

Examples for Reef Reconstructions from the Phanerozoic

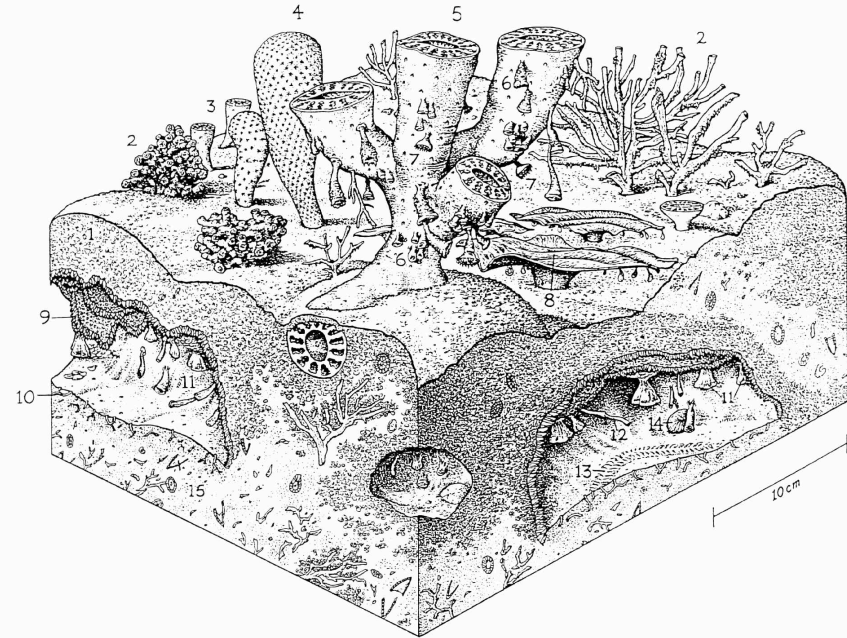
Drawings from John Sibbling

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Cambrian



CS 3.2 (a) Reconstruction of radiocyath–archaeocyath–cribricyath community, Zuune Arts, western Mongolia (Cambrian; ~ 535 Ma). 1: *Renalcis* (calcified cyanobacterium); 2: branching archaeocyath sponges; 3: Solitary cupped archaeocyath sponges; 4: chancelloriid; 5: radiocyaths; 6: small archaeocyath sponges; 7: 'coralomorphs'; 8: *Kulitichyathus* (archaeocyath sponge); 9: fibrous cement; 10: microburrows (traces of a deposit-feeder); 11: cryptic archaeocyaths and coralomorphs; 12: cribricyaths; 13: trilobite trackway; 14: cement botryoid; 15: sediment with skeletal debris. (Copyright, John Sibbick)

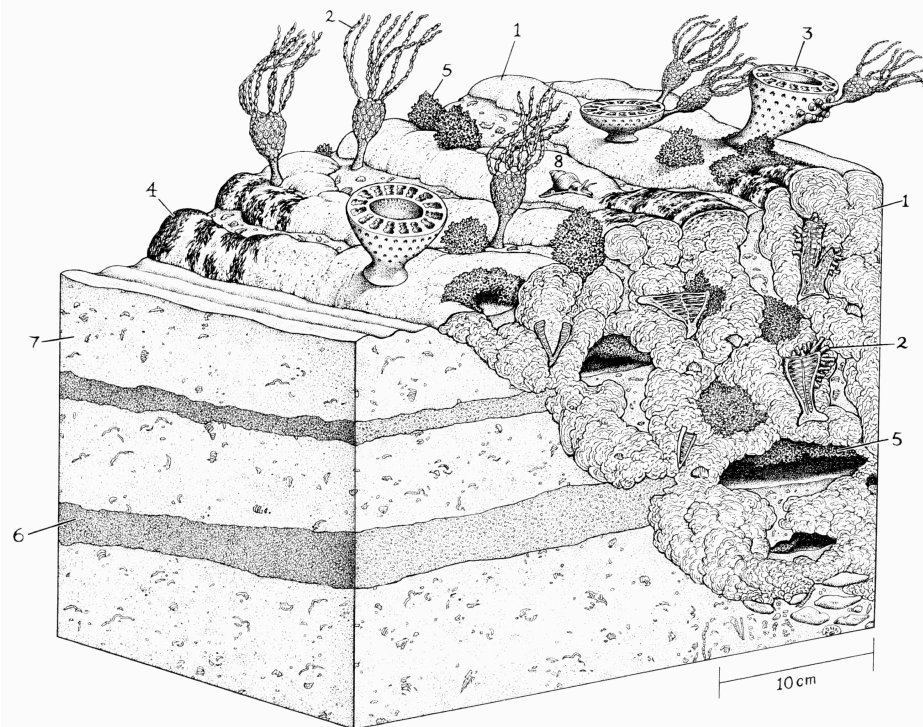


Fig. 3.13: Reconstruction of Upper Cambrian reef community. Llano Uplift, Texas. 1: Thrombolite; 2: eocrinoids; 3: lithistid sponges (*Wilbernisicyathus*); 4: calcified cyanobacterial mats (*Girvanella*); 5: calcified cyanobacterial bushes (*Renalcis*); 6: horizons rich in ooids; 7: wackstone/packstone sediments; 8: gastropod. (Modified from Spincer 1998; copyright, John Sibbick.)

