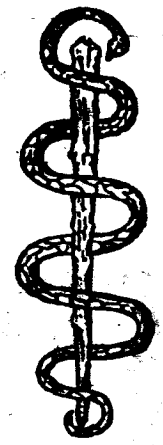
# STEDMAN'S MEDICAL DICTIONARY



## ILLUSTRATED

*A vocabulary of medicine and its allied sciences, with pronunciations and derivations*

TWENTY-SECOND EDITION

*Completely revised by a staff of 33 editors, covering 44 specialties and subspecialties*

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# PUBLISHER'S PREFACE TO THE 22ND EDITION

It is customary among editors of medical dictionaries to preface each new edition with scholarly dissertations about the impact of advancing scientific knowledge on the philological standards, size, and nature of the vocabulary. The consideration of philology as it is affected by our growing vocabulary is presented in the introduction to the section on medical etymology—where it belongs, eternally. As to size, we hasten to present some basic statistics: in this edition of *Stedman's* there are 7,199 new entries, and 24,877 revised definitions; both new and revised terms reflect an updating, chiefly in the presentation of new information, of more than 30 per cent of the 21st edition.

But we can't rely on statistics alone to describe the nature of the new *Stedman* vocabulary, because the computer has given us a new dimension—a comprehensive, multifaceted editorial approach that could not otherwise have been achieved, with results that cannot be realistically interpreted by quantitative analysis.

The technological impact of the computer on book composition is, of course, no longer news. Hardly an eyebrow will be lifted at the statement that, by Videocomp (an electronic typesetter), a camera-ready page of this book was produced every 15 seconds. Infinitely more exciting, and still real news in the world of dictionary publishing, is the impact of the computer on the actual process of editing.

Control, retrieval, and flexibility were the operative words for the thorough, over-all revision accomplished for this edition. These three mechanical factors acted as editorial aides to a greatly expanded, highly specialized staff of 33 editors in 44 medical and allied specialties, to wit:

Adhering to preliminary advice given by each editor, we established a set of arbitrary criteria for categorization of vocabulary entries. Every entry in the 21st edition was reproduced on computer tape, then retrieved by category and reprinted in the form of specialized review proofs for each editor. Terms that could not be restricted to one specialty were assigned to two or more editors in interrelated specialties. Finally, to make sure that nothing escaped the editorial eye, all editors were given *carte blanche* over the entire range of the dictionary.

At predetermined intervals over our period of editorial revision the updated material—new entries, revisions, and re-revisions—was fed to the computer. It was possible at any stage for any editor to add his specialty-oriented information to new or revised definitions submitted by other editors. Definitions that are more comprehensive—broader in scope—reflect this editorial "cross-pollination."

It is perhaps fallacious to define a new vocabulary in terms of new and revised entries. By far the greatest portion of the terms counted as new for this edition are indeed new—that is, not listed in other dictionaries; some have been kicking around in the literature for some time; others are newly recognized names for old entities previously defined under some other name; and still others comprise terms that were deleted in editions past, only to be reinstated now because of new significance. Old entries, by the same token, have been revised to reflect brand new concepts and new nomenclatural trends or standards, as well as to accomplish our editorial objective of providing fuller definitions.

After all, perusal of the vocabulary is the only realistic way to evaluate its contents. You will find, for example, that updating of anatomical terms not only reflects nomenclatural recommendations established by *Nomina Anatomica* (there was little to add to our gross anatomical definitions), but provides added information from the histology editor. In bacteriology, new official binomial nomenclature and descriptions have replaced no longer valid information. The table of viruses is now the most complete of any dictionary to date, with corresponding changes in the related areas of immunology and infectious diseases. In the several pathology specialties, malignancies are described, etiological factors redefined, cytopathological procedures explained; even the moot question, "what is death?" is answered anew. The whole spectrum of blood diseases and blood cell terminology was subjected to careful scrutiny. New and revised definitions of hereditary diseases represent the mutual interests of the editors for genetics, pathology, and endocrinology.

Practically the entire *Stedman* vocabulary in the fields of biochemistry and chemistry has been completely redesigned to present terms and definitions that will fill the advanced needs of today's medical students. Definitions of enzymes, vitamins, hormones, steroids, sugars, and other chemical substances relevant to the life sciences bear little resemblance to those in the old edition

—and new entries have superseded old terms that have no real significance in this new medical vocabulary.

In this edition, definitions of some hormones found in plants and invertebrate animals are provided. Because these substances exert an important regulatory influence on growth and reproduction in the simpler forms of life, they have attracted the attention of a large and varied body of scientists, and new impetus has been given to the studies of the etiology and control of human and animal disease caused by invertebrate organisms. *Stedman's* acknowledges this scientific activity further in new information pertaining to protozoan and insect parasites, insect anatomy and physiology, parasitic diseases, and the ecology.

Deletions have been minimal—*Stedman's* has always been a modern, "working" dictionary. Some terms considered by the individual editors to be conceptually obscure or otherwise obsolete have been so labeled and retained—at least for this edition—for their historical interest. By substituting cross-references for duplicated definitions in several thousand vocabulary entries involving synonyms, we were able to avoid increasing the actual size of the book, while accomplishing better correlation of these synonymous terms.

Practically every illustration in the book has been redrawn; some old ones of waning informational significance have been replaced by new ones for items not heretofore illustrated; and the color plates, located in the center of the book, include three new ones pertaining to the maturation of blood cells.

*Stedman's* informative as well as interesting section on medical etymology has been reproduced in full in the preliminary pages of the dictionary. We did, indeed, look for ways to enhance its value for the ever-increasing number of medical students who do not study the classical languages, but found little that could be improved.

The section, "How to Get the Most Out of Your Dictionary," defines the editorial policies governing selection and arrangement of special categories of terms, including anatomy, pharmacology, chemistry, and biochemistry; the treatment of eponyms and synonyms; new cross-referencing procedures; and especially an innovational alphabetized index of subentries that banishes once and for all the frustration provoked by elusive multiple-word terms (this index comprises the new Appendix 11).

Also new in this edition are Appendix 1A, pharmaceutical preparations; Appendix 1B, a directory of antivenin distributors; Appendix 7, a tabulated list of normal results of 268 types of laboratory analyses involving all of the body fluids. Appendix 9 (elements) and 10 (standard abbreviations) have been updated.

