Kingdom Animalia

Subkingdom I: Protozoa
(Cell, or colony of like cells)

Phylum (1): Protozoa
- Class 1: Flagellata
- Class 2: Rhizopoda
- Class 3: Ciliata
- Class 4: Sporozoa

Subkingdom II: Metazoa
(ulike cells losing bounderies)

A: Mesozoa (epithelial cells, enclosing reproductive cells)

Phylum (2): Mesozoa

B: Parazoa (tissues, no organs)

Phylum (3): Porifera
- Class 1: Calcarea
- Class 2: Hexactinellida
- Class 3: Demospongiae

C: Eumetazoa (organs, especially mout and digestive tract)

C: Eumetazoa, (repeated)

Grade I: Radiata (primary radial symmetry)

Phylum (4): Coelenterata (with nematocysts)
- Class 1: Hydrozoa
- Class 2: Scyphozoa
- Class 3: Anthozoa

Grade II: Bilateria (bilateral or secondary radial symmetry

Phylum (5): Ctenophora (without nematocysts, 8 rows of ciliated plates)
- Class 1: Tentaculata
- Class 2: Nuda

Grade II: Bilateria, (repeated)

Sectian a: Acoelomata (no space between digestive tube and body wall)

Phylum (6): Platyhelmintes
- Class 1: Turbellaria
- Class 2: Trematoda
- Class 3: Cestoda

Phylum (7): Nemertina

Section b: Pseudocoelomata (false space between digestive tube and body wall, Anus)

Phylum (8): Acanthocephala

Phylum (9): Aschelminthes
- Class 1: Rotifera
- Class 2: Gastrotricha
- Class 3: Kinorhyncha
- Class 4: Nematoda
- Class 5: Nematomorpha

Phylum (10): Entoprocta

Section c: Eucoelomata (true coelom, Anus and organ system)

Section c: Eucoelomata, (repeated)

1: with lophophore

Phylum (11): Phoronida
Phylum (12): Bryozoa
Phylum (13): Brachiopoda

2: with mesodermal split

a: unsegmented

Phylum (14): Molluscs
- Class 1: Solenogastres
- Class 2: Placophora
- Class 3: Gasteropoda
- Class 4: Scaphopoda
- Class 5: Pelecypoda
- Class 6: Cephalopoda

Phylum (15): Sipunculoidea
Phylum (16): Priapuloidea
Phylum (17): Echiuroidea

b: segmented

Phylum (18): Annelida
- Class 1: Archiannelida
- Class 2: Chaetopoda
- Class 3: Hirudiena

Phylum (19): Arthropoda
- Class 1: Onychophora
- Class 2: Crustacea
- Class 3: Arachnida
- Class 4: Pentastomida
- Class 5: Pantopeda
- Class 6: Pauropoda
- Class 7: Diplopoda
- Class 8: Symphyla
- Class 9: Chilopoda
- Class 10: Insecta

3: with outpouchings of digestive tube

3: with outpouchings, (repeated)

a: with secondary radial symmetry

Phylum (20): Echinodermata
- Class 1: Asteroidea
- Class 2: Phiuroidea
- Class 3: Echinoidea
- Class 4: Holothuroidea
- Class 5: Crinoidea

b: bilateral symmetry retain

Animal kingdom continued.

Subkingdom Metazoa, C: Eumetazoa, Grade II: Bilateria, section c: eucoelomata, 3: with outpouchings of digestive tube, b: lateral symmetry retained

Phylum 21: Chaethognata
Phylum 22: Hemichordata
Phylum 23: Chordata

Subphylum 1
Tunicata

Subphylum 2
Acrania

Subphylum 3
Vertebrata or Craniata
Class 1: Agnatha
Class 2: Placodermi
Class 3: Chondrichthyes
Class 4: Osteichthyes
Class 5: Amphibia
Class 6: Reptilia
Class 7: Aves
Class 8: Mammalia

Subkingdom II: Metazoa. Multicellular animals with at least two cell layers.
C: Eumetazoa: Those who, unlike the sponges, habe true organs, especially a mouth and a digestive system

Grade II: Bilateria: animals with an anterior-posterior, and a dorso-ventral axis. Therefore a digestive cavity.