Ordovician-Silurian

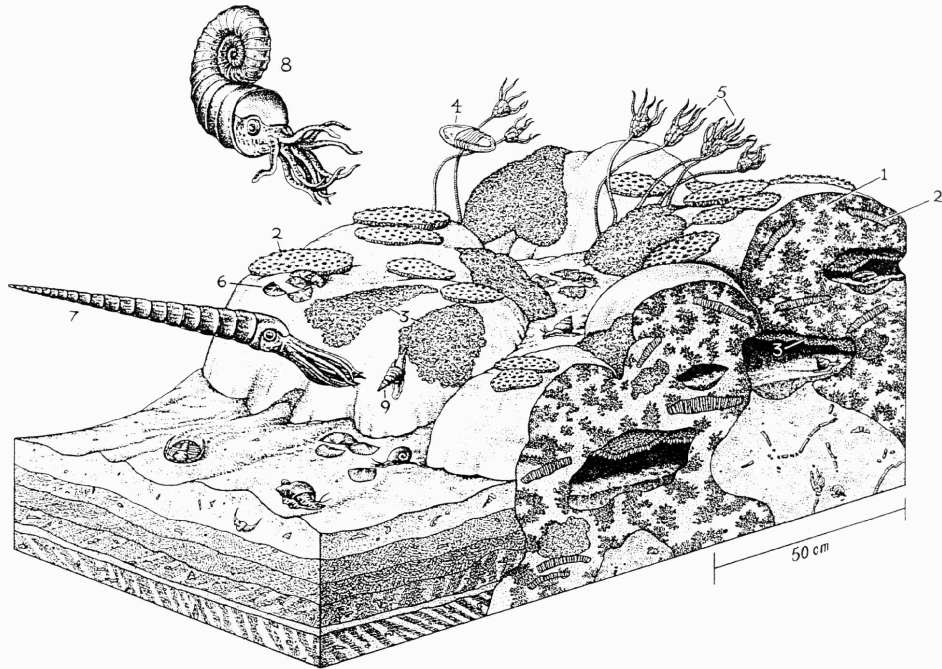


Fig. CS 3.3 Lower Ordovician reef reconstruction: Thrombolite–*Lichenaria*–*Renalcis* community. 1: Living algal mats and thrombolite heads; 2: *Lichenaria* (tabulate coral); 3: *Renalcis* (calcified cyanobacterium); 4: swimming trilobite; 5: crinoids; 6: brachiopods; 7: straight nautiloid; 8: coiled nautiloid; 9: grazing gastropod. (Modified from Pratt and James 1982; copyright, John Sibbick.)

