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DORLAND'S ILLUSTRATED

MEDICAL DICTIONARY

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DORLAND'S ILLUSTRATED

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FUNDAMENTALS OF MEDICAL ETYMOLOGY

Dedicated
To All Who Have Helped
in the
Revision of This Dictionary

Preface

SO EXTENSIVE HAS BEEN THE REVISION for this, the twenty-fourth edition of Dorland's Illustrated Medical Dictionary, that it seems appropriate to explain not only the lexicographic principles upon which this Dictionary is built but also the specific measures which have been taken to make this the most changed of all the editions in a sixty-five-year period of service to biomedical scientists, students, and physicians.

All learning in science is based on education in vocabulary, for the imagery of words and symbols is the only means to expression of scientific data and concepts. For the continuing successful interchange of ideas, the words and ideographs of science must have precise and specific meanings and these must be recorded in a carefully arranged repository of such information. Accuracy, comprehensiveness, ease of understanding, and typographic legibility are obvious standards of usefulness in such a work. The occasional assembly of related data in tables and illustrations serves the additional purpose of grouping information under broad headings of reference or educative value.

Codification of knowledge is made increasingly difficult by the steadily broadening scope and mounting complexity of contemporary medical science. In this trying situation we believe that writers and editors constitute the first line of defense, particularly against erosion and adulteration of the language. We believe that editors should not be unmindful of the advisability of safeguarding the faithful transmission of ideas, by insuring the integrity of the words in which they are expressed. In furtherance of this purpose, we believe that the exercise of judgment is a legitimate activity of the compiler of a dictionary of scientific terms: to lend support to words properly compounded of properly derived stems, and to favor such terms over words which may bear the taint of ambiguity or even of illegitimacy.

The function of a dictionary must then be something more than that of a record of usage. It is our belief that maintenance of certain standards of etymological propriety and of selection is also a responsibility of the lexicographer—no less in the language of science than in that of imaginative or creative writing. Validity of formation of a word supplies its best assurance of intact passage across language barriers that are fast disappearing in medicine, as in other sciences. And the extensive usage of this Dictionary outside the United States makes us all the more aware of this responsibility.

Certain questions that arise in writing or editing may be entirely a matter of style, and their answers are not primarily to be established by recourse to a dictionary—such questions as that regarding hyphenation of a word, or whether, in instances not covered by official pronouncement, a word should be spelled with a diphthong. It would be impossible, except in unabridged volumes, to present every variation on such themes that might be completely acceptable and proper.

Within the framework of these principles, certain areas of information have received particular attention in this new edition. The greatest revision has been in the anatomical entries, with major overhauling of the definitions. This activity, under the supervision of Dr. C. Murphy Combs, Professor of Anatomy at Northwestern University Medical School, was assisted by

Dr. Carolyn E. Thomas, Assistant Professor of Anatomy, and Miss Hope C. Smith, research fellow in the department.

Consistent with the desire of most anatomists to achieve universal adoption of the new *Nomina Anatomica*, approved by the Sixth and Seventh International Congresses of Anatomists held in Paris in 1955, and New York in 1960, the definitions of the various anatomical structures are placed on the N A terms. Definitions are also placed on common terms which are more frequently encountered in clinical literature. Hence, elaboration is placed on both "stomach" and "ventriculus," "liver" and "hepar," "gallbladder" and "vesica fellea," "lung" and "pulmo," and on many other similar pairs of equivalent common and N A terms. Many common names for specific anatomical structures having circulation almost exclusively among anatomists are cross referred to the official terms, where the definitions appear.

Dr. L. R. C. Agnew, Professor of the History of Medicine at the University of Kansas, was responsible for revision of the entries on historical figures and concepts. Names of winners of Nobel prizes in medicine and physiology since publication of the last edition have been added.

Hundreds of drug names were added or deleted on the advice of Dr. Domingo M. Aviado, Associate Professor of Pharmacology at the University of Pennsylvania School of Medicine.

Dr. Jerome I. Brody, Assistant Professor of Medicine at the University of Pennsylvania Graduate School of Medicine, examined the terms relating to hematology, and Dr. William Burrows, Professor of Microbiology at the University of Chicago, again gave his excellent assistance in updating the microbiological nomenclature.

