Edward Lhwyd

The earliest documented geological specimens to survive in the Museum's collections are those described by Lhwyd in his *Lithophylacii Britannici ichnographia* of 1699. One hundred and twenty copies were published in February of that year; a second, posthumous, *Editio Altera* was published in 1760. A selection of Lhwyd's surviving specimens, and the plates of the 1760 edition are figured here.

Who was Edward Lhwyd?

Edward Lhwyd was born in 1660, the illegitimate son of Edward Lloyd of Llandforda, near Oswestry, Shropshire, and Bridget Pryse of Gogerddan, Cardiganshire. In 1682 he entered Jesus College, Oxford, where he studied for five years, although he did not finish his degree course. He supported himself by becoming assistant to Robert Plot (1640-1696), first Keeper of the Ashmolean Museum, and succeeded him as Keeper in 1691. One of Lhwyd's first tasks was to catalogue the new museum's collection, which included many "formed stones", as fossils were then termed. His spare time was spent scouring the quarries of Oxfordshire for specimens for the collection. He trained quarrymen to recognise fossils, paying them for finds. He corresponded with collectors around Britain in order to trade specimens with them, and also travelled a great deal himself.

In 1686, Lhwyd put before the Oxford Philosophical Society a new catalogue of all the British fossils in the Ashmolean Museum, and over the next few years he continued to add to it, with a view to publication. The work eventually appeared in 1699. Written in Latin and entitled *Lithophylacii Britannici ichnographia*, it consisted of a catalogue of 1,766 minerals and fossils, and was the first illustrated catalogue of a public collection of fossils to be published in England. Lhwyd's aim was to take the contents of the museum cabinets and put them into the hands of the field-worker, and several aspects of the work reflect this - the text was entirely in Latin and thus accessible to a pan-European readership, the engravings of fossils would enable even beginners to recognise immediately those things that they might discover, and the book could easily be taken into the field and used there because of its handy octavo size.

As an appendix at the end of the book were six letters to friends, dealing with geological subjects. The sixth, addressed to John Ray and dated 29 July 1698, extends to twelve pages, and sets out Lhwyd's views on the origin of fossils. "He suggested a sequence in which mists and vapours over the sea were impregnated with the 'seed' of marine animals. These were raised and carried for considerable distances before they descended over land in rain and fog. The 'invisible animacula' then penetrated deep into the earth and there germinated; and in this way complete replicas of sea organisms, or sometimes only parts of individuals, were reproduced in stone. Lhwyd also suggests that fossil plants known to him only as resembling leaves of ferns and mosses which have minute 'seed', were formed in the same manner. He claimed that this theory explained a number of features about fossils in a satisfactory manner: the presence in England of nautiluses and exotic shells which were no longer found in neighbouring seas; the absence of birds and viviparous animals not found by Lhwyd as fossils; the varying and often quite large size of the forms, not usual in present oceans; and the variation in preservation from perfect replica to vague representation, which was thought to represent degeneration with time" (Edmonds, 1973, p. 307-8).

Lhwyd discovered the keepership of the Ashmolean to be "a mean place, seeing there is no salary", and his chief source of income must have been the fees paid by visitors for seeing the curiosities. At home he lived a quiet life at Eynsham, near Oxford. He is described as "a person of singular modesty, good nature, and uncommon industry", often referred to by his contemporaries as "honest Lhwyd" (Thomas, 1909). In November 1708, Lhwyd was elected fellow of the Royal Society, but he did not long survive his election. He had suffered from asthma for many years, and died in the Old Ashmolean Museum on 30 June 1709, of the combined effects of asthma, pleurisy, and, it is said, a chill caught from sleeping in damp quarters in the Museum. He was buried in St Michael's church, in the south aisle, appropriated to Jesus College and known as the Welsh aisle. A monument now marks the spot.

Lhwyd specimens

Sixteen specimens figured in *Lithophylacii Britannici ichnographia* have been identified in the Museum's collections. Page and plate numbers are those of the 1870, *Editio Altera*.

Lhwyd no. 184a Leaf of seed-fern, Carboniferous, Acton, Gloucestershire; figured plate 5, cited p. 12

Lhwyd no. 188 (possibly) Leaf of seed-fern, Carboniferous, Glamorgan, Wales; figured plate 4, cited p. 12

Lhwyd no. 812 *Protocardia* sp., ? Purbeck Beds, Garsington, Oxfordshire; figured plate 24, cited p. 40

Lhwyd no. 1132e Arm of crinoid, Carboniferous, locality not recorded; figured plate 14, cited p. 54

Lhwyd no. 1153 *Dialutocrinus polydactylus* (Miller), Carboniferous, Caldy Island, Pembrokeshire; figured plate 22, cited pp. 56, 98, 104.

Lhwyd no. 1259 Tooth of *Carcharodon*, [Basal nodule bed of Red Crag, Suffolk]; figured plate. 15, cited p. 64

Lhwyd no. 1260 Shark tooth, Eocene, Sheppey, Kent; figured plate 15, cited p. 64

Lhwyd no. 1261 Shark tooth, Eocene, Sheppey, Kent; figured plate 15, cited p. 64

Lhwyd no. 1266 Shark tooth, Eocene, Sheppey, Kent; figured plate 15, cited p. 64

Lhwyd no. 1278 Shark tooth, Lower Greensand, Faringdon, Oxfordshire; figured plate 15, cited p. 64

Lhwyd no. 1284 Shark tooth, Lower Greensand, Faringdon, Oxfordshire; figured plate 15, cited p. 65

Lhwyd no. 1448 Palatal tooth of *Asteracanthus*, Middle Jurassic, Raunds, Northamptonshire; figured plate 16, cited p. 73

Lhwyd no. 1488 Palatal tooth of *Asteracanthus*, Middle Jurassic, locality not recorded; figured plate 16, cited p. 75

Lhwyd no. 1522 *Corynella foraminosa* Goldfuss, Faringdon Sponge Gravels, Faringdon, Oxfordshire; figured plate 18, cited p. 78

Lhwyd no. 1551 (possibly) Fin spine of shark, Middle Jurassic, Charlton-on-Otmoor, Oxfordshire; figured plate 18, cited p. 79

