

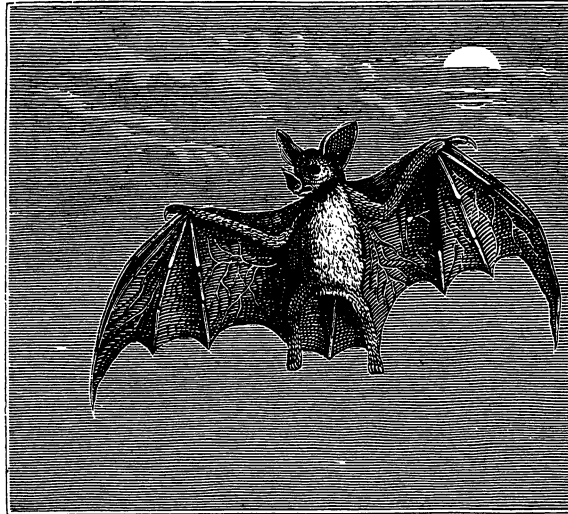
**BIOLEXICON**  
**A Guide to the Language of Biology**



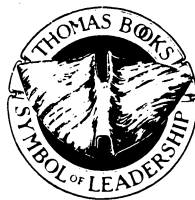
# BIOLEXICON

## A Guide to the Language of Biology

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Worcester, Massachusetts*



*Chiropteran, a Bat*  
from Greek *chiro-*, hand + *pteran*, wing



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## PREFACE

**B***iolexicon* is a guide for students and others who need or want to learn the meanings of words in the vocabulary of biology, especially in the vocabulary of medicine. The first principle of the book is that learning this vocabulary is made easier through knowing the meanings of elements that make up whole words. Its second principle is that knowing this history will contribute to a comprehensive and interdisciplinary liberal education.

The reader should anticipate incursions into philosophy, religion, history, mythology, theories of evolution, Renaissance anatomy, spooky obsessions that frighten people. I hope that *Biolexicon* will provide an economical way to decipher the words of a very large biological vocabulary. I hope the book will be not only informative and useful, but also at least sometimes, enjoyable.

Long lists of words can be intimidating. Though it's necessary to have these lists as examples of how elements join to make up words, it is not necessary to memorize the words themselves. We are pursuing the elements given in **bold** at their fullest presentation and listed alphabetically in the index. Fortunately, there's a finite number of these elements.

Tracking elements will often lead us to prehistoric ancestral sources that have themselves gone extinct while their descendants live on in various linguistic sites. The process is like reconstructing an extinct animal ancestor from its modern descendants. The geneologies of these elements are given in boxes which are not parenthetical comments but very much at the heart of the process of learning the meanings of biological words. One box will reveal, for example, that *Oedipus* is a sibling to *platypus* and that these words are cousins to *fetch*, *moped*, *podiatrist*, and *pajamas*.

The elements are called prefixes, suffixes, and bases; for the central part of a word, the term *base* has been chosen in preference to *stem* and *root*. *Stem* as a noun is not used at all, and *root* is used for an original prehistoric hypothesized term from which the elements evolved.

Like an element in chemistry, the base joins with other parts to form compounds.

As in the past, English continues to adopt words from foreign languages and to build its vocabulary by the more generative process of inventing new words from old elements. Close to 500 words enter English every year, most of them inventions that reside in technical vocabularies. Knowing what the elements mean will prepare the pre-medical or medical student, the aspiring biologist, the practitioner of any biological science, and anyone else to decipher these new words that might name a newly discovered microbe or mastodon, a disease, or a surgical procedure.

As in the past, English continues to give new meanings to old words. Greek *thorax*, which once meant breastplate underwent metaphoric transference in referring to the body area that used to be covered by that shield. Latin *acetabulum*, which once meant vinegar cup, underwent such transference in referring to the cup of the pelvis that embraces the knob of the femur. *Culture* is used metaphorically in describing a planned growth of micro-organisms. Recently, *lawn* became a metaphor for surface growth on a culture. A particular kind of transference is someone's name being generalized to some thing or event. *Iris* was once the goddess of the rainbow; *morphine* comes from the name of the god of sleep; and *arachnid*, from the name of a precocious spinster, now refers to spiders. Transferences of old words and names provide many intriguing stories.

