

# Greek in Scientific Terminology

## LECTURE 1

Based on Ayers (1972), chapters 1–3.

### *Greek Prefixes*

- A- (AN- BEFORE VOWELS OR H) 'not', 'without'  
atheist, anaesthetic (*inducing a lack of sensation*)
- AMPHI-, AMPHO- 'both', 'on both sides of', 'around'  
amphibious, amphitheatre
- ANA- 'up', 'back', 'again'  
analysis, anatomy, anachronism
- ANTI- 'against', 'opposite'  
antidote, antagonist, antarctic
- APO- 'from', 'off', 'away'  
apology, apostle, apheliotropism (*the habit in plants of bending away from the light*)
- CATA- 'down', 'against', 'according to'  
catalyst, catastrophe, category, catholic (*universal, i.e. 'in respect of the whole'*)
- DIA- (DI- BEFORE VOWELS OR H) 'through', 'across', 'between', 'apart'  
diameter, diagnosis, diocese
- DYS- 'bad', 'disordered', 'difficult'  
dysentery, dystrophy
- ES-, EIS- 'inward', 'into'  
esoteric, esodic (or eisodic)
- EC- (EX- BEFORE VOWELS OR H) 'out', 'out of', 'outside'  
exodus, exodontist
- EN- (EM-, EL-) 'in', 'into', 'inward'  
energy, embryo, emphatic
- EN- + ANTI- 'opposite'  
enantiopathy (the treatment of disease by contraries), enantiobiosis (the condition in which associated organisms are antagonistic to each other)
- ENDO-, ENTO- (END-, ENT- BEFORE VOWELS OR H) 'within', 'inner'  
endocrine, entophyte, endarteritis, entoptic
- EPI- (EP- BEFORE VOWELS OR H) 'upon', 'on', 'to', 'in addition to'  
epidemic, epidermis, epitaph
- EU- 'well', 'good', 'normal'  
eugenics, eulogy
- EXO-, ECTO- 'outside', 'external'  
exoskeleton, ectoparasite
- HYPER- 'over', 'excessive', 'more than normal'  
hypercritical, hypertension
- HYP- (HYP- BEFORE VOWELS OR H) 'under', 'below normal', 'slightly'  
hypodermic, hypothesis, hyphen, hypaesthesia
- META- 'after', 'change', 'transfer'  
metamorphosis, metencephalon
- PARA- (PAR- BEFORE VOWELS OR H) 'beside', 'resembling', 'disordered'

parasite, paratyphoid, parenthesis, paramedical  
 PERI- 'around', 'near'  
 periscope, perimeter  
 PRO- 'before', 'in front of', 'forward'  
 program, prologue, prostate  
 PROS- 'toward', 'in addition', 'fronting'  
 proselyte, prosthetic, prosencephalon  
 SYN- (SYM-, SYL-, SY-, SYS-) 'with', 'together'  
 synthetic, symphony, systole, synonym

*Roots, Part I*

ALG- 'pain' (-*algisia*, 'sense of pain')  
 an-ALG-*esic*, a drug acting to relieve pain; nost-ALG-*ia*, a sentimental longing or wistful affection for a period in the past  
 ARTHR- 'joint', 'speech sound', 'articulation'  
 dys-ARTH-*ia*, impairment of speech articulation  
 BI- 'life'  
 sym-BIO-*sis*, living together for mutual benefit  
 BALL-, BOL-, BLE- 'to throw', 'to put'  
 BALL-*ist-ics*; sym-BOL; em-BOL-*ism*, destruction of a blood vessel by foreign matter lodged in it; em-BOLO-LAL-*ia*, insertion of meaningless words into speech  
 BRADY- 'slow'  
 BRADY-LEX-*ia*, slowness in reading; BRADY-CARD-*ia*, slowness of the heart  
 CRYPT- 'hidden'  
 CRYPT; CRYPTO-GRAPH-*y*; CRYPT-*ic*; CRYPTO-PHYTE, a plant the produces buds underground or underwater; CRYPT-ORCH-*ism*; condition wherein the testes do not descend  
 DROM- 'running', 'course'  
 syn-DROME, symptoms that occur together and characterize a particular disease; a-DROM-*ia*; failure of impulse conduction in muscles or nerves  
 GE- 'earth'  
 amphi-GE-*an*; living around the world; GEO-CARP-*y*, ripening of fruits underground (peanuts, for instance)  
 HOD-, OD- 'road', 'way'  
 HODO-phobia, fear of travel; UR-OD-*eum*, a tract for carrying urine  
 MNE- 'to remember'  
 a-MNE-*sia*, loss of memory; ACOU-st-a-MNE-*sia*, inability to remember sound; AUTO-ana-MNE-*sia*; history related by the patient  
 MORPH- 'form'  
 meta-MORPHO-*sis*; changing form; PHYLLO-MORPHO-*sis*; variation of leaves in different seasons  
 ODONT- 'tooth'  
 ex-ODONT-*ist*, a specialist in tooth extraction; pros-TH-ODONT-*ia*; the replacement of teeth by artificial means, a branch of dentistry  
 PHOR-, PHER- 'to bear', 'to go'  
 eu-PHOR-*ia*, exaggerated feeling of well-being; meta-PHER-*y*, displacement of organs  
 PLEX-, PLEG- 'to strike', 'to paralyze'  
 apo-PLEX-*y*, sudden paralysis with loss of consciousness, when a blood vessel in the brain breaks or is blocked  
 POD-, -PUS 'foot'  
 CEPHALO-POD; mollusc with sucker-bearing arms on its head, such as an octopus

PROCT- 'anus', 'rectum'  
 PROCTO-logy; medical specialty concerned with the anus, the rectum and the sigmoid colon

STOL-, STAL-, -STLE 'to send', 'to contract'  
 peri-STAL-sis, rhythmic contraction of the alimentary canal that sends its contents downward; ana-STAL-sis, its opposite, the same as anti-peri-STAL-sis; sy-STOLE, contraction of the heart

STOM-, STOMAT- 'mouth', 'opening'  
 STOMAT-itis; inflammation of the mouth, not the stomach; ENTERO-stomy; operation to form an opening into the intestine; MICRO-STOME, a small opening or orifice

TROP-, TREP- 'to turn', 'response to stimulus'  
 apo-TROP-aic; intended to avert evil; ap-HELIO-TROP-ism, turning away from the sun; TREP-omena, a genus of spiral bacteria, including *Trepomena pallidum*, which causes syphilis.

UR- 'urine', 'urinary system'  
 UR-EM-ic, describes the presence of urine in the blood; UR-OD-eum, a tract for carrying urine; URE-ter, the duct by which urine passes from the kidney to the bladder or cloaca (URE-, 'to urinate')

### Roots, Part II

BUL- (BOUL-) 'will', 'volition'  
 a-BUL-ia, loss of ability to make decisions

CARDI- 'heart'  
 MYO-CARDI-al, pertaining to the muscular tissue of the heart

CEPHAL- 'head' (enCEPHAL-, 'brain')  
 CEPHALO-POD; pros-ENCEPHAL-on, forebrain or anterior brain vesicle of the embryo; met-ENCEPHAL-on

CHONDR-, CHONDRI- 'cartilage', 'granule' (orig, 'groat (hulled grain) of wheat')  
 peri-CHONDRI-um; fibrous connective tissue covering cartilage

DEM- 'people', 'country'  
 apo-DEMI-ALG-ia, morbid dislike of home life and a desire to wander; epi-DEM-ic, occurring widely within a certain geographic area; ec-DEM-ic, of foreign origin, opp. of en-DEM-ic

DERM- 'skin'  
 PODO-DERM; dermal layer of a hoof; the DERM-is is between the epi-DERM-is and the subcutaneous tissues

GAM- 'marriage', 'union'  
 a-GAMO-GENE-sis, asexual reproduction; GAM-ete, a sexual cell capable of uniting with another to form a new individual, such as sperms and eggs

LECITH- 'yolk'  
 CENTRO-LECITH-al, having the yolk aggregated in the centre; LECITH-in describes a group of yellow-brown fatty substances first isolated in egg yolks

OPHTHALM- 'eye'  
 MEGAL-OPHTHALM-us or MEG-OPHTHALM-us, excessive largeness of the eyes

OST(E)- 'bone'  
 OSTEO-DERM-ia, bony formations in the skin; OSTE-ana-GENE-sis, regeneration of bone

PHYLL- 'leaf'  
 PHYLLO-POD-ous, having leaflike swimming feet, as in branchiopods, (some shrimp, for instance)

PHYT- 'plant', 'growth'

endo-PHYTE, a plant growing within another; ZOO-PHYTE, an animal resembling a plant, such as a sponge

PLAS(T)- 'to form', 'to mould'  
 hyper-PLAS-ia, excessive formation of tissue; meta-PLAS-ia, transformation of one form of adult tissue to another

SOM-, SOMAT- 'body'  
 SOM-AESTHE-sia, sensibility to bodily sensations; GYMNO-SOMAT-ous, having no shell or mantle, as certain molluscs

THEC- 'case', 'sheath'  
 THECA, spore or pollen case; THECA-PHORE, a structure on which a theca is borne; THEC-ODONT, having teeth in sockets

THERM- 'heat'  
 a-dia-THERM-ancy, imperviousness to heat waves; hyper-THERM-algesia, abnormal sensitivity to heat

TOM- 'cut', 'section' (enTOM-, 'insect')  
 LITHO-TOM-ous, stone-boring, as certain molluscs

TOP- 'place'  
 a-TOPO-GNO-sia, lack of ability to locate a sensation accurately; OST-ec-TOP-y, displacement of a bone

TROPH- 'nourishment', 'development'  
 AUTO-TROPH, organism capable of self-nourishment; TROPHO-TROP-ism, tendency of an organism to turn towards its food supply; dys-TROPH-y; deficiency of nourishment

ZO- 'animal', 'living being'  
 ZOO-logy; ZOO-GAM-y, sexual reproduction in animals; ZOO-PHYTE

*Roots, Part III*

ACOU-, (ACU-) 'to hear'  
 ACOU-smat-a-GNO-sis; inability to recognize spoken words; an-ACU-sia, complete deafness

AMBL- 'dull'  
 AMBLY-CEPHAL-idae, a genus of broad-headed, nonpoisonous snakes, bluntheads; AMBLY-ACU-sia

ANTH- 'flower'  
 ANTHO-philous, attracted by flowers, feeding on flowers; ex-ANTH-ema, an eruption on the skin

CHROM-, CHROMAT-, CHRO- 'colour'  
 meta-CHRO-sis, the change or play of colours seen in the squid, chameleon, etc.

