
Glossary

- Aberrant** feature/condition different from usual or normal.
- Abscess** cavity containing localized pus collection.
- Acheiria = acheiropodia = apodia** absent paw.
- Acheiropodia = apodia = acheiria.**
- Achondroplasia** abnormal cartilage conversion to bone, producing short, abnormally limbed dwarfism.
- Acromegaly** disproportionate increase in bone size related to overproduction of growth hormone.
- ACTH** adrenocorticotrophic hormone.
- Adenoma** benign neoplasm of glandular cells.
- Adrenocorticotrophic hormone** Anterior pituitary hormone that stimulates the adrenal cortex.
- Agensis** failure of formation of all or part of structure.
- Adactyly** absence of digits.
- Amely** congenital absence of limb(s).
- Amyloidosis** disease associated with tissue deposition of abnormal protein or abnormal immunoglobulin.
- Anacatadidymus** two heads and two tails (Fischer 1868).
- Anadidymus** a two-tailed (Fischer 1868).
- Anakatamesodidymus** separated at the anterior and posterior ends and also in the middle of the trunk (joined only along body).
- Ankylodactyly** fused digit.
- Ankylose** growing together.
- Ankylosis** Rigid union.
- Anulus fibrosus** often misspelled term for the outer layers of intervertebral disks.
- Anurans** frogs and toads.
- Aphalangia** absence of some phalanges or finger bones.
- Aplasia** congenital absence, total failure of development of specific element.
- Apodia = acheiropodia = acheiria.**
- Arthrogryphosis** flexed positioning due to muscle fibrosis.
- Atlodymus** complete cranial duplication, with a single enlarged or duplicated atlas vertebra.
- Batrachian** amphibian.
- Bends** nitrogen bubble-induced complication of decompression syndrome (caisson disease).
- Bicephalic = dicephalic** having two heads.
- Bipartite ossification** unfused ossification centers as opposed to bipartite bones.
- Bone bridge** spans space between two margins of bent bone. Linear rays of bone extending filling margins between bone margins.
- Brachydactyly** abnormally short fingers or toes.
- Brachymely = micromelia = acromelia = nanomely** shorter limb.
- Brachygnathia** mandibular micrognathia; abnormal shortness of mandible.
- Brachyuria** short tail.
- Caecilians** third order of Lissamphibia.
- Calcium pyrophosphate deposition disease** crystals of calcium pyrophosphate dihydrate accumulate in the hyaline articular cartilage or fibrocartilage (pseudogout).

- Callus** reactive bone which forms a splint during fracture healing.
- Carcinoma** malignant neoplasm derived from epithelial cells. Tissue of origin can be skin, lungs, stomach, breast, cervix, and prostate.
- Catadidymus** two-headed (Fischer 1868).
- Caudata** salamanders and newts (= urodeles).
- Cebocephaly** reduced distance between orbital cavities.
- Cephaloderopagus** fusion by cranium and cervical vertebrae.
- Cephalomegaly** additional extremity(ies) in the head.
- Cheigagra** gout affecting the hand.
- Cheilognathopalatoschisis** = **cheilognathouranoschisis** cleft lip, jaw, and palate.
- Cheilognathoschisis** split (cleft) anterior jaw.
- Cheilognathouranoschisis** = **Cheilognathopalatoschisis**.
- Chiloschisis** hairlip.
- Chirodactyly** finger curvature.
- Chondrodysplasia** = **chondrodystrophy** abnormal cartilage development in long bones, especially at epiphyseal plates, resulting in short-limbed individuals with normal axial skeleton.
- Chondrodystrophy** = **Chondrodysplasia**.
- Chondrogenesis** cartilage formation.
- Chondroid** cartilage.
- Chondromyxoma** benign mesenchymal cell tumor additionally containing cartilage differentiated/recognizable cells.
- Chondro-osteofibroma** benign fibrous neoplasm containing chondroid and osseous elements.
- Chondrosarcoma** malignant cartilage neoplasm.
- Chordoma** notochord-derived neoplasm.
- Clinodactyly** curvature of one or more digits.
- Cortical bone** component of bone between periosteum and medullary region.
- Corticosteroid** adrenal hormones of variable forms, with corticosterone dominant in amphibians and reptiles, contrasted with cortisol in metamorphic ranid tadpoles, *Xenopus laevis*, and some urodeles, which are the major endocrine portion of the stress response.
- Craniophagus** fusion by cranium.
- Craniosynostosis** premature cranial suture closure.
- Dactylomegaly** long digit (= macrodactyly).
- Derodidymus** vertebral column bifurcated in the cervical region, double-headed (two complete heads and necks).
- Deropodymus** incomplete cranial duplication and complete vertebro-cervical duplication.
- Diagnosis** formal character state description distinguishing one taxon from another (herpetology definition), contrasted with use in this annotated bibliography as identified disease state.
- Diarthrodial** synovial-lined joint, at which motion occurs.
- Dicephalic** = **bicephalic** having two heads.
- Dichocephalic** two-headed ribs.
- Dipygus** caudal duplication below leg.
- Dolichocephaly** = **macrocephaly** large or long head.
- Dorsoventral vertebral column curvatures** commonly attributed to metabolic bone disease; usually refers to thoracic spine (hump-like arching of tortoise carapace).
- Dysplasia** any abnormality of tissue development. Conventionally used for nonmalignant pathology.
- Ectodactyly** = **ectrodactyly** in Rostand absence of one or more digits.
- Ectomely** absence of one or more limbs or incomplete limb with missing lower portion; the term encompasses amely, hemimely, and meromely.
- Ectromelia** = **phocomelia**.
- Enchondroma** benign cartilage neoplasia, typically within bone. Perhaps representing cartilage remnant.
- Endosteal** medullary surface of cortical bone.
- Enthesis** area of muscle, tendon, or joint capsule attachment.
- Erosive** biologic process-derived bone disruption in living tissue.
- Ethmocephaly** cyclopi with small eyes and snout.
- Etiology** cause of the phenomenon/disease.
- Exostosis** surface bone growth (at muscle attachments, referred to as entheses).