## Acknowledgments

In compiling the 22nd edition of *Stedman's*, we have endeavored to adhere to standard, authoritative recommendations for nomenclature and definitions. We wish especially to acknowledge the following:

Our source and standard for anatomical nomenclature is *Nomina Anatomica* (Paris, 1955), as revised by the Seventh and Eighth Congresses of Anatomists in 1960 and 1965, respectively.

Of major significance in this new edition is the invaluable assistance we have received from the Academy of Denture Prosthetics, who made available to us the entries in the *Glossary of Prosthodontic Terms*, Edition 3. This glossary, edited by the Nomenclature Committee of the Academy (Judson C. Hickey, D.D.S., Carl O. Boucher, D.D.S., and George A. Hughes, D.D.S.) and published in 1968 by the *Journal of Prosthetic Dentistry*, C. V. Mosby Company, St. Louis, Missouri, is a collection of terms and definitions in the arts and science of prosthodontics. In the preceding 20th and 21st editions of *Stedman's* the glossary was printed as a separate appendix, but we have added the glossary entries to the vocabulary section of this edition, in their proper alphabetical locations. *Stedman's* is enriched, therefore, by the addition of several hundred entries from the *Glossary of Prosthodontic Terms*.

Also included are many entries from the new *Glossary of Oral Surgery Terms*, published in 1971 by the American Society of Oral Surgeons' Committee on Hospital Oral Surgery Service, Chicago, Illinois. We are deeply indebted to this Committee for making their new material available to us in time for inclusion in this edition of *Stedman's*.

In making possible extensive updating in the specialty of bacteriology, we gratefully acknowledge the cooperation of the Board of Trustees of *Bergey's Manual of Determinative Bacteriology*.

Through the courtesy of the Congress of Neurological Surgeons and its Committee on the Nomenclature of Neurosurgical Operations, we have been able to include new and revised definitions of operations upon the scalp, skull, cranial contents, spine, and spinal cord.

Reference sources for pharmacological and pharmaceutical terms include current editions of *United States Pharmacopeia* (USP), *British*

*Pharmacopoeia* (BP), *National Formulary* (NF), and the lists published by the United States Adopted Names Council (USAN). We are grateful for the privilege of using and citing these references. The definitions as given in *Stedman's* serve primarily as guides to the information currently available. They do not represent the opinions of the *Stedman* Editorial Committee, nor are the publishers of any of these references responsible for inaccuracies which may occur in our use.

For enzymes, we have devoted special attention to the recommendations of the Enzyme Commission of the International Union of Biochemistry Committee on Nomenclature, and many entries give the EC numbers.

The Elsevier Publishing Company, Amsterdam, The Netherlands, kindly gave us permission to use *Nobel Lectures* as a reference source for the biographical information pertaining to Nobel laureates in medical and allied fields.

Appendix 7, a detailed tabulation of normal results of laboratory analyses and observations, is the work of Parker R. Beamer, Ph.D., M.D., Professor of Pathology (Anatomic and Clinical) of the Chicago Medical School/University of Health Sciences, and Mount Sinai Hospital Medical Center, Chicago, Illinois, and a former *Stedman* editorial consultant. We are indeed proud to include this valuable information in this edition.

We are grateful to Edward S. Stafford, M.D., Professor, Department of Surgery, The Johns Hopkins University School of Medicine, Baltimore, Maryland, for his help with illustrations and definitions of surgical sutures.

We also express our deep appreciation to all of the authors, editors, and publishers of the many other texts, journals, and reference sources whose works have been individually cited and duly acknowledged where used, throughout the dictionary, and to all of the interested *Stedman* users whose letters to us contained suggestions of inestimable value.

*Stedman* editors who contributed to the preliminary sections and appendices include: Dr. Bernard J. Freedman (on British *versus* American spelling); Dr. Henry J. L. Marriott (introduction to etymology section); Dr. Frederick G. Hofmann (discussion of the significance of plant and invertebrate physiology); Dr. Waldo E. Cohn (explanation of editorial policies concerning chemical and biochemical terms); Dr. Gerda I. Klingman (Appendix 1, pharmaceuticals); and Dr. C. Nash Herndon (Appendix 2, blood groups).

To the entire *Stedman* staff of editors we are truly indebted, not only for their acumen, so enthusiastically applied in the demanding task of revising this edition, but also for their patience and cooperation in ironing out the complexities that were bound to occur in our massive program of multidimensional editorial revision.

THE WILLIAMS & WILKINS COMPANY
By Anne G. Cutler, *Stedman Managing Editor*

# HOW TO GET THE MOST OUT OF YOUR DICTIONARY

*Stedman's Medical Dictionary* has been carefully designed for you. If you will spend a few minutes now in learning to use your dictionary as it is intended to be used, it will repay you many times over—not only in breadth and depth of information, but also in convenience, in time saved, in simplified search, and in many other fringe benefits. To this end, we offer the guide-notes below.

## PRONUNCIATION

Simplified phonetic spellings, where needed, are given in parentheses immediately following the boldface major entry and preceding the derivation. Accent marks *follow* the stressed syllables, and the position of the accent mark also determines, in most instances, the vowel sound (see "Key to Pronunciation" below). For exceptions, appropriate diacritical marks are given in the phonetic spelling. Where the phonetic spelling is superfluous, the boldface entry is accented to show stressed syllables.

### *Key to the Pronunciations*

a at the end of a syllable as a in mate, before a consonant as a in mat.
ă as a in mat.
ā as a in mate.
ah as a in father.
ai as ai in fair.
ar as a in far.
aw as a in fall.
e at the end of a syllable as e in be, before a consonant as e in met.
ĕ as e in met.
ē as e in be.
ë as the French eu or the German oe, nearly as e in her.
eh as a in mate, though not so prolonged.
i at the end of a syllable as i in pine, before a consonant as i in pin.
ĭ as i in pin.
ī as i in pine.
o at the end of a syllable as o in note, before a consonant as o in not.
ŏ as o in not.
ō as o in note.
oo as oo in food.
o͝o as oo in foot.
or as o in for.
ow as ow in cow.
oy as oy in boy.
u at the end of a syllable as u in pure, before a consonant as u in bud, before r as u in fur.
ŭ as u in bud.
ū as u in pure.
ü as the French u or the German ü or ue.
dh as th in the.
g hard as in get.
kh a guttural k, as ch in the German bach or Scotch loch.
ṅ as the French nasal n in bon.
th as th in think.
zh as z in azure.

