

Adam, P. and May, E. (2009). Linnaeus: king of natural history. *Proceedings of the Linnean Society of New South Wales* **130**, 245-249.

We argue that Linnaeus also laid the foundation for other major areas of ecology, including comparative biogeography, plant demography, and comparative anatomy. His legacy was far more encompassing than taxonomic, even though the systematic recording of species remains absolutely fundamental to modern ecological concerns.

Chalson, J.M. and Martin, H.A. (2009). A Holocene history of the vegetation of the Blue mountains, New South Wales. *Proceedings of the Linnean Society of New South Wales* **130**, 77-110.

The Greater Blue Mountains Area has been inscribed on the World Heritage list for its exceptionally diverse *Eucalyptus* communities. Hanging swamps in this region, listed as 'vulnerable ecological communities', accumulate sediments that contain the palaeoenvironmental record. Seven of these swamps have been studied, revealing a history of the vegetation, climate and fire regimes.

Palynological analysis of each swamp reveals a history of the surrounding vegetation. There are similarities and parallel changes between some of the swamps allowing generalities about the climate of the Holocene to be made. In the early Holocene, about eleven to nine thousand years ago (11-9 ka), the vegetation was more wooded and the climate was probably somewhat warmer and wetter. By the mid Holocene about 6-4 ka, trees were less dominant in the vegetation suggesting that the climate was probably drier. By 3-2 ka, wooded vegetation had mostly returned, and after 2 ka, *Baeckea*, *Leptospermum*, *Kunzea* and *Melaleuca* species increased somewhat, with further increases in European settlement time, possibly reflecting a reduction or thinning of the wooded canopy.

Charcoal analysis of the accumulated sediments suggest that there was more fire in the early Holocene when trees increased the biomass. There was less fire through the mid Holocene when the biomass was lower, but it increased with the return to more wooded vegetation in the late Holocene. In particular, the woody shrubs of *Baeckea*, *Leptospermum*, *Kunzea* and *Melaleuca* increased with an increase in charcoal, probably because these shrubs benefit from a more open canopy, but they also grew on the swamps hence could deposit charcoal directly into the sediments. Charcoal values are particularly high after European settlement. It is possible that the disruption of Aboriginal burning practices allowed the increased growth of woody shrubs and hence a much greater fuel load.

Chalson, J.M. and Martin H.A. (200x). Modern pollen deposition under vegetation of the Blue Mountains, New South Wales. *Proceedings of the Linnean Society of New South Wales* **130**, 111-138.

Pollen was extracted from surface samples of swamp sediments and soils under various types of vegetation in the catchments of these swamps. The pollen assemblages in these surface samples were compared with the floristic composition of the vegetation to provide a means of interpreting the assemblages of fossil pollen retrieved from the swamp sediments.

The surface pollen assemblages reflected the local vegetation, indicating more/less tree cover, swamp and/or adjacent dryland environment and local flora diversity. All the evidence pointed to very local deposition and little long distance dispersal of pollen. A number of different units may be defined within the one major vegetation type, dry sclerophyll forest/woodland in this case, but the floristics of the units are too similar to allow discrimination of them from their modern pollen assemblages.

Choo, B. (2009). A basal actinopterygian fish from the Middle Devonian Bunga Beds of New South Wales, Australia. *Proceedings of the Linnean Society of New South Wales* **130**, 37-46.

A partial articulated skeleton of a basal actinopterygian fish is described from the Middle Devonian Bunga Beds of New South Wales. The specimen represents a new species and is questionably assigned as a congener of *Howqualepis rostridens* from the Middle Devonian of central Victoria. This represents the first record of an articulated postcranium of a Devonian ray-finned fish from New South Wales. The pectoral fin of *Howqualepis* is also redescribed based on a re-examination of Victorian material. The fin is broader in shape and less extensively unsegmented than previously recognised. The close similarity of the new form with contemporaneous taxa from

Victoria and the Aztec Siltstone of Antarctica adds to an already wide body of evidence supporting a regionally endemic freshwater vertebrate fauna in the Middle Devonian of Eastern Gondwana.