DACTYL- 'finger', 'toe'  
 DACTYLO-lysis, a tropical disease in which a toe is slowly and spontaneously amputated by a fibrous ring

DE-; DESM- 'to bind'; 'binding', 'ligament'  
 amphi-DESM-ic, furnished with a double ligament; syn-DESMO-logy, the study of ligaments; syn-DE-sis, the state of being bound together

ENTER- 'intestine'  
 an-ENTER-ous, having no alimentary tract; MY-ENTER-ic, relating to the muscular coat of the intestine; dys-ENTER-y

ERG- 'work'  
 endo-ERG-ic; relating to the absorption of heat, endothermic; ADREN-ERG-ic, activated by adrenaline

AESTHE-, (ESTHE-) 'to feel', 'to perceive'  
 syn-AESTHE-sia, a secondary sensation accompanying an actual perception; ACANTH-AESTHE-sia, a sensation as of pricking with a needle

GER-, GERONT- 'old person', 'old age'

GERONTO-phobia, morbid fear of old age; GER-ODONT-ia, dentistry for the aged; GERONTO-logy

GNATH- 'jaw'  
 dys-GNATH-ic, pertaining to improperly developed jaws; GNATHO-THECA, the horny outer covering of a bird's lower jaw

GNO- 'to know'  
 BAR-a-GNO-sis; loss of perception of weight; AUTO-TOP-a-GNO-sia, loss of ability to orient parts of one's own body

GRAPH-, GRAM- 'to write'; 'thing written'  
 DROMO-GRAPH, instrument for registering the velocity of blood current

HEPAT-, HEPAR- 'liver'  
 HEPAR-in, a substance or mixture of substances occurring in liver and other tissues having the property of prolonging the clotting time of blood; HEPAT-itis, inflammation of the liver

KINE- (CINE-) 'to move'  
 a-KIN-AESTHE-sia, loss of muscle sense or sense of movement; eu-KINE-sia; normal power of movement; TELE-KINE-sis; the alleged ability to move objects without touching them

LEX- 'to read'  
 BRADY-LEX-ia, abnormal slowness in reading; dys-LEX-ia, impairment of the ability to read

MY-, MYS-, MYOS- 'muscle'  
 MYO-CHROME, any muscle pigment; MY-ENTER-ic; MYO-CARDI-al

NEPHR- 'kidney'  
 peri-NEPHR-ium, the connective or adipose tissue surrounding a kidney

OSM- 'smell'  
 an-OSM-ia, absence of the sense of smell; MACR-OSM-atic, possessing a highly developed sense of smell

THE- 'to put', 'to place'  
 ALL-en-THE-sis, introduction of foreign substance into the body; meta-THE-sis, a chemical reaction in which there is an exchange of radicals

## LECTURE 2

Based on Ayers (1972), chapters 4–6.

### *Greek Adjective-Forming Suffixes*

-AL 'pertaining to', 'like', 'belonging to', 'having the character of'  
 BIO- 'life' + -logy, 'science of' + ic + al

-AN (-IAN) 'pertaining to', 'like', 'one connected with'  
 amphi-, 'both' + BI-, 'life' + -an; PROTO-, 'first' + ZO-, 'life' + -an; THE, 'god' + -logy, 'study of' + -an

-OUS (-IOUS) 'full of', 'having', 'pertaining to', 'like'  
 amphi- + BI-, 'life' + -ous; syn- + ONYM- 'name' + -ous; HOMO-, 'same' + GENE-, 'kind' + -ous

-IC, -TIC, (-AC AFTER -I) 'pertaining to', 'like'  
 GASTR-, 'stomach' + -ic; STA-, 'to stand' + -ic; CARDI-, 'heart' + -ac

-ICS, -TICS 'art, science or study of'  
 PHYS-, 'nature' + -ics; GENE-, 'to be produced' + -tics'; PAED, 'child' + IATR-, 'doctor' + -ics

-OID, -ODE 'like', 'having the shape of'  
 SPHER-, 'sphere' + -oid; ADEN-, 'gland' + -oid; NEMAT-, 'thread' + -ode; PHYLL-, 'leaf' + -ode

## *Compound Suffixes*

- AEMIA, (-EMIA) 'condition of the blood', 'congestion of blood'  
anaemia, leukaemia, anoxaemia
- LOGY 'science of'  
physiology, cardiology, psychology
- LYSIS 'dissolution of or by' ('surgical division or separation')  
hydrolysis, nephrolysis, electrolysis
- MANIA 'madness for of about'  
kleptomania, dipsomania, egomania, monomania
- PATHY 'disease of', 'treatment of disease of or by'  
osteopathy, neuropathy, hydrophobia
- PHOBIA 'abnormal fear of'  
claustrophobia, agoraphobia, hydrophobia
- THERAPY 'treatment of or by'  
chemotherapy, psychotherapy, heliotherapy
- TOMY 'surgical operation on', 'surgical cutting of'  
glossotomy, gastrotomy, lobotomy
- ECTOMY 'surgical operation', 'surgical removal of'  
appendectomy, tonsillectomy
- URIA 'condition of the urine'  
haematuria, acetonuria, noctambulminuria
- GENOUS, -GENIC 'producing', 'produced'  
photogenic, endogenous, cytogenous
- HEDRON 'solid figure having a (specified) number of faces'  
icosahedron, dodecahedron
- IASIS 'diseased condition'; often refers to an infestation by parasites  
psoriasis, amebiasis, elephantiasis
- METER 'instrument for measuring', 'measure'  
-metry, 'art or science of measuring'; thermometer, anemometer, perimeter, telemetry, optometry, photometry
- NOMY 'science of', 'system of laws governing', 'rules for the direction of'  
agronomy, astronomy, economy, autonomy
- OECIOUS 'having a house or dwelling'  
monoecious (having male and female sex organs in the same individual), androdioecious (having perfect and staminate flowers on different plants)
- PHILOUS, -PHILIC 'loving', 'thriving in'  
necrophilic, anemophilous
- PLASTY 'formation', 'plastic surgical operation'  
arthroplasty, anaplasty, hysteroplasty
- RRHOEA 'flux', 'abnormal flow or discharge of'  
diarrhoea, gonorrhoea, logorrhoea
- STOMY- 'the making of a surgical opening'  
gastrostomy, arthroscopy, hepaticostomy

## *Roots, Part I*

- AMYGDAL- 'almond', 'tonsil'  
AMYGDAL-itis; inflammation of the tonsils, tonsillitis; AMYGDALAE, almond-shaped structures in the medial temporal lobes of the brain, responsible for memory and emotional reactions
- ANDR- 'man', 'male'  
ANDRO-GYN-y, hermaphroditism; ERG-at-ANDR-ous, having worker-like males
- ANTHROP- 'human being'

ANTHROPO-logy; ANTHROPO-MORPH-ism; ANTHROPO-philic, showing a preference for human beings over other animals

CHRON- 'time'  
 HETERO-CHRON-ism, departure from typical sequence in time of formation of organs; ana-CHRON-ism

CLAD- 'branch'  
 HETERO-CLAD-ic, describing a communication between branches of different arteries; PHYLLO-CLAD (or CLADO-PHYLL), a green, flattened or round stem that functions as a leaf, as in cacti.

DYNAM-, DYN- 'power'  
 a-DYNAM-ia, loss of vital strength or muscular power, weakness; DYNAMO-meter, an instrument for the measurement of muscular strength

EME- 'to vomit'  
 hyper-EME-sis, excessive vomiting; EME-tic, having the power to evoke vomiting

GYMN- 'naked', 'uncovered'  
 GYMNO-SOMAT-ous; GYMNO-CARP-ous, with naked fruit (applicable to lichens with uncovered apothecia); GYMNO-RHIN-al, having nostril region not covered by feathers, as some birds

GYN(E), GYNAEC- (GYNEC-) 'female'  
 GYNAECO-logy; ERG-ato-GYNE, female ant resembling a worker; GYN-ANDR-ous, having stamens fused with pistils, as some orchids; GYNAECO-MAST-ia, enlargement of the mammary gland in the male

HELIC-, HELIX 'spiral'  
 HELIX, the rounded, convex margin of the ear; ant-HELIX, the curved ridge of the pinna just anterior to the helix

HYDR- 'water', 'fluid'  
 HYDR-ARTHR-osis, accumulation of fluid in a joint; HYDRO-TROP-ism, response to the stimulus of water

IATR- 'physician', 'medical treatment'  
 PSYCH-IATR-y; POD-IATR-ist; IATRO-GEN-ic, induced by a physician; effect of physician's words or actions upon a patient

MELAN- 'black', 'dark'  
 MELAN-CHOL-y; MELAN-in, a dark brown or black animal or plant pigment; MELAN-IDR-osis, a form of chromhidrosis in which the sweat is dark coloured or black

NECR- 'corpse', 'dead tissue'  
 NECRO-TOX-in, a toxin produced by the death of cells; NECRO-PHAG-ous, eating carrion

OLIG- 'few', 'scanty'  
 OLIG-ANDR-ous, having few stamens; OLIGO-HYDR-uria, urine with a relative diminution of water, highly concentrated urine

PAED- (PED-) 'child' (-pedia, 'instruction')  
 PED-AGOG-y; PAED-IATR-ics; PAEDO-MORPH-ic, pertaining to retention in the adult of youthful and juvenile characteristics

PHAG- 'to eat'  
 PHAGO-CYTE, colourless blood corpuscle which tends to ingest foreign particles; PHYLLO-PHAG-ous, feeding on leaves

PHIL- 'to love', 'have an affinity for'  
 GEO-philous, living on or around earth; POLY-CHROMATO-PHIL-ism, capacity to be stained with more than one dye

POLY- 'many', 'much'  
 POLY-AESTHE-sia, an abnormality of sensation in which a single touch is felt in two or more places at the same time; POLY-PHAG-ous, eating various kinds of food; POLY-POD, furnished with many feet or legs

TARS- 'instep', 'edge of the eye'

TARS-ALG-ia, pain, especially of neuralgic character, in the tarsus of the foot; TARSO-plasty, plastic surgery of the eyelid

*Roots, Part II*

ACR- 'extremity', 'summit'

ACRO-MICR-ia, underdevelopment of the extremities and of the skull as contrasted with visceral development; ACRO-GER-ia, premature aging of skin of the hands and feet

AMYL- 'starch'

AMYLO-LYSIS, the digestion of starch or its conversion to maltose; AMYLO-PLAST, a leucoplast or colourless, starch-forming granule

BAR-; BARY- 'weight', 'pressure'; 'heavy'

BAR-AESTHE-sia, perception of weight or pressure; BAR-ODONT-ALG-ia, dental pain occurring in individuals exposed to decreased barometric pressures such as occur in high-altitude flying, also called AER-ODONT-ALG-ia

BLENN- 'mucus'

BLENN-OPHTHALM-ia, catarrhal conjunctivitis; OLIGO-BLENN-ia, a deficient secretion of mucus

CYT- 'cell'

CHROMO-CYTE, any coloured cell; CYTO-DERM, in botany, a cell wall; CYTO-STOME, the oral aperture of a unicellular organism

DIPS- 'thirst'

a-DIPS-ia, absence of thirst, avoidance of drinking; DIPSO-phobia, a morbid fear of drinking

DREPAN- 'sickle'

DREPANO-CYTE, a crescent-shaped cell

ERYTHR- 'red'

an-ERYTHRO-BLEPS-ia or an-ERYTH-OPS-ia, impaired colour perception of red, red blindness; ERYTHRO-PHYLL, a red colouring matter in some leaves and red algae

GLYC-; GLYCOS- 'sugar', 'glucose'

GLYCO-LYSIS, the process of conversion of carbohydrate in tissue into pyruvic acid or lactic acid; hyper-GLYCOS-uria, the presence of excessive amounts of sugar in the urine

HIST-, HISTI- 'tissue'

HISTO-KINE-sis, movement that takes place in the minute structural elements of the body; HISTO-meta-PLAS-tic, causing the transformation of one tissue into another type

HYSTER- 'uterus', 'hysteria'

HYSTER-ia; HYSTERO-tomy, incision of the uterus

ICHTHY- 'fish'

ICHTY-ODONT, a fossil fish tooth; ICHTHYO-TOX-ismus, food poisoning from fish

IRID-, IRIS- 'iris', 'rainbow'

IRIDO-CYTE, a special cell responsible for the iridescence (!) of many fishes; IRIDO-dia-lysis, the separation of the iris from its attachments; IRIDO-KINE-sia, any movement of the iris; IRIDO-PLEG-ia, paralysis of the sphincter pupillae of the iris

ISCH- 'to suppress'

ISCHO-MEN-ia, suppression of the menstrual flow; ISCH-uria, retention or suppression of the urine

LAPAR- 'abdomen', 'soft part of the body between the ribs and abdomen'

LAPARO-TRACHELO-tomy; low caesarian section

LIP- 'fat'



LIPO-CHROME or CHROMO-LIPO-id, any one of the group of fat-like substances containing a pigment or colouring matter and occurring in natural fats such as egg yolks