**Unusual pronunciations of some initial consonants.** In some words the initial *sound* gives no clue to the initial *letter*, and this may occasion difficulty. Some examples are listed in the table following:

| Initial letters | Pronounced | Examples |
|---|---|---|
| phth- | th-, fth- | phthalein |
| pn- | n- | pneumonia |
| ps- | s- | psoas, psychology |
| pt- | t- | pterygoid, ptosis |
| x- | z- | xanthic, xenon, xiphoid |

## GUIDE TO DERIVATIONS

Get acquainted, first, with the section on Medical Etymology, pages xix–lii. Here you will find an informative discussion of the origins of our medical vocabulary; a thorough explanation of word formation and syntax, including a new series of tables showing the formation of plural, adjectival, and combining forms; a list of Greek and Latin prepositional and adverbial prefixes; and the Root Word List, where specific derivations are discussed in greater detail than is possible in the vocabulary section of the dictionary.

In the vocabulary, etymology is given in square brackets [ ] immediately following the word and its pronunciation. The bracketed material includes (1) the abbreviation indicating the language from which the word is derived, *e.g.*, G. (Greek), L. (Latin), etc. (for other such abbreviations, see "Abbreviations Used in This Dictionary," page xiv); (2) in italics, the word from which the term is derived; and (3) in roman type, the English translation. In addition, in many instances references to the Root Word List (pages xxv–xlviii) in the etymological section are given in capital letters, thus: **imperception** [L. *in-*, not, + *per-cipio*, pp. *-ceptus*, to perceive. CAP-]. Whenever you can, take the time to look up these references. This practice will build your medical

vocabulary more quickly and easily than you might think possible.

When the brackets contain only the letter G. or L. (or any abbreviation designating a language), the word being dealt with has the same spelling and the same or approximately the same meaning in Greek or Latin, *e.g.*, **corpus** [L.]. The body. . . . If the classical meaning differs from the modern, this is indicated after the capital letter. This applies also where the formula "G. fr." or "L. fr." is used, as in **lentigo** [L. fr. *lens* (*lent-*), a lentil].

An effort has been made to reduce the derivation to a simple Greek or Latin word which is easy to remember and which usually occurs in other derivatives. When a verb is hyphenated it indicates that the second part of the word exists as a simple verb with the same or approximately the same meaning, qualified by the addition of the adjectival or adverbial prefix. But if the simple verb undergoes a change when forming part of a compound it is shown in the derivation, for example, *com-primo*, to press together, fr. *premo*, to press.

The first person singular present of Greek and Latin verbs is used in most instances, rather than the infinitive. Where the English meaning is given in the infinitive it refers to the verb and all its parts. Verbs in most continental European languages are listed by their present infinitives.

The aorist, a Greek tense denoting simple occurrence in the past, without limitations as to its continuance, etc., is given when it contains the stem from which a derivative is formed.

The stem is given in parentheses after a Greek or Latin noun when necessary to show word formation. See page xxii.

Combining forms used in the prefix position are listed as separate vocabulary entries with full definitions and with bracketed derivations, often including a reference to the more detailed information in the Root Word List in the etymology section of the dictionary. For the longer lists of compound words containing identical prefixed combining forms, we have bracketed that combining form without repeated translation for each, because this information is easily found in a nearby boldface "prefix" entry. Many combining forms used in the suffix position are also listed as separate vocabulary entries.

## ABBREVIATIONS USED IN THIS DICTIONARY

adj. . . . . adjective.
adv. . . . . adverb.
Am. Ind. . . . . American Indian.
Ar. . . . . Arabic.
A.S. . . . . Anglo-Saxon.
BP. . . . . British Pharmacopoeia.
*cf*. . . . . L. *confer*, compare.
D. . . . . Dutch.
EC. . . . . Enzyme Commission.
Eng. . . . . English.
*e.g.* . . . . . L. *exempli gratia*, for example.
foll. . . . . following.
Fr. . . . . French.
fr. . . . . from.
G. . . . . Greek.
Gael. . . . . Gaelic.
gen. . . . . genitive.
Ger. . . . . German.
*i.e.* . . . . . L. *id est*, that is.
Ind. . . . . Indian.
It. . . . . Italian.
Jap. . . . . Japanese.
L. . . . . Latin.
LL. . . . . late Latin.
M.E. . . . . Middle English.
Mod. L. . . . . Modern Latin.
[NA]. . . . . Nomina Anatomica.
NF. . . . . National Formulary.
Obs. . . . . Obsolete.
O.E. . . . . Old English.
O.Fr. . . . . Old French.
Pers. . . . . Persian.
Pg. . . . . Portuguese.
p. . . . . participle.
pl. . . . . plural.
pp. . . . . perfect participle passive.
prec. . . . . preceding.
priv. . . . . privative, negative.
*q.v.* . . . . . L. *quod vide*, which see.
Sansk. . . . . Sanskrit.
sing. . . . . singular.
Sp. . . . . Spanish.
thr. . . . . through.
USAN. . . . . United States Adopted Names.
USP. . . . . United States Pharmacopeia.
W. Af. . . . . West African.
* . . . . . in biographical data, denotes year of birth.
† . . . . . in biographical data, denotes year of death.

## SPELLING

**Important departures from older spellings.** Some changes in spelling, especially many recommended by the *Nomina Anatomica* (1960 revision)

were incorporated in the preceding edition of *Stedman's* and retained in this edition. For example, annulus is now spelled anulus, chorioid is spelled choroid, calyx has been superseded by calix, the combining forms thyreo- and -physeal now appear as thyro- and -physial, and diphthongs have been omitted from anatomical terms in favor of simpler spellings (though retained for taxonomic classifications of organisms). Cross-referencing has been supplied for these spelling changes.