Harris, J.M. and Goldingay, R.L. (2009). Museum holdings of the Broad-headed Snake *Hoplocephalus bungaroides* (Squamata: Elapidae). *Proceedings of the Linnean Society of New South Wales* **130**, 1-20.

The broad-headed snake *Hoplocephalus bungaroides* (Schlegel, 1837) is a highly endangered species endemic to the Sydney basin. We attempted to track down the whereabouts of museum specimens of this snake by contacting mainly Australian, European and North American curators of natural history museums and university herpetological collections. We received replies from 200 institutions, and from these we present details of 159 specimens from 27 museums in 11 countries reported to us as *H. bungaroides*. Countries include Australia (108 specimens), Germany (13), the United States (9), United Kingdom (7), France (4), Belgium (5), the Netherlands (5), Austria (3), Denmark (3), Italy (1), and Switzerland (1). At least 47 specimens are from the 19th Century, and accurate locality records were available for 98 specimens. Obviously, all of the specimens have value insofar as they may provide important biological data that will be useful to researchers working on the future conservation of this snake. Many of these specimens also provide important historical evidence of the species' past distribution.

Mackness, B.S. (2008). Reconstructing *Palorchestes* (Marsupialia: Palorchestidae) - from Giant Kangaroo to Marsupial 'Tapir'. *Proceedings of the Linnean Society of New South Wales* **130**, 21-36.

Since their initial description in 1873, palorchestid marsupials have been reconstructed in a variety of ways ranging from giant kangaroos, long-necked llama like-forms, bizarre okapians to their present popular image as quadrupedal marsupial 'tapirs'. These reconstructions have resulted from an improved understanding of the phylogenetic position of *Palorchestes*, more complete fossil material and even the interpolation of supposed Australian Aboriginal renderings of these animals in Arnhem Land rock art. An examination of the timing of these different 'views' of *Palorchestes* has revealed that historical and social factors have also influenced how this animal has been visualized.

Myerscough, P.J. (2009). Fire and habitat interactions in regeneration, persistence and maturation of obligate-seeding and resprouting plant species in coastal heath. *Proceedings of the Linnean Society of New South Wales* **130**, 47-62.

After a fire in January 1991, populations of two obligate-seeding and two resprouting species were followed from seeds sown in dry heath and wet heath on Pleistocene beach sands in the Myall Lakes area. In each type of heath, there were four plots, each with ninety 25 X 25 cm quadrats in which seeds of the four species had been sown in various combinations and surface soil conditions. All four wet-heath plots burned again in January 1998, as did two of the dry-heath plots. The two obligate-seeding species were confined to their respective habitats early in the life cycle; *Acacia ulicifolia* to dry heath by lack of seeds and suitable conditions for seedling emergence in wet heath; *Dillwynia floribunda* to wet heath by failure of its seedlings to survive in dry heath. The two resprouting species were confined to their respective habitats in different ways; *Banksia oblongifolia* by failure of its seedlings to survive in dry heath; *Banksia aemula* by lack of suitable soil surface in wet heath for establishment of its seedlings. In both species of *Banksia*, seedlings require a lignotuber to survive their first fire, and may persist several years without appreciable growth.

Percival, I.G. 2009. Late Ordovician Strophomenide and Pentameride Brachiopods from central New South Wales. *Proceedings of the Linnean Society of New South Wales* **130**, 157-178.