Dr. Maynard K. Hine, Dean of the Indiana University School of Dentistry, and members of his department accepted the task of going over dental terms. Indebtedness in this area is also acknowledged to the Glossary of Prosthodontic Terms, published by the C. V. Mosby Company and edited by The Nomenclature Committee of The Academy of Denture Prosthetics: Carl O. Boucher, Chairman, with Richard Kingery, LeRoy E. Kurth, Victor H. Sears, Vincent R. Trapozzano, Jack Werner, Arthur A. Frechette, and Daniel H. Gehl, all Doctors of Dental Surgery.

Terms relating to dermatology were the special object of the attention of Dr. Walter B. Shelley, Professor of Dermatology at the University of Pennsylvania School of Medicine.

Dr. Carl M. Gambill of the Section of Publications of Mayo Clinic was the greatest single source of information in clinical medicine, giving immeasurable help in other areas as well. Dr. Roy F. Butler, Professor of Classics at Baylor University, gave unstintingly of help on questions of etymology. Dr. Otto Glasser, Late Emeritus Consultant in Biophysics at Cleveland Clinic Foundation, was an unfailing source of help and encouragement.

In this complex endeavor, wisdom of selection, contemporaneity of definition, and accuracy of information would have been impossible without the dedicated help of those listed on the title page as Consultants and those included in the list of Contributors. Hundreds of others, not specifically named, have made valuable suggestions for the improvement of this book of words. To these persons, named and unnamed, we gratefully acknowledge our great debt for help beyond measure. This help can be repaid only insofar as we have succeeded in combining these separate threads of knowledge into a fabric useful and authoritative to all.

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Notes on Use of This Dictionary

THE NEW USER of this Dictionary, we believe, will profit from an understanding of the policies that have been followed in its actual construction. This section is therefore presented to explain some of the mechanics which were involved in the compilation of the material.

It is our hope that a corollary of the conventional use of this Dictionary, to discover the spelling, meaning, and derivation of specific terms, will be assistance in the reverse direction—to aid in the creation of words desired to express new concepts. To this end individual elements—prefixes, suffixes, and stems—may be found both in the vocabulary portion and in the section entitled Fundamentals of Medical Etymology. An understanding of the elements of a term encountered for the first time, if the term is too new to be in any dictionary, will aid one in arriving at an approximation if not an exact distillation of its meaning. Similarly, knowledge of these elements and of the conventions governing their combination will be of help to a person seeking to construct a new word. We believe the serious user of the Dictionary will find familiarity with these features highly rewarding.

ARRANGEMENT OF ENTRIES

Quick simple usefulness continues to be one of the principal objectives of this work. Words appearing as main entries are recognizable at a glance, not being distorted by accents or other indication of syllabication. Accents and syllables are shown in the phonetic respelling immediately following the bold face entry. Subentries—terms consisting of two words which are ordinarily defined under the second (or principal) word, the *noun*—are immediately apparent as subentries, run on in the same paragraph, and set in the same bold face type as the word constituting the main entry. For example, acetic acid, acetrizoic acid, iopanoic acid, neuraminic acid, shikimic acid, and the like, are included as subentries under acid, regardless of the pH of the specific compounds. Absorption bands, Büngner's bands, Lane's band, Parham band are defined under band; Heinz-Ehrlich bodies, Howell-Jolly bodies, Leishman-Donovan bodies are defined under body.

The space-imposed practice of defining a term only once accounts for the cross references necessitated on eponymic terms where biographical information is given. Thus you will find such entries as "Apgar score . . . See under *score*" and "Aran's cancer, law . . . See under *cancer* and *law*." When the entry combines several terms, the words under which the definitions appear are not separately specified: the instruction instead is to "See under the nouns." Thus "Huguier's canal, circle, disease, glands . . . See under the nouns" directs the reader to look within the subentries under canal, circle, disease, and gland, respectively, for definition of the term desired. An exception to this policy of arrangement occurs in the case of specific chemical terms embodying the name of the element: aluminum acetate, aluminum hydroxide, aluminum sulfate, and the like are defined under aluminum; calcium carbonate, calcium oxide, calcium sulfate under calcium.

If biographical information is not given for an individual named in an eponymic term, such as Kortzeborn's operation, the definition should be sought directly under the noun, in this case under operation. For certain phrases, because of prevalent multiplicity of terminology, it may be necessary to look in more than one place. For example, what one man may speak of as a disease may originally have been called a syndrome; if the desired term does not appear under one, it should be sought under the alternative term. Similarly for phenomenon and sign, and numerous other entities.