**Variations in prefixed combining forms.** Combining forms frequently have alternative spellings; for example, hemo- and hemato-, dermo- and dermato-, cine- and kine-, cata- and kata-, phac- and phak-, and sympatho-, sympathico-, sympatheto-. The boldface entries that supply the derivations for these combining forms (see p. xiv, "Guide to Derivations") also serve as guides to their alternative spellings. In addition, strategic cross-referencing for many hundreds of individual terms of this type has been provided.

**Some British and American spellings compared.** Because of differences between British and American spellings, British users may have difficulty in tracking down certain words. When a word can be spelled in two ways—the British way and the American way—look for it in its American form.

The main sources of confusion are *ae* and *oe*, both of which are generally preserved in British use but almost always contracted to *e* in American. Less important differences include the American *-or* for *-our*, *f* for *ph*, and the terminals *-ter* for *-tre* and *-ize* for *-ise*.

British users will experience little or no difficulty when the American equivalent in question occurs toward the end of a word (*e.g.*, diar*rhea* for diar*rhoea*); but when the difference occurs at or near the beginning of a word, the actual entry may be elusive since it is far removed from the alphabetical site at which it is sought. For example, the British reader may be searching for oedema under the letter "o" whereas the American entry will be under "e" (edema).

Most of these occurrences are handled in *Stedman's* by cross-references, for example: "**oe-**. For words so beginning and not found here, see e-." Since such cross-references occur only for prefixes, readers should watch for the same variations within compound words, as these too may change the alphabetical locations of some words.

The following lists are not intended to be complete; rather, they give several examples of British-American equivalents that will serve as guides.

| | British | American |
|---|---|---|
| **ae** for **e** | aegophony | egophony |
| | aetiology | etiology |
| | anaemia | anemia |
| | anaesthetic | anesthetic |
| | caecum | cecum |
| | defaecation | defecation |
| | faeces | feces |
| | gynaecology | gynecology |
| | haematuria | hematuria |
| | haemoglobin | hemoglobin |
| | haemorrhage | hemorrhage |
| | paediatric | pediatric |
| | taenia | tenia |
| **ei** for **i** | cheiromegaly | chiromegaly |
| | cheilitis | chilitis |
| **oe** for **e** | coeliac | celiac |
| | foetor | fetor |
| | foetus | fetus |
| | oedema | edema |
| | oesophagus | esophagus |
| | oestrus | estrus |
| | -rrhoea | -rrhea |
| **-tre** for **-ter** | goitre | goiter |
| | litre | liter |
| | metre | meter* |
| | titre | titer |
| **ph** for **f** | sulphonamide | sulfonamide |
| | sulphur | sulfur |
| **c** for **k** | leucocyte | leukocyte† |
| **miscellaneous** | artefact | artifact |
| | liquorice | licorice |

* In linear measures, British usage prefers *-tre* (metre, centimetre); in apparatus for making measurements, both use *-ter* (manometer, micrometer).

† British usage prefers leuc- to leuk- except in leukaemia.

## ORGANIZATION OF THE VOCABULARY

**Main entry-subentry arrangement.** In general *Stedman's* adheres to the traditional grouping of multiple-word terms as subentries under governing noun main entries. For example, typhoid fever is defined as a subentry under the main entry, fever; crocodile tears syndrome is under syndrome; zona orbicularis, under zona. In a specialty dictionary (as opposed to a language dictionary) the advantages to be gained from such categorization of information are obvious, but this index-like arrangement, used in most medical dictionaries, has often proved to be a thorn in the flesh of the reader, who either forgets the reiterated injunc-

tion, "Look under the noun," or experiences difficulty, and sometimes failure, in locating a given multiple-word term because it has been positioned under some other, synonymous, main entry.

**Alphabetical subentry index.** Computerization has provided us with a simple expedient for overcoming the harassing problem of elusive subentries, while at the same time allowing us to retain the indispensable "main entry-subentry" arrangement. We have included in this edition of *Stedman's*, as Appendix 11, an index of subentry titles, arranged alphabetically according to the subentry key word (that is, the first, or modifying word of the term), with cross-references to the main entry titles under which the subentries are listed in the vocabulary section.

The subentry index has replaced the somewhat haphazard cross-references from adjectival main entries to the relevant noun main entries, formerly listed in the vocabulary thus:

**optical**
**o. aberration, density,** see the nouns.

**libido**
l. **theory,** see under theory.

When we have for any reason deviated from standard procedure, we have supplied cross-references within the vocabulary section to lead you to the definition. Such deviations occur for some terms that present individual problems, and for some categories of terms that have received special handling over-all. These are explained in following sections. Additional information relating to the use of the subentry index is given at the beginning of that index, Appendix 11.

**Alphabetization of main entries.** For main entries, the letter-for-letter system of alphabetization is used, rather than the word-for-word system. In other words, when a main entry consists of a hyphenated word or of more than one word (as in the case of many chemical terms) such main entry is alphabetized as though all one word. Abbreviations and contractions, too, are alphabetized as written, letter for letter.

With few exceptions, main entries are printed in the singular form. If use of a plural term is mandatory, and if the plural spelling removes it from the alphabetical location it would occupy if singular, a cross-reference has been inserted from the singular to the defined plural form.

**Alphabetization and abbreviation of subentries.** In subentry titles (as well as throughout definitions of both main entries and subentries), the main entry word is represented by its initial letter only. Subentries may be either singular or plural; the plural form is denoted by the addition of an apostrophe-s to the abbreviation, sometimes by the spelled out irregular English plural, or, in the case of Latin nomenclature, by the spelled out Latin plural form. In alphabetizing subentries, the abbreviation for the main entry word, or the pluralized form of that abbreviation, or the spelled out Latin plural, is always completely disregarded. Also disregarded in alphabetizing subentries are prepositions, conjunctions, and articles (except in French terms), and the apostrophe-s denoting the possessive in eponymic terms. Examples:

**canaliculus**
auricular c.
canaliculi dentales
c. innominatus
intercellular c.

**law**
Graham's l.
l. of gravitation
l. of the heart
Mendel's l.'s
l. of multiple proportion

**Alphabetization and location of compound words.** Compound words that are written closed up (as one word) or that are hyphenated, are generally alphabetized as main entries rather than as subentries under the portion of the term that would ordinarily represent a noun main entry. For example, aftercontraction will be found as a main entry in the A's, rather than as a subentry under contraction; counterirritant as a main entry in the C's, rather than under irritant; self-hypnosis is in the S's; end-plate, in the E's. There are many exceptions because spelling usages vary; cheese fly, for example, is usually written as two words, and so will be found as a subentry under fly, whereas horsefly (one word) will be found in the H's as a main entry. Other exceptions have occurred as a result of arbitrary editorial decisions aimed at achieving better correlation of related information. For example, all viruses, including those written as one word (arbovirus, picornavirus, herpesvirus) are listed as subentries under virus. Although extensive cross-referencing has been provided for individual exceptions to the general rule for handling compound terms, it is well to be alert to the possibility that such words may be listed in either of two ways.