Lhwyd no. 1561 Fin spine of shark, Lower Lias, Pyrton Passage, Gloucestershire; figured plate 17, cited p. 79

Lhwyd no. 1661 *Orthoceras* sp., Carboniferous Limestone, Bristol, Avon; figured plate 25, cited p. 85

184a
Leaf of seed-fern

188 Leaf of seed-fern

812 *Protocardia*

1132e Crinoid

1153 *Dialutocrinus*

1259 Tooth of *Carcharodon*

1260 Shark tooth

1261 Shark tooth

1266 Shark tooth

1278 Shark tooth

1284 Shark tooth

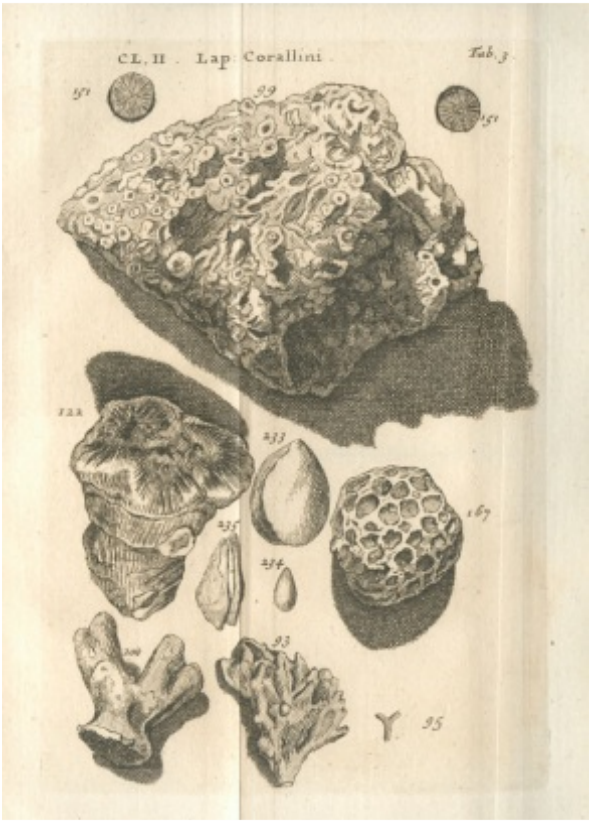
1448 & 1488 Palatal teeth of *Asteracanthus*

1522 *Corynella*

1661 *Orthoceras*

1551 & 1561 Shark fin spines

Plates from *Lithophylacii Britannici ichnographia, Editio Alterata*, 1760



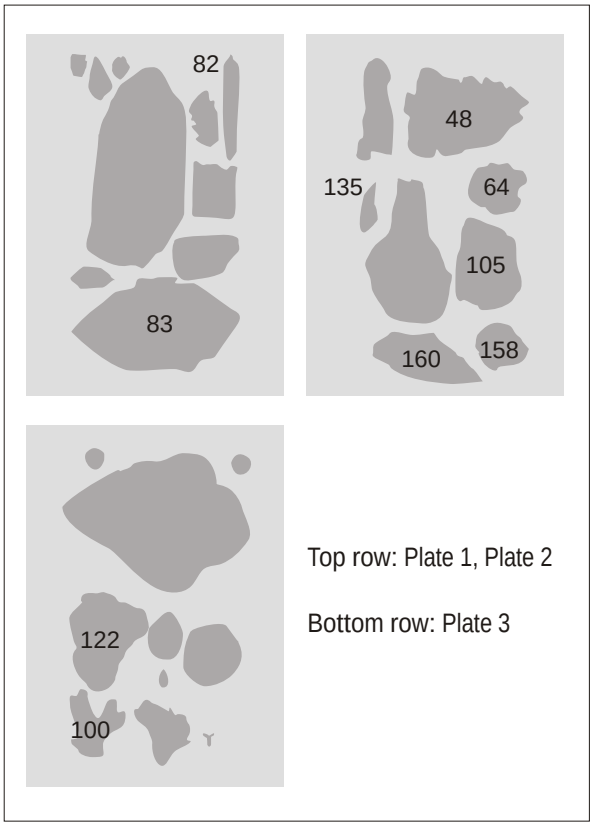
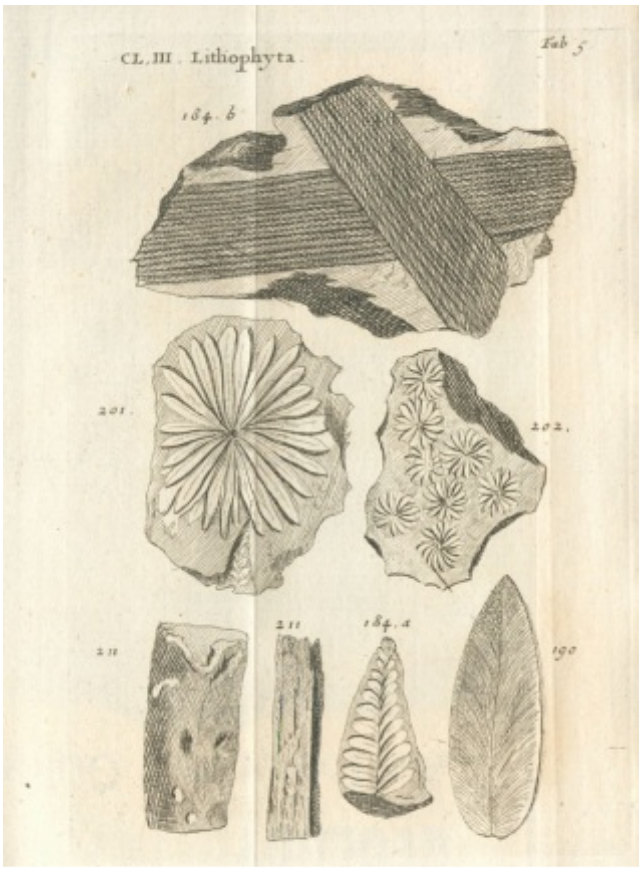
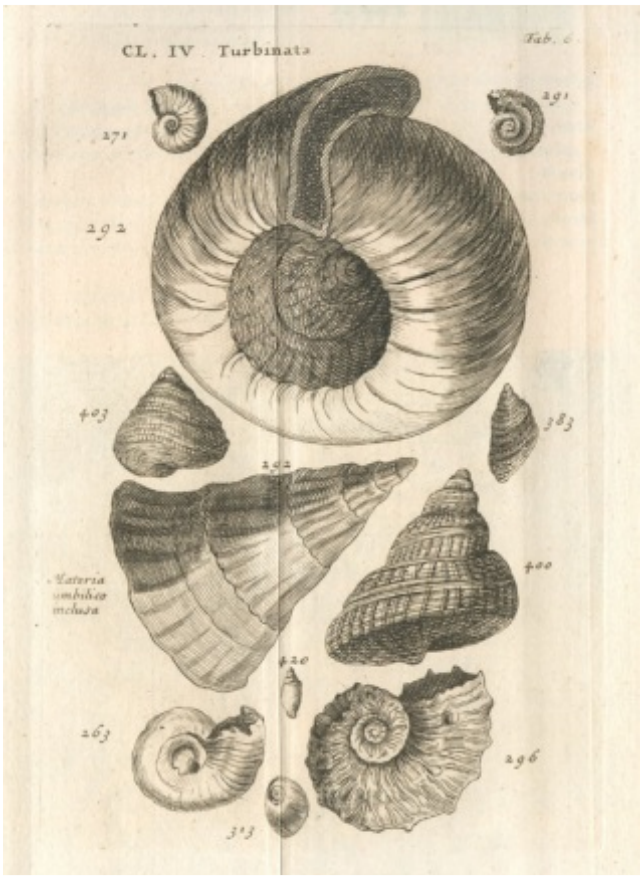
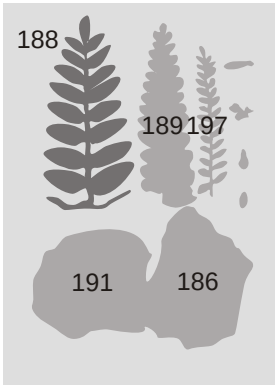
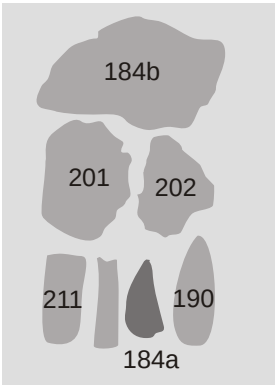