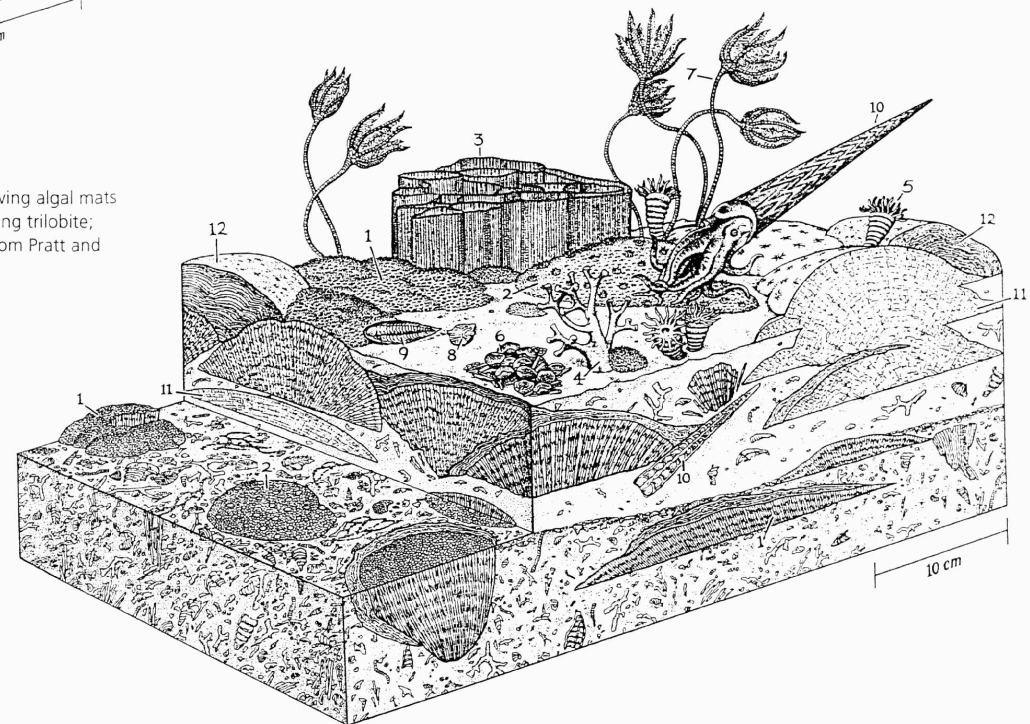


Fig. CS 3.4 Reconstruction of Silurian (Wenlock) patch reef, England. 1: Tabulate coral (*Favosites*); 2: tabulate coral (*Heliolites*); 3: tabulate coral (*Halysites*); 4: bryozoan (*Hallopora*); 5: streptelasmatic rugose coral; 6: spiriferid brachiopod (*Atrypa*); 7: crinoid; 8: brachiopod (*Leptaena*); 9: trilobite (*Dalmanites*); 10: orthocone nautiloid; 11: stromatoporoid (*Actinostroma*); 12: thrombolite. (Modified from McKerrow 1978; copyright, John Sibbick.)

Upper Devonian

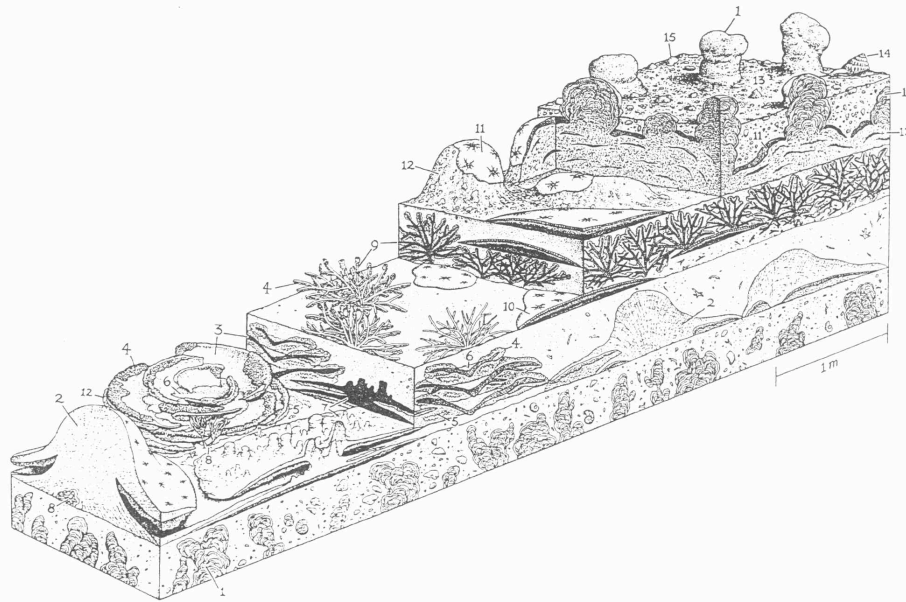


Fig. CS 3.5 (b) Reconstruction of an Upper Devonian shallowing-upwards back-reef cycle: Windjana Gorge, Canning Basin, western Australia. 1: Stromatolites; 2: domal stromatoporoid (*Actinostroma*); 3: inferred whorl-forming foliaceous stromatoporoids (?*Actinostroma* sp.); 4: calcified cyanobacterium (*Renalcis*); 5: fibrous cement; 6: geopetal sediment infill; 7: platy stromatoporoid; 8: crinoids; 9: branching stromatoporoid (*Stachyodes* sp.); 10: laminar stromatoporoid; 11: Encrusting stromatoporoid (?*Clathrocoilona spissa*); 12: microbialite; 13: coarse clastic sediment; 14: gastropods; 15: oncolites. (Copyright, John Sibbick.)