SEQUENCE OF ENTRIES

Entries will be found alphabetized on the sequence of the letters, regardless of space or hyphens which may occur between them. Thus sequences such as

bitemporal,	or	serum,
bite-rim,		serumal,
biterminal,		serum-fast,
bite-wing		serum identical

appear in that order. An exception to this occurs in the case of compound eponymic terms: Bard-Pic's syndrome precedes Bardach's test. In eponymic terms, the apostrophe s ('s) is ignored in determining the alphabetical sequence, thus *Hahn's cannula* precedes *hahnemannian*, *Sabouraud's agar* precedes *Sabouraudia*, and *Förster's operation* precedes *Förster-Penfield operation*, both as a main entry and under operation. Similarly umlauts (ö, ü) are ignored in alphabetizing the entries, and *Löwenthal's reaction*, *Lower's rings*, *Löwi's reaction*, *Löwitt's bodies*, and *Lowman balance board* appear in that sequence. Proper names beginning with "Mc" or "Mac" are alphabetized as though spelled "mac" in every instance, the sequence being determined by the letters immediately following the c.

Proper names (or capitalized entries) commonly appear before a common noun (or lower case entry) with the identical spelling. Thus *Diplococcus* precedes *diplococcus*, *Micrococcus* precedes *micrococcus*.

INDICATION OF PRONUNCIATION

As in the twenty-three preceding editions, phonetic respelling of a term appears in parentheses immediately following the main bold face entry. As a rule only the most commonly heard pronunciation is given, with no effort to represent any variants. Such phonetic respelling is presented in the simplest possible manner, with a minimum of diacritical markings. The basic rule is this: An unmarked vowel ending a syllable is long; an unmarked vowel in a syllable ending with a consonant is short. By this same token, a long vowel in a syllable which must end with a consonant is indicated by a macron (ā, ē, ī, ō, ū, and ōō): for example ah-bāt', lēd, la'bīl, mī'o-fōn, mol'e-kūl, tōōth. A short vowel ending or alone constituting a syllable is usually indicated by use of the breve (ĕ, ĭ, ŏ, ŭ, ōō): for example ĕ-fish'ent, ĭ-mu'nĭ-te, ŏ-kloo'zhun. However, such vowels constituting an unaccented syllable following a syllable which bears a major accent may appear without the breve, as in jen'e-sis, ther-mom'e-ter, and the like.

The use of the syllable *ah* for the sound of *a* in open, unaccented syllables (ah-bāt', ah-lu'mĭ-num, ah-pof'ĭ-sis, ah-tak'se-ah) has been continued;

ah is also used in syllables ending with a consonant, to indicate a broader *a* sound (fahr'mah-se, in contrast to am-ne'se-ah). No effort has been made to complicate the system by introduction of additional diacritical marks showing the finer gradations of sound, such as the circumflex (*â*, *ô*), diaeresis (*ä*, *ü*), tilde (*ë*). The primary (') and secondary (") accents are indicated in polysyllabic words (as pol'e-si-lab'ik); an unstressed syllable is followed by a hyphen.

To recapitulate, unmarked vowels not followed by a consonant have the long sound:

- ba, da, ka, la, ma, na, etc., are all pronounced to rhyme with *fay*
(bāt, kām, mām, etc., have the same vowel sound).
- be, de, le, re, te, we, etc., are all pronounced to rhyme with *fee*
(bēm, dēp, rēt, etc., have the same vowel sound).
- bi, di, ni, pi, ti, zi, etc., are all pronounced to rhyme with *sigh*
(bīd, pīnt, tīm, etc., have the same vowel sound).
- bo, do, lo, mo, to, wo, etc., are all pronounced to rhyme with *go*
(bōd, lōm, tōt, etc., have the same vowel sound).
- bu, du, hu, mu, nu, su, etc., are all pronounced to rhyme with *few*
(kūt, mūt, etc., have the same vowel sound).

Short vowels terminating syllables are affected by the value or the consonantal sounds of the adjoining syllables. For example, as usually pronounced, the sound of *i* in the second syllable more closely approaches that of long *e* in multiarticular than it does in multigravida, although in either word it may show any gradation between the long *e* and an indeterminate vowel sound. Combinations of vowels are also indicated: *oi* as in oil; *ou* as in out; *aw* as in paw.

It has been impossible, within the framework of this simplified system, to represent the exact pronunciation of many foreign words and proper names which have entered the medical vocabulary. They have been represented as well as possible by an English approximation.