Strophomenide and pentameride brachiopods are described from shelfal environments (BA 3) flanking islands of the Macquarie Arc during the Late Ordovician (latest Sandbian to early Katian stages). Most of the strophomenoid genera recognized are new, monotypic, and hence endemic, although the occurrence of a new species of *Shlyginia* is indicative of affinities with Kazakhstan. Taxa described include the strophomenid *Geniculomena barnesi* gen. et sp. nov., the rafinesquinid

Testaprica rhodesi gen. et sp. nov., glyptomenids *Resupin sculpta cuprafodina* gen. et sp. nov., *Paromalomena zheni* sp. nov., and *Platymena?* sp., and the plectambonitoid *Shlyginia rectangularis* sp. nov. Review of the generic assignment of *Oepikina? walliensis* Percival, 1991 suggests that this species is better placed in *Murinella* Cooper, 1956. Relatively rare pentameride brachiopods are represented by only a few specimens, including an unnamed species of *Parastrophina*, and a species tentatively referred to *Eoanastrophia*.

Percival, I.G. 2009. Rare fossils (Conulata; Rostroconchia; Nautiloidea) from the Late Ordovician of central New South Wales. *Proceedings of the Linnean Society of New South Wales* **130**, 179-192.

Four decades of detailed palaeontological investigations into highly fossiliferous Upper Ordovician strata of the Macquarie Arc in central New South Wales has revealed several unique specimens which in some instances represent the only known examples of phyla or subphyla in this region. Conulariids have not previously been reported from Ordovician rocks in NSW; here is documented *Conularia* sp., known from one specimen found in the Fossil Hill Limestone, and several microscopic specimens of different genera (including *Metaconularia?* sp., and the new genus and species *Microconularia fragilis*) from deep water allochthonous limestones (Malongulli Formation, and Donderry Limestone Member of the Ballingool Limestone). The first Ordovician rostroconch mollusc from NSW is described from a solitary individual of *Eopteria*, from the top of the Malongulli Formation. A coiled nautiloid tentatively identified as *Plectoceras* from the Gunningbland Formation, again represented by a single specimen, is also described and illustrated.

Pickett, J.W., Och, D.J., and Leitch, E.C. (2009). Devonian marine invertebrate fossils from the Port Macquarie Block, New South Wales. *Proceedings of the Linnean Society of New South Wales* **130**, 193-218.

Two assemblages of rugose and tabulate corals, with accessory stromatoporoids and chaetetids, are described from the Touchwood and Mile Road Formations of the Wauchope – Port Macquarie district of northeastern New South Wales. Both assemblages are derived from allochthonous limestone clasts, except that the Mile Road fauna is accompanied at the same level by branching tabulate corals occurring in the matrix, indicating probable contemporaneity. The fauna from the Touchwood Formation indicates an Early Devonian (Emsian) age. Macrofossils from the Mile Road Formation indicate a broad Middle Devonian, probably Givetian age; conodonts accompanying the coral assemblage yield a precise age in the upper part of the early Givetian *varcus* Zone. Geographic affinities of the assemblages are typically eastern Australian, so that if terranes are represented in the block, these were not remote. Stratigraphic and structural relationships of the units are discussed. The name Mile Road Formation is formally defined.

Rickards, R.B., Wright, A.J. and Thomas, G. 2009. Late Llandovery (Early Silurian) dendroid graptolites from the Cotton Formation near Forbes, New South Wales. *Proceedings of the Linnean Society of New South Wales* **130**, 63-76.

A well-preserved dendroid graptolite fauna of Early Silurian (late Llandovery: probable *turriculatus* graptolite zone) age is described from the Cotton Formation near Forbes, New South Wales. A possible rhabdopleuran hemichordate is described from Australia for the first time. The fauna consists of 13 taxa as follows: *Dendrograptus* sp. aff. *D. avonleaensis*, *Dictyonema zalasiewiczii* sp. nov., *Dictyonema* sp. aff. *D. paululum australis*, *Dictyonema paululum australis*, *Dictyonema* sp. aff. *D.* sp. cf. *D. venustum* of Bulman (?ssp. nov.), *Dictyonema venustum*, *Dictyonema* sp. cf. *D. falciferum*, *Callograptus bridgecreekensis*, *Callograptus rigbyae*, *Callograptus* sp. aff. *C. ulahensis*, *Stelechocladia* sp. cf. *S. praeattenuata*, *Acanthograptus praedeckeri* and ?*Rhabdopleura* sp. (? with zooids). The fauna is close in composition (although less diverse) and age to a dendroid fauna recently described from Bridge Creek near Orange, NSW, which was assigned to the slightly younger *griestoniensis* zone.