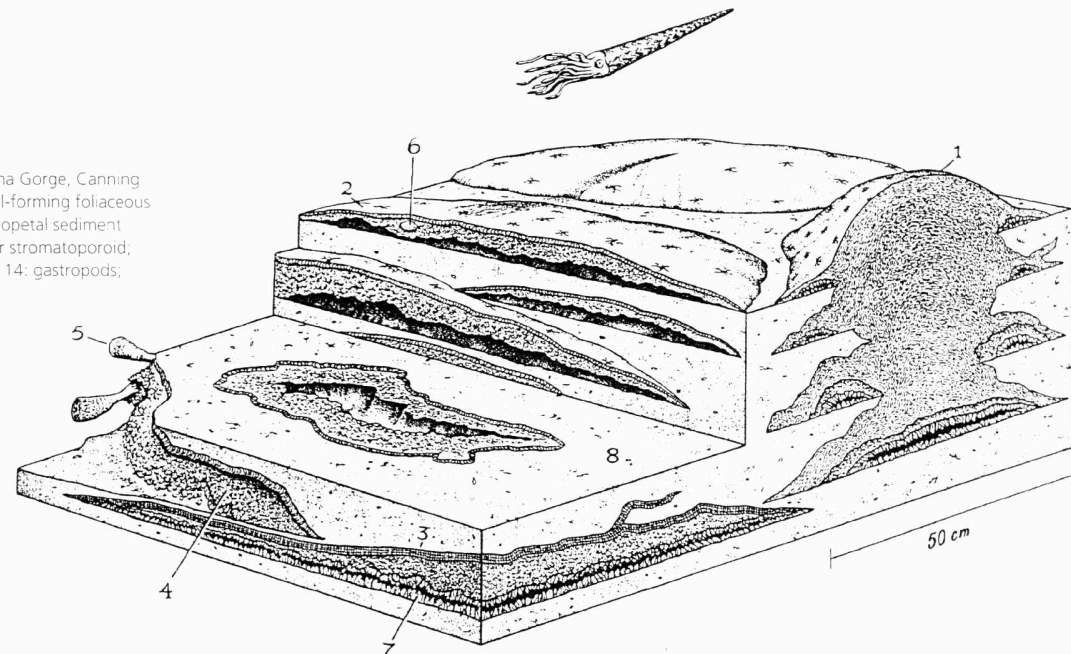


Fig. CS 3.5 (c) Reconstruction of an Upper Devonian marginal-slope stromatoporoid community: Geikie Gorge, Canning Basin, western Australia. 1: Domal stromatoporoid (e.g. *Actinostroma* sp.); 2: laminar stromatoporoid (e.g. *Stachyodes australe*); 3: tabular stromatoporoid; 4: *Renalcis* (calcified cyanobacterium); 5: stalked lithistid sponge; 6: spiny atrypid brachiopod; 7: radiaxial fibrous calcite cement; 8: sediment. (Copyright, John Sibbick.)