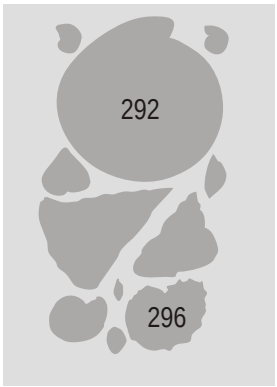
Plate 1: Crystals of various sorts 82 and 83 are gypsum var. selenite.
Plate 2: Stalagmitic calcite and corals 48 and 64 are stalagmitic calcite, from Glamorgan, and Wookey Hole, Somerset. 135 is a solitary rugose coral from the Carboniferous of Cumberland. 105 is the coral *Lithostrotion* from the Carboniferous of North Wales. 158 is a colonial coral from the Jurassic of Cricklade, Gloucestershire. 160, another Jurassic colonial coral, is also from Gloucestershire.
Plate 3: Corals and sponges 122 is the coral *Thecosmilia* from the Upper Jurassic Coral Rag of Cowley, Oxford. 100 is the sponge *Corynella* or *Peronidella* from the Lower Cretaceous Sponge Gravels of Faringdon, Oxfordshire.









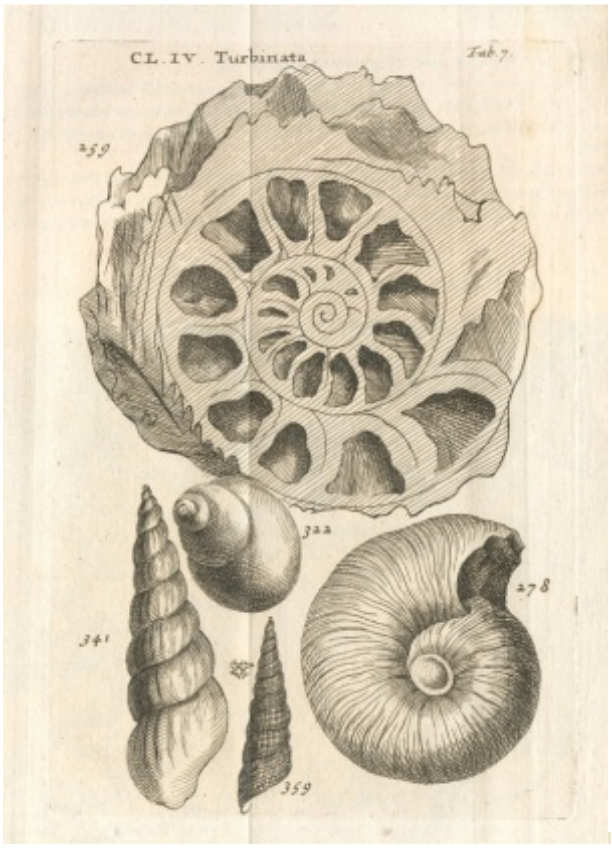


Top row: Plate 4, Plate 5

Bottom row: Plate 6

Fossils marked in dark grey are illustrated on page two, and can be found today in the collections.

Plate 4: Carboniferous seed-ferns From Gloucestershire (186, 189), Glamorgan (188), Flint (191) and the Forest of Dean (197).
Plate 5: Fossil plants, mainly Carboniferous 184b may be *Cordaites*, the leaves of a gymnosperm tree. 201 and 202 are horsetail leaves. 184a and 190 are leaves of seed-ferns. 211 appears to be fossil wood, probably from the Cretaceous of Bedfordshire.
Plate 6: Ammonites and gastropods I 292 is the ammonite *Cadoceras* from the Middle Jurassic Kellaways Beds of Kellaways, Wiltshire. 296 is the ammonite *Kosmoceras* from the Middle Jurassic Oxford Clay of Faringdon, Oxfordshire.