MAST-, MAZ- 'breast'

ACRO-MAST-itis, inflammation of a nipple; hyper-MAST-ia, overgrowth of the mammary gland; a-MAST-ia, congenital absence of the mammae

PHREN- 'mind', 'diaphragm'

PHREN-ic, pertaining to the mind or the diaphragm; GASTRO-PHREN-ic, pertaining to the stomach and the diaphragm, as the gastrophrenic ligament; HEBE-PHREN-ia, a type of schizophrenia characterized by extreme mannerisms, often caricaturing adolescent behaviour

PY- 'pus'

HYDRO-PYO-NEPHRO-sis, distention of the pelvis of the kidney with urine and pus; PYO-RRHE-a, a purulent discharge

THANAT- 'death'

THANTO-id, resembling death; THANATO-logy, the study of the phenomenon of organic death; THANATO-phobia, a morbid fear of death

### *Roots, Part III*

ACANTH- 'thorn', 'prickle'

ACANTH-AESTHE-sia, a sensation as of pricking with needles; ACANTHO-CLAD-ous, having spiny branches

AER- 'air', 'gas'

AERO-CYST, an air vesicle of algae; AERO-CYTO-SCOP-y, examination of the interior of the urinary bladder with a cystoscope, with the bladder distended with air; AERO-PHYTE, a plant which grows attached to an aerial portion of another plant

AGON- 'contest', 'to struggle'

AGON-y; AGON-ize; AGON-ist, (in anatomy) a muscle whose contraction moves a part of the body directly, (in biochemistry) a substance which initiates a physiological response when combined with a receptor

AUT- 'self'

AUT-OPS-y; AUTO-CYTO-TOX-in, a cell toxin produced against the cells of one's own body; AUT-ODONT, designating or pertaining to teeth not directly attached to jaws, as in cartilaginous fish; AUTO-PHAG-ia, self-consumption, emaciation; biting of one's own flesh, as in dementia

BLEPHAR- 'eyelid'

a-BLEPHAR-y, congenital absence of the eyelids; BLEPHARO-plasty, operation for the restoration of the eyelids; sym-BLEPHAR-osis, adhesion of the eyelids to the globe of the eye or to each other

CARCIN- 'cancer'

CARCINO-GEN, any cancer-producing substance; MASTO-CARCIN-oma, malignant mammary tumour

CHEIL-, CHIL- 'lip'

a-CHEIL-ia, congenital absence of the lips

COL- 'colon'

COLO-PROCTO-stomy, formation of a new passage between the colon and the rectum; para-COL-itis; inflammation of the tissue adjacent to the colon; PHREN-ico-COL-ic or PHRENO-COL-ic, pertaining to the diaphragm and the colon

COPR- 'excrement'

COPR-OD-aeum, the division of the cloaca which receives the rectum (cf. UR-OD-aeum); COPRO-LITH, a hard mass of faecal matter in the bowels

CRY-, CRYM- 'cold', 'ice'  
 CRY-AESTHE-sia, abnormal sensitiveness to cold

CYST- 'bladder', 'cyst', 'sac'  
 CYST-itis, inflammation of the urinary bladder; HAEMATO-CYST; a cyst containing blood; POLY-CYST-ic, containing many cysts

DACRY- 'tear' (i.e. from crying, etc.)  
 DACRYO-CYST-itis, inflammation of the lacrimal sac

GASTR- (GASTER-), 'STOMACH', 'BELLY OF A MUSCLE' GASTRO-  
 POD, a mollusc with ventral muscular disc adapted for creeping;  
 meta-GASTR-ic, pertaining to posterior gastric regions

HELMINTH- 'worm'  
 ant-HELMINT-ic, destructive to worms; HELMINTHO-logy, the study of parasitic worms; HELMINTH-oma, a tumour caused by the presence of a parasitic worm

HETER- 'other', 'different'  
 HETERO-CHROM-ia, a difference in coloration in two parts or structures that are normally alike, as the the irises of the eyes; HETERO-PHOR-ia, any tendency of the eyes to turn away from the position correct for binocular vision; HERTERO-PHOR-ALG-ia, pain caused by heterophoria

HYGR- 'moisture'  
 HYGRO-KINE-sis, movement in response to changes in humidity;  
 HYGRO-STOM-ia, chronic salivation

MEN- 'moon', 'menstruation'  
 MENO-PAUSE; ISCHO-MEN-ia

OT- 'ear'  
 di-OT-ic, binaural, pertaining to both ears; OTO-CYST, in invertebrates, an auditory vesicle, otocell or otidium, or in vertebrates, an embryonic auditory vesicle; OTO-LITH, calcareous particles or platelike structures found in the auditory organ of many mammals

PSYCH- 'mind', 'soul'  
 PSYCHO-logy; PSYCH-IATR-y

RHIN-, -RRHIN- 'nose'  
 amphi-RHIN-al, having or pertaining to two nostrils; GYMNO-RHIN-al, with nostril region not covered by feathers, as in some birds; RHIN-ENCEPHAL-on, that portion of the cerebrum concerned with olfactory impulses; RHINO-THECA, the sheath of the upper jaw of a bird

TAC-, TAX- 'to arrange', 'to put in order'  
 ANTHO-TAX-is, arrangement of flowers on an axis; PHYLLO-TAX-is, arrangement of leaves on an axis or stem; a-MYO-TAX-ia, muscular ataxia or incoordination of spinal or cerebellar origin

### LECTURE 3

Based on Ayers (1972), chapters 7–10.

#### *Noun-Forming Suffixes*

-TER 'means of', 'place of'  
 URE-, 'to urinate' + -ter = ureter; SCEP(T)-, 'to support oneself' + -ter = sceptre; SPHING-, 'to bind' + -ter = sphincter; CRA-, 'to mix' + -ter = crater (orig. a mixing bowl); THEA-, 'to view' + -ter = theatre

-IST, -AST 'one who'  
 ant- + AGON-, 'to struggle' + -ist; GYMN-, 'naked' + -ast; PSYCH-, 'mind' + IATR-, 'physician' + -ist; BACTER- 'bacterium' + -logy + -ist

-TE, -T 'one who', 'that which', (-tes)

- pro- + PHE-, 'to speak' + -t = prophet; GAME-, 'to marry' + -te = gamete; anti- + DO, 'to give' + -te = antidote; dia- + BE-, 'to go' + -tes = diabetes
- ICIAN 'specialist in', 'practitioner of'  
PAED-, 'child' + IATR-, 'physician' + -ician = paediatrician; DIET-, 'way of life' + -ician = dietician; MUS-, 'music' + -ician = musician
- IA, -Y 'state of', 'condition of', 'quality of'  
HYSTER-ia, PHILO-SOPH-y; NEUR-, 'nerve' + ALG-, 'pain' + -ia = neuralgia; AGON-, 'struggle' + y = agony; PHIL-, 'loving' + SOPH-, 'wise' + -y = philosophy
- ISM, -ISMUS 'condition of' ('belief in')  
ALCOHOL + -ism; BOTUL-, 'sausage' + -ism; meta-BOL-ism; LARGYNG-, 'larynx' + -ismus; STRAB-, 'to squint' + -ism
- SIS, -SIA, -SY, -SE 'act of', 'process of' (sometimes the result of the process)  
syn-THE-sis; dia-GNO-sis; a-MNE-sia; an-AESTHE-sia; ec-STA-sy  
NB: adjectival form -tic, -stic, 'pertaining to the act or process of', e.g. synthetic, analytic
- MA, -M, -ME, -MAT- 'result of the act of'  
CINE-ma; DRA-, 'to act' + -ma; STIG, 'to brand' + -ma; SCHIZ-, 'to split' + m; THE-, 'to place' + -me
- OMA, -OMAT- denoting tumours and other abnormal growths  
MELAN-oma; CARCIN-oma; HAEMAT-oma; GLAUC-oma; When followed by another element, the form is -omat-, e.g. MELAN-omat-ous
- OSIS 'diseased condition of', 'act of', 'process of'  
PSYCH-osis; NEUR-osis; HYPN-osis
- ITIS 'inflammation of', 'inflammatory disease of'  
APPENDIC-itis; ARTHR-itis; TONSILL-itis
- IN 'chemical substance'  
anti-TOX-in; INSUL-in; epi-NEHRH-ine
- IUM 'part', 'lining or enveloping tissue', 'region'  
peri-NEPHR-ium (the capsule of connective and fatty tissue about the kidney); epi-GASTR-ium (the upper and middle region of the abdomen)
- US 'condition', 'person'  
an-OT-us (a *Sphenomorphus anotus* is a lizard without external ears); HYDRO-CEPHAL-us (a condition in which fluid accumulates in the brain)
- IDAE, -IDA, -ID 'descended from', 'related to'  
ACAR, 'mite' + -idae; ARACHN-ida; ARACHN-id

### Roots, Part I

- ACTIN- 'ray'  
ACTINO-GEN-ic, producing radiation; ACTINO-STOME, mouth of the sea anemone, or five-rayed oral aperture of the starfish
- ARGYR- 'silver'  
ARGYR-ia, the dusty grey or bluish discolouration of skin and mucous membrane produced by the prolonged administration or application of silver preparations; HYDR-ARGYR-OPHTALMIA, ophthalmia due to mercurial poisoning
- BA- 'to step', 'to go', 'to walk'  
BASO-phobia, morbid fear of walking or of standing erect; basis; acrobat
- BROM- 'stench', 'bromine'  
BROMO-DERM-a; skin eruption due to ingestion of bromides; BROM-in-ism, bromine poisoning; bromide
- CHOL(E)- 'bile', 'gall'

CHOL-AGOGUE, agent which stimulates the flow of bile from the liver; CHOLO-CHROME, any bile pigment; EU-CHOLIA, normal condition of the bile; choleric; melancholy

CLAS- 'to break'  
 ARTHRO-CLAS-ia, breaking down of ankylosis of a joint; CARDIO-CLAS-is, rupture of the heart; iconoclast

CRANI- 'cranium'  
 amphi-CRAN-ia, headache affecting both sides of the head, as opposed to hemi-CRAN-ia; CHONDRO-CRANI-um, the embryonic cartilaginous cranium; peri-CRANI-um, the periosteum on the outer surface of the cranial bones

CRI-; CRIN- 'to separate', 'to distinguish'; 'to secrete'  
 epi-CRIT-ic, of sensory nerve fibres permitting very fine distinctions of temperature or touch; endo-CRINE, secreting internally; ENTERO-CRIN-in, a hormone produced by the intestinal mucosa stimulating the glands of the small intestine; critic; criterion

EURY(s)- 'wide'  
 EURY-PHAG-ous, subsisting on a wide variety of foods; PROCT-EURY-nter, an instrument for dilating the anus or rectum

HAEM-, HAEMAT-, (HEM-, HEMAT-) 'blood'  
 a-CARDIO-HAEM-ia, lack of blood in the heart; HAEMATO-BI-c, living in blood; HAEMATO-PHAG-ous, pertaining to a blood-sucking insect

HIDRO(s)- 'sweat'  
 syn-HIDROS-is, concurrent sweating; the association of perspiration with some other condition; ACRO-hyper-HIDROS-is, increased perspiration of the hands and feet; CHROM-HIDROS-is, a rare condition in which the sweat is coloured

LITH-, -LITE 'stone'  
 CRYO-LITE, sodium-aluminium fluoride, named from its icy appearance; DACRYO-LITH, a calcareous concretion in the lacrimal passages; LITHO-PHYLL, a fossil leaf or leaf impression

MYI- 'fly'  
 MYI-[i]asis, a disease caused by the invasion of fly larvae; OPHTHALMO-MYI-[i]asis, disease due to the presence of the larvae of flies in the eye