Carboniferous

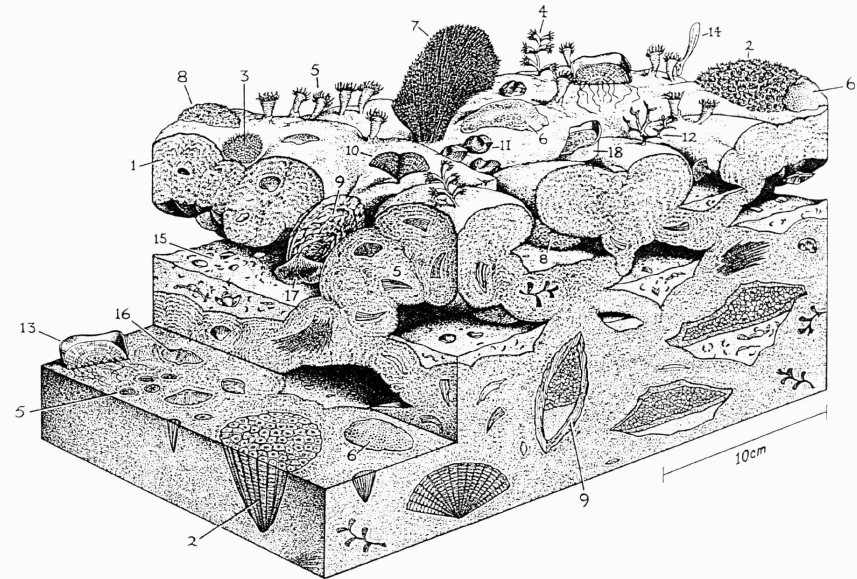


Fig. CS 3.8 (b) Reconstruction of a Lower Carboniferous (Late Viséan) 'Cracoean' reef, northern England. 1: Stromatolite/microbialite; 2: tabulate coral (*Michelinia*); 3: tabulate coral (*Emmonsia parasitica*); 4: tabulate coral *Cladochonus*; 5: rugose coral (*Cyathaxonia*); 6: bryozoan (*Fistulipora*); 7: frondose bryozoan (*Fenestella*); 8: lithistid sponge; 9: cementing bivalve (*Pachypteria*); 10: brachiopod (*Reticularia*); 11: rhynchonellid brachiopod (*Stenosisma*); 12: robust fenestrate bryozoan (*Thamniscus*); 13: attached productid brachiopod (*Limbifera*); 14: attached productid brachiopod (*Proboscidella*); 15: myodocopid ostracod concentration (*Cypridinea*, *Entomonchus*); 16: trilobite (*Griffithides*); 17: strophomenid brachiopod (*Streptorhynchus*); 18: strophomenid brachiopod (*Leptagonia*). (Modified from McKerrow 1978 and Mundy 1993; copyright, John Sibbick.)

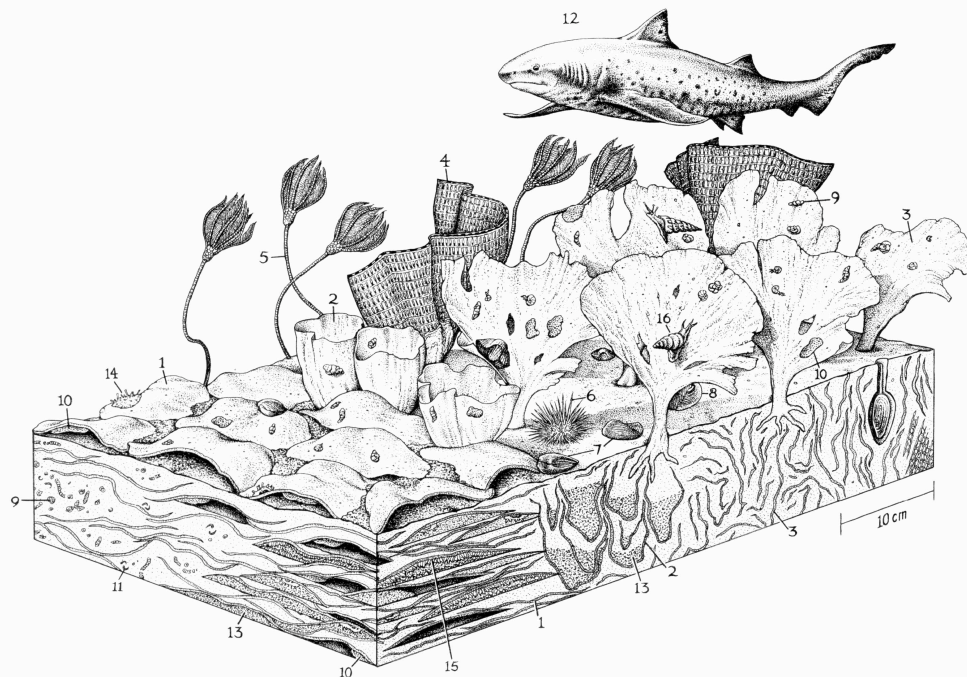


Fig. 3.25: Reconstruction of composite phylloid algal reef community. 1: *Archaeolithophyllum* (phylloid algae); 2: cup-shaped *Eugonophyllum* (phylloid algae); 3: leafy *Eugonophyllum* (phylloid algae - the root-like holdfasts are conjectural); 4: frondose bryozoan; 5: crinoids; 6: echinoderms; 7: brachiopods; 8: brachiopods; 9: encrusting foraminifera; 10: encrusting bryozoans; 11: fusulinid foraminifera; 12: shark; 13: ostracodes; 14: micrite-infill; 15: *Tubiphytes*; 16: gastropod. (Copyright, John Sibbick.)

