

INFORMATION TO USERS

This dissertation copy was prepared from a negative microfilm created and inspected by the school granting the degree. We are using this film without further inspection or change. If there are any questions about the content, please write directly to the school. The quality of this reproduction is heavily dependent upon the quality of the original material.

The following explanation of techniques is provided to help clarify notations which may appear on this reproduction.

1. Manuscripts may not always be complete. When it is not possible to obtain missing pages, a note appears to indicate this.
2. When copyrighted materials are removed from the manuscript, a note appears to indicate this.
3. Oversize materials (maps, drawings and charts are photographed by sectioning the original, beginning at the upper left hand corner and continuing from left to right in equal sections with small overlaps.

UMI[®]

ProQuest Information and Learning
300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA
800-521-0600

PREVIEW

SYSTEMATIC DERIVATIONAL MORPHOLOGY
IN ENGLISH MEDICAL TERMINOLOGY
OF GREEK AND LATIN ORIGIN

APPROVED:

Charles Ehrlich

John H. Heston

Michael Ehrlich

Michael Ehrlich
Dean of the Graduate School

To Germana and Eleonora

PREVIEW

SYSTEMATIC DERIVATIONAL MORPHOLOGY
IN ENGLISH MEDICAL TERMINOLOGY
OF GREEK AND LATIN ORIGIN

by

DANIELA CROVATO DE FALCO

THESIS

Presented to the Faculty of the Graduate School of
The University of Texas at El Paso
in Partial Fulfillment
of the Requirements
for the Degree of
MASTER OF ARTS

THE UNIVERSITY OF TEXAS AT EL PASO

May 1983

ACKNOWLEDGMENTS

I would like to express my appreciation and gratitude to Dr. Charles Elerick, who directed my thesis and whose help and guidance made this study possible. I would also like to thank Dr. Jon Amastae and Dr. Richard Teschner for assisting me in this work.

I take this opportunity to mention the Head of the Department of Linguistics, Dr. Ray Past, whose encouragement, when I first entered the Department, I appreciate deeply.

Daniela de Falco

TABLE OF CONTENTS

	Page
 CHAPTER ONE: INTRODUCTION	
Purpose of This Study	1
Latin and English	2
Greek and English	5
Latin and Greek as the Languages of Science	6
Why Latin and Greek in Medical Terminology.	7
The Importance of Knowing Latin and Greek Borrowings. . .	8
Orthography and Pronunciation	9
Further Observations.	10
Analysis of the Present Corpus.	11
 CHAPTER TWO: THE SYSTEMATIZED LEXICON	
Lexicon	15
List of Suffixes.	145
List of Prefixes.	151
List of Bases	155
APPENDIX.	184
Inverse List of Medical Terms	185
BIBLIOGRAPHY.	212
VITA.	215

INTRODUCTION

Purpose of This Study

Every day those studying in the medical and paramedical fields encounter many new technical words which they have to learn. At the beginning, the student will be bewildered by the quantity as well as by the strange and foreign look of medical terms.

These words can, obviously, be learned as single, isolated items, but memorizing each one of them without correlation to other words requires a great deal of time and effort. The alternative is to treat them in a systematic way. The words borrowed from Latin and Greek can--to a great extent--be broken up into single recognizable elements that are diversely combined to form many different words. Familiarity with these elements will improve not only the student's knowledge of scientific and technical terminology but also his knowledge of the English vocabulary in a larger sense.

Even though there are different theories about the mechanics of the learning process, practically everybody recognizes the power of making associations, i.e., the power of connecting what is new with something already known. David Ausubel (1968) and Frank Smith (1978), among others, have determined that these associations allow for easier learning, faster retrieval, and longer retention.

Only when the student is able to analyze the words that he encounters daily in his studies and masters the skill of combining roots with prefixes and suffixes, will he not feel overwhelmed by his learning

task. Once the student becomes familiar with a certain number of these elements, he will discover that the effort expended to memorize them pays off. Since these elements are recurrent, he will be able to recognize on sight a very large number of words he has never encountered before, and, since technical words are often very descriptive, he will frequently be able to understand the precise meaning they carry just by considering the meaning of the components. The student's analytic ability will also improve through this systematic study.