OP-, OPT- 'to see'  
 CHROMATO-PSEUD-OP-sis, colour blindness; em-METR-OP-sia, normal or perfect vision, wherein parallel rays are focussed exactly on the retina without the effect of accommodation; PROSOP-a-GNO-sia, inability to recognize faces (PROSOP-, 'face')

ORTH- 'straight', 'correct'  
 an-ORTH-ite, feldspar not at right angles in cleavage, oblique cleavage; ORTH-optic, pertaining to normal binocular vision

PHA-, PHAN- 'to appear', 'to show'  
 dia-PHANE, transparent investing membrane of an organ or a cell; MYO-PHAN, muscle-like, applies to striation of protozoa; MENO-PHAN-ia, first appearance of the menses

RHE-, -RRH 'to flow', 'current'  
 dia-RRHOE-a; CRYPTO-RHE-tic, secreting internally, endocrine; RHEO-CARDIO-GRAPH-y, recording of differences of electrical conductivity of the body synchronous with the cardiac cycle; RHEO-PHORE, an electrode

SCOP- 'to view'  
 CRYO-SCOPE, device for determining the freezing point of any liquid; endo-SCOPE, instrument used to examine an internal body cavity or viscus through its natural opening; SCOPO-phobia, morbid dread of being seen

STA- 'to stand', 'to stop', 'to fix', 'to regulate'

a-cata-STA-sia, irregularity, nonconforming to type; BLEPHARO-dia-STA-sis, excessive separation of the eyelids, inability to close the eyelids completely; HAEMO-STA-sis, the stopping of a flow of blood

STYL- 'pillar'

STYLE, the slender upper part of the pistil; sy-STYL-ous, in botany, with coherent styles

### *Roots, Part II*

BLEP- 'to see'

a-BLEP-sia, loss or absence of vision; MONO-BLEP-sia, a condition in which either eye is stronger than both together, or a form of colour blindness in which only one colour can be perceived

COR(E)- 'pupil of the eye'

CORE-dia-STA-sis, dilatation of the pupil; CORE-LY-sis, the detachment of iritic adhesions to the lens or cornea; POLY-COR-ia, the existence of more than one pupil in an iris

CRA- 'to mix'

CRA-sis, constitution, make-up; HAEMATO-dys-CRA-sia, diseased state of the blood; hypo-CRA-ter-iform, saucer-shaped

CYAN- 'blue'

CYANO-PHYLL, a bluish-green colouring matter in plants; CYAN-OP-ia or CYAN-OP-sia, a condition in which all objects seen are rendered blue

CYE- 'to be pregnant'

CYO-PHOR-ia, pregnancy, gestation; pseudo-CYE-sis, false or phantom pregnancy

GALACT-, GALA- 'milk'

GALACT-in, an amorphous substance derived from milk, a potent hormone stimulating lactation; GALACTO-RRHE-a, excessive flow of milk

GEU- 'to taste'

dys-GEU-sia, morbidity or distortion of the sense of taste; hyper-GEU-sia, abnormal acuteness of the sense of taste

GLOSS-, GLOT(T)- 'tongue', 'language'

BRADY-GLOSS-ia, slow speech due to difficulty in tongue movements; PHRENO-GLOTT-ismus, spasm of the glottis caused by disease of the diaphragm

IDI- 'one's own', 'peculiar', 'distinct'

IDIO-BIO-logy, the branch of biology concerned with the study of organisms as individuals; IDIO-CHROM-atic, having a distinctive and constant coloration, used especially of minerals; IDIO-TYPE, individual genotype, set of all hereditary determinants of an individual

IS- 'equal', 'same'

ISO-ZO-ic, inhabited by similar forms of life; ISO-metr-ic, pertaining to equality of measure

LAL- 'to talk'

BRADY-LAL-ia, slowness of utterance; ENANTIO-LAL-ia, a disturbance in mental and speech function which prompts ideas and words opposite those presented as stimuli; RHINO-LAL-ia, a nasal tone in the voice due to undue closure or patulousness of the choanae

MEGA-, MEGAL- 'large', 'one million'

HYDRO-MEGA-THERM, a plant which must have much heat and moisture to develop fully; MEGAL-OP-ic, belonging to the megalops stage, i.e. a larval stage of certain crustaceans, conspicuous by large, stalked eyes; MEGA-PHYLL-ous, having relatively large leaves

MOGI- 'difficult'

- MOGI-LAL-ia, difficulty in speech, such as stuttering or stammering;  
MOGI-GRAPH-ia, writer's cramp
- NE- 'new', 'new and different form of'  
GLYCO-NEO-GENE-sis, the formation of carbohydrates from substances which are not carbohydrates; NEO-PLAS-m, any new growth, usually applied to a tumour, an aberrant new growth; NEO-phobia, dread of new scenes or novelties
- ODYN- 'pain'  
an-ODYNE; GLOSS-ODYN-ia, pain in the tongue; MY-ODYN-ia, muscular pain
- ONYCH- 'finger or toenail', 'claw'  
ACR-ONYCH-ous, having claws, nails or hoofs; ONYCHO-HETERO-TOP-ia, an anomaly consisting of the presence of abnormally situated nails
- PATH- 'disease', 'suffering', 'feeling'  
sym-PATH-y; IDIO-PATH-ic, pertaining to a primary disease, i.e., one not the result of any other disease, but of spontaneous origin, or a disease for which no cause is known; PATHO-MIME-sis, imitation of the symptoms and signs of a disease
- PEP(S)-, PEPT- 'to digest'  
PEPS-in, a substance containing a proteolytic enzyme obtained from the glandular layer of a hog's stomach; PEPT-ic, pertaining to pepsin; pertaining to digestion, as peptic ulcer
- PSEUD- 'false'  
PSEUDO-NYM; CHROMATO-PSEUD-OPS-is, colour blindness; PSEUDO-BLEPS-ia, a visual hallucination, a distorted visual image; PSEUDO-CYE-sis, phantom pregnancy
- TELE- 'afar', 'operating at a distance'  
TELE-PHONE; TELE-therapy, treatment at a distance, e.g. by a source or radiation at a distance from the patient

*Roots, Part III*

- ADEN- 'gland'  
ADENO-PHORE, the stalk of a nectar gland; HETER-ADEN-ia, an abnormality in the formation or location of gland tissue
- ANGI- 'vessel'  
ANGIO-STOMAT-ous, narrow-mouthed (applicable to molluscs and snakes with nondistensible mouths); GAMET-ANGI-um, a structure producing sexual cells
- ARACHN- 'spider' (occasionally 'arachnoid membrane')  
ARACHN-ida, a large class of ARTHRO-POD-a which includes spiders and mites; ARACHN-idium, device by which a spider web is produced
- ASTR-, ASTER- 'star'  
ASTER, the radiating structure surrounding the centrosome of a cell, seen at the beginning of mitosis; CYT-ASTER, the starlike system of cytoplasmic radiations surrounding the central body during mitosis; ASTER-oid, one of the small 'planets' between Jupiter and Mars
- BLAST- 'bud', 'germ', 'embryonic cell'  
ASTRO-BLAST, a primitive cell which develops into an ASTRO-CYTE; LIPO-BLAST, a formative fat cell
- CHLOR- 'green', 'chlorine'  
CHLORO-PLAST, a minute granule or plastid containing chlorophyll; CHLOR-osis, green sickness, a type of anemia; hypo-CHLOR-uria, diminution in the amount of chloride in the urine
- COCC- 'berry-shaped organism'

CYTO-COCC-us, nucleus of a fertilized egg; PYO-COCC-us, any pus-producing coccus; STREPTO-COCC-us, a genus of gram-positive, chain-forming bacteria

CONI- 'dust'  
 CON-idio-PHORE, bearing conidia, a fungal spore; OTO-CONI-um, one of minute crystals of calcium carbonate found in membranous labyrinth of the ear, or ear dust

EO(s)- 'dawn or early age', 'rosy'  
 EO-LITH-ic, relating to the earliest period of the Stone Age; EOS-in, red crystalline fluorescent dye

LY- 'to loosen', 'to dissolve', 'to break up'  
 DERMATO-LY-sis, abnormal laxation of the skin; LITHO-dia-lysis, solution of calculi in the urinary bladder; breaking up of a vesical calculus before its removal; LY-sin, a cell-dissolving substance

MENING- 'membrane', especially 'meninges, membranes enveloping the brain and spinal cord' ('MENINX')  
 MENING-uria, presence or passage of membranous shreds in the urine; MENING-itis, inflammation of the membranes of the brain or spinal cord

METR- 'uterus'  
 HAEMATO-METR-a, an accumulation of blood or menstrual fluid in the uterus

MYC-, MYCET- 'fungus'  
 ACTINO-MYC-osis, a parasitic, infections, inoculable disease, affecting cows, pigs and sometimes humans; MYCO-DERM, a bacterial film formed during fermentation

MYEL- 'spinal cord', 'marrow'  
 HYDRO-MYEL-ia, a dilatation of the central canal of the spinal cord containing an increased quantity of cerebrospinal fluid; MENINGO-ENCEPHALO-MYEL-itis; inflammation of the meninges, brain and spinal cord

NEUR- 'nerve', 'nervous system', 'tendon'  
 ARGYRO-NEUR-ous, with silver-coloured nerves or veins; CRYPT-NEUR-ous, with no definite or distinct nervous system; NEURO-ana-TOMY, the nervous system; NEURO-TOMY, the division of a nerve

ORCH(I)-, ORCHID- 'testicle'  
 syn-ORCH-ism, partial or complete fusion of the testes within the abdomen or scrotum; CRYPT-ORCH-ism, failure of the testes to descend; ORCHID-ectomy, surgical removal of the testicles, castration

PAN-, PANT- 'all', 'complete'  
 PAN-GAM-ic, pertaining to indiscriminate mating, or found in all seeds; PAN-GE-a; PAN-ZOO-tic, in veterinary medicine, affecting many kinds of animals

PNEUMON-, PNEUM- 'lung'  
 PNEUMO-LITH, a calculus or concretion in a lung; PARA-PNEUMO-ia, a disease presenting the symptoms of lobar pneumonia but not caused by the PNEUMO-COCC-us

POLI- 'grey'  
 POLI-ENCEPHALO-MYEL-itis, inflammation of the grey matter of the brain and spinal cord; POLIO-MYEL-itis, polio; POLIO-ENCEPHALO-pathy, any disease of the grey matter of the brain

THROMB- 'clot'  
 THROMBO-CYTE, blood platelet; THROBO-CYTO-CRIT, a glass tube for counting blood platelets; THROMBO-PLAST-in, extracts which promotes clotting