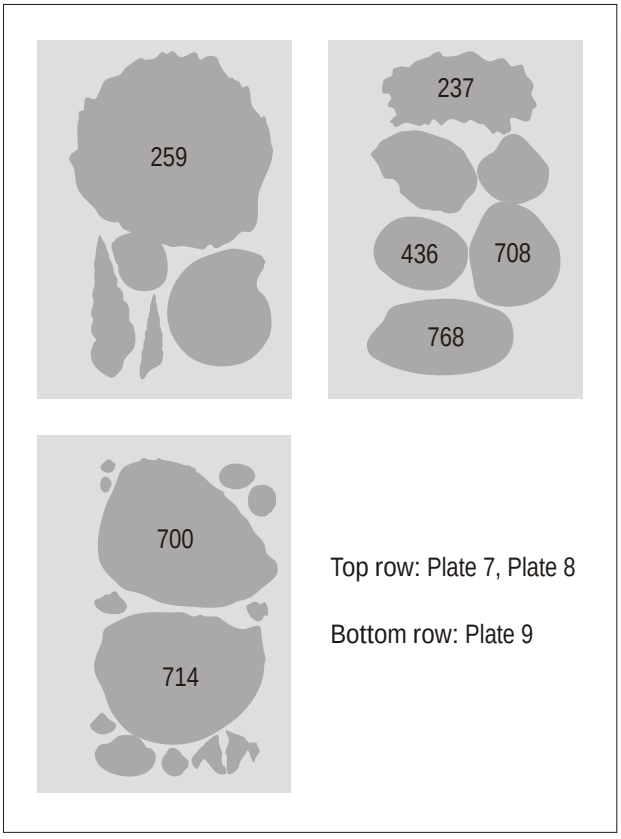
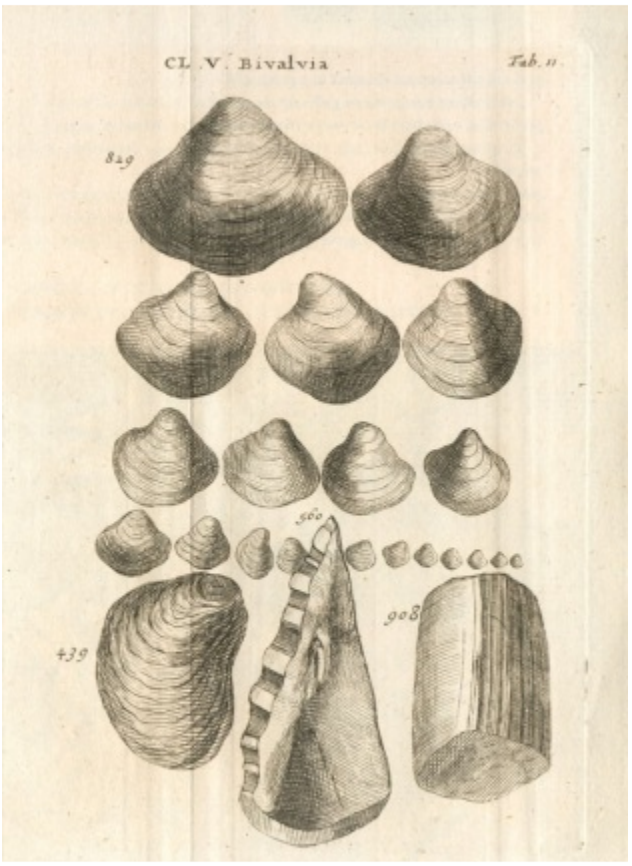
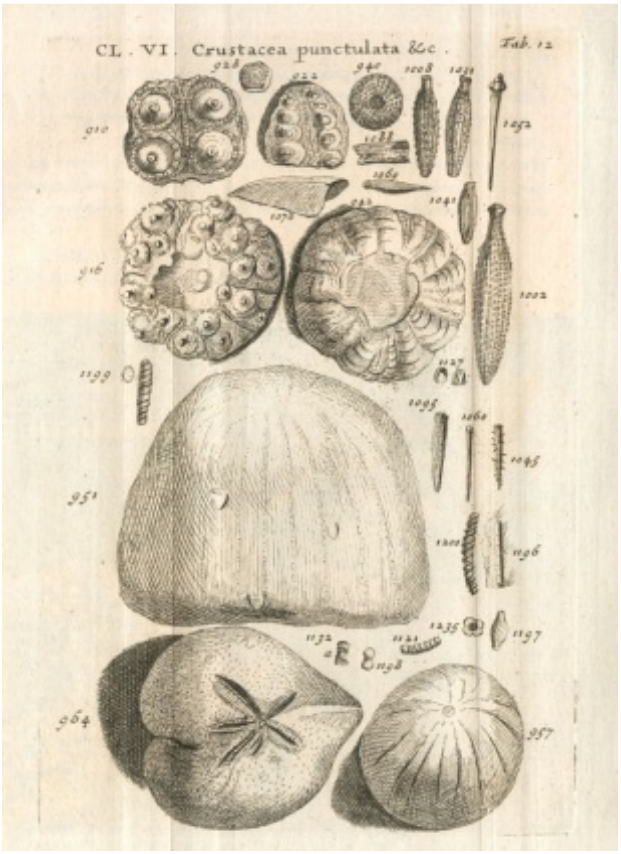


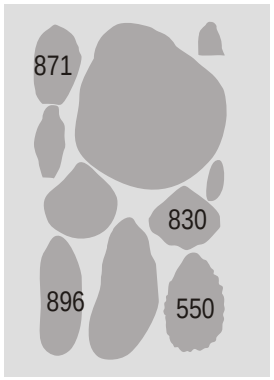
Plate 7: Ammonites and gastropods II 259 is a perisphinctid ammonite from the Upper Jurassic Corallian Beds of Marcham, Oxfordshire, split in half and showing chambers infilled with calcite.