This study is essentially a systematic analysis of English medical terminology of Greek and Latin origin. To provide a framework for a broad understanding of the matter, the introduction provides a brief overview of when, how, and why Latin and Greek words were borrowed into the English language.

Once the necessity of an organized approach to Latin and Greek borrowings in the medical and paramedical fields is established, the study continues with an outline of a systematic analysis for a more effective learning of these difficult scientific terms.

Latin and English

One of the most conspicuous peculiarities of the English language is its cosmopolitan vocabulary. English has a Germanic grammatical structure, and much of its core vocabulary is of Germanic origin. Yet, about 65 percent of all English words, including most

scientific terms, are ultimately Latin. Latin words have entered English directly or by way of other languages, especially French. Some of the loan-words have been taken over in their original forms; most have been modified to some extent to conform to the English morphological pattern.

Contact with Latin started before Anglo-Saxons settled in England and stretched over many centuries. At first, as the loan-words testify, the contact was confined to the military and mercantile spheres; then it became wider and deeper, extending to religion and to other intellectual spheres.

During the Old English period, Latin influence can be divided into three stages. The first was through the Celts and was very circumscribed. The Latin words that entered Old English were limited in number and most of them were confined to place names. Chester, Lancaster, Worcester are all nouns formed by adding the ending -ceaster, corresponding to castra, the Latin word for 'military encampment.'

The second stage of Latin influence was the result of the christianization of England, which began in 597. Most of the Latin words that penetrated into the English language at this time did so when the missionaries' influence was especially active. Many of the words borrowed at this time dealt with religion but, since the Church also influenced every-day life, not a few of the borrowings were common words. Terms like angel, altar, candle, pine, plant, cook, purple, and silk testify to the extent of Latin influence on English during this period.

The third phase of Latin influence took place during the reign of Alfred the Great, who for twenty years strongly supported religion

and intellectual revival. As a result, once more Latin terms were introduced through the writings of clerics and other learned men. The terms borrowed during this period differed from the ones introduced during the christianization of England in having a more scientific and learned character. Words like apostle, cantor, idle, accent, history, cancer, and paralysis reflect the religious and erudite aspect of the borrowings that occurred at this time.

Some of the loan-words that entered English during Old English times disappeared; some others were reintroduced; and many are still part of the English vocabulary, even though they were sometimes modified.

Approximately five hundred words entered English during Old English times. This is a very small number when compared with the number of Latin words that entered English later. During Middle English times, borrowing took place on a large scale, especially from French, which was the language used by the upper classes in England for about two centuries after the Norman Conquest. Since Old French developed from Latin, many of the words borrowed from French were ultimately of Latin origin. Mostly, these borrowings were from the spheres of religion, law, and science, as terms like Redeemer, mediator, client, conviction, medicine, mercury, and orbit make evident.

Some of these words were adopted because there was no English equivalent, while others drove out the English words. Others were kept even though there was an English equivalent to express the same or slightly different concept. As a matter of fact, the richness of the English language, as far as synonyms are concerned, is due in large part to Latin and French borrowings. The practice of borrowing from Latin

has continued ever since.

During the Renaissance--or Revival of Learning--English had to struggle to be recognized in all the fields of knowledge in which the use of Latin was sanctioned. While there was a very strong objection to borrowing, the revival of interest in Greek and Latin works brought about translations on a large scale to allow people who did not know the two languages to have access to these works. The very translators were the ones who introduced many other Latin and Greek borrowings: every time they could not find an English equivalent, they used the Latin and Greek terms. Most of the Latin words present in the English word stock were introduced during the Renaissance. Words like abdomen, delirium, gradual, notorious, series, janitor, medium, and modern attest to the importance of the Latin influence upon English in everyday speech as well as in scientific terminology.

Greek and English

The Greek influence upon English has not been so extensive nor so continuous as the Latin influence. There are three different periods in which Greek words entered the English language.