**Cross-referencing of synonyms and related terms.** A concerted effort has been made to substitute cross-references for duplicated definitions under synonymous terms. Use of a cross-reference does not denote priority of, or preference for, the defined term over the cross-referenced synonym; however, for the sake of editorial consistency we have routinely endeavored to follow predetermined plans in some classes of terms. These are

explained in the section, "Special Categories of Terms."

A cross-reference from a term to its defined synonym consists merely of the name of that synonym, without the word "see." When such a cross-reference leads to a multiple-word term (that is, to a subentry), we have italicized that portion of the term that represents the main entry under which the defined subentry is located, thus:

**disease**

**Bannister's d.**, angioneurotic *edema*.

**band**

**iliotibial b.**, *tractus* iliotibialis.

Cross-references to related information rather than to synonyms are identified by the words "see" or "see also." For these cross-references leading to multiple-word subentries, we have similarly italicized the word representing the noun main entry.

Italics have been omitted from cross-references leading from one subentry to another under the same main entry, from all cross-references leading to a one-word term (that is, to a main entry *per se*), and from most of those leading to chemical terms.

The synonyms for a defined term are usually listed at the beginning of the definition, but when the number of synonyms is excessive, or when this procedure would for other reasons be confusing for the reader, the synonyms are listed at the end of the definition, where they are set apart from the definition by such phrases as "also called," "also known as," etc.

## SPECIAL CATEGORIES OF TERMS

**Anatomical terms.** *Nomina Anatomica* (Paris, 1955), as revised by the Seventh and Eighth International Congresses of Anatomists in 1960 and 1965, respectively, is the controlling system for anatomical nomenclature. The terms in the NA list appear in their proper alphabetical order in the *Stedman* vocabulary section and are there defined and indentified by the letters NA in brackets [NA]. Alternate names for the same structures are, when necessary, entered in alphabetical order and cross-referred to the NA term, but we have not attempted to achieve 100 per cent cross-referencing for English anatomical terms with spellings that closely approximate the corresponding alphabetical locations of their Latin equivalents. For example, under artery we have not listed appendicular artery because its defined NA synonym, arteria appendicularis, is easily found under arteria, where the definition, of course, includes the Anglicized version. Anatomical structures that have no NA name are defined under their most commonly used name.

**Chemical, biochemical, and pharmacological terms.** Most multiple-word drug and chemical terms are alphabetized exactly as spelled; this represents a departure from the standard procedure of listing them as subentries under noun main entries. Thus, nicotinic acid is listed in the N's rather than as a subentry under acid, glucose dehydrogenase is in the G's, methyl donors in the M's, vanadium group in the V's. Such multiple-word terms are treated as subentries under the first word of the term when use of the abbreviated first word would cause no confusion. However, compound chemical terms that are written closed up or that are hyphenated are treated as main entries rather than subentries. Examples:

**methyl**
**active m.**
**m. alcohol**
**m. chloride**
**m. donors**
**m. red**

**methylcellulose**

**methyltransferase**

Greek-letter, numerical, configurational, and most italicized prefixes such as *p-* (*para-*), *o-* (*ortho-*), *m-* (*meta-*), *cis-*, *trans-*, *tert-*, etc., are disregarded in alphabetizing (except for official pharmaceutical spellings in which the prefixes are spelled out and closed up, without italics). Such components occurring within compound chemical terms are similarly disregarded in alphabetization.

The definitions of drugs, biochemically important compounds (metabolites, hormones), pesticides, etc., accompany the *trivial* (common, short) or *generic* (nonproprietary) names, and these definitions usually include the *systematic* (formal, definitive) names, which are the only fully correct descriptions other than structural formulas. (For further definition of *systematic*, *semisystematic*, *semitrivial*, *trivial*, *generic*, *proprietary*, and *nonproprietary* as applied to the names of chemicals, see these adjectives in the vocabulary.)

In some instances, the definition of a trivial name consists solely of its systematic one, this being considered adequate information (that is, self-defining). Systematic names, generally, are not included as vocabulary entries, though some commonly used ones have been retained; those that are listed usually serve as cross-references to the defined trivial or generic name. The various terms comprising each systematic name are, however, listed and defined. For example, the definition of alanine includes its systematic name, aminopropionic acid, but the latter is not listed as a vocabulary entry, being easily reconstructed from "amino" and "propionic acid," both of which

are defined. The definition of cortisone includes its systematic name, 17,21-dihydroxy-4-pregnene-3,11,20-trione, the parts of which are defined by words, formula, or numbered structure, so that the full structure of cortisone may be written.

Special attention has been devoted to the recommendations of the Enzyme Commission of the International Union of Biochemistry Committee on Nomenclature, and many *Stedman* entries show the EC numbers (rather than the EC systematic names) where such exist.

Abbreviations, contractions, or symbols that have earned acceptance by recognized authority or common practice have been made a part of the *Stedman* vocabulary, and are alphabetized letter-for-letter as boldface entries. The terms for which they stand are not always defined, though, if a definition seems unnecessary, as stated above.

Proprietary or trade names for drugs are not listed alphabetically as boldface entries; many are, however, included as a part of the definition of generic or nonproprietary names. We have tried to identify trade names by capitalizing the initial letter; our failure to do so in any instance is not to be regarded as indication that the term is not a trade name.

For greater accessibility, a selected group of pharmaceutical preparations formerly listed by class or category (*e.g.*, injections, ointments, solutions, vaccines) under table mastheads within the *Stedman* vocabulary section are now listed, again by class or category, in Appendix 1, "Pharmaceutical Preparations."

