particular brand name may represent such dosage form(s) or perhaps some other dosage form not contemplated by the stated category.

Usually a drug product has only one formulator and one labeler, which are one and the same firm; however, sometimes a single formulator produces a drug product for several labelers and sometimes a single labeler purchases a drug product from more than one formulator. While there is no general effort to make in this book a distinction between the formulator and the labeler of a product, it may be of interest to note that such information may in the future become a more generally available item of drug information.

Where a firm has indicated that it is distributor as distinct from manufacturer, its name is shown within brackets, e.g., "[Adria]," in the entry on Ceruletide Diethylamine.

Code Designations

Alphanumeric combinations frequently are used during the investigational phase required to demonstrate the utility of new, potentially therapeutic substances. The alphabetic portion of a code designation usually is identifiable with the institution or firm that assigns the code designation to the agent under test. For example, among the code designations commonly encountered are some that include the initials "NSC" (National Service Center of the National Cancer Institute, NIH). Code designations find their way into the scientific literature because it is customary to use them in identifying the compounds in early publications, often prior to adoption of a USAN.

To accommodate to computer sorting procedures, and thereby retain a more conventional sequence of entries, a few of the alphanumeric code designations in this edition have been modified by the insertion of a space between the alpha and the numeric character(s); e.g., "A5MP" becomes A 5MP, and "R19,317" becomes R 19,317.

Summary of Types of Information Provided

The individual entries in this volume comprise, in general, the following: (1) USAN (in **boldface** type), with year of its publication in brackets; (2) official names (usually of the drug substances as distinct from the dosage forms) from the current editions of the United States Pharmacopeia and the National Formulary, with some exceptions, e.g., combinations; (3) names that were official in previous revisions of the USP and the NF; (4) miscellaneous older names that had been in general use at various times in the past; (5) official names established by the FDA (marked by asterisks); (6) brand names; and (7) code designations.

The statement of claimed pharmacologic and/or therapeutic activity is italicized in USAN entries and in entries for USP and NF names that have appeared in the compendia since 1970. In other entries, this statement is not italicized, simply because the older terminology frequently does not fit the pattern generally followed in recent years. Thus, recognition is given the fact that in this volume it has been necessary to accommodate to several different pharmacologic and/or therapeutic classification schemes, with the result that some inconsistencies will be apparent. In the case of many new entries, the sponsors of the USAN may not have complete information insofar as all of the categories of activity are concerned. Comments aimed toward the attainment of greater uniformity and usefulness in the pharmacologic classification system used herein will be welcomed, particularly if they are supported by authoritative information.

Literature references (e.g., "AMA-DE"; "MI 9") are given in some entries solely as sources of possible further information about the compound, and do not imply any connection with the program for selection of nonproprietary names. [NOTE—See explanation of abbreviations on page 14.]

The names of the manufacturers currently or formerly concerned with the respective compounds are mentioned. Information that a manufacturer is no longer concerned with a compound will be gratefully received.

Further analysis of the content of this edition is given under *How to Use This Book*, on the inside front cover.

Acknowledgments

Highest tribute is due the late Dr. Clarence T. Van Meter (1905–1981), who contributed as a volunteer expert in providing information on graphic formulas, chemical names, and CAS registry numbers for all editions of this book from its beginning in 1963. His scholarly and dedicated work is evidenced once again in the additional entries on International Nonproprietary Names introduced in this edition, and is indelibly a part of the heritage of the USAN program.

Dr. Joseph B. Jerome, Secretary Emeritus of the USAN Council, has contributed a number of helpful suggestions during the preparation of this book. Having administered the work of the Council for 20 years and otherwise made distinguished scientific and

professional contributions toward standard and useful nonproprietary names for drugs, he is deserving of utmost praise and appreciation. Dr. Donald O. Schiffman, current Secretary of the Council, similarly has contributed helpful suggestions as he carries on in the same high tradition.

Dr. Kurt L. Loening, Director of Nomenclature, Chemical Abstracts Service, and his associate Joy E. Merritt continue to render invaluable assistance with the graphic formulas and in providing chemical names consistent with the *Chemical Abstracts* conventions, and in helping to compile the CAS registry numbers herein.

Carolyn A. Fleeger is cited for thorough and able assistance in both the preparation and the processing of the manuscript, including the compilation of new material. Patricia H. Morgenstern, Deborah A. Fratta, and Jesusa F. de Vera also assisted commendably during the various phases of work on this edition. The valued help and support of Dr. William M. Heller, Executive Director of the USPC, are acknowledged. A special vote of appreciation is due also H. Leslie Varley, who prepared the graphic formula drawings, and who is mainly responsible for the design of the format of the present volume. The Mack Printing Company is commended for excellent cooperation and assistance throughout the printing stages.