*Roots, Part IV*

- AGOG(UE)- 'inducing the flowing', 'expelling' (orig. 'to lead' or 'to drive')  
CHOL-AGOGUE, agent promoting the flow of bile; GALACT-AGOGUE, an agent that promotes the flow of milk; HELMINTH-AGOGUE, agent expelling worms from the body, an ant-HELMINT-ic
- ARCH(E)- 'ancient', 'beginning', 'primitive'  
ARCH-ENTER-on, embryonic alimentary cavity
- AUX(E)- 'increase'  
AUXE-sis, increase in size or bulk; AUX-in, a plant hormone which governs cell extension or growth; AUXO-BAR-ic, increasing pressure, denoting development of pressure in the cardiac ventricle
- DIDYM- 'twin', 'testicle'  
ISCHIO-DIDYM-us, twins conjoined at the hip; DIDYMO-SPORE, a two-celled spore; DIDYM-itis, same as ORCH-itis
- GYR- 'circle', 'ring'  
GYR-oid-al, spiral in arrangement; GYR-ose, with undulating lines, sinuous; OPHTHALMO-GYR-ic, pertaining to or causing movements of the eye
- HIPP- 'horse'  
HIPPO-POTAM-us; HIPPO-DROME; EO-HIPP-us, a genus of small, primitive horses; HIPP-UR-ic acid, an acid found in high concentration in the urine of herbivorous animals
- ISCHI- 'hip'  
ISCHIO-ALG-ia, pain in the hip or lower back, sciatica; SAUR-ISCH-ia, an order of class Reptilia distinguished by a pelvis; ISCHIO-DIDYM-us, twins conjoined at the hip
- LEP- 'to seize'  
epi-LEP-sy; NARCO-LEP-sy, a condition characterized by a transient compulsive tendency to attacks of deep sleep; NYMPHO-LEP-sy, ecstasy of an erotic type, supposed to be caused by nymphs
- MACR- 'large', 'long'  
MACRO-CARP-ous, producing large fruit; MACRO-GLOSS-ia, enlargement of the tongue; MACR-OPS-ia, disturbance of vision in which objects seem larger than they are
- MEL- 'limb'  
GASTRO-MEL-us an individual with an accessory limb attached to the abdomen; a-MEL-us, person minus a limb or limbs
- MICR- 'small', 'one millionth'  
hypo-MICRO-GNATH-us, an individual having an abnormally small lower jaw; MICRO-LITH-iasis, formation of very minute calculi; MICRO-MEL-ia, abnormal smallness of the limbs
- NARC- 'stupor', 'make numb'  
NARCO-LEP-sy; NARCO-tic, drug which produces a stupor, complete insensibility or sleep
- OMPHAL- 'navel'  
ACR-OMPHAL-us, centre of the umbilicus, or unusual prominence of the navel; OMPHALO-GENE-sis, development of the umbilical vesicle and cord
- PEX-; PAG- 'to fasten'; 'united'  
ISCHIO-PAG-us, same as ISCHIO-DIDYM-us; CRANIO-PAG-us, conjoined twins united by their heads; HYSTERO-PEX-y
- PLATY(s)- 'broad', 'flat'  
PLATY-PUS (flat-footed); PLATY-CEPHAL-ic, characterizing a person with a flat skull
- SAPR- 'rotten'  
SAPRO-BI-c, living on decaying organic matter; SAPRO-PHYT-ic, pertaining to a plant that lives on decaying organic matter



SIAL- 'saliva'

GLYCO-SIAL-ia, presence of glucose in saliva; SIALO-LITH-iasis, presence of salivary calculi

STHEN- 'strength'

ADEN-a-STHEN-ia, functional deficiency of a gland; an-ISO-STHEN-ia, not of equal power, said of pairs of muscles

TACH(Y)- 'swift'

TACHY-PHAG-ia, rapid eating; TACH-inidae, a large family of rapid-flying, two-winged insects

UR- 'tail'

URO-STHEN-ic, having tail strongly developed for propulsion; URO-STYLE, posterior part of vertebral column in anurous amphibians

#### LECTURE 4

Based on Ayers (1972), chapters 11–14.

#### *Greek Diminutive Suffixes*

-IUM, -ION 'little'

BACTER-ium, 'little rod' (*bacteria* is plural); POD-ium, 'little foot' (tube foot of echinoderm); THEC-ium, 'little case' (the spore-bearing layer in fungi); STOM-ion, 'little mouth' (the midpoint of the oral fissure determined with the lips closed)

-IDIUM, -IDION 'little'

CONI, 'dust' + -idium = conidium, a spore produced asexually by various fungi; BAS-, 'base' + -idium = basidium, a microscopic club-shaped spore-bearing structure produced by certain fungi; PLAST-, 'to mould' + -idion = plastidion, any of various small bodies of specialized protoplasm lying in the cytoplasm of cells

-ARIUM, -ARION 'little'

CON-, 'cone' + -arium = conarium, pineal body; HIPPI-, 'horse' + -arion = Hipparion, a genus of extinct three-toed mammals related to horses

-ISK, -ISCUS 'little'

ASTER-, 'star' + -isk = asterisk; LEMN-, 'ribbon' + -iscus = lemniscus, a secondary sensory pathway of the central nervous system; MEN-, 'moon' + -iscus = meniscus, a crescent or crescentic body

#### *Greek Verb-Forming Suffixes*

-IZE 'to make', 'to treat', 'to do something with'

CARBON-, 'coal' + -ize = carbonize; syn- + CHRON-, 'time' + -ize = synchronize; ant(i) + AGON-, 'to struggle' + -ize = antagonize

-ATE 'to make', 'to treat', 'to do something with'

GYR-, 'circle' + -ate = gyrate; AER-, 'air' + -ate = aerate; de- + HYDR- + -ate = dehydrate

#### *Bases, Part I*

ASC- 'bag'

ASC-us (pl. asci), a sac, typically cylindrical in shape, in which the spores of ascomycete fungi develop; ASCO-genous, producing asci; ASCO-MYCETE, a fungus whose spores develop within asci

BRANCHI- 'gills'

BRANCHI-a, the gills of fish and some invertebrate animals; meta-BRANCHI-al, pertaining to or in the posterior gill region; PHYLLO-BRANCHI-a a gill consisting of numbers of lamellae or thin plates

CARP- 'fruit'

ACTINO-CARP-ous, of plants with flowers and fruit radially arranged; ANGIO-CARP-ic, having or being fruit enclosed within an external covering, opposite of GYMNO-CARP-ic

-CELE 'hernia', 'swelling'  
 ENTERO-CELE, hernia containing a loop of intestine; HYDRO-MYELO-CELE, excessive accumulation of a fluid in the central canal of the spinal cord; GALACTO-CELE, a cystic tumour in the ducts of the breast; VARICO-cele, a mass of varicose veins in the spermatic cord

COLP- 'vagina', 'womb'  
 COLPO-SCOPE, a surgical instrument used to examine the vagina and the cervix of the womb; PYO-COLPO-CELE, a suppurating cyst of the vagina

GEN(E), GON- 'to be produced', 'to produce'; 'seed'  
 GENE-sis; eu-GEN-ics (i.e. 'producing well'); COCCO-GONE, a reproductive cell in certain algae; GON-ad, an organ that produces gametes; a testis or ovary

HELI- 'sun'  
 HELIO-CENTR-ic; HELI-um; HELIO-TAX-is, locomotor or other response to stimulus of sunlight; HELIO-LITH-ic, marked by sun worship and erection of megaliths

MER- 'part'  
 MER-ONYM, a term which denotes part of something but which is used to refer to the whole of it; ADENO-MERE, that portion of a developing gland which will be responsible for its functioning; dys-MERO-GENE-sis, segmentation resulting in unlike parts

NYCT- 'night'  
 NYCTI-TROP-ism, tendency of certain leaves to curl upward at night; NYCT-ALOP-ia, a condition characterized by an abnormal inability to see in dim light or at night; NYCTO-phobia, extreme or irrational fear of the night or of darkness

ONYM- 'name'  
 an-ONYM-ous; PSEUD-ONYM; hyp-ONYM, a generic name not based on a type species

OO- 'egg'  
 OO-CYTE, a cell in an ovary which may undergo meiotic division to form an ovum; OO-CYST, a cyst containing a zygote formed by a parasitic protozoan such as the malaria parasite

PACHY- 'thick'  
 PACHY-DERM, a very large mammal with thick skin; PACHY-ACR-ia, condition marked by clubbing fingers and toes; PACHY-CLAD-ous, thick-branched; PACHY-SANDR-a, an evergreen creeping shrubby plant of the box family

PEN- 'deficiency', 'want'  
 PEN-ury, extreme poverty; GLYCO-PEN-ia, tendency towards hypoglycaemia

PHLEB- 'vein'  
 PHLEB-itis, inflammation of the walls of a vein; phlebotomy; METRO-PHLEB-itis, inflammation of the veins of the uterus; PHLEBO-tomy, the surgical opening or puncture of a vein in order to withdraw blood, to introduce a fluid, or (historically) when letting blood

PHYC- 'seaweed', 'algae'  
 PHYCO-logy, the branch of botany concerned with seaweeds and other algae; CHLORO-PHYC-eae, algae having clear, green colour; DREPANO-PHYC-us, genus of fossil plans

PTO- 'to fall'  
 PTO-sis, drooping of the upper eyelid; pro-PTO-sis, falling downward, prolapse (e.g. abnormal protrusion of the eyeball); PTO-ma-ine, an

amino compound which results from decomposition of protein or dead animal matter by micro-organisms

SALPING- 'tube'; specifically relating to the fallopian tubes (orig. 'trumpet')  
SALPING-ectomy, surgical removal of the fallopian tubes; SALPINGO-CYE-sis, tubal pregnancy

SAUR- 'lizard'

DINO-SAUR; SAURO-POD, a dinosaur with massive limbs;  
BRANCHIO-SAUR, small, prehistoric amphibian, similar to a salamander; SAUR-ian, like a lizard; SAURO-GNATH-us, with saurian arrangement of jaw bones

XANTH- 'yellow'

XANTH-ic, yellowish; XANTH-OP-sia, visual disturbance in which objects look yellow; XANTHO-CHROM-ia, a yellowish discolouration of the skin

### Roots, Part II

-AGRA 'painful seizure'

ARTH-AGRA, muscular pain in the joints; MEL-AGRA, muscular pain in the limbs

BRACHI- 'arm'

BRACHI-al, relating to the arm; MACRO-BRACH-ia, excessive development of the arms; MONO-BRACHI-us, an individual congenitally lacking one arm; BRACHIO-SAUR-us, a dinosaur with forelegs much longer than the hind legs

CENTE- 'to puncture', 'to prick'

ENTERO-CENTE-sis, surgical puncture of the intestine; PNEUMONO-CENTE-sis, surgical puncturing of a lung; *centre* is also from this root (via *kentron*, 'sharp point, stationary point of a pair of compasses')

CHIR-, CHEIR 'hand'

CHIRO-PRACT-ic; CHIRO-GRAPH-y, handwriting; MEGALO-CHIR-ous, large-handed; POLY-CHEIR-ia state of having a supernumerary hand

COEL(I)-, (CEL-), -COEL 'cavity', 'abdominal cavity', 'belly'

COELI-ac, relating to the abdomen; COELIO-tomy, opening of the abdominal cavity; ENCEPHALO-COEL, cavity within the brain, cerebral ventricle (cf. encephalocele, a hernia of the brain)

DENDR- 'tree'

RHODO-DENDR-on (RHODO-, rose-coloured); DENDR-ite or DENDR-on, a short branched extension of a nerve cell

HYAL- 'glass', 'vitreous body of the eye'

HYAL-in, a clear substance produced especially by the degeneration of epithelial or connective tissues; HYAL-oid, glassy or transparent (e.g. hyaloid membrane); HYLALO-MERE, clear, homogeneous part of the blood

LARYNG- 'larynx'

LARYNG-itis, inflammation of the larynx; LARYNGE-al, relating to the larynx; LARYNGO-logy, the branch of medicine that deals with the larynx and its diseases; LARYNGO-tomy, surgical incision into the larynx

LEI- 'smooth'

LEIO-DERM-ia, condition of abnormal smoothness and glossiness of skin; LEIO-THRIX, an Asian bird of the babbler family

MALAC- 'soft'

MALACO-logy, study of molluscs; MALACO-philous, adapted to polination by snails

MASTIG- 'whip', 'flagellum'

MASTIG-ium, defensive posterior lash of certain larvae; HETERO-MASTIG-ate, having two different types of flagella (a *flagellum* is a slender thread-like structure, especially a microscopic whip-like appendage which enables many protozoa, bacteria, spermatozoa, etc. to swim)

MIS- 'hate'

MIS-ANTHROP-y, a dislike of humankind; MISO-GYN-ist, a person who hates women; MISO-GAM-y, the hatred of marriage

PTER-, PTERYG- 'wing'

HELICO-PTER; PTERO-DACTYL; an-ISO-PTER-ous, unequally winged, applies to seeds; HYALO-PTER-ous, having transparent wings

SCHIZ-, SCHIS(T)- 'to split'