Other observations on how the biological vocabulary has been constructed will be given in appropriate places in the text, and at times illustrated. For now, I hope that the exploration will be as pleasurable for the reader as it has been for the writer.

#### Abbreviations:

<	stemming or derived from		
>	producing or giving rise to		
cp.	compare	adj.	adjective
syn.	synonym	orig.	originally
ant.	antonym	pert.	pertaining to
lit.	literally	etym.	etymological
pl.	plural		
IE	Indo-European	L.	Latin
OE	Old English	Fr.	French
E.	English	Gk.	Greek

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# CONTENTS

	<i>Page</i>
<i>Preface</i> .....	v
<b>Part I: Introduction</b>	
Chapter 1. The Biolexicon .....	3
2. History of English .....	17
<b>Part II: Sources</b>	
Chapter 3. From Echoes to Eponyms .....	27
4. Greek Mythology .....	37
5. Metaphors .....	62
6. More Metaphors .....	95
<b>Part III: Affixes</b>	
Chapter 7. Prefixes .....	105
8. Direction and Location .....	116
9. Colors and Numbers .....	127
10. Suffixes .....	139
<b>Part IV: Natural History</b>	
Chapter 11. Evolution .....	145
12. Geology .....	157
13. Taxonomy .....	166
14. Metazoa .....	174
<b>Part V: Birth and Growth</b>	
Chapter 15. Gen .....	187
16. Living and Growing .....	200
17. Sensing .....	209
18. Thinking .....	223

**Part VI: Anatomy**

Chapter 19.	Body and Bones .....	233
20.	Head, Skull, and Face .....	249
21.	Torso, Muscles, and Viscera .....	262
22.	Roots of Hair .....	279
23.	Affliction and Repair .....	291

**Part VII: Conclusion**

Chapter 24.	Phiz .....	308
25.	Love and Fear .....	324
Appendices .....		337
A.	Grimm's Law .....	337
B.	Alphabet .....	341
C.	Combinations .....	343
<i>Bibliography</i> .....		347
<i>Illustrations and Permissions</i> .....		349
<i>Index</i> .....		353

## ILLUSTRATIONS

	<i>Page</i>
<i>Chiropteran</i> , a Bat . . . . .	iii
Sea cucumber . . . . .	4
Stamen and pistil . . . . .	10
African chameleon . . . . .	12
American Indians . . . . .	58
Anthropophagi preparing dinner . . . . .	23
Tarantula . . . . .	30
Darwin's tubercle . . . . .	33
Eponymic scorpion . . . . .	34
Ammonites and Ammon . . . . .	35
Ceres . . . . .	37
Titan Atlas and atlas first cervical vertebra . . . . .	39
Goddess Aphrodite and the sea mouse . . . . .	41
Venus' girdle . . . . .	42
<i>Priapulus</i> . . . . .	42
Hercules beetle . . . . .	44
Aesculapius attending sick man . . . . .	43
Dormatorium . . . . .	45
Monster chimaera and sea cat . . . . .	47
Flying dragon . . . . .	48
Hercules fighting Hydra and hydra . . . . .	49
Mythological Gorgon, gorgonia, and medusa . . . . .	49
Satyr holding syrinx . . . . .	51
Nymph and nymphon . . . . .	52
Seaworm <i>Nereis</i> . . . . .	53
Psyche . . . . .	54
Labyrinthodont teeth and labyrinth of ear . . . . .	55
Intestine . . . . .	56