The first Greek words that came into English did so during Old English times. They were very limited in number, dealt with religion and science, and were introduced into English by way of Latin, which, in turn, had borrowed them from Greek. This is the case, for example, of the words comet and paper.

Other words, ultimately of Greek origin, enriched the English lexicon from the Middle English period on, especially during the Renaissance. At this time, thanks to the renewed study of the ancient classics, the Greek words, which until then had been introduced via Latin (allegory, anemia, anesthesia) or French (center, character, democracy), were introduced first hand (acronym, agnostic, pathos, phone, chlorine).

The third period is the most important. Starting from the end of the sixteenth century, Greek words have been used to coin new scientific terms and the number of words introduced into English since then has kept pace with scientific progress.

Latin and Greek as the Languages of Sciences

For many centuries Latin was the universal language of educated men; during the Middle Ages, through the Renaissance and into early modern times, it was truly a 'lingua franca.' Since it was taught in most universities, its knowledge enabled students to move from one university to another without linguistic inconvenience. It was natural, then, that scientists utilized Latin with its Greek lexical overlay to communicate among themselves. Every time it was necessary to express new ideas or facts, Latin and Greek elements--prefixes, stems, suffixes--were recombined to form the new terminology. This practice is still alive internationally and, therefore, many scientific terms are similar, if not identical, in many different languages.

Why Latin and Greek in Medical Terminology

There are some obvious reasons for the use of Latin and Greek in medical terminology. Scientific studies require a very large and precise terminology. Both Latin and Greek form compounds very easily and effectively, each element adding some information to the word so that there is almost no room left for inaccuracy, as noted by Agard (1960). If we consider English, we notice that compounds are usually made up of two elements. This is not the case with Latin and Greek. Lymph-adenopath-y, disease of the lymph glands (literally "lymph-gland-disease-condition of") and ileo-sigm-oido-stom-y , surgical creation of an opening between the ileum and the sigmoid colon (literally "ileum-'s'-like-opening-act of") are two of the many words which show this ease in combining. Since each element contributes to the total meaning of the word, the result is that usually the meaning of the word can be derived by summing up the meanings of the single, different elements. Since compounds coming from Greek are more self-explanatory than compounds of Latin origin, Greek has become the language of medicine par excellence.

Common words change over time more than learned words. The use in medical terminology of words of Greek and Latin origin inhibits popular currency and the acquisition of inexact and diffusive meanings.

The predominance of terms coming from Greek and Latin in medical nomenclature is also due to the fact that it was in Greece and in Rome that rational medicine first developed. As a matter of fact, the first center of rational medicine was in Greece. Hippocrates (460 B.C.-377 B.C.?), the greatest of the early physicians, was regarded from classical times as the father of medicine. Then the center moved to

Rome. The Romans took over the vocabulary of Greek physicians and added to it. Many of these technical words are still in use.

Another result and benefit for the use of Greek and Latin terminology is its universality. Physicians all over the world can communicate among themselves by using terms derived from Greek and Latin that are generally adopted and understood. Also, these international terms of Greek and Latin origin make possible the reading of foreign texts, since these technical terms are only slightly different if at all (see Leclercq 1979).

The Importance of Knowing Latin and Greek Borrowings

Donald M. Ayers (1965), among others, noticed that students seeking higher education had a problem in understanding textbooks because they possessed an inadequate vocabulary. Research has shown that there is an important correlation between successful university study and adequate vocabulary. R. Masciantonio (1982) pointed out the positive effect of the study of Latin on the vocabulary and skills of students.

If a knowledge of Latin and Greek borrowings is important in general, it is extremely necessary in the medical and paramedical fields. As noted by J. H. Phillips (1981), in the first year the medical student has to become familiar with about 13,000 new items, 75 percent of which are based on Greek or Latin. Needless to say, he cannot take advantage of the information to which he is exposed unless he knows the terms used by his teachers and textbooks and the meaning they convey. Very often,

when entering medical school, the student has little if any knowledge of Latin and no knowledge of Greek. Recently Barker and Harden (1981) asked that authors of medical education articles include in their writings a set of definitions of the technical terms used in order to facilitate the reader's understanding. Baker and Harden were motivated in their request by the results of a study investigating the comprehension of the vocabulary used in medical education. The majority of the medical educators who were asked to distinguish among twenty-two medical terms had problems with approximately one third of these words. Even though each of these terms presented problems of comprehension, all of them are commonly used in medical education.