SCHIZO-PHREN-ia, lit. having a split mind; ana-SCHIS-tic, applied to a type of tetrads which divides twice longitudinally in meiosis; SCHISTO-GLOSS-ia, condition of having a cleft tongue

SPLANCHN- 'entrails', 'viscera'

SPLANCHN-ic, relating to the viscera or internal organs, especially those of the abdomen; SPLANCHNO-dia-STA-sis, displacement or separation of the viscera; SPLANCHNO-PLEURE, a layer of tissue in a vertebrate embryo comprising the endoderm and the inner layer of mesoderm (cf. somatopleure; *pleura*, 'side')

THI- 'sulphur'

THIO-BACTER-ia, bacteria which grow where decaying organic matter releases hydrogen sulphide; THIO-GEN-ic, applies to sulphur-producing bacteria

THORAC- 'chest', 'thorax'

THORAC-ic, relating to the thorax; THORACO-tomy, surgical incision into the chest wall; HAEMO-THORAX, accumulation of blood in the pleural cavity; THORACO-MEL-us, parasitic limb attached to the thorax of a host

TOX- 'poison'

TOX-ico-DERMAT-itis, skin inflammation due to poison; TOX-ico-DENDR-on, genus of plants including poison ivy and oak; TOX-ico-GNATH, poison fangs of the centipede

TRICH-, (THRIX-) 'hair'; 'be hairy'

TRICH-iasis, ingrowth or introversion of the eyelashes; amphi-TRICH-ous, with flagellum at each pole; SCHIZO-TRICH-ia, splitting of the hair; TRICHO-logy, the branch of medical and cosmetic study and practice concerned with the hair and scalp

XER- 'dry'

XER-ic, containing little moisture; XERO-PHYTE, a plant which needs very little water; XERO-PHOB-ous, having little capacity to resist drought; XERO-THERM, a plant which survives drought and heat

### Roots, Part III

ALL- 'other', 'different'

ALLE-GOR-y, a story, poem, or picture which can be interpreted to reveal a hidden meaning, typically a moral or political one; ALLO-plasty, a plastic operation in which material outside the human body is used; ALLO-PATR-ic, animals or plants occurring in separate non-overlapping geographical areas

ANKYL- 'bent', 'stiff', 'adhesion of parts'

ANKYLO-CHEIL-ia, adhesion of the lips; ANKYL-osis, abnormal stiffening and immobility of a joint due to fusion of the bones; ANKYLO-SAUR, a heavily built dinosaur

CYCL- 'circle', 'wheel'

BI-CYCLE; en-CYCLO-PED-ia; a-CYCL-ia, state of arrested circulation of bodily fluids; CYCLO-COEL-ic, with intestines coiled in one or more distinct spirals

ER-, EROT- 'love', 'sexual love'  
 AUTO-EROT-ic, relating to sexual excitement generated by stimulating or fantasizing about one's own body; ALLO-EROT-ism, sexual excitement induced by and directed toward another

GENY-; GENI- 'jaw', 'cheek'; 'chin'  
 GENY-plasty, surgical reconstruction of the jaw; GENIO-GLOSS-us, muscle of the tongue arising from the mandible

HOL- 'whole', 'entire'  
 CAT-HOL-ic (in respect of the whole); HOLO-CAUST (burning of the whole); HOLO-GASTRO-SCHIS-is, fissure involving the whole length of the abdomen

HOM-, HOME- 'same', 'similar'  
 HOMO-CHROM-ous, of one colour; HOMO-PHONE, pronounced alike but different in meaning or derivation or spelling; HOMO-PTER-ous, having wings alike

HYPN- 'sleep'  
 HYPN-AGOG-ic, inducing sleep, pertaining to inception of sleep, applies to visions seen just before complete sleep

IDE- 'idea', 'mental image'  
 MONO-IDE-ism, absorption in a single idea, as in mental depression, hypnosis or trance; IDEO-phobia, morbid fear of ideas

LEUK-, (LEUC-) 'white'  
 LEUK-AEM-ia; LEUKO-CYTE, a colourless cell which circulates in the blood; LEUKO-ENCEPHAL-itis, inflammation of the white substance of the brain

ONT- 'being', 'individual'  
 ONTO-logy, the branch of metaphysics dealing with the nature of being; SCHIZ-ONT, a cell that divides by schizogony to form daughter cells (in biology, *-ont* denotes an individual or cell of a specified type)

PHYL- 'race'  
 PHYL-um, (in zoology) a principal taxonomic category that ranks above class and below kingdom; POLY-PHYL-etic, a group of organisms derived from more than one common evolutionary ancestor or ancestral group and therefore not suitable for placing in the same taxon

PYEL- 'pelvis (especially of the kidney)'  
 CYSTO-PYEL-itis, inflammation of the urinary bladder and pelvis of the kidney; PYELO-stomy, incision of the renal pelvis; PYELO-GRAPH-y, an X-ray technique for producing an image of the renal pelvis and urinary tract

PYG- 'rump'  
 PYG-id-ium, the terminal part or hind segment of the body in certain invertebrates; PYGO-POD-ous, having feet set far back, as some birds

STEAR-, STEAT- 'fat', 'tallow'  
 STEAT-itis, inflammation of adipose tissue; STEAT-oma, a sebaceous cyst or tumour of a sebaceous gland; STEAR-in, a white crystalline substance which is the main constituent of tallow and suet

STREPT-, STROPH- 'turned', 'twisted'  
 PHLEBO-STREP-sis, the twisting of a vein; STREPTO-COCC-us, a bacterium of a genus that includes the agents of souring of milk and dental decay, and haemolytic pathogens causing various infections such as scarlet fever and pneumonia

THALL- 'young shoot'  
 THALLO-PHYTE, plant not differentiated into stem and root, such as algae, fungi and lichens; THALL-us (*pl.* thalli), a plant body that is not

differentiated into stem and leaves and lacks true roots and a vascular system (i.e. algae, fungi, lichens, and some liverworts)

THYM- 'mind', 'emotions'

eu-THYM-ia, a joyful but tranquil mood; hyper-THYM-ia, heightened emotional response; hypo-THYM-ia, subnormal emotional response and depression

TRIB-, TRIP- 'to rub', 'to crush'

OMPHALO-TRIP-sy, separation of the umbilical cord by a crushing instrument; XERO-TRIP-sis, dry friction

ZYG- 'yoke'; relating to joining or pairing

ZYG-ODONT, having molar teeth in which the four tubercles are united in pairs; ZYG-ote, cell formed by the union of two gametes or reproductive cells (a fertilized ovum)

### *Counting in Greek*

HEMI- 'half'

HEMI-SPHERE, a half of a sphere; HEMI-BRANCH, a gill having filaments on one side only, a half-gill; HEMI-NEPHR-ectomy, removal of part of a kidney; HEMI-an-OP-ia or HEMI-an-OP-sia, blindness over half the field of vision; HEMI-ALG-ia, pain affecting one half of the body.

MON- 'single', 'one'

MON-ARCH; MONO-GRAPH, a detailed written study of a single specialized subject or an aspect of it; MONO-CARP-ic, a plant flowering only once and then dying; MONO-TRICH-ous, having only one flagellum at one pole (opp. *amphi-TRICH-ous*)

PROT- 'first', 'original', 'primitive'

PROTO-CEPHAL-on, first of six segments composing an insect's head; PROTO-PHYTE, any plant of the lowest and most primitive type; PROTO-ZO-an, a unicellular or noncellular animal organism

DI- 'twice', 'double'

DI-LEM-ma, a situation in which a difficult choice has to be made between two or more alternatives; DI-PLO-ma ('folded paper'); DI-ARTHR-osis, a freely movable articulation; DI-oecious, having sexes separate, usually refers to plants which have male and female flowers on different individuals

DICH- 'in two'

DICHO-tomy, a division or contrast between two things (in botany, repeated branching into two equal parts); DICH-OP-tic, having the borders of the compound eyes separate, or having the eyes wide apart (of an insect)

DEUT-, DEUTER- 'second'

DEUTER-AGON-ist, the person second in importance to the protagonist in a drama; DEUTERO-nomy ('second law'); DEUTERO-GENE-sis, second phase of embryonic development

TRI- 'three'

TRI-POD; TRI-CYCLE; TRI-CHROMAT-ic, able to perceive the three primary colours; TRI-DACTYL, having three digits; TRI-COCC-us, a three-carpel fruit

TETR(A)- 'four'

TETRA-meter; TETRA-CHEIR-ous, having four hands; TETRA-CYCL-ic, with four whorls

PENT(A)- 'five'

PENTA-GON; PENTA-meter; PENTA-DACTYL, having all four limbs normally terminating in five digits

HEXA- 'six'

HEXA-GON-al; HEXA-meter; HEXA-GYN-ous, having six pistils; HEXA-hedron, a POLY-hedron having six faces; HEX-ose, any monosaccharide containing six carbon atoms

HEPT(A)- 'seven'

HEPTA-GYN-ous, having seven pistils; HEPTA-HYDR-ate, a compound with seven molecules of water

OCT(A)- 'eight'

OCTO-PUS; OCT-ODONT, having eight teeth; OCT-OPHTHALM-us, having eight eyes

ENNE(A)- 'nine'

ENNE-ad, a group of nine; ENNEA-GON, a nine-sided polyhedron; ENNE-ANDR-ous, having nine stamens

DEC(A)- 'ten'

DECA-LOGUE, the Ten Commandments; DECA-HYDR-ate, compound with ten molecules of water; DECA-hedron, a ten-sided polyhedron; DECA-POD, having ten legs

HECT- 'hundred'

HECT-ARE, one hundred ares (10,000 square metres); HECTO-GRAM, one hundred grams

KILO- 'one thousand'

KILO-CALOR-ie, one thousand calories (equal to one large calorie); KILO-GRAM, one thousand grams

## LECTURE 5

Based on Ayers (1972), chapters 15–18.

### *Roots, Part I*

BRACHY- 'short'

BRACHY-ODONT or BRACHY-DONT, a molar tooth with a low crown; BRACHY-PODUS; BRACHY-logy, concise or shortened expression

CAC-, (ΚΑΚ-) 'bad'

CACO-PHON-y; CAC-AESTHE-sia, any morbid sensation; CAC-OSM-ia, imaginary odours, particularly putrefactive odours

CAU-, CAUS- 'to burn'

CAUS-tic; en-CAUS-tic; CAUM-AESTHE-sia, experience of a sense of heat when temperature is not high; CRYO-CAUT-ery, the destruction of tissues by application of extreme cold; CAUT-er-ize to apply an agent capable of burning or destroying tissue

CLI-, CLEI-; CLEIST- 'to close'; 'closed'

CLEISTO-GAM-y, state of having small, inconspicuous, self-fertilizing flowers; fertilization without opening of florets; CORE-CLI-sis, pathologic closure or obliteration of the pupil

CLY(S)- 'to wash'

cata-CLYSM; ENTERO-CLY-sis, injection of a fluid preparation into the rectum; hypo-DERMO-CLY-sis, introduction of large quantities of fluids into subcutaneous tissues

CROT- 'pulse beat'

TRI-CROT-ism, the condition of having three waves corresponding to one pulse beat

DOLICH- 'long'

DOLICHO-PLATY-CEPHAL-us, a person having a long skull which is unusually broad; DOLICHO-RRHINE, having a long nose

OEDE- (EDE-) 'to swell'

OEDE-ma, excessive accumulation of fluid in tissue spaces; ARTHR-OEDE-ma, oedema affecting the joints; TROPH-OEDE-ma, oedema due to damaged nourishment or nerve supply

LEPT- 'thin', 'delicate'  
 DOLICHO-LEPTO-CEPHAL-us, a person whose skull, in addition to being long, is also high and narrow; LEPTO-DERMAT-ous, thin-skinned