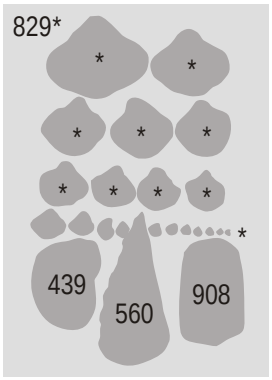
Plate 8: Ammonites, bivalves and gastropods 237 is a series of the calcite-filled chambers of an ammonite, probably *Aspidoceras*, from the Upper Jurassic Corallian beds of Marcham, Oxfordshire. 436 is a fossil limpet (*Symmetrocapulus*) from Middle Jurassic Stonesfield Slate near Oxford. 708 is the bivalve *Laevitrigonia gibbosa* from the Upper Jurassic Portland Beds of Buckinghamshire. 768 is the bivalve *Cardinia* from Byfield, Northamptonshire.

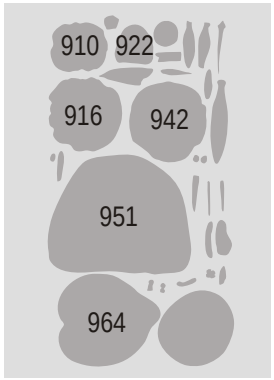
Plate 9: Bivalves 700 is *Trigonia clavellata* from the Upper Jurassic Corallian Beds of Garsington, Oxfordshire. 714 is *Trigonia elongata* from the same beds at Witney, Oxfordshire.