Sirens and mudfish .....	58
The blinding of Cyclops and copepod cyclops .....	57
Caduceus .....	59
Argonaut .....	60
Culina, or kitchen .....	68
Cloaca maxima and condor cloaca .....	68
Clavis and ape clavicle .....	71
Head and proboscis of butterfly .....	70
Acetabula, boy holding pelvis, and acetabuklum .....	71
Boy holding amnium and fetal structures .....	73
Fascia clothing and striated muscle .....	76
Spinal cord neuroglia cell .....	75
Vascula, Mercury, and kangaroo marsupium .....	77
Sacculus .....	79
Miter and mitral valve .....	80
Tunics and tunica .....	80
Tapeworm <i>Cestoda</i> .....	82
Fibulae and tibia .....	83
Tibiae with syrinx and trumpet salpinx .....	84
Greek flagellum, flagellated protozoa and flagellated person .....	85
Carpenter's shop .....	87
Smith with mallet forging metal on incus and bones of the inner ear .....	88
Ancient serrae .....	88
Sea anemone .....	89
Belemnites .....	90
<i>Trypanosoma</i> .....	89
Ivory arrow-head used by sagittarii and seaworm <i>Sagitta</i> .....	91
Clitellum on horse and of earthworm .....	92
Old yoke and zygomatic arch of gorilla .....	94
Cochlea .....	99
Membranes of brain .....	100
Nidus or nest .....	100
Sacral bone .....	102
Hyoid bone and chiasma .....	104
Leeuwenhoek's microscope .....	110
Pleisosauros dolichodeirus .....	111

Aneurysm . . . . .	112
Pleiosaurus macrocephalus . . . . .	114
<i>Amphioxus</i> . . . . .	117
Acus crinalis or hair pin and apex or cap on head . . . . .	117
Dextral and sinistral openings . . . . .	119
Planes . . . . .	122
<i>Peripatus</i> . . . . .	123
Prosthetic devices . . . . .	126
<i>Drosophila melanogaster</i> . . . . .	133
Trephination . . . . .	136
Artiodactyla and Perissodactyla toes . . . . .	138
Fossil footprint of dinosaur . . . . .	141
Garden snail <i>Helix</i> , double helix, and helix of ear . . . . .	146
Saltatio . . . . .	152
Scheuchzer's <i>Homo diluvii testis</i> . . . . .	154
Beringer's <i>Lugensteine</i> . . . . .	155
<i>Hesperopithecus haroldcookii</i> . . . . .	156
Trilobite . . . . .	159
Calculi . . . . .	163
Phosphatic coprolites . . . . .	164
Diastole and systole . . . . .	170
Coeloms . . . . .	176
Coleopteran tiger beetles and ladybug . . . . .	178
Crinoid . . . . .	181
Marsupial skull . . . . .	183
Orang-utan . . . . .	185
Man and ape . . . . .	186
The cell . . . . .	194
Plastic surgery . . . . .	197
Ichneumon wasp and larvae . . . . .	202
Speculum . . . . .	211
Capsa . . . . .	216
Dissection . . . . .	227
Autopsy . . . . .	228
Cro-Magnon drawing . . . . .	230
Silurian crinoid . . . . .	230

Anatomical drawing . . . . .	233
Skeleton . . . . .	236
Spine . . . . .	237
Armadillo . . . . .	238
A brachiating ape . . . . .	240
The arm . . . . .	239
Greek woman at play with tali . . . . .	243
The leg . . . . .	243
Polyp . . . . .	247
Oedipus and platypus . . . . .	248
The skull . . . . .	252
The eye . . . . .	255
The ear . . . . .	257
<i>Rhinocerus</i> . . . . .	258
<i>Lingula anatina</i> . . . . .	260
Shark's head and teeth . . . . .	261
Thorax . . . . .	263
Bellybuttons . . . . .	264
Egyptian amulets representing the heart . . . . .	266
Mastodon teeth . . . . .	274
Sarcophaga carnaria and Cyprian sacrophagus . . . . .	279
British nudibranches . . . . .	281
Hair . . . . .	284
Gymnasts . . . . .	283
Two villi . . . . .	284
Lemur teeth . . . . .	285
Hirsutism . . . . .	287
Tragus of ear . . . . .	288
Pinnigrade feet . . . . .	290
Plague doctor . . . . .	293
Urinary discharge, from ancient Egyptian papyrus depiction . . . . .	295
Dicephalic monster . . . . .	301
Pagan surgical instruments . . . . .	302
Hydrotherapy . . . . .	303
Dr. Jenner at vaccination. . . . .	307
Physiognomic signs . . . . .	310