Upper Permian

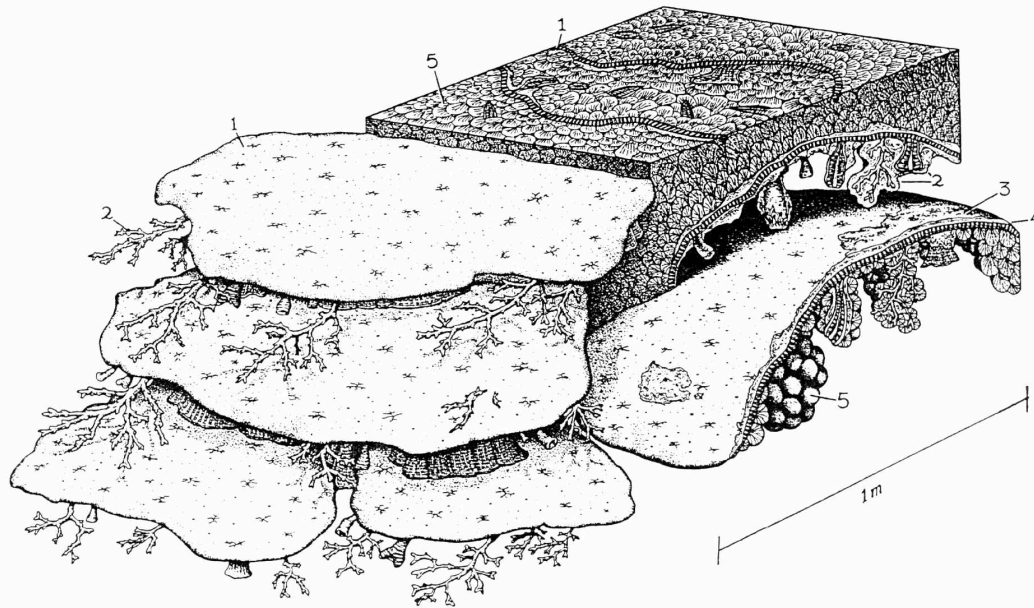


Fig. CS 3.9 (a) Reconstruction of the Upper Permian Capitan Reef: Platy sponge community 1. *Gigantospongia discoforma* (platy sponge); 2: solitary and branching sphinctozoan sponges; 3: *Archaeolithoporella* (encrusting ?algae); 4: microbial micrite; 5: cement botryoids. (Copyright, John Sibbick.)



Fig. CS 3.9 (b) Reconstruction of the Upper Permian Capitan Reef: Frondose bryozoan-sponge community 1. Frondose bryozoans (*Polypora* sp.; *Goniopora* sp.) 2: solitary sphinctozoan sponges; 3: *Archaeolithoporella* (encrusting ?algae); 4: microbial micrite; 5: cement botryoids; 6: sediment (grainstone-packstone). (Copyright, John Sibbick.)