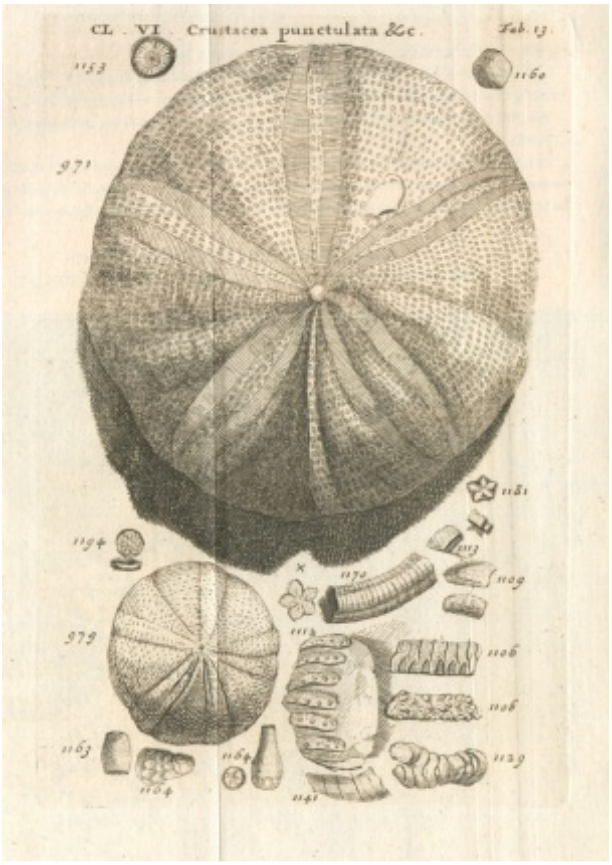


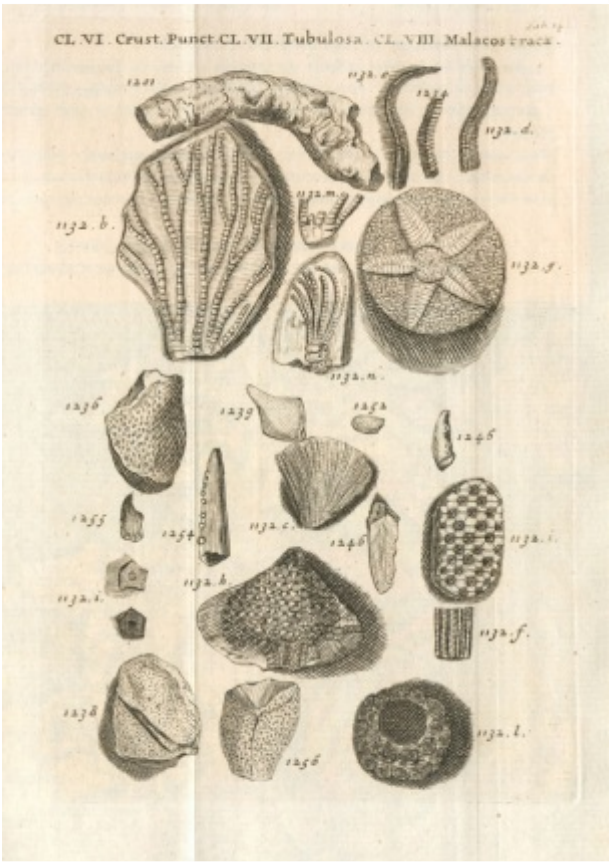


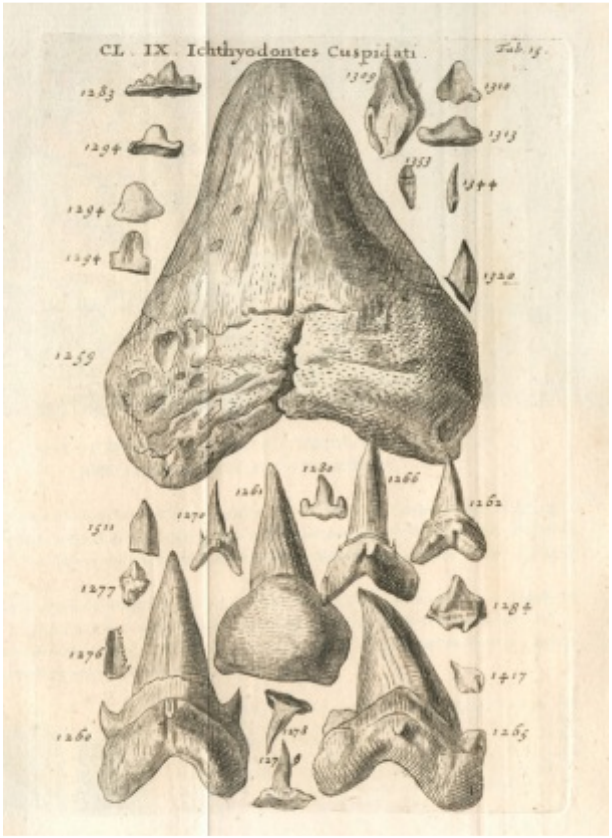
Top row: Plate 10, Plate 11

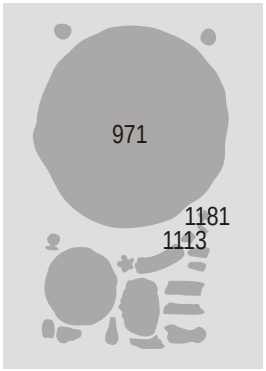
Bottom row: Plate 12

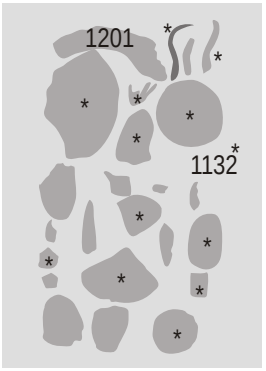
Plate 10: Brachiopods and bivalves 830 and 871 are terebratulid brachiopods from the Jurassic of Oxfordshire. 896 is the Jurassic bivalve *Modiolus* from Humberside. 550 is the ribbed oyster *Lopha* from the Upper Jurassic of Witney, Oxfordshire.
Plate 11: Brachiopods and bivalves 829 is the terebratulid brachiopod *Epithyris* from the Middle Jurassic Great Oolite of Witney, Oxfordshire. 439 is the bivalve *Ostrea* from the Upper Jurassic Portland Beds of Brill, Buckinghamshire. 560 is the hinge of the bivalve *Gervillia aviculoides* from the Upper Jurassic Corallian Beds of Cowley, Oxford. 908 is the bivalve *Pinna* from the Jurassic of Merston, Northamptonshire.
Plate 12: Mainly echinoderms 910, 916, 922 and 942 are whole and fragmentary casts of Jurassic cidarid echinoids. 951 is an *Echinocorys* from the Upper Cretaceous Upper Chalk of Gravesend, Kent. 964 is a *Micraster* from the same horizon and locality.

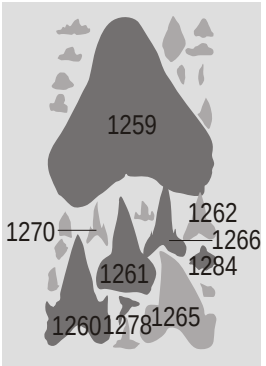












Top row: Plate 13, Plate 14

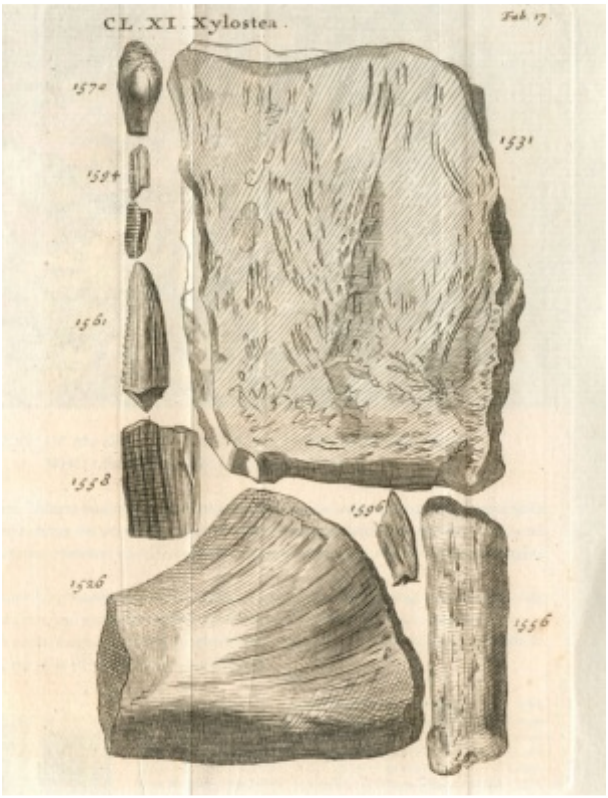
Bottom row: Plate 15

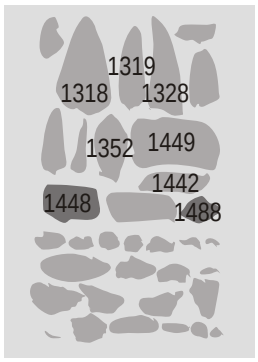
Fossils marked in dark grey are illustrated on page two, and can be found in the collections.

Plate 13: Echinoderms 971 is the echinoid *Clypeus ploti*, named in honour of Robert Plot, Lhwyd's predecessor at the Ashmolean, from the Middle Jurassic Inferior Oolite of Fulbrook, Oxfordshire. 1181 is a crinoid ossicle from the Jurassic of Islip, Oxfordshire. 1113 is a starfish plate from the Upper Cretaceous Chalk of Kent.

Plate 14: Echinoderms and serpulid worms All the specimens marked 1132 are crinoids. 1201 is a serpulid worm tube from the Jurassic of Witney, Oxfordshire.

Plate 15: Fossil teeth, mainly of sharks 1259 is a tooth of the Great White Shark *Carcharodon*, said to be from Kent, but probably derived from the Red Crag, Suffolk. 1260-1262, 1265-1266 and 1270 are all shark teeth from the Eocene of Sheppey, Kent.