- Fibrodysplasia** replacement of bone tissue by fibrous tissue (= fibrous dysplasia).
- Fibroma (ossifying)** mass composed of fibrous tissue or connective tissue.
- Fibroma (nonossifying)** benign fibroblastic mass, also called fibroxanthoma, nonneoplastic lesions from faulty ossification at the growth plate. Allegedly present at some time in a third of all children. May have a bubbly appearance and sclerotic margin and may expand cortex but has no matrix calcification.
- Fibrous dysplasia** replacement of bone by fibrous tissue.
- Fracture** bone broken into one or more pieces.
- Gangrene** death of tissue.
- Gastromely** additional extremity(ies) between thorax and pelvic.
- Giantism-gigantism** overgrowth of body in whole or part.
- Gonagra-gonatagra** gout affecting the knee/stifle.
- Gout** a metabolic disorder in which sodium urate crystals deposit in joints (referred to as articular gout) or internal organs (referred to as visceral gout).
- Greenstick fracture** herpetologic use (e.g., Lane et al. 1984) was to describe the “folding fracture” of metabolic bone disease. This contrasts with medical use to describe a form of incomplete fracture in immature bone.
- Hamartoma** overgrowth of tissue normally located in the area.
- Hemimely** defective limbs, especially distal components.
- Heterotopic** transplantation to abnormal location or occurring in many habitats (herpetology definition), contrasted with use in this annotated bibliography to indicate spontaneous occurrence in locations usually lacking the anlage.
- Hump** deformed kyphotic spine.
- Hypermely** additional extremities (= melomely).
- Hyperparathyroidism** disorder caused by overactivity of the named glands, producing osteitis fibrosa cystica and other bone changes.
- Hyperphalangy** fingers or toes with supernumerary phalanges.
- Hyperplasia** nonneoplastic increase in cells of any body tissue.
- Hypoplasia** underdevelopment incomplete development of a tissue or organ.
- Hypertrophy** nonneoplastic increase in tissue bulk but not number of component cells. Term is often misused since hyperplasia is the more accurate term.
- Ileopolymely** multiple limbs coming off ilium.
- Interstitial** extracellular, extravascular tissue space.
- Ischiomely** extra limb coming off ischium.
- Keratoconjunctivitis** conjunctival inflammation, which may be a component of the immunologic disorder Sjögren’s syndrome or associated with eye inflammation in reactive arthritis.
- Kypholordosis** combination of kyphosis and lordosis.
- Kyphoscoliosis** combination of kyphosis and scoliosis.
- Kyphosis/kyphotic** curvature of axial skeleton, with accentuated posterior apical apex.
- Lesion** pathologic area.
- Lordosis** curvature of axial skeleton, with accentuated anterior apical apex. Usually refers to lumbar spine.
- Lymphoid** anatomic system of vessels and glands which drain and filter, respectively, interstitial fluids.
- Lymphoma** malignant neoplasia of lymphoid tissues.
- Lymphosarcoma** variety of malignant neoplastic tumor of lymphoid origin.
- Lytic** destruction of structures (herpetologic definition), contrasted with use in this annotated bibliography to holes in bone.
- Macrocephaly** large or long head (= dolichocephaly).
- Macrodactyly** = dactylomegaly.
- Macromelia** long limb.
- Medullary** marrow space.
- Melanoma** malignant neoplasm of the variety of skin cells that are capable of producing the pigment melanin.
- Melomely** form of hypermely with additional extremity(ies) at the base of the normal extremity.