The reference sources for many pharmacological terms are given in parentheses following the boldface entry, both in the vocabulary section of the dictionary and in Appendix 1. These sources include the *United States Pharmacopeia* (USP), *British Pharmacopoeia* (BP), *National Formulary* (NF), and *United States Adopted Names* (USAN).

**Eponyms.** The names of all persons credited with eponymic nomenclature are listed as main entries in their proper alphabetical location in the vocabulary, usually with additional identifying biographical data. Each biographical entry provides cross-references to all of the eponymic terms attributed to that person.

Wherever feasible, definitions are given under noneponymic rather than under eponymic nomenclature, therefore many eponymic subentries will redirect you to the defined noneponymic synonyms. For example, the biographical entry for Caesar P. M. Boeck contains cross-references to Boeck's disease, Boeck's sarcoid, and Besnier-Boeck-Schaumann syndrome or disease, but each of these subentries is, in turn, a cross-reference to sarcoidosis, where the full definition (including the list of eponyms and other synonyms) is given.

Proper names have been investigated in many sources and contributed by many *Stedman* editors, with additional review by the editor for history and biography. We have followed the spelling most frequently used, and alphabetization is determined precisely by that spelling. Examples to be kept in mind are spellings such as Fränkel *versus* Fraenkel, Löffler *versus* Loeffler, etc. For names beginning with prefixes such as von, Van, de, and others, and which may be used eponymically either with or without the prefix, we have similarly tried to base alphabetical location, for both biographical entries and eponymic subentries, on the most common usage. In many cases we have inserted cross-references, but a double check for such names (with and without the prefix) will be rewarding. When prefixes are considered in determining alphabetization, the name is alphabetized exactly as spelled, letter-for-letter, as though one word. This procedure has also been followed for the prefixes Mac and Mc; if you are not sure which spelling is used, check both.

With the exception of a selected group of Nobel laureates and a few classically historical names, biographical entries are included only for those persons to whom eponymic terms defined in *Stedman's* have been attributed.

**Binomial nomenclature (genera and species).** Definitions for the genera and species of bacteria, protozoan and insect parasites, plants, etc., accompany the proper Latin binomial terms rather than the common or vernacular names; the latter, however, are listed as vocabulary entries, with cross-references to the proper names. Spellings follow official, rather than simplified or Americanized, usages; thus we have *Taenia*, not *Tenia; Haemophilus*, not *Hemophilus; Leucocytozoon*, not *Leukocytozoon*. (See also "Spelling," p. xiv.)

# MEDICAL ETYMOLOGY

As with all modern learning, the vocabularies of medical and paramedical sciences keep pace with the growth of knowledge. New discoveries, new concepts, new theories—all must have, it seems, new words or new groupings of words to describe and define them in speech and print.

This dictionary—any medical dictionary—any *general* dictionary—contains hundreds of words which are, by philological standards, mis-formed, mis-pronounced, mis-spelled, mis-used; but, by the standards of those who have long used those words, they are familiar, acceptable, and are firmly and irremovably embedded in the language. A dictionary, if it is to be a useful guide to a living language, must spell, pronounce, and define the words as they are used—not, wistfully, as they should have been. *Stedman's* is a working dictionary, a record of a living language.

A dictionary can suggest or set standards—it cannot enforce them. It can point out the right way to go; it cannot bar the writer or speaker from the path which he is accustomed to using, wrong though it may be.

*Stedman's*, however, recognizes its obligation to guide those who would speak more carefully, write more precisely, even coin new words more accurately. To these objectives we dedicate this section on medical etymology.

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Study of the origins of our medical vocabulary can be rewarding fun. Rewarding, because it makes the difficult medical vernacular much easier to learn and retain and at the same time is a hobby that affords much intellectual pleasure and satisfaction. Fun, because many of our commonly used words have intriguing, romantic, or even humorous origins.

The overwhelming majority of our medical terms stem from Greek; another sizable group is derived from Latin. Indeed it is impossible to appreciate much of the English language itself, let alone the medical vocabulary, without some knowledge of these "dead" languages which are, unfortunately, slipping more and more out of the curricula in both the new and the old worlds. Most of the following paragraphs will therefore be devoted to the consideration of terms having a classical origin.

Meanwhile, a few of our words have other sources. From the Arabic we derive a number of terms, especially for our pharmacopeia, such as *alcohol, alkali, camphor, naphtha, senna, syrup, tartar;* others are formed by prefixing the Arabic definite article (*al, el*) to a Greek stem, *e.g.*, *al*-chemy, *el*-ixir.

Most of our simple anatomical terms (*arm, back, bladder, blood, chin, eye, finger, foot, gall, gum, gut, hair, hand, head, heart, hip, knee, liver, lung, mouth, neck, thumb, tongue*) are Anglo-Saxon, as are certain other short words of medical flavor, *e.g.*, *ache, fat, hives, sick, swell.* A few other simple monosyllables are of Scandinavian descent: *ill, leg, scab, skin.*

From the French we have adopted a number of medical terms unchanged or slightly modified such as *ballottement, bougie, bruit, chancre, cretin, curette, fontanelle, fourchette, grippe, malaise, pipette, plaque, poison, rale, souffle, tampon, tourniquet, trocar, venom, cul de sac, grand mal, petit mal, mal de mer, tic douloureux.* Others are Anglicized or Americanized forms of French words, *e.g.*, *goiter, gout, malady, malinger, jaundice, ointment, physician, powder.* Still others come from the Greek via a French intermediary: *surgeon, plaster, migraine, quinsy, palsy, frenzy.*

For a few words we are indebted to Italian, *e.g.*, *belladonna, influenza, malaria;* and to Spanish, especially for the names of certain medicaments, *e.g.*, *cascara, guaiacum.* Another small handful of words comes from the Dutch (*cough, litmus, splint, sprue*), German (*anlage, Fahrenheit, magenstrasse*), Persian (*bezoar, borax, talc*), Chinese (*kaolin*), Bengalese (*chaulmoogra*), and Tupian (*curare, ipecacuanha*).