LOG- 'word', 'speech', 'reason'  
 ana-LOG-ous; dys-LOG-ia, difficulty in expression of words by speech; LOGO-PLEG-ia, loss of power of uttering articulate speech

MES- 'middle'  
 MESO-POTAM-ia; MESO-PHYTE, plant thriving in a temperate climate with a normal amount of moisture; MESO-POD-ium; middle part of the molluscan foot

MYX- 'mucus', 'slime'  
 MYX-oma, connective tissue tumour composed of cells of stellate and spindle form with processes separated by mucoid material; MYXO-POD-ium, a slimy PSEUDO-POD-ium

OXY-, ox- 'sharp', 'acid', 'oxygen'  
 PAR-OXY-sm; OXY-GEN; OXY-BLEP-sia, acuteness of vision; OXY-DACTYL, having slender, tapering digits; OXY-philous, tolerating only *acidic* soils or substrates

PETR- 'rock'  
 PETR-OL-eum; PETER; PETRO-philous, attached to or living on rocks, especially used of marine life

PHON- 'sound', 'voice'  
 TELE-PHONE; BARY-PHON-ia a heavy or deep quality of voice; RHINO-PHON-ia, nasal tone in the speaking voice

PHOT- 'light'  
 PHOTO-GRAPH; PHOTO-LY-tic, of a substance which is decomposed by action of light; PHOTO-TROPH-ic, requiring light as a source of energy in nutrition

POIE- 'to make'  
 PO-et; ONOMATO-POE-ia; ANGIO-POIE-sis, the process by which certain cells cause the formation of blood vessels in new tissue; HIDRO-POIE-sis, formation of sweat

PRESBY- 'old'  
 PRESBY-CUS-is, progressive hearing loss occurring with age; PRESBYO-PHREN-ia, failure of the sense of location and memory in the aged

PYR-, PYRET-; PYREX- 'fire', 'fever'; 'fever'  
 PYRETO-GEN-ic, causing fever; PYRETO-lysis, reduction of fever

RHIZ-, -RRHIZ- 'root'  
 POLY-RRHIZ-al, having many roots; RHIZO-SPHERE, soil immediately surrounding the root system of a plant

### *Roots, Part II*

GLAUC- 'silvery', 'grey-green'  
 a-GLAUC-OP-sia, green-blindness

GON(Y)-, GONAT- 'knee'  
 GON-ALG-ia, pain in the knee joint; GON-ARTHR-itis, inflammation of the knee joint; GONATO-CELE, tumour of the knee

(H)APT-; (H)APH- 'to touch'; 'sense of touch'  
 HAPH-ALGE-sia, a sensation of pain experience on the mere touching of an object; HAPT-ics, the branch of psychology dealing with the tactile sense; syn-APSE, the region of connection between two neurons

KARY-, CARY- 'nucleus', 'nut'  
 CARYO-CLAS-tic, agent which splits the cell nucleus; KARYO-GAM-y, the fusion of cell nuclei, as in fertilization

KERAT-, CERAT-, KER-, CER- 'horn', 'horny tissue', 'cornea'



RHINO-CER-os; BRACHY-CER-ous, short-horned, or with short antennae; KERAT-oma, a horny thickening of the skin; KERATO-MALAC-ia, softening of the cornea

LEPID- 'scale'

HOMO-LEPID-ous, having one kind of scales; LEPIDO-SAUR-ia, reptiles with scaly skin, including lizards and snakes

NEM-, NEMAT- 'thread'

MICRO-NEM-ous, furnished with short filaments; NEMAT-ode, roundworm

NOS- 'disease'

NOSO-GEO-GRAPH-y, the geography of endemic diseases; NOSO-PHYTE, any pathogenic vegetable organism; PHOTO-NOS-us, disease from intense or glaring light, such as snow blindness

ONC-, -ONCUS 'tumour', 'swelling'

ONCO-logy; ADEN-ONCUS, an enlargement or tumour of a gland; par-OPHTHALM-ONC-osis, development of tumour near the eye

PHRA- 'to speak'

PHRA-se; para-PHRA-se; peri-PHRA-sis; a-PHRA-sia, loss of power to utter connected phrases; em-BOLO-PHRA-sia, insertion of meaningless words into speech, embololalia

PNEUM-, PNEUMAT- 'air', 'gas'

PNEUMAT-iz-ation, progressive development of, or state of having, air-filled cavities in the bone

related to PNEUMON-, 'lung'

PHYLAC(T)- 'to guard', 'to protect'

pro-PHYLACT-ic; cata-PHYLAX-is, movement and transportation of phylactic agents, such as leukocytes, to the site of an infection (X=c+s)

PORPHYR- 'purple'

PORPHYR-in, a heterocyclic ring derived from porhin, named for its deep-red or purple colour; PORPHYR-in-uria, the excretion in the urine of an abnormal amount of porphyrin

SARC- 'flesh'

SARCO-PHAG-us; SARCO-BI-ont, living on flesh; SARCO-CARP, the fleshy or pulpy part of a fruit

SCLER- 'hard'

SCLER-osis; SCLER-a, the sclerotic coat of the eyeball, i.e., the firm fibrous outer layer of the eyeball; SCLERO-MENINX, dense fibrous lining of the cranial cavity and spinal canal, dura mater

SEP- 'to rot', 'to putrefy'

a-SEP-tic, pertaining to the exclusion of microorganisms causing decay; anti-SEP-tic, preventing SEP-sis or poisoning by destruction of or exclusion of microorganisms from body tissue

SIT- 'food'

para-SITE; apo-SIT-ia, aversion to or loathing of food; SITO-therapy, the use of food for therapeutic purposes, a.k.a. DIETO-therapy; SITO-TROP-ism, tendency to turn in the direction of food

SPLEN- 'spleen'

SPLEN-etic; GASTRO-SPLEN-ic, relating to the stomach and spleen; SPLEN-ALG-ia, pain originating in the spleen

STEN- 'narrow'

STENO-GRAPH-y, shorthand; STENO-COR-iasis, narrowing of the pupil; STENO-STOMAT-ous, narrow-mouthed

STERE- 'solid', 'three-dimensional'

STEREO-PHON-ic; STEREO-ARTHRO-lysis, loosening stiff joints by operation or manipulation; STEREO-PLASM, more solid part of a protoplasm, opp. of HYDRO-PLASM

*Roots, Part III*

- CYN- 'dog'  
CYN-ic; CYNO-CEPHAL-ous, with the head shaped like a dog's;  
CYNO-POD-ous, with non-retractile claws
- HAPL- 'single', 'simple'  
HAPLO-id, have the number of chromosomes characteristic of mature germ cells for the organism in question; HAPL-OP-ia, single vision, as opposed to DIPL-OP-ia
- KYM-, CYM- 'wave'  
KYMO-GRAPH, an instrument for recording physiologic cycles or actions in a patient; MYO-KYM-ia, constant quivering of a muscle; CYMO-TRICH-ous, having wavy hair
- LEMM(A)- 'sheath', 'husk'  
MYO-LEMMA or SARCO-LEMMA, the sheath of muscular fibre; NEURO-LEMMA, delicate elastic membrane outside medullary sheath of nerve fibre; LEMMO-CYTE, a formative cell for the neurolemma
- LYMPH- 'water', 'lymph'  
CYTO-LYMPH, cell-sap, the fluid part of protoplasm; KARYO-LYMPH, nuclear sap; LYMPHO-CYTE, a small mononuclear cell of blood or lymph; LYMPH-ADEN-oma, tumourlike enlargement of a lymph gland
- MIT- 'thread'  
MITO-sis, indirect or karyokinetic cell division, with chromosome formation, etc.; MITO-GENE-sis, formation as a result of mitosis; MITO-CHONDR-ion, an organelle found in large numbers in most cells
- ORNIS-, ORNITH- 'bird'  
ORNITHO-logy; HELI-ORNITH-idae, a family of tropical aquatic birds comprising the sun grebes; ORNITHO-philous, of flowers pollinated through the agency of birds
- PALAE- (PALE-) 'old', 'ancient'  
PALAE-ONTO-logy; PALAEO-GRAPH-y; PALAEO-ENCEPHAL-on, the phylogenetically old part of the brain
- PHA-; PHEM- 'to speak'; 'voice'  
a-PHEM-ia an inability to articulate words or sentences due to a central lesion; HETERO-PHEM-ia, the unconscious saying of one thing while another is meant
- PHRAG- 'to block up', 'to wall in'  
dia-PHRAG-m; em-PHRAC-tic, any agent that obstructs the function of an organ, especially the excretory function of the skin
- PLAN- 'wandering'  
PLAN-et; ANGIO-PLAN-ia, irregularity or abnormality in the course of a vessel (ANGI-ec-TOP-ia); a-PLANO-GAM-ete, a nonmotile, conjugating germ cell of various plants and animals; PLANO-mania, a morbid desire for wandering
- PLEUR- 'side', 'rib', 'pleura'  
an-ISO-PLEUR-al, bilaterally asymmetrical; eu-DI-PLEUR-al, symmetrical about a median plane, bilaterally symmetrical; PLEUR-ODYN-ia, pain in the abdominal wall; PLEURO-SOMATO-SCHIS-is, lateral abdominal fissure
- PLO- 'folded', 'fold' (as in 'threefold')  
DI-PLO-ma; DI-PLO-m-at; DI-PLO-CEPHAL-us, an organism with two heads; HETERO-PLO-id, not having a multiple of the basic HAPLO-id number of chromosomes; TETRA-PLO-id, with four times the normal haploid number of chromosomes
- PNE(A)-, PNEUST- 'breathing'  
amphi-PNEUST-ic, having both gills and lungs throughout life history; HOLO-PNEUST-ic, with all spiracles open for respiration; hyper-PNEA, increase in depth of inspiration

RHAPH-, -RRHAPH- 'to sew'  
 RHAPE, the seamlike union of the two lateral halves of a part or organ (as of a tongue); dys-RAPH-ism, defective raphe formation, defective

SPA- 'to draw', 'to jerk'  
 SPAS-m; anti-SPAS-tic, anti-SPASM-od-ic, or SPAS-m-o-LY-tic, an agent relieving convulsions or spasmodic pains

STAPHYL- 'bunch of grapes', 'uvula'  
 BRACHY-STAPHYL-ine, having a short alveolar arch; STAPHYLO-COCC-us, spherical bacteria sometimes occurring in clusters; STAPHYLO-RRAPH-y, repair of a cleft palate by plastic operation and suture

STETH- 'chest'  
 MESO-STETH-ium, middle part of the sternum in vertebrates; MICRO-STETHO-PHONE, a STEHO-SCOPE that amplifies the sounds heard

XEN- 'host', 'stranger', 'foreigner'  
 XENO-phobia; peri-XEN-itis, inflammation around a foreign body embedded in the tissues; XENO-CHROMA, the effect of foreign pollen producing a change in colour of fruit; XENO-LITH, a fragment of a rock included in another rock

*Roots, Part IV*

BALAN- 'acorn', 'the glans penis'  
 BALAN-idae, sessile barnacles comprising acorn barnacles; BALAN-oid, acorn-shaped (of barnacles); BALAN-itis inflammation of the glans penis

BRY- 'moss'  
 BRYO-PHYTE, any of the mosses or liverworts; BRYO-logy the science dealing with mosses and liverworts

CAMP(T)-, CAMPYL- 'bent'  
 a-CAMP-sia, inflexibility or rigidity of a joint or limb; GONY-CAMP-sis, deformity of the knee due to abnormal bending or curving

CARP- 'wrist'  
 CARP-itis, arthritis of the carpal join in domestic animals; CARP-ectomy, excision of a carpal bone or bones; meta-CARP-al, part of hand between carpus and phalanges

CERC- 'tail'  
 LEPTO-CERC-al, with long, slender, tapering tail, as some fishes; LOPHO-CERC-al, having a rayless caudal fin like a ridge