Meromely absence of digits (= adactyly).

Mesenchymal those mesodermally derived cells which form the musculoskeletal, vascular, lymphatic, and urogenital systems.

Mesoderm embryonic germ layer between ecto- and endoderm.

Metabolic bone disease nonspecific term which includes many diseases (e.g., osteoporosis, fibrous osteodystrophy, osteomalacy, rickets). According to Lillewhite, disease related to inadequate dietary calcium or UV light exposure. Actually, probably a renal osteodystrophy.

Microcephaly abnormally small head, snout blunted.

Microcheiria small paw.

Microdactyly = **brachydactyly**.

Micromely small or short limb (= nanomely).

Museum/Collection Abbreviations:

AMNH American Museum of Natural History, New York City.

AUMP Auburn University Museum of Paleontology, Auburn, Alabama.

BMS Buffalo Museum of Science, Buffalo, New York.

CM Carnegie Museum, Pittsburgh, Pennsylvania.

IVPP Institute of Vertebrate Paleontology and Paleoanthropology, Beijing, China.

KU University of Kansas, Lawrence, Kansas.

MNCN Natural History Museum of Madrid, Spain.

MSU Michigan State University, East Lansing, Michigan.

NMNH National Museum of Natural History, Smithsonian, Washington, D.C.

ROM Royal Ontario Museum, Toronto, Canada

UCMP University of California Berkeley Museum of Paleontology.

UFMNH University of Florida Museum of Natural History, Gainesville, Florida.

UMMZ University of Michigan Museum of Zoology, Ann Arbor, Michigan.

USNM National Museum of Natural History, Smithsonian, Washington, D.C.

YPM Yale Peabody Museum, New Haven, Connecticut.

Mutation heritable genetic alteration.

Mycobacteria rod-shaped, acid-fast gram-positive bacteria. One variety causes tuberculosis.

Mycoplasma A species-dependent pathologic microorganism lacking a cell wall.

Nanomely small or short limb (= micromely).

Necrosis tissue death.

Neoplasm new, abnormal tissue growth.

Notomely additional extremity(ies) on the back (dorsum).

Oligodactyly less than normal number of digits.

Opisthodichotomy axial duplication with two complete bodies and single cranium.

Opodidymus cranium bifurcated two broadly joined heads (mostly three-eyed).

Osteitis inflammation of bone (herpetologic definition), contrasted with use in this annotated bibliography to identify bone infection, not discriminating use from osteomyelitis.

Osteitis fibrosa cystica fibrous tissue replacement of bone secondary to exaggerated osteoclastic resorption in hyperparathyroidism.

Osteoarthritis = **osteoarthropathy** overgrowth of diarthrodial joint margins, producing osteophyte.

Osteoarthropathy = **osteoarthritis**.

Osteochondritis dessicans detachment of an articular bone fragment. May complicate intra-articular fracture or avascular necrosis. Often mistakenly called osteochondrosis.

Osteochondrodystrophy variation on chondrodystrophy, wherein the axial skeleton is also affected, often producing flattened or wedged vertebrae.

Osteochondroma benign neoplasm producing a cartilage cap on an exostosis.

Osteochondrosis failure of cartilage region to ossify (transform into bone). Often mistakenly referred to as degenerative cartilage.

Osteochondrosarcoma malignant neoplasm derived from both bone and cartilage.

Osteoclastic cells responsible for resorption component of bone remodeling.

Osteodystrophy defective bone formation.

Osteoid the framework for calcification secreted by bone cells.

Osteolysis resorption or destruction of bone.

Osteoma benign tumor of bone cells.

Osteomalacia vitamin D deficiency-related softening of bone with failure of mineralization,

usually refers to the disease in adults (in children, referred to as rickets).

Osteomyelitis infection of bone. Inflammation of marrow cavity (herpetologic definition), contrasted with use in this annotated bibliography to identify bone infection not limited to the external surface.

Osteopathy combination of osteomalacia and rickets.

Osteopenia reduced bone ossification/density.

Osteoperiostitis inflammation/reaction of/at both the outer layer (periosteum) and underlying component (cortex) of bone.

Osteophyte abnormal bony overgrowth extending from margins of articular surfaces of diarthrodial joints. They are the identifier for the condition called osteoarthritis. When affecting vertebral bodies, they are indicative of spondylosis deformans, not osteoarthritis.

Osteoporosis reduction in quantity and quality (e.g., thickness) of trabecular components of bone. Deficient bone mineral content, associated with loss of structural integrity.

Osteosarcoma malignant bone neoplasm.