Orthography and Pronunciation

Since authorities do not agree on classical pronunciation, there is no set of established rules to follow. The practical rule is to adopt the pronunciation of teachers or educated men or to look the word up in a dictionary. However, it is important to know that

- a) c and g are usually pronounced as English s and j when followed by e and i;
- b) ch is generally pronounced as k;
- c) ae and oe, when in the middle of a word, are pronounced as ee.

There are also variations in spelling, usually listed in good dictionaries. The following examples illustrate these variations: ae and oe are often simplified to e, except when at the end of a word; k and c sometimes alternate; ei is sometimes simplified to i.

The rules for stress are very complicated and the fact that there is no agreement in use does not simplify things. Again, imitating teachers and consulting a dictionary is the practice usually followed.

It is useful to know some general rules for forming the plural of words coming from Latin and from Greek. The most common ones are

- a) if the singular ends in -e or -a, the plural will end in -ae;
- b) if the singular ends in -os or -us, the plural will end in -i.
- c) if the singular ends in -on or -um, the plural will end in -a.

Further Observations

The meaning of a compound word is usually deducible from the meaning of its components. Sometimes, however, this is not true, for one of a variety of reasons. The word can be a metaphor, i.e., have a figurative meaning; the meaning may have undergone changes in time; the word has been kept even if it was originally employed for a reason that in time turned out to be wrong. This is the case, for example, with hysteria. This term comes from the Greek word for 'uterus,' since it was thought that hysteria was caused by some uterine disfunction.

Students should also be aware of the fact that some components which sound alike have different meanings depending on the language they come from. The root ped means 'foot' if it comes from Latin, but it means 'child' if it comes from Greek.

Another problem area concerns the fact that there is not always a correspondence between the literal meaning of the single components of a certain word and the meaning of the word itself. For example,

while the term anemia indicates a condition of paucity of red blood cells and hemoglobin, its literal meaning is 'without blood.'

Analysis of the Present Corpus

The analyses offered by most textbooks are usually systematic or morphological. When morphological, the analysis is habitually introduced only to explain the medical terminology with which the student has to become acquainted. If a selection of this kind is effective and necessary in teaching the human body and its complex functions, it is fragmentary and dispersive for a systematic introduction to medical terminology of Greek and Latin origin. The student's analytical capability is not solicited and the generalizations necessary to breaking up and understanding other terms that make use of the same elements are not encouraged. The problem with texts that analyze the medical terminology of classical derivation in a systematic way is that the elements are offered in abstract and unrelated alphabetical lists. The task of dividing a word into its components and assigning each component the proper meaning is substantially left to the student.

The present study has been elaborated on the basis of carefully applied linguistic principles. It offers a systematic derivational morphology. The elements are not given as isolated items. This investigation was limited to about nine hundred words. In selecting the items, two different criteria were followed. The words that are included are the most common ones, i.e., the ones that a student who enters a medical or paramedical field is most likely to encounter.

Other words were selected to demonstrate the systematic processes involved in the combining of the elements: how the same root can take different meanings, depending on the other elements with which it is combined; how the same prefix or suffix tends to modify the bases to which it is joined in an analogous way.

The items, alphabetically listed, were divided into their components. Each one of these components was assigned a number which allows a rapid reference to suffixes (from 100 to 154), prefixes (from 200 to 237), and bases (from 300 to 637). Elements derived from Greek are not marked since they are the majority. When of Latin origin, an element is marked by (L).