The important key to remember in interpreting the phonetic respelling is that an unmarked vowel not followed by a consonant has the long value; one followed by a consonant has the short. A long vowel which must perforce be followed by a consonant is indicated by use of the macron; a short vowel ending its respective syllable is indicated by use of the breve.

PRESENTATION OF PLURAL FORMS

The plural of a word which is irregularly formed or of a foreign word is given following the phonetic respelling and often, but not invariably, is given a separate bold face listing in proper alphabetical order. Alternate plurals (e.g., exanthemas, exanthemata) are frequently shown. Subentries appear in proper alphabetical order, determined by the subsequent, modifying word or phrases, regardless of whether they are singular or plural. For example, under *ligamentum*, the entries

- l. annulare baseos stapedis
- ligamenta annularia digitorum manus
- ligamenta annularia digitorum pedis
- l. annulare radii
- ligamenta annularia (trachealia)

appear in that order.

ETYMOLOGY

Information on the derivation of a word appears in square brackets following the phonetic respelling, or following the plural form of the word, when that is given. Greek characters are no longer used in presentation of the etymological information in the vocabulary portion of this book,* being transliterated into the English alphabet as shown in the following tabulation:

initial	<i>a</i> = a	initial	<i>λ</i> = l
"	<i>ā</i> = a	"	<i>μ</i> = m
"	<i>ā</i> = ha	"	<i>ν</i> = n
diphthong	<i>ai</i> = ai	"	<i>ξ</i> = x
initial	<i>ai</i> = ai	"	<i>ο</i> = o
"	<i>ai</i> = hai	initial	<i>ο</i> = o
diphthong	<i>av</i> = au	"	<i>ο</i> = ho
initial	<i>av</i> = au	diphthong	<i>oi</i> = oi
"	<i>av</i> = hau	initial	<i>oi</i> = oi
"	<i>β</i> = b	"	<i>oi</i> = hoi
"	<i>γ</i> = g	diphthong	<i>ou</i> = ou
"	<i>γγ</i> = ng [as in "angeion"]	initial	<i>ou</i> = ou
"	<i>γκ</i> = nk [as in "ankyle"]	"	<i>ou</i> = hou
"	<i>γξ</i> = nx [as in "salpinx"]	"	<i>π</i> = p
"	<i>γχ</i> = nch [as in "anchousa"]	"	<i>ρ</i> = r
"	<i>δ</i> = d	initial	<i>ρ</i> = rh
"	<i>ε</i> = e	"	<i>ρρ</i> = rrh [used in compounds,
initial	<i>ε</i> = e	"	although the root has
"	<i>ε</i> = he	"	only initial rh, e.g.
diphthong	<i>ei</i> = ei	"	diarrhoia—(English)
initial	<i>ei</i> = ei	"	diarrhea]
"	<i>ei</i> = hei	"	<i>σ, s</i> = s
diphthong	<i>ev</i> = eu	"	<i>τ</i> = t
initial	<i>ev</i> = eu	"	<i>υ</i> = y
"	<i>ev</i> = heu	[initial	<i>υ</i> does not occur]
"	<i>ζ</i> = z	"	<i>υ</i> = hy
"	<i>η</i> = ē	diphthong	<i>ui</i> = ui
initial	<i>η</i> = ē	initial	<i>ui</i> = hui
"	<i>η</i> = hē	"	<i>φ</i> = ph
"	<i>θ</i> = th	"	<i>χ</i> = ch
"	<i>ι</i> = i	"	<i>ψ</i> = ps
initial	<i>ι</i> = i	"	<i>ω</i> = ō
"	<i>ι</i> = hi	initial	<i>ω</i> = ō
"	<i>κ</i> = k	"	<i>ω</i> = hō

The original words from which the terms presented in this dictionary are derived are reproduced in *italic*, the language of their origin being indicated by one of the following abbreviations:

Ar.	= Arabic	It.	= Italian
A.S.	= Anglo-Saxon	Jap.	= Japanese
Dan.	= Danish	L.	= Latin
Fin.	= Finnish	Mex.	= Mexican
Fr.	= French	Peruv.	= Peruvian
Ger.	= German	Port.	= Portuguese
Gr.	= Greek	Russ.	= Russian
Hind.	= Hindu	Sp.	= Spanish

As a guide to related vocabulary, especially on anatomical terms, the main entry may be followed in brackets by its Latin and/or Greek equivalent, such as "liver [L. *hecur*; Gr. *hepar*]" and "kidney [L. *ren*; Gr. *nephros*]."

