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.
Agenesis 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.
Chiroydactyly 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).
Deroidymus 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 neoplasm, 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.

**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).

**Macroductyly = 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, fib-
rous osteodystrophy, osteomalacia, rickets).
According to Lillewhite, disease related to in-
adequate 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 Paleon-
tology, Auburn, Alabama.
BMS  Buffalo Museum of Science, Buffalo,
New York.
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 Mu-
seum of Paleontology.
UFMNH  University of Florida Museum of Nat-
ural History, Gainesville, Florida.
UMMZ  University of Michigan Museum of Zo-
ology, Ann Arbor, Michigan.
USNM  National Museum of Natural History,
Smithsonian, Washington, D.C.
YPM  Yale Peabody Museum, New Haven, Con-
necticut.
Mutation  heritable genetic alteration.
Mycobacteria  rod-shaped, acid-fast gram-posi-
tive 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 anno-
tated bibliography to identify bone infection,
not discriminating use from osteomyelitis.
Osteitis fibrosa cystica  fibrous tissue replace-
ment of bone secondary to exaggerated osteo-
clastic resorption in hyperparathyroidism.
Osteoarthrosis = osteoathropathy  overgrowth
of diarthrodial joint margins, producing osteo-
phyte.
Osteoarthropathy  = osteoarthritis.
Osteochondritis depressicans  detachment of an ar-
ticular bone fragment. May complicate intra-
articular fracture or avascular necrosis. Often
mistakenly called osteochondrosis.
Osteochondrodystryphosis  variation on chon-
drodystryphosis, 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 de-
rived 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 soft-
ening 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.

**Pannostitis** 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.

**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 syndesmophyte and is a sign of spondyloarthropathy.
Spongiform bone  expansion of cancellous bone at distal tip of ectromeliae limbs.
Symmelia  fused limb.
Symodia  fused paw.
Syndactylus  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° angle.
Teratogeny  concept (precept, knowledge) of causes of formation of anomalies.
Teratology  concept (precept, knowledge) of formation of anomalies. Study of embryologic malformations.
Teratodamus  an individual with part of body doubled.
Teratopagus  independent axial skeletons (e.g., Siamese twins).
Thoracodamous  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
Annotated Bibliography of Amphibians and Reptiles
Rothschild, B.M.; Schultze, H.-P.; Pellegrini, R.
2012, XI, 450 p. 90 illus., 78 illus. in color., Hardcover