Upper Jurassic

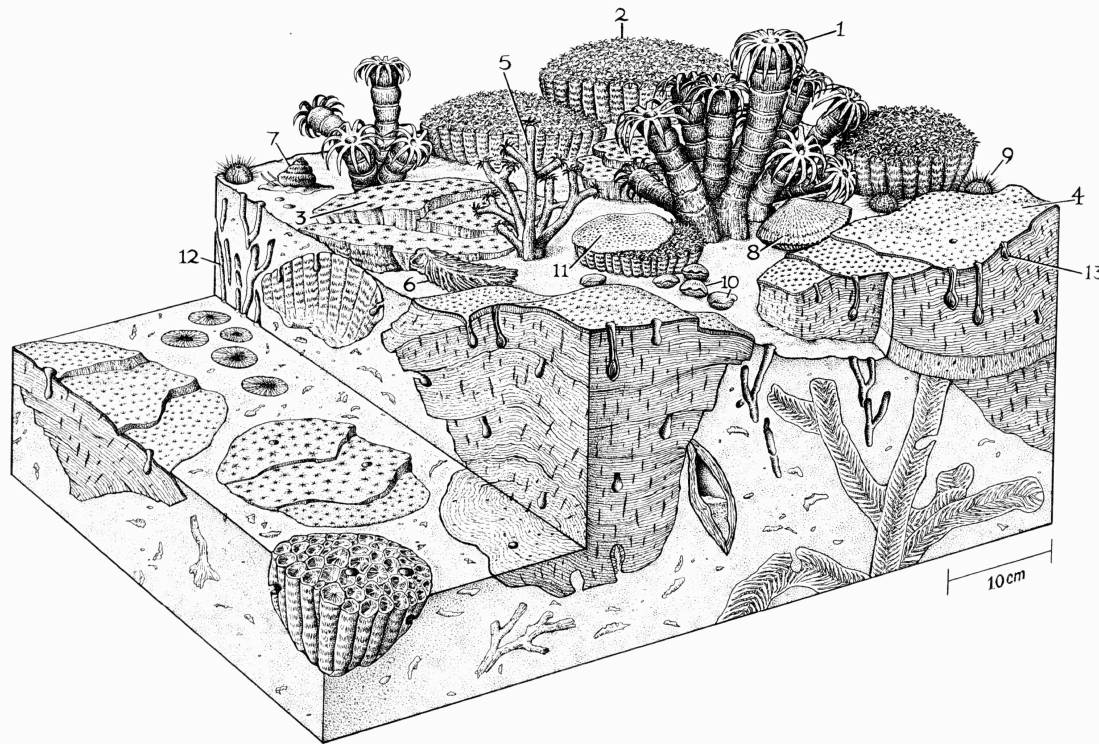


Fig. CS 3.11: Reconstruction of Jurassic (Oxfordian) coral patch-reef community, England. 1: Scleractinian coral (*Thecosmilia*); 2: scleractinian coral (*Isastrea*); 3: scleractinian coral (*Thamnasteria arachnoides*); 4: scleractinian coral (*Thamnasteria concinna*); 5: scleractinian coral (*Rhabdophyllia*); 6: bivalve (*Lopha*); 7: trochid gastropod; 8: pectinid bivalve (*Chlamys*); 9: sea urchin (*Cidaris*); 10: terebratulid brachiopod; 11: bryozoan; 12: scleractinian coral (*Cladophyllia conybeari*); 13: boring bivalve (*Lithophaga*). (Modified from McKerrow 1978; copyright, John Sibbick.)

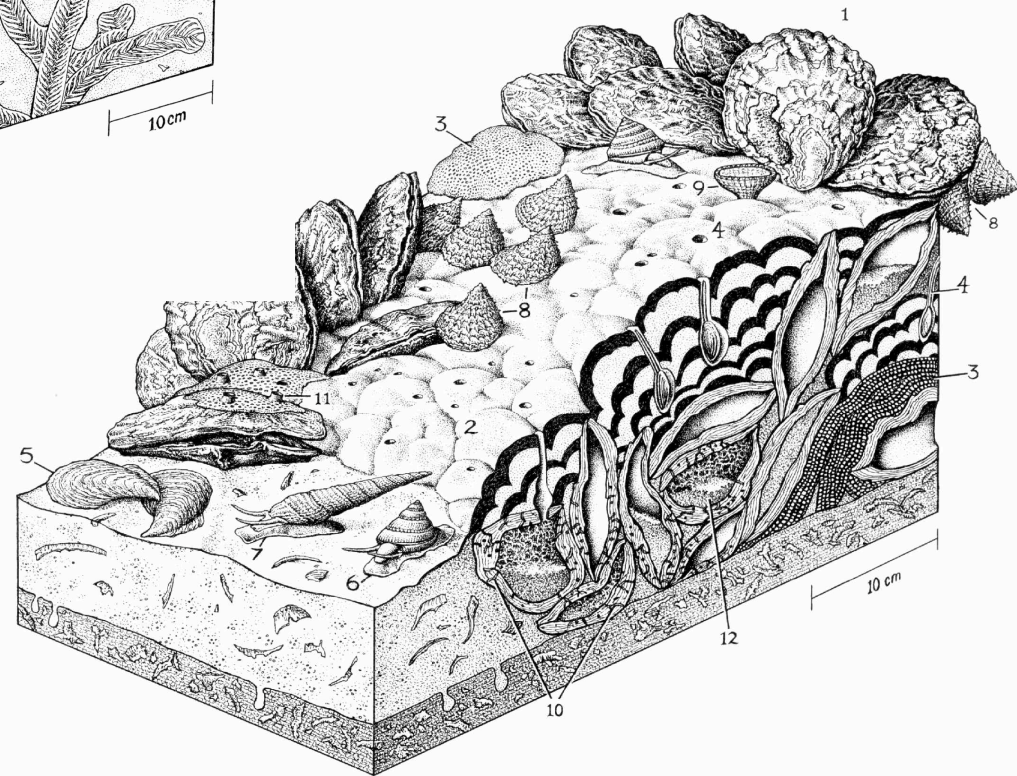


Fig. CS 3.12 Reconstruction of Jurassic (Portlandian) oyster-algal patch-reef community, England. 1: Oyster (*Liostrea*); 2: calcareous red algae (*Solenopora*); 3: thick bryozoan encruster (*Hyporosopora*); 4: boring bivalve (*Lithophaga*); 5: bivalve (*Isognomon*); 6: gastropod (*Pleurotomaria*); 7: gastropod (*Aptyxiella*); 8: spiny bivalve (*Plicatula*); 9: lithistid sponge; 10: sponge borings; 11: boring sponge (*Cliona*); 12: pellets and fungal hyphae. (Modified from McKerrow 1978; copyright, John Sibbick.)