When it comes to a study of the host of words derived from the classical languages, it is interesting to note the number of current words that were used in the same form, though not necessarily with an identical meaning, by the earliest medical writers; much of our present vocabulary has been going strong for 2000 years and more. Hippocrates (460–370 B.C.), for example, used such words as acromion, adenoma, amblyopia, anthrax, apophysis, borborygmus, bregma, bronchus, cachexia, carcinoma, cholera, chorion, diapedesis, ecchymosis, emphysema, erythema, exanthema, herpes, hippus, ileus, kyphosis, lichen, lochia, lordosis, meninges, nephritis, noma, nystagmus, olecranon, paresis, peritoneum, phagedena, phthisis, polypus, psilosis, symphysis, thorax, typhus, urachus, ureter, urethra. Galen (131–201 A.D.) had in his medical vocabulary such words as anthrax, aponeurosis, ascites, chalazion, chemosis, coccyx, diaphoresis, diastole, epididymis, epiphora, gom-

phosis, hippus, hypophysis, hypospadias, iris, kerion, lysis, mydriasis, pemphigus, peritoneum, phimosis, pityriasis, pterygium, pylorus, sarcoma, skeleton, strabismus, syndrome, systole, tarsus, tenia, thymus, tinea, trichiasis. Aristotle (384–322 B.C.) used alopecia, canthus, exophthalmos, glaucoma, leukoma, meconium, nystagmus, pancreas, and podagra. Others of our present-day terms that first found employment in ancient Greek medical writings include eczema, kerion, trachoma (Dioscorides, fl. 100 A.D.); asphyxia, diabetes (Aretaeus, fl. 70 A.D.); ozena, philtrum, tarsus, zygoma (Pollux, fl. 180 A.D.); parenchyma (Erasistratus, fl. 300 B.C.); amnion (Empedocles, 504–443 B.C.).

Everyday terms that appeared in ancient medical Latin include abdomen, anus, cancer, delirium, fistula, hernia, maxilla, omentum, patella, pus, radius, scabies, tibia, valgus, and varus (Celsus fl. 30 A.D.); and acetabulum, tinea, and verruca (Pliny, 23–79 A.D.).

Next, it is diverting to group them into miscellaneous categories. There are, for instance, a number of ancient and honorable names, chiefly of important organs, that have come down to us unchanged through the ages; *hepar*, *gaster*, *cerebrum*, and *cor* are still what they always were, though each of them by common usage has long since taken second place to *liver*, *stomach*, *brain*, and *heart*. On the other hand a number of old anatomical terms have been translated to a nearby part; thus in early medical Greek the original *pleura* was a rib, *bronchus* was the trachea, and *ureter* the urethra. In early Latin, *(h)umerus* was the shoulder, *ulna* the elbow, *maxilla* the lower jaw, *femur* the thigh, *anus* the buttocks, and *vulva* the uterus.

Other medical words have deviated from their original meanings: *nausea* (originally nausia) must have been reserved for seasickness (G. *naus*, ship) and *hysteria* was clearly a feminine monopoly (G. *hysterikos*, of the womb). *Asphyxia*, which now means suffocation, properly meant a stopping of the pulse (G. *a-* privative + *sphygmos*, pulse).

Another group of words is based on ancient misconceptions. For example, it was formerly thought that the blood vessels carried air; hence *arteries* were named "air-carriers" (G. *aēr* + *tereo*, carry). The *pituitary* was so called because it was believed that the gland was responsible for the secretion of nasal mucus (L. *pituita*, mucus). Again, the state of *melancholia* is no longer believed to be caused by the presence of black bile (G. *melas*, black, + *cholē*, bile). The humoralists are also responsible for the romantic ideas behind such words as *choleric*, *phlegmatic*, *sanguine;* and for the "boiling out" of the humors as seen in *eczema* (G. *ekzeō*, boil out).

Then there is a group of terms that started life as adjectives but which now, through usage, have become substantives in their own right. In Greek, *trachea* is the feminine of *trachus*, rough, and it was originally part of the full description, trachea arteria, rough airpipe; then arteria was dropped and trachea alone remained. Similarly all the ancient words ending in -itis (*e.g.*, nephritis, arthritis, rhachitis, hepatitis) were originally adjectives indicating whereabouts; thus hepatitis phleps, the "in-the-liver vein," was Aristotle's description of the inferior vena cava and affords conclusive evidence that the suffix -itis originally contained no inkling of inflammation. Used with *nosos*, disease, such adjectives indicated the site of the lesion—nephritis nosos, in-the-kidney disease, and so on. Nosos then became taken for granted and the adjectives, nephritis, etc., were allowed to stand on their own feet. *Skeleton* was originally *skeleton soma*, a dried-up body.

Among Latin adjectives that have been preserved as anatomical nouns, we have *cecum* (originally *intestinum caecum*, blind intestine), *jejunum* (originally *intestinum jejunum*, hungry intestine—because it was usually found empty at autopsy), and *rectum* (originally *intestinum rectum*, straight intestine). *Decidua* is, of course, the *membrana decidua* (falling-off membrane) and *conjunctiva* is the *tunica conjunctiva* (connecting coat).

But much the largest group of words comprises those that were formed from nonmedical origins, such as *meconium*, poppy-juice; *anthrax*, a hot coal; *pancreas*, all-flesh; *pylorus*, gatekeeper; *scaphoid*, boatlike; *trochlear* (trochlea), pulley. From this largest category it adds interest to separate subgroups that have a common etymological denominator. For example, certain anatomical terms indicate resemblance to letters of the Greek alphabet: *deltoid*, delta-like (Δ); *lambdoid*, lambda-like (Λ); *sigmoid*, sigma-like (ς); *hyoid*, upsilon-like (υ); *chiasma*, from *chiazo*, to mark with the letter chi (X).

Then our semantic debt to the grapevine is considerable. *Uva* is Latin for the grape itself and gives us *uvea* and *uvula*. *Botrys* and *staphyle* are two Greek words meaning a bunch of grapes, and *racemus* is their Latin equivalent; hence our words *staphylo*coccus, *botyroid* and *racemose*—all describing objects that give the appearance of clustering grapes or berries. Finally the vine itself gives us our *pampiniform* plexus (*pampinus*, tendril). Other words with a fruity flavor include *periform* (pear-shaped), *sycosis* (G. *sykon*, a fig), *morula* (L. *morus*, a mulberry), *nucleus*, a little nut (L. *nux*, nut), *karyo-* (G. *karyon*, nut), *glans* (L. acorn) and *balanitis* (G. *balanos*, acorn), *myrtiformes* (shaped-like-myrtle-berries), *pomum Adami* (Adam's apple), streptococcus and other cocci (G. *kokkos*, berry).