CLEID- 'clavicle'  
 HYPO-CLEID-ium, the interclavicle

DOCH- 'to take or receive'  
 ELAEO-DOCH-on, the preen gland or oil gland of birds; SIALO-DOCHO-plasty, plastic surgery of a salivary gland duct

ECH- 'echo', 'repetition'  
 ECHO-ACU-sia, the subjective sensation of hearing echoes following sounds heard normally; ECHO-LAL-ia, the meaningless repetition of words spoken by others

GANGLI- 'mass of nerve tissue', 'small cyst or swelling'  
 DI-PLO-GANGLI-ate, with ganglia in pairs; GANGLIO-CYTE, a ganglion cell outside the central nervous system

GLI- 'glue'  
 NEURO-GLI-a, fibrous or protoplasmic cells supporting nerve cells and nerve fibres; GLI-osis, excessive development of neuroglia

IN- 'fibre', 'muscle'  
 INO-CHONDR-itis, inflammation of fibrocartilage; INO-TROP-ic, pertaining to influences that modify muscle contraction

RHACH(I)-, RACH(I)-, -RRACH- 'the spine'

RHACHIO-CAMP-sis, curvature of the spine; RACHI-ODYN-ia, spasmodic pain in the spinal column

-RRHAG- 'excessive discharge, usually of blood'  
 ENTERO-RRHAG-ia, intestinal haemorrhage; BALANO-RRHAG-ia, haemorrhage from the glans penis

SPHYGM- 'pulse'  
 SPHYGMO-GRAPH, instrument for graphically recording pulse and variations in blood pressure; SHYGMO-GRAM, the tracing made by the sphygmograph

SPONDYL- 'vertebra'  
 ASTERO-SPONDYL-ous, having centrum with radiating, calcified cartilage; SPONDYLO-lysis, dissolution or destruction of a vertebra

STERN- 'chest', 'breastbone'  
 CHONDRO-STERN-al, pertaining to rib cartilage and sternum; SCHISTO-STERN-ia, sternal fissure

THEL- 'nipple'  
 ENDO-THEL-ium, tissue lining blood and lymph vessels; EPI-THEL-ium, tissue forming epidermis and lining hollow organs; POLY-THEL-ia, the presence of supernumerary nipples; THEL-ion, central point of a nipple

TOC-, TOK- 'childbirth'  
 OLIGO-TOC-ous, bearing few young; OO-TOC-ous, egg-laying

TRE(T)- 'bore', 'to perforate'  
 a-TRETO-STOM-ia, imperforation of the mouth; TRE-ma, a foramen (an opening, orifice, hole or short passage)

ZYM- 'ferment', 'enzyme'  
 ZYMO-sis, fermentation; ZYMO-GEN-ic, causing fermentation; enZYME, catalytic substance promoting chemical change; ZYMO-PHORE, active part of an enzyme (that which bears the ferment)

## LECTURE 6

Based on Ayers (1972), chapters 19–20.

### *Roots, Part I*

ADELPH- 'brother', 'sibling'  
 PHIL-ADELPH-ia; IS-ADELPH-ia, conjoined twins united by unimportant tissues, with each body being normal in the development of all essential organs; ADELPH-ous, joined together in bundles, as filaments of stamens

ANCON- 'elbow'  
 ANCON-eus, a small muscle at the back of the elbow joint; ANCON-itis, inflammation of the elbow joint

CALYPT(R)- 'hidden'  
 CALPYTO-BRANCHI-ate, with gills not visible from the exterior; CALYPTO-BLAST-ic, pertaining to hydroids in which gonophore is contained in a gonotheca

CHORD- 'cord'  
 NOTO-CHORD, the dorsal supporting axis of lowest vertebrates

CHOR(I)- 'fetal membrane' (chorion), 'tunic of the eye-ball' (choroid)  
 CHORIO-BLAST-osis, abnormal proliferation of cells of the chorion; CHOROID-itis, inflammation of the choroid coat of the eye

CLON(US)- 'muscle spasm'  
 CLONO-GRAPH, apparatus for recording spasmodic movements of the head, lower jaws, trunk, etc.

COLL(A)- 'glue'

COLLA-GEN, the albuminoid substance of the white fibre of connective tissue, cartilage and bone; COLLO-oid, a gelatinous substance which does not readily diffuse through animal or vegetable membrane

EC-, (OEC-, OEK-), OIK-, OIC- 'house'  
 ECO-nomy; ECO-logy, that part of biology which deals with the relationship between organisms and their surroundings; GYN-OEC-ium, pistils, carpels and female organs of a flower

NOT- 'the back'  
 NOT-an-ENCEPHAL-ia, congenital absence of the cerebellum; STENO-NOT-al, with a very small thorax, as a worker insect

OM- 'shoulder'  
 ACR-OM-ion, the flat, long process formed by the lateral extension of the scapular spine situated just above the glenoid cavity; met-ACR-OM-ion, posterior branch process of the acromion process

OPISTH- 'behind'  
 OPISTH-ion, median point of posterior margin of the foramen magnum (i.e., the opening in the skull for the spinal cord); OPISTH-ODONT, having back teeth only

PHY- 'to grow'  
 apo-PHY-sis, a process, outgrowth or projection of some part or organ, as of a bone; DACTYLO-sym-PHY-sis, syndactyly (having some or all digits united, naturally or as a malformation)

POR- 'passage', 'pore'  
 POR-ous; POLY-POR-in, antibiotic derived from POLY-PORE fungus; POR-ENCEPHAL-itis, encephalitis with a tendency to form cavities

PTY-; PTYAL- 'to spit'; 'saliva'  
 PTYALO-CELE, a cyst containing saliva; PYO-PTY-sis, expectoration of pus

RHABD- 'rod'  
 RHABDO-MY-oma, tumour of striated muscle; RHABDO-phobia, morbid fear of being beaten, unreasoning fear at the sight of a stick

SPOR- 'seed', 'spore'  
 dia-SPOR-a; ANGIO-SPOR-ous, having spores contained in a theca or spore capsule; SPORO-GON-y, spore formation (= SPORO-GENE-sis); TRICHO-SPOR-osis, fungous infection of a hair shaft

STIG- 'pricking', 'mark', 'point'  
 STIG-ma; a-STIG-mat-ism, the faulty vision which results from irregularity in the curvature of one or more refractive surfaces of the eye, preventing rays of light from coming to a single focus; OSTEO-STYX-is, surgical puncturing of a bone (here X = G+s)

TEL(Ε)- 'completion', 'end', 'purpose'  
 TELEO-logy; a-TELO-GNATH-ia, imperfect development of a jaw; TELO-KINE-sis, last stage of mitosis

TROCH- 'wheel', 'disk'  
 TROCO-CEPHAL-ia, an abnormal roundness of the skull caused by premature union of frontal and parietal bones; CEPHALO-TROCH-a, a tubellarian larva with eight processes around the mouth

XYL- 'wood'  
 XYLO-PHONE; XYLO-PHYTE, a woody plant; XYL-oma, a tree tumour; XYLO-TOM-ous, able to bore or cut wood; XYLO-PHAG-ous, wood-eating

### *Roots, Part II*

ALEX- 'to ward off'  
 ALEX-ANDER; ALEX-in, a complex substance with the capacity, in cooperation with antibody and cellular elements, to destroy a variety of pathogenic organisms and other foreign substances

ANTR- 'cavity', 'sinus'  
 ANTR-itis, maxillary sinusitis; ANTRO-CELE, an accumulation of fluid in the maxillary sinus

BRONCH(I)- 'air tube'  
 BRONCH-ADEN-itis, inflammation of bronchial lymph nodes; BRONCH-itis, inflammation of mucous membrane of bronchial tubes

CHLAMYD- 'cloak', 'envelope'  
 CHLAMYDO-SAUR-us, a genus of reptiles including the frilled lizard of Australia; HETERO-CHLAMYD-eous, having a calyx differing from the corolla in colour

CHY-; CHYM-, CHYL- 'to pour'; 'juice'  
 CHY-me, the viscid fluid contents of the stomach, consisting of food which has undergone gastric digestion; CYTO-CHYL-ema, the inter-reticular portion of protoplasm, cell-juice

CONDYL- 'knob', 'knuckle'  
 CONDYLE, any rounded eminence such as occurs in the joints of many bones; CONDYL-oma, a wartlike growth or tumour

CORM- 'trunk of a tree or body'  
 RHIZO-CORM, an underground stem like a single-jointed rhizome, a bulb; SCHISTO-CORM-us, having a cleft thorax

GON(I)- 'angle'  
 PENTA-GON; MICRO-GONI-SCOPE, an apparatus for measuring extremely small angles, as in ophthalmology

HAL- 'salt'  
 HAL-ite, rock salt; HALO-PHYTE, a shore plant, a plant capable of living on salt; HALO-GEN, any one of the nonmetallic elements: iodine, chlorine, bromine, fluorine

PALI(N)- 'again', 'back'  
 PALIN-DROME; PALIN-ODE; PALIN-DROM-ia, recurrence or intensification of a disease; PALI-OP-sia, recurrence of a visual impression after stimulus has ceased

PHARYNG- (PHARYNX) 'pharynx'  
 PHARYNG-eal, relating to the pharynx; PHARYNG-itis, inflammation of the pharynx, causing a sore throat; NASO-PHARYNX, the upper part of the pharynx, connecting with the nasal cavity above the soft palate

POIKIL- 'varied', 'irregular', 'mottled'  
 POIKILO-CYTE, a large red blood cell or irregular shape; POIKILO-THERMAL, a cold-blooded animal, of which the temperature varies with its surroundings

PYCN-, PYKN- 'thick', 'frequent'  
 PYCNO-meter, instrument for determining the specific gravity of fluids

PYL(E)- 'gate', 'entrance'  
 THERMO-PYL-ae; apo-PYLE, exhalant pore of a sponge; MICRO-PYLE, aperture for admission of pollen tube at ovule apex; PYLE-THROMBO-PHLEB-itis, inflammation and thrombosis of the portal vein

SPERM(A)-, SPERMAT- 'seed', 'semen'  
 COELO-SPERM, a carpel hollow on its inner surface; GYMNO-SPERM-ous, having seeds not enclosed in a true ovary, as conifers; SPERMATO-ZOON, a male reproductive cell; SPERMATO-CYST, a seminal sac

SPHEN- 'wedge'  
 SPHEN-oid, a basal compound skull bone of some vertebrates, including humans; SPHEN-oid-itis, inflammation of the sphenoid air sinus

SPIR- 'coil'  
 SPIR-al; ACRO-SPIRE, the first shoot or sprout, being spiral, at the end of a germinating seed; SPIR-eme, threadlike appearance of nuclear chromatin during the prophase of mitosis

SYRING-, (SYRINX) 'pipe', 'tube'

DACRYO-SYRINX, a lacrimal fistula, or a syringe for use in lacrimal ducts; SIALO-SYRINX; a salivary fistula, or a syringe for use in salivary ducts; SYRINGO-PHIL-us, genus of parasitic mites that live in the gullets of birds

TA- 'to stretch'

BRONCHI-ec-TA-sis, dilatation of bronchi; IRIDO-TA-sis, stretching the iris, as in the treatment of glaucoma; PHLEB-ec-TA-sia, dilatation of a vein, varicosity

TON- 'stretching', 'tension'

TONE; TON-us, the state of partial contraction characteristic of normal muscle; a-TON-ia, absence of tonus; OPHTHALMO-TONO-meter, an instrument for measuring inter-ocular tension; PSYCH-en-TON-ia, mental strain or overwork

TRACHEL- 'neck'

LAPARO-TRACHELO-tomy, low caesarean section in which the peritoneal cavity is not opened, the approach being through the neck (cervix) of the uterus; TRACHELO-SYRINGO-RRHAPH-y, operation for vaginal fistula with stitching of the cervix uteri (the neck of the uterus)