Top row: Plate 16, Plate 17

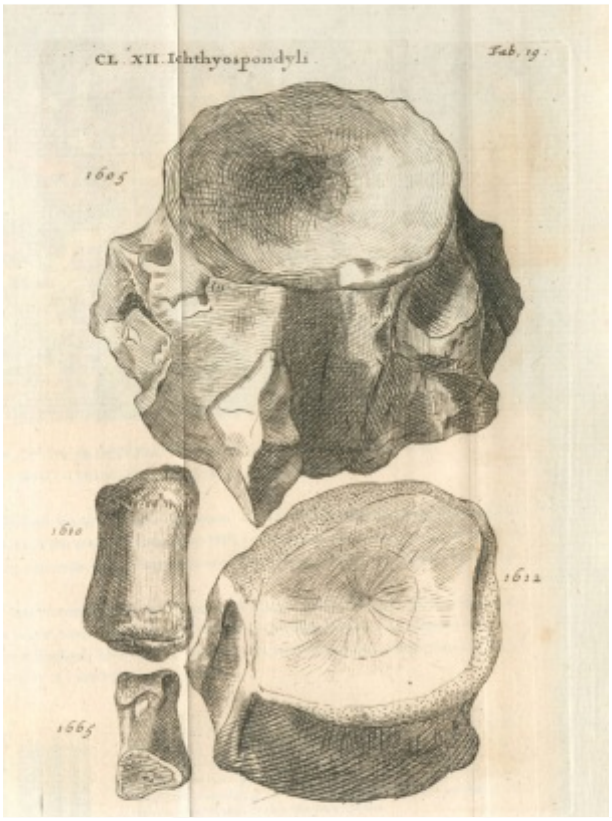
Bottom row: Plate 18

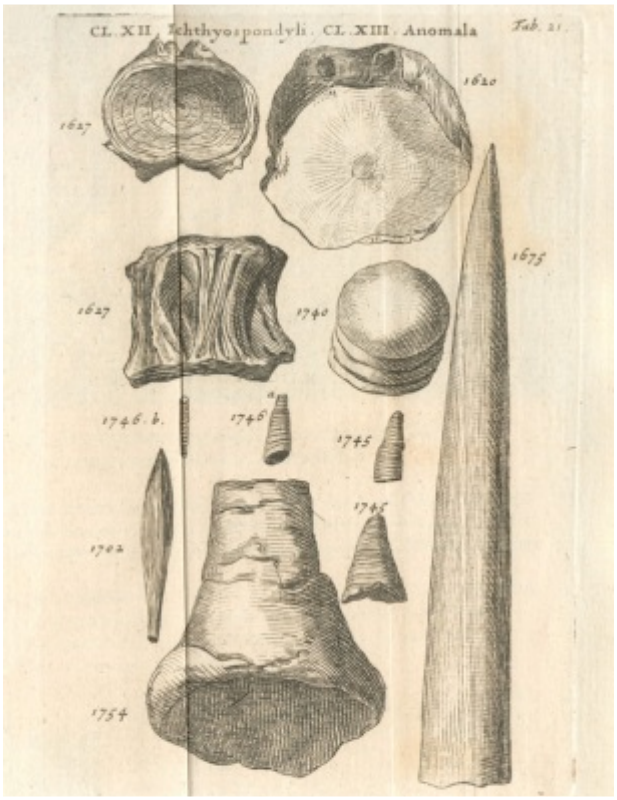
Fossils marked in dark grey are illustrated on page two, and can be found in the collections.

Plate 16: Fossil teeth 1318 is a pliosaur tooth occurring as a derived Jurassic fossil in the Lower Cretaceous Sponge Gravels of Faringdon, Oxfordshire. 1319 is a crocodile tooth from the same horizon and locality. 1328 is a tooth of the carnivorous dinosaur *Megalosaurus* from the Middle Jurassic Great Oolite of Stonesfield, Oxfordshire. 1352 is a tooth of the herbivorous dinosaur *Cetiosaurus* from the Great Oolite of Witney, Oxfordshire. 1442 and 1449 are palatal teeth of the shark *Asteracanthus*, also from the Great Oolite of Stonesfield.

Plate 17: Vertebrates and fossil wood 1531 is fossil wood, probably from the Middle Jurassic Great Oolite of Witney, Oxfordshire. 1561 is the fin spine of a shark and 1526 is an ichthyosaur scapula, both from the Lower Jurassic Lower Lias of Pyrton Passage, Gloucestershire. 1556 is a fragment of Jurassic bone occurring as a derived fossil in the Lower Cretaceous Sponge Gravels of Faringdon, Oxfordshire.

Plate 18: Fossil vertebrates and a sponge 1528 is an ichthyosaur humerus from the Lower Lias of Pyrton Passage, Gloucestershire. 1611 is a crocodile vertebra from the Middle Jurassic Stonesfield Slate of Stonesfield, Oxfordshire. 1522 is the sponge *Corynella* from the Lower Cretaceous Sponge Gravels of Faringdon, Oxfordshire.





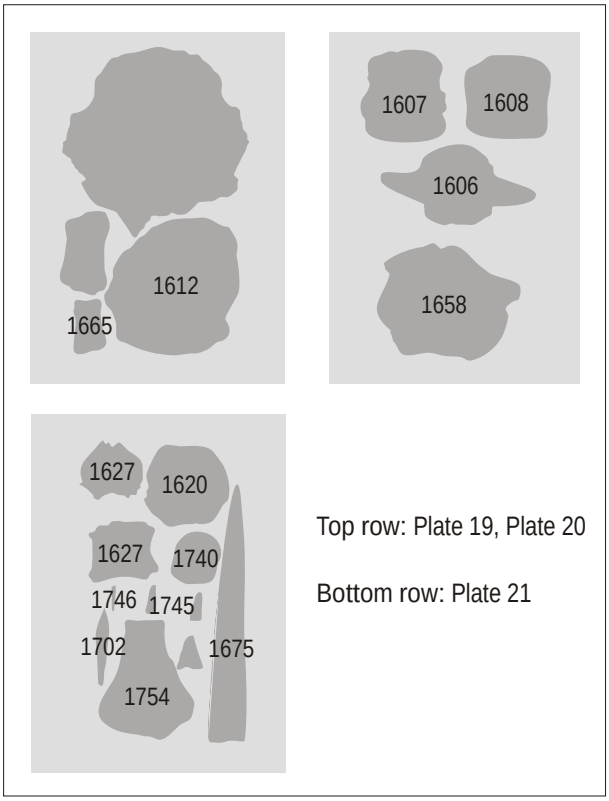
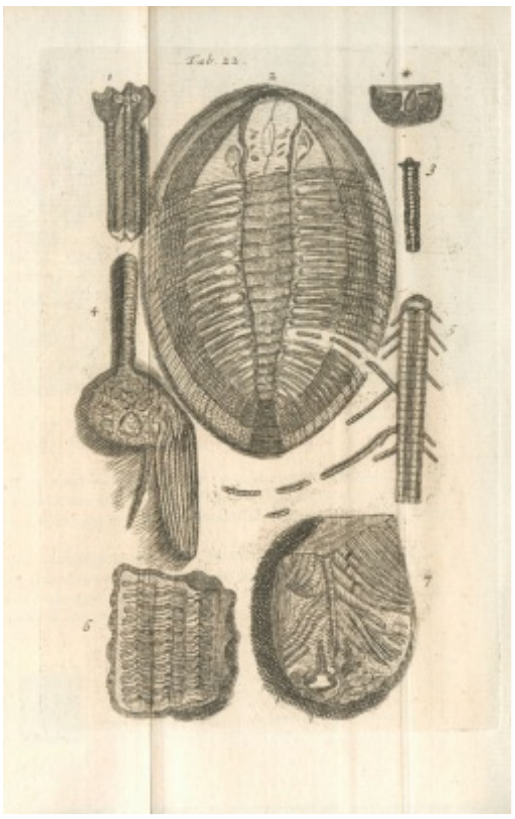