It is particularly true that much of the work on the USAN program is hidden from view. The results, however, are shared by many, all of whom thus benefit from the labors of the few who give freely of time and effort and of others whose cooperation makes success possible. The continued willing cooperation from all segments of the pharmaceutical industry, which contributes immeasurably to the success of the USAN program as well as provides helpful information on the various entries throughout this book, is gratefully recorded.

M. C. G.
L. C. M.

ABBREVIATIONS

AMA-DE	*AMA Drug Evaluations*, published by the American Medical Association
BAN	British Approved Name
BVC	British Veterinary Codex
CA	*Chemical Abstracts*, published by the American Chemical Society
CAS	Chemical Abstracts Service
CID	*CTFA Cosmetic Ingredient Dictionary*, published by The Cosmetic, Toiletry and Fragrance Association, Inc.
DCF	Dénomination Commune Française (French approved nonproprietary name)
FDA	Food and Drug Administration
INN	International Nonproprietary Name
JAMA	*Journal of the American Medical Association*
MI	*Merck Index*, published by Merck & Company, Inc.
ND	*New Drugs*, former publication of the American Medical Association
NF	National Formulary
NFN	Nordiska Farmakopénämden (Nordic Pharmacopoeia Council approved name)
NND	*New and Nonofficial Drugs*, former publication of the American Medical Association
NNR	*New and Nonofficial Remedies*, former publication of the American Medical Association
NSC	National Service Center, National Cancer Institute, National Institutes of Health
PHS	Public Health Service [United States]
USP	United States Pharmacopeia
USPC	The United States Pharmacopeial Convention, Inc.

United States Adopted Names (USAN)

AND OTHER NAMES FOR DRUGS

A 5MP. Code designation for Adenosine Phosphate.

A-82. Code designation for Nitroxoline.

A-118. Code designation for Sultroponium.

A-272. Code designation for Rutamycin.

A-2205. Code designation for Profadol Hydrochloride.

A-2371. Code designation for Mithramycin.

A-2655. Code designation for Dioxamate.

A-4180. Code designation for Isometamidium Chloride.

A-4694. Code designation for Actaplanin.

A-4828. Code designation for Trofosfamide.

A-7283. Code designation for Guanoctine Hydrochloride.

A-8103. Code designation for Pipobroman.

A 8999. Code designation for Aspartocin.

A-12253A. Code designation for Nebramycin.

A-16612. Code designation for Teroxalene Hydrochloride.

A-17624. Code designation for Ditolamide.

A-19120. Code designation for Pargyline Hydrochloride.

A-19757. Code designation for Encyprate.

A-20968. Code designation for Piposulfan.

A-27053. Code designation for Chromonar Hydrochloride.

A-32686. Code designation for Proscillaridin.

A-35957. Code designation for Altrenogest.

A-41-304. Code designation for Desoximetasone.

A 46 745. Code designation for Gestrinone.

A-1981-12. Code designation for Prodilidine Hydrochloride.

A IX. Code designation for Demecycline.

AAFC. Code designation for Flurocitabine.

Aarane. Syntex† brand of Cromolyn Sodium.

AB-100. Code designation for Uredepa.

AB-103. Code designation for Benzodepa.

AB-132. Code designation for Meturedepa.

Abate. American Cyanamid brand of Temefos.

Abbocillin-DC. Abbott† brand of Penicillin G Procaine.

Abbokinase. Abbott brand of Urokinase.

Abbott-16900. Code designation for Teflurane.

Abbott-19957. Code designation for Lorbamate.

Abbott-22370. Code designation for Trimetozine.

Abbott-24091. Code designation for Berythromycin.

Abbott-34842. Code designation for Butamben Picrate.

Abbott-35616. Code designation for Clorazepate Dipotassium.

Abbott-36581. Code designation for Butamirate Citrate.

Abbott-38579. Code designation for Protirelin.

Abbott-38642. Code designation for Fosfonet Sodium.

Abbott-39083. Code designation for Clorazepate Monopotassium.

Abbott-40728. Code designation for Cetocycline Hydrochloride.

Abbott-41070. Code designation for Gonadorelin Acetate.

Abbott-43326. Code designation for Carteolol Hydrochloride.

Abbott-43818. Code designation for Leuprolide Acetate.

Abbott 44090. Code designation for Valproate Sodium.

Abbott-44747. Code designation for Astromicin Sulfate.

Abbott-45975. Code designation for Terazosin Hydrochloride.

Abbott-46811. Code designation for Cefsulodin Sodium.

Abbott-48999. Code designation for Cefotiam Hydrochloride.

Abbott-50192 (HCl). Code designation for Cefmenoxime Hydrochloride.

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* Published in Federal Register as FDA established name.

† Brand name formerly used, and/or firm no longer concerned with this product.