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

hypo- (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’ (*-algesia*, ‘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-ARTHR-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 paralyse’

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-OPTHALM-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

AMBLY-

‘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, hydropathy

-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’

icosohedron, 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, arthrostomy, hepaticoenterostomy

## 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 vescicle of algae; AERO-CYSTO-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, opthalmia 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; OPTHALMO-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; pseduo-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 condia, 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; OPTHALMO-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 propuslion; 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; HIPP-, ‘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 pollination 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 plans 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-OPTHALM-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-, (KAK-)

‘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 joing; 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-OPTHALM-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; en-ZYME, 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(E)-

‘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 interreticular 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; OPTHALMO-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)