ANATOMICAL ENTRIES

Because the major revision in this edition has been in the anatomical vocabulary, it may be well to repeat here the principles that have governed that activity. A definition (as opposed to a cross reference) appears on every

* The Greek characters do appear, however, in the section entitled Fundamentals of Medical Etymology (pp. xxi—xxxvi).

term official in the *Nomina Anatomica* as approved by the International Anatomical Nomenclature Committee appointed by the Fifth International Congress of Anatomists held at Oxford in 1950, and approved by the Sixth and Seventh International Congresses of Anatomists, held in Paris, 1955 and New York, 1960. Such terms, when unchanged from the Basle *Nomina Anatomica*, are indicated "[N A, B N A]." BNA terms which have been changed in the new nomenclature are listed but not defined: there is simply reference to the NA term. Definitions are also placed on the common names by which various structures are universally referred to in clinical medicine, such as gallbladder, heart, kidney, liver, lung, and stomach. Other common names are cross referred to the official names. Thus the reader will find on the anglicized common names of anatomical structures, as those under artery, ligament, muscle, nerve, and vein, a cross reference to the official name of the specific structure. The complete descriptions, in these particular instances, are given in the tables of *arteriae*, *ligamenta*, *musculi*, *nervi*, and *vena*.

ABBREVIATIONS

Numerous abbreviations have been employed in the vocabulary portion of this book. They include:

a.	artery (<i>L. arteria</i>)	lt.	left
ant.	anterior	m.	muscle (<i>L. musculus</i>)
C.	cervical	med.	medial, median
ca.	about (<i>L. circa</i>)	n.	nerve (<i>L. nervus</i>)
cf.	compare (<i>L. confer</i>)	pl.	plural
Coc.	coccygeal	q.v.	which see (<i>L. quod vide</i>)
def.	definition	rt.	right
dim.	diminutive	S.	sacral
inf.	inferior	sing.	singular
L.	lumbar	sup.	superior
lat.	lateral	Th.	thoracic

Fundamentals of Medical Etymology

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The very size of current medical dictionaries is evidence of the massive proportions which the medical, scientific, and technical vocabulary has attained within the English language. As this vocabulary grows, its mastery by each succeeding generation becomes increasingly difficult. It is popularly believed that the study of Latin at least, if not also of Greek, is prerequisite for the study of medicine. Although this is no longer literally true, the composition of the medical vocabulary makes it evident why such study was formerly considered necessary. At least fifty per cent of the general English vocabulary is of Greek and Latin derivation, and it is a conservative estimate that as much as seventy-five per cent of the scientific element is of such origin.

Some familiarity with these two languages which contribute so largely to the terminology must obviously simplify the task of learning a basic vocabulary and of comprehending new words as they are encountered. Experience shows that it does. However, since it no longer seems economical to learn to read the two languages for this purpose, some short cut to the necessary information is needed, and again experience has shown that certain fundamentals of vocabulary and linguistic principle can easily be mastered and are of great assistance. The purpose of the present introduction is to present those fundamentals in as practical and concise a form as possible; any statements in the following pages which are contrary to historical linguistic fact are made deliberately, in keeping with this purpose.

GREEK

Alphabet and transcription

The Latin alphabet as we use it is derived, with slight modifications, from the Greek alphabet, which is almost completely phonetic. The table (p. xxii) shows as nearly as possible the sound equivalent of each letter in terms of our own alphabet, the names of the letters, and their transcribed equivalents in English. The first syllable of the name of each letter, properly pronounced, also gives its sound equivalent.

Greek words are written with an accent (*θέσις, φῶλον*); for present purposes, the two kinds of accent mark may be regarded simply as indicating the syllable on which the stress of accent is placed. Words beginning with a vowel, diphthong, or *rho* (ρ) are written with a breathing mark over the initial vowel or *rho*, or over the second vowel of the diphthong (*ἄλλος, ῥυθμός, αὐτός*). The so-called rough breathing mark (') indicates that the syllable over which it is placed should be initiated in pronunciation with an *h* sound, and words beginning with such a sound are usually transcribed into English with an initial *h*. Rarely they may appear with or without the *h*.^{*} The smooth breathing mark (ˊ) has no effect on pronunciation.

^{*} For example, in the Analytical Word List, following, compare -em- and hem(at)-, -aph- and hapt-, -elc- and helc-; such forms without the *h* rarely appear as the initial element of a compound.