Osteosclerosis increased bone density.

Osteopetrosis failure of endosteal bone resorption during growth, resulting in much diminished or absent medullary cavity.

Otocephaly absent or underdeveloped lower jaw.

Pachyostosis benign bone thickening.

Paedomorphosis adult retention of juvenile characteristics.

Panostitis reaction of all bone layers (typically sclerosis).

Pathogenesis development of a disease.

Pathognomonic definitive for a specific disease diagnosis.

Pedomorphosis adult retention of juvenile characteristics.

Periosteopathy any disorder of the outer layer (periosteum) of bone.

Periostitis inflammation/reaction of/at outer layer of bone.

Phocomely incomplete limb with missing proximal portion.

Polyarthritis multiple joint involvement by arthritis. Medical convention limits use of the

term to individuals with affliction of 5 or more joints. This convention is not necessarily followed.

Polydactyly increased number of metatarsals (= hyperdactyly).

Polymely additional limbs.

Polypody a limb with two or more hands or feet.

Polyphalangy duplicate phalangeal sets.

Podagra pedal gout.

Porosity volume of openings in rock/soil (herpetologic definition), contrasted with use in this annotated bibliography to identify presence of minute surface holes in bone.

Prodichotomous duplication of head and neck.

Pseudoarthrosis false joint related to failure of fracture components to unite.

Pseudogout acute attacks of calcium pyrophosphate deposition disease-crystals of calcium pyrophosphate dihydrate accumulate in the hyaline articular cartilage or fibrocartilage.

Psodidymus parasacral bifurcation.

Psodymus vertebral column bifurcated near sacrum.

Pygomely additional extremity(ies) behind or within the pelvic region.

Pygopagus fused at pelvis.

Rachitis = rickets.

Reactive arthritis form of inflammatory arthritis characterized by erosions and new bone formation, affecting peripheral and/or axial skeleton. It is a form of spondyloarthropathy.

Renal disease disease of the kidney.

Renal osteodystrophy combination of vitamin D deficiency (osteomalacia) and hyperparathyroidism.

Rhinocephaly proboscis-like nose overlying partial or complete eye fusion.

Rhinodymus minimum degree of duplication in mouth and nose area, double-nosed (two snouts).

Rhoecosis vertebral displacement.

Rickets failure of bone osteoid to calcify. Related to deficiency of active form of vitamin D. Usually refers to individuals in whom/which epiphyses have not fused (in adults, called osteomalacia).

- Sarcoma** malignant tumor of mesenchymal cell origin.
- Scoliosis** lateral curvature of the vertebral column.
- Scurvy** vitamin C deficiency.
- Septic joint** infected joint.
- Sesamoid** normal intratendinous bone. It provides mechanical advantage to the muscles whose tendons transgress the area.
- Shunting** redirecting.
- Sirenomelia** side to side fusion of lower extremities, often associated with pelvic reduction.
- Sjögren's syndrome** disorder characterized by a complex of symptoms including dry eyes (keratoconjunctivitis), dry mouth, and arthritis.
- Spondyloarthropathy** inflammatory arthritis characterized by erosions and new bone formation in animals, affecting peripheral and/or axial skeleton.
- Spondylosis (actually spondylosis deformans)** term accurately utilized to describe vertebral body osteophytes. This is not a sign of osteoarthritis. It is sometimes inaccurately utilized to describe vertebral ankylosis. The latter actually is properly termed a syndesmo-phyte and is a sign of spondyloarthropathy.
- Spongiform bone** expansion of cancellous bone at distal tip of ectromeliac limbs.
- Symmelia** fused limb.
- Symodia** fused paw.
- Syndactyly** fusion or failure of separation of fingers or toes. Fusion of two or more pedal elements.
- Syndesmophyte** calcification/ossification of outer layer of annulus fibrosus. A sign of spondyloarthropathy.
- Synovial** referring to diarthrodial articulation.
- Taumely** long bone bent back on itself, forming $>90^\circ$ angle.
- Teratogeny** concept (precept, knowledge) of causes of formation of anomalies.
- Teratology** concept (precept, knowledge) of formation of anomalies. Study of embryologic malformations.
- Teratodymus** an individual with part of body doubled.
- Teratopagus** independent axial skeletons (e.g., Siamese twins).
- Thoracodymus** vertebral column bifurcated in the thoracic region.
- Ulcerative disease** lesion resulting from disruption of surface.
- Urodele** salamanders.
- Uranoschisis** cleft palate.
- Uveitis** inflammation of the middle coat of the eye, which may be a component of reactive arthritis.
- Vasculitis** inflammation of blood vessels.
- Zygodactylus** fusion of digits in bundles of two or three.

Herpetological Osteopathology

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