C. L. Stewardson, T. Prvan, M. A. Meyer and R. J. Ritchie (2009). Age determination and growth in the male South African fur seal *Arctocephalus pusillus pusillus* (Pinnipedia: Otariidae) using external body measurements. *Proceedings of the Linnean Society of New South Wales* **130**, 219-244.

Morphology, relative size and growth of the South African fur seal or Cape fur seal, *Arctocephalus pusillus pusillus*, from the coast of southern Africa are described and comparisons made to data available on the closely related Australian fur seal (*Arctocephalus pusillus doriferus*) and the New Zealand fur seal (*Arctocephalus forsteri*). Useful information can be gained from body measurements of seal carcasses provided canine teeth are extracted for aging. External body measurements (12 linear variables) were examined in relation to standard body length (**SBL**) and chronological age (y) using linear regression and non-linear least squares fitting as appropriate. Animals ranged from < 1 month to \geq 12 y. Of the 149 animals in the study, 39 were animals of known-age based on tagging; 34 were aged from highly reproducible counts of incremental lines observed in the dentine of upper canines (i.e., range 1–10 y); 10 were identified as adults \geq 12 y (i.e., pulp cavity of the upper canine closed); and 66 were not aged. At birth, male South African fur seals are 35% (c. 69 cm) of their mean adult size. At puberty, they are 57% (c. 113 cm). The foreflippers measure 25–26% (c. 18 cm) of standard body length (**SBL**) in pups, and 24% (c. 48 cm) of **SBL** in adults. The hind flippers are considerably shorter, measuring 19% (c. 13 cm) in pups, and 14.5% (c. 29 cm) in adults. Axillary girth is usually about 57–67% of **SBL**. Growth of **SBL** was rapid during the early postnatal period with a significant growth spurt occurring at the onset of puberty (2–3 y). The rate of growth slowed significantly between 6 and 7 y. Social maturity was reached at about 9 to 10 y. Growth slowed thereafter. The mean **SBL** for aged males >10 y and unaged animals > 200 cm was 199 cm. Relative to **SBL**, facial variables and the fore/hind limbs scaled with negative slope relative to **SBL** or were negatively allometric; tip of snout to genital opening scaled with positive slope; and tip of snout to anterior insertion of the foreflipper was positively allometric. Relative to age, body variables scaled were negatively allometric. **SBL** was found to be a 'rough indicator' of age and age group. The growth kinetics of juvenile and adult the South African fur seal and the Australian fur seal are best described by the logistic and double exponential (Gompertz) models rather than the exponential von Bertalanffy model. Australian fur seals grow at a faster rate but asymptotic maximum sizes are similar in South African and Australian fur seals.

Strusz, D.L. (2009). Silurian rhynchonellide brachiopods from Yass, New South Wales. *Proceedings of the Linnean Society of New South Wales* **130**, 139-146.

Rhynchonellide brachiopods are rare in the Silurian sequence at Yass. In this paper two species are described, one new species *Agarhyncha australe* being abundant at just one locality in the late Wenlock or earliest Ludlow Yass Formation. The other species, tentatively assigned to *Tuvaerhyncha*, is known from only a few specimens of late Wenlock to Ludfordian age.

Wood, A.E. (2009). *Cortinarius* Fr. subgenus *Cortinarius* in Australia. *Proceedings of the Linnean Society of New South Wales* **130**, 147-156.

Three new species within *Cortinarius* subgenus *Cortinarius* from Australia. are described, each belonging near a different species, but differing significantly from the type variety in all cases. They represent distinct species – *C. jenolanensis*, *C. kioloensis* and *C. hallowellensis*.