Phrenological signs .....	311
Criminal faces .....	312
The Humours .....	314
Chaucer's Doctour .....	316
Endocrine glands .....	320
Ophiolatry .....	321
<i>Mantis religiosa</i> .....	322
Hogarth's Bedlam .....	323
<i>The Nightmare</i> , by Johann Fuseli .....	329
Luposilopophobia .....	333
Gnomes and ichthyosaurus .....	335



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## PART I: INTRODUCTION

### CHAPTER 1—THE BIOLEXICON

- 1.1 Adoptions
- 1.2 Advantages
- 1.3 To Be Human
- 1.4 Etymology

The characteristics of modern English arose from English having been remarkably, maybe uniquely, hospitable to adopting words from other languages. All of English has been enriched by this hospitality, and the scientific vocabulary has benefited particularly from Greek and Latin adoptions. These Latin and Greek adoptions sometimes seem like an impenetrable code, but they have brought advantages to the scientific vocabulary, advantages that can be seen in tracking the history of words like *human*. The study of the history of words in the general as well as in specialized scientific vocabularies is called *etymology*. Etymology is the subject of this book.

#### 1.1 Adoptions

Starting five hundred years ago, Arabic has endowed English with dozens of words. *Assassin* is from Arabic. A medieval character with the nickname Old Man of the Mountains encouraged his gang to get high on *hashish* and then go out and murder Crusaders. From the name of the weed they ate there came the name of their profession: *assassin*. *Assassin* entered English in the early 16th century, *hashish* and the compound *assassinate* much later in that century. When a bloodsucking insect of the Reduviidae family was identified three hundred years later, it received the popular name *assassin bug*.

Less bloody histories attend other words that English adopted from Arabic:

<i>alcohol</i>	<i>alfalfa</i>	<i>amber</i>	<i>caliber</i>
<i>alkali</i>	<i>artichoke</i>	<i>emerald</i>	<i>average</i>
<i>nitre</i>	<i>syrup</i>	<i>giraffe</i>	<i>gazelle</i>
<i>algebra</i> , entered E. in 1541			

Words may enter English directly from a foreign language's own stores, as *sputnik* rocketed into English from Russian in 1957. Or they may undertake extensive journeys from one language to another, sometimes wandering across the globe. A couple of useful words that originated in Greek were transmitted through Arabic:

Gk. *chyma* became Arabic *alchemy* and, in 1555, E. *chemist*, in 1600 E. *chemistry*. Gk. *xeros*, dry, is the source of Arabic *elixir* as well as the name of a photocopying process. *Camphor* came to E. from Arabic at the beginning of the 14th century; it travelled into Arabic from Malay.

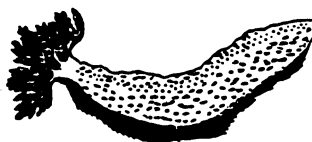
A Sanskrit word, *sunya*, empty, was adopted by Arabic as *sifr*, with the same meaning; this travelled into English in the mid-14th century as *cipher*. Arabic *sifr* also travelled into Italian and came into E. in the late 16th century as *zero*.

Sanskrit itself, through its descendant Hindi, has contributed *pepper*, *cheetah*, *anaconda*, and *jungle* to the vocabulary of natural history, and *sugar* and *sacchar* to the vocabulary of the kitchen and the laboratory. That story begins with Sanskrit *sarkara*, sugar. This went into Italian as *zucchero*, from which, eventually, Middle French *sucre* and E. *sugar*. *Sugar* came into E. in the second half of the 13th century. Centuries later, the Sanskrit root was revisited to produce, in 1665, *saccharine*, which orig. meant like sugar, very sweet, and in 1880, as *saccharin* became a word for a sugar substitute. The base for *sugar* and *saccharin* therefore undertook a long journey: Sanskrit > Arabic > Italian > French > English.