Vegetables or other crops give us *pisiform* (pea-

shaped), *hordeolum* (L. *hordeum*, barley), *pityriasis* (G. *pityra*, bran), *sesamoid* (G. *sēsamon*, sesame seed), *aphrakia* (G. *phakos*, lentil), *lens* (L. lentil), *fabella* (a little bean).

Many living creatures lend their descriptive names: *cancer* (L. crab), *carcinoma* (G. *karkinos*, crab), *hippocampus* (sea-horse), *cauda equina* (horse's tail), *lumbrical* (L. *lumbricus*, worm), *vermis* (L. worm), *cochlea* (G. snail), *chemosis* (G. *chēmē*, cockle-shell), *lupus* (L. wolf), *muscle* (L. *musculus*, little mouse), *buphthalmos* (G. ox-eyed), *lagophthalmos* (hare-eyed), *ichthyosis* (G. *ichthus*, fish), *phrynoderma* (G. toadskin), *estrus* (G. *oistros*, gadfly), *formication* (L. *formica*, ant), *coccyx* (G. cuckoo), *coronoid* (G. *korōnē*, crow), *coracoid* (G. *korax*, crow), *chenopodium* (G. *chēnē*, goose), *rostrum* (L. beak). Wings from both Latin (*ala*, *axilla*, *pinna*) and Greek (*pterion*, *pterygium*, *pterygoid*) are well represented; other parts of avian anatomy are *crista galli* (coxcomb) and *calcar avis* (the spur on a bird's leg). The horse's accouterment is represented by *stapes* (stirrup) and *sella* (saddle).

Weapons and armor are freely borrowed: thus the club (*coryne-*), sword (*xiphoid*, *ensiform*), sheath (*vagina*), bow (*toxic*), arrow (*sagittal*), helmet (*galea*), shield (*thyroid*, *umbo*, *umbilicus*), and breastplate (*thorax*) are all featured. Musical instruments are not hard to find: *salpinx* (G. trumpet), *tympanum* (L. drum), *calamus*, *fistula* (L.), and *syrinx* (G.) (reedpipe); but the only musician seems to be the trumpeter (*buccinator*).

Household and other utensils make an important contribution. *Pyelos*, a pan or basin, gives us *pyelitis; amnion* and *pellis* (platy*pelloid*) are further Greek words for bowls, while *patella* is a little pan. *Platysma* is a flat plate and *arytenoid* is from *arytaina* (G.), ladle. *Ascites* comes from *askos*, a leather wineskin, and *acetabulum* is a receptacle for vinegar. The *ampulla* was a bottle or pitcher with a narrow neck and relatively bulbous body. The *amphora* was an earthenware storage vessel with two handles from which it got its name (*amphi-*, on both sides, *phoreus*, carrier); we in turn derive *amphoric* breathing from the sound of blowing across the mouth of a hollow vessel. *Calyx* and *cotyle* (*cotyloid*, *cotyledon*) were Grecian drinking vessels, while sieves have given us *cribriform* and *ethmoid*. Finally *infundibulum* is a funnel and *haustrum* a machine for drawing water.

Then one can collect coinages of relatively recent date such as *achalasia* (G. *a-*, privative + *chalasis*, relaxing), *dysdiadochokinesis* (G. *dys-*, prefix expressing difficulty, + *diadoche*, a succession, + *kinesis*, movement) and *hypertension* (G. *hyper*, over, + L. *tensio*, stretch). Such words as the last, composed of both Greek and Latin roots, are often frowned on by the purists and pedants; and it is perhaps true that supertension would be more desirable etymologically than hypertension. However, the medical vocabulary is teeming with such hybrids and the illegitimate admixture of bloods does nothing to lessen the vigor of our jargon. Anyhow they are here to stay, they are often convenient and expressive, and we might as well accept the established ones even if we make an effort to keep our new coinages thoroughbred. Among the common hybrids are *idioventricular* (G.-L.), *sinu-atrial* (L.-G.), *kernicterus* (Ger.-G.), *vagotonia* (L.-G.), *fibroma* (L.-G.), *chancroid* (Fr.-G.), *argentaffinoma* (L.-L.-G.), *autoclave* (G.-L.), *jejunostomy* (L.-G.), *claustrophobia* (L.-G.), *lymphagogue* (L.-G.), etc.

Several of our common words remain of doubtful origin. For example, does the *basilic* vein come from the Arabic, *basilik*, inner, or from the Greek, *basilikos*, royal? Is it the inner, medial vein or the royal, hence prominent, vein of the forearm? Then does its antecubital companion, the *cephalic* vein, come from the Arabic, *alkifal*, outer, or from the Greek, *kephalē*, head? The Oxford English Dictionary suggests that this vein influences the head and is therefore so named—a conclusion that is hard to justify with current anatomical or physiological knowledge. One school of thought likes to derive *syphilis* from the name of the swineherd in Fracastoro's poem who was supposed to have been the first afflicted with the disease; but others would prefer to derive it from the Greek adjective, *sipholos*, crippled.

Despite a small number of such gray areas, the majority of our medical words have clear-cut, meaningful origins whose study pays handsome dividends in both practical usefulness and academic satisfaction. A by-product of such a study is improvement in our style of writing; for two of the pillars of good style are accurate spelling and the use of words in their proper sense, and a knowledge of word derivation is the best possible insurance against lapses in these two spheres.

## WORD FORMATION AND SYNTAX

The reader whose eye alights for the first time upon such words as hemangioendothelioblastoma, or acrocephalosyndactylism, recoils with something of a shock. But if he knows the individual words that make up these compounds, what appears to be an unintelligible aggregation of letters stands out with stereoscopic clearness as hem-angio-endothelio-blast-oma or acro-cephalo-syn-dactyl-ism.

Not only is a word more easily remembered,