In the analysis, emphasis was put on meaning because this is thought to facilitate acquisition as well as retention. The purpose was to help the student understand medical terminology and offer him a different, systematic way of learning as well as a way of seeing and appreciating the logic of medical terminology. As a consequence, no particular attention was given to etymological subtleties. Pseudo-suffixes are considered as suffixes; linking vowels and euphonic changes are considered as variations of a given element. The analysis of each item is presented in terms of a transparent numerical and alphabetical code; the numbers and letters correspond to the range of forms and meanings respectively for each base or affixal component.

To see how the analysis works, let us consider the word acroanesthesia, loss of feeling or sensation in the extremities. In the lexicon it is divided into four components:

acro/530.2a

an/208.2b

esthe/481.1a-b

sia/120.4b

As the numbers indicate, these components are, respectively, a base, a prefix, a base, and a suffix. Let us examine the first one. In the list of bases, the number 530 is analyzed as

530.1 acr- a) extremity b) summit
 .2 acro-

Since in the word considered the base is marked by .2a, this means that it appears as 'acro-' (corresponding, in the array of forms, to .2) and it has the meaning of 'extremity' (corresponding, in the array of meanings, to the letter 'a'). Now let us consider the second component. In the list of prefixes, the number 208 is analyzed as

208.1 a- a) not b) without
 .2 an-

This means that, in the word considered, it appears as 'an' and it has the meaning of 'without.' The following component is another base, listed as 481.1a-b. This item reads

481.1 esthe- a) to feel b) to perceive
 .2 aesthe-

In this case, the form 'esthe,' as indicated by .1 and both the possible meanings, as the indication 'a-b' shows, have been used. The last component '-sia-' is listed as 120.4b. The item 120 appears in the list of suffixes as

120.1 -sia a) act of b) state of c) result of
 .2 -se

.3 -sy

.4 -sia

.5 -sio-

In this case, the form '-sia,' labeled .4, and the meaning of 'state of,' corresponding to the letter 'b,' are the ones to be chosen.

PREVIEW

LEXICON

abduction ab/204.1b duct/333.2 ion/110a-c	1. the moving of a part of the body away from the median axis or from another part. 2. the changed position resulting from this.
abscess abs/204.3a cess/441.2a	a localized collection of pus in a cavity formed by the disintegration of tissues.
accommodation ac/205.2a commod/548 ation/131	adaption.
achalasia a/208.1 chalias/383 ia/106.1a-b	failure to relax.
acid ac/327 id/103a	sour; having properties opposed to those of the alkalis.
acidosis ac/327 id/103a osis/108.1a	a condition in which the alkali reserve of the blood is lower than normal.
acroanesthesia acro/530.2a an/208.2b esthe/481.1a-b sia/120.4b	loss of feeling or sensation in the extremities.

acromegalic acro/530.2 megal/403.2a ic/102.1a	of or having acromegaly.
acromegaly acro/530.2 megal/403.2a y/106.2a	a disease which permanently enlarges the bones of the extremities, caused by abnormal activity of the pituitary gland.
adduction ad/205.1b duct/333.2 ion/110a	the moving or pulling of a part of the body toward the median axis or toward another part: opposed to abduct.
adenalgia aden/437.1 alg/334.1 ia/106.1a-b	pain in a gland.
adenectomy aden/437.1 ec/200.1a tom/335.1 y/106.2c	the surgical removal of a gland.
adenia aden/437.1 ia/106.1a-b	enlargement of the glands.
adeniform adeni/437.3 form/147a	shaped like a gland.

adenitis glandular inflammation.

aden/437.1

itis/112.1a

adenographic pertaining to adenography.

adeno/437.2

graph/368.1

ic/102.1a

adenography that part of descriptive anatomy which
adeno/437.2 treats of the glands.

graph/368.1

y/106.2c

adenoid

1. glandlike; glandular.

aden/437.1

2. of or like lymphoid tissue.

oid/104.1

adenoidectomy excision of the adenoids.

aden/437.1

oid/104.1

ec/200.1a

tom/335.1

y/106.2c

adenological pertaining to adenology.

adeno/437.2

log/105b

ic/102.1a

al/113.1a

adenology the study of glands.

adeno/437.2

logy/105b