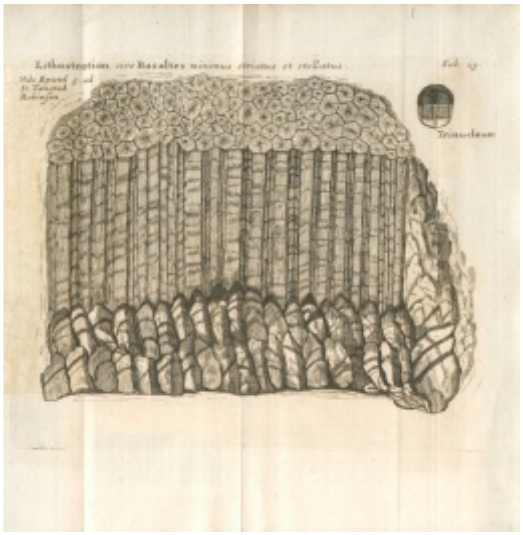
Plate 19: Fossil vertebrates 1605 is a plesiosaur vertebra from the Upper Jurassic Kimmeridge Clay of Marcham, Oxfordshire. 1612 is an ichthyosaur vertebra from the Lower Jurassic Lower Lias of Pyrton Passage, Gloucestershire.

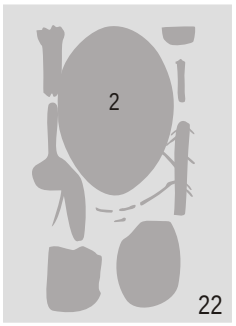
Plate 20: Fossil vertebrae 1606 and 1607 are plesiosaur vertebrae from the Lower Lias of the Severn Estuary. 1608 is a plesiosaur vertebra from the Upper Jurassic Kimmeridge Clay of Garford, Oxfordshire. 1658 is an unidentified vertebra from the Severn Estuary.

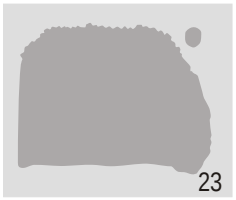
Plate 21: Fossil vertebrates and belemnites

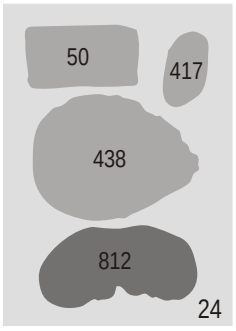
1627 is a fish vertebra from the Eocene of Sheppey, Kent. 1620 is a saurian vertebra from the Lower Jurassic Lower Lias of the Severn Estuary and 1754 is a saurian bone from the same beds at Pyrton Passage, Gloucestershire. 1675 is a belemnite from the Lower Jurassic of Byfield, Northamptonshire and 1740 is a belemnite phragmocone from Jurassic rocks near Boughton, Northamptonshire. 1702 is the belemnite *Hibolites hastatus* from the Middle or Upper Jurassic Oxford Clay from a claypit on the banks of the Cherwell, while 1745 and 1746 are belemnite phragmocones from the Oxford Clay near Magdalen College, Oxford.

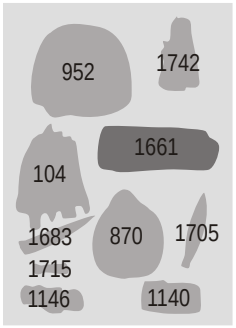












Top row:
Plate 22, Plate 23
Bottom row:
Plate 24, Plate 25

Fossils marked in dark grey are illustrated on page two, and can be found in the collections.

Plate 22: Crinoids and a trilobite 2 is the trilobite *Ogygiocarella* from the Ordovician of Cader Idris, Wales.
Plate 23: Trilobite and a coral The trilobite is *Trinucleus*. The coral is *Lithostrotion*.
Plate 24: Various fossils 50 is fossil wood bored by shipworms from the Eocene London Clay of Sheppey, Kent. 417 is the gastropod *Cylindrobullina luidii*, from the Middle Jurassic of Witney, Oxfordshire. 438 is the bivalve *Ostrea bellovacina* from the Palaeogene of Surrey. 812 is the internal moulds of the bivalve *Protocardia*, probably from the Upper Jurassic of Garsington, Oxfordshire.
Plate 25: Various fossils 952 is a flint cast of the echinoid *Echinocorys* from the Upper Cretaceous of Kent. 1742 is the phragmocone of a belemnite from the Upper Jurassic Corallian Beds of Cowley, Oxfordshire. 104 is a Palaeozoic colonial rugose coral. 1661 is a Palaeozoic orthoconic nautiloid. 1683 is a belemnite from Merston, Northamptonshire, probably from the Middle Jurassic. 870 is a terebratulid brachiopod from the Jurassic of Birdlip, Gloucestershire. 705 is a belemnite from the Jurassic of Stonesfield. 1140, 1146 and 1715 are crinoid ossicles.

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