From German itself have come *anlage*, the initial embryological stage of organ development, *diener*, a laboratory handyman, and words originally from Greek transmitted through German into the vocabulary of psychiatry, such as *psychoanalysis*, *narcissism*, *Oedipal complex*.

Renaissance and subsequent explorations introduced Europe to the fauna and flora and exotic diseases of faraway lands. A quick inventory displays words from these languages:

African languages	> <i>chimpanzee</i> , <i>gorilla</i> , <i>gnu</i> , <i>yam</i> , <i>tsetse</i> <i>banana</i>
Persian	> <i>kala-azar</i> , <i>borax</i>
Hebrew	> <i>balsam</i> , <i>balm</i>
Tibetan	> <i>panda</i>
Chinese	> <i>trepang</i> , sea cucumber



Sea cucumber  
Genus *Holothuroidea*

Japanese	> <i>sodoku</i> , fever caused by infection from a rat bite
Sinhalese	> <i>beri-beri</i>
Austronesian	> <i>kangaroo</i> , <i>koala</i> <i>kiwi</i> , bird and fruit <i>pangolin</i> , an anteater <i>agar</i> , seaweed nutrient <i>bantam</i> , an Indonesian bird

Samoan > *palolo*, a worm, taxonomic name  
*Eunica viridis*

The people who originally settled into North America contributed words for the plants and animals of this land,

<i>terrapin</i>	<i>sequoia</i>	<i>persimmon</i>	<i>hickory</i>
<i>opossum</i>	<i>squash</i>	<i>skunk</i>	
<i>woodchuck</i> , orig. Algonquian <i>ockqutchaun</i>			

Those who originally settled into South America contributed, mostly through the intermediary of Spanish:

<i>maize</i>	<i>marijuana</i>	<i>jaguar</i>
<i>potato</i>	<i>cocaine</i>	<i>jaguarundi</i>
<i>tomato</i>	<i>quinine</i>	<i>coati-mundi</i>
<i>ipecac</i> , an emetic		

These words for animals, plants, diseases, do not exhaust the vocabulary that English adopted from entirely unrelated languages; but the total contribution from these languages is small relative to the fragment consisting of words from native English (about 5%) and tiny relative to the great number from Greek and Latin.

Ninety-five percent of the words in the medical vocabulary comes from Greek and Latin. The abundance of Greek and Latin terms could inspire a pretentiousness by which we intimidate people by using uncommon terms instead of common ones, such as *cephalgia* instead of *headache*, *lentigo* instead of *freckle*, *rhexis* instead of *rupture*, and *verruca* instead of *wart*.

In turning our attention to Greek and Latin, we can note first that in ancient times these adopted words from other languages. The Greek invaders who took over Crete absorbed some Cretan words:

<i>sponge</i>	<i>syrinx</i>	<i>salping</i> , trumpet, oviduct
<i>turpentine</i>	<i>hyacinth</i>	<i>porphyra</i> , purple
<i>labyrinth</i> , once a Cretan palace		

It should be noted that some of these terms have not definitely been traced back to Cretan, and that the original sources of other words in the medical vocabulary remain uncertain: *coccyx*, *clitoris*, *abdomen*.

It has been estimated that the Latin medical vocabulary is at least half Greek. All Roman medical literature was written in Greek. Among many other words, Latin adopted Gk. *nausea*, *skeleton*, and *placenta*. Gk. *gangraina* became L. *gangrene*, and Gk. *dakrma*, tear, L. *lacrima*. The New Latin of the Renaissance did this too, for example, Gk. *amoibe* becoming *amoeba*, today's *ameba*. Sometimes, Latin would find an equivalence for a Greek term, as it did in substituting *spiritus* for the Greek *pneuma*.

Many words have come into English with the same form and often with the same meaning that they had in ancient Greece and Rome, such as