Cretaceous; Modern

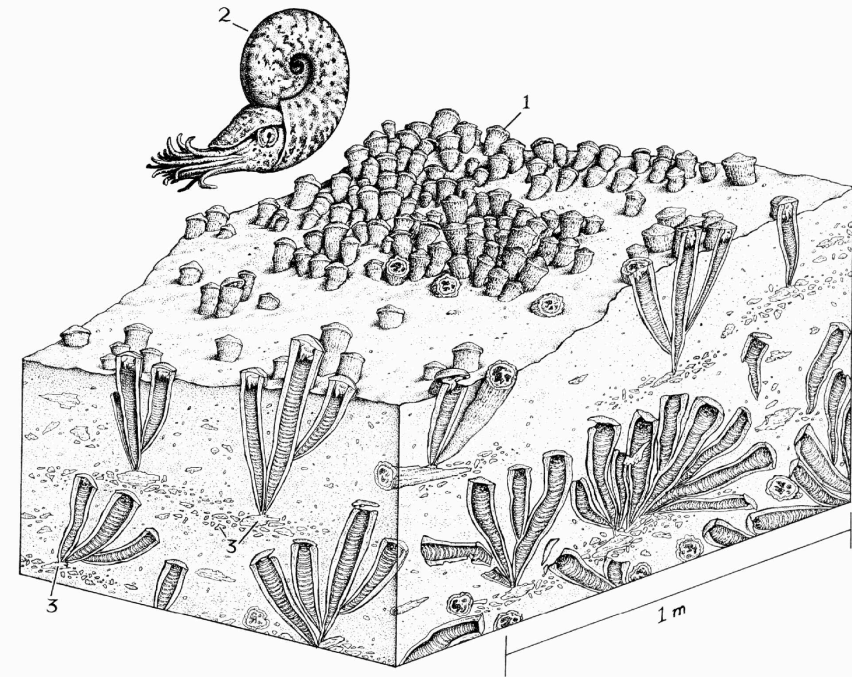


Fig. Box 3.12 Reconstruction of a rudist aggregation (Late Cretaceous). 1: Rudists (*Vaccinites* sp.); 2: ammonite; 3: shell lags. (Copyright, John Sibbick.)

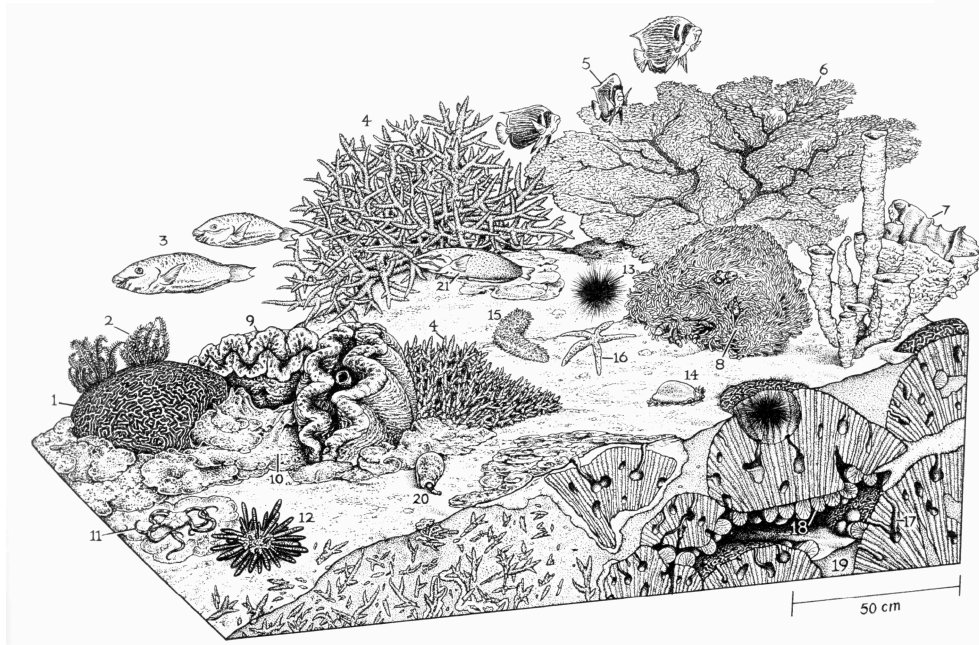


Fig. 3.35: Reconstruction of an Indo-Pacific coral reef. 1: Brain coral (*Leptoria phrygia*); 2: feather star (*Comanthus bennetti*); 3: parrotfish (*Scarus* sp.); 4: Staghorn coral (*Acropora* sp.); 5: Emperor Angelfish (*Pomacanthus imperator*); 6: Gorgonian; 7: vase sponge (*Callyspongia* sp.); 8: anemone with clown fish; 9: giant clam (*Tridacna gigas*); 10: encrusting corals (*Montipora* and *Hydnophora*); 11: brittle star (*Ophiarachella gorgonia*); 12 and 13: sea urchins; 14: cowrie; 15: sea cucumber (*Thelenota ananus*); 16: sea star; 17: boring bivalve (*Lithophaga*); 18: cement botryoids; 19: internal sediment; 20: cone shell (*Conus textile*); 21 wrasse (*Coris gaimard*.) (Copyright John Sibbick.)