Section c. Eucoelomata: Animals with a "true" coelom. I;e: the mesoderm splits into two layers, the outer one lining the ectoderm, (somatopleura), and the inner one the entoderm, (splanchnopleura). Between them is the coelom

Paragraph 2: coelom a schizocoel, instead of an enterocoel, like in Chordata. A cavity for gonads, (sex cells) and kidneys

Phylum 14: Molluscs. Unsegmented schozoloela, (as opposed to, for instance the arthropods.)

They have an alongated form and originally a symmetric organisaton. The viscera are sheathed in a mantle, of which the lower part is is modified into a muscular organ, the foot. The mantle hangs lose and forms a cavity which gives rise to the organs of respiration. The mantle secretes a clacareous shell. The mantle also protrudes into a head with sensory appendages and sense organs. Thus there are three sections of the body: viscera, foot, head. Other characteristics are: (1° the coelom is represented by pericardium and gonad, but is much reduced, by the extensive vascular system. 2° The alimentary system is characterized by a peculiar tongue beset with chitinous teeth, (radula). 3° the nervous system is a circumoesophageal ringwith an upper cerebrla half and a lower labial half. At the point of junction there are longitudinal chords on each side. 4° The cleavage of the egg is spiral.

The Gastropoda, (class 3), are asymmetrical, through the atrophy of the organs of the original left-hand side, due to the spiral winding of the shell and the visceral mass. In the Cephalopoda, (class 6), head and foot are fused. They thus become abbreviated, the foot is transformed into a series of appendages, and locomotion is mainly through an organ , the funnel, developed from the foot, and ejecting jets of water. Thus the entire nervous system tends to concentrate in the head of Cephalopods, and it is enclosed by a cephalic cartelage, a cephalisation uncommon in invertebrates. The mantle is important in certain molluscs for;respiration, nutrition and incubation of the young. In Cephalopoda it also serves locomotion and excretion. In all molluscs except Cephalopoda it also serves to excrete the shell. It is of an albuminoidal substance impregnated with mineral salts. It is formed of various layers, like pearls and mother_of-pearl. The shell grows by secretion by the edge of the mantle from inside outward. There may be an external horny shell-epidermis.

The digestion consists of three sections: a) mouth, pharyngx, oesophagus, b) stomach and liver, c) intestine. The liver is the most important digestive organ. In Gastropoda there is an additional organ, the crystalline style, (A rod containing enzymes). In Cephalopoda there is a spiral opening into the stomach, a "coecum", which is a style-sac.

The blood is colorless, but hemoglobin may occur. It is contained in a vascular system which opens into capacious spaces, (lacunae). The heart has one ventricle and two auricles. The blood is oxygenized on the surface tissue of the mantle. This surface has cilia in all molluscs except Cephalopoda, in which the water is kept in circulation within the mouth by contractions of the mantle.

The coelom contains a precardium and a spacious cavity for gonads. In Cephalopoda there is a spacious coelum wall from which ovary and testis are developed. In all molluscs excpet Cephalopoda the two parts of the coelom are separate. The primitive connection between them is preserved in Cephalopods. The renal and generative ducts are not allways true evaginations of the coelemic cavity. The kidneys are of mesodermic origin. The genital conduit has gradually shifted forwardtoward the external end of the kidneys and eventually acquires a separate opening. In Cephalopoda they are entirel separate.

The nervous system consists of ganglionic centers, nerve cords and sense organs. The term "central nervous s stem" can only be employed fot Cephalopods. The head and its sense organs are supplied with nerves from cerebral ganglia sitting on the dorsal side of the circumoesopageal ring. The mantle and the foot are inervated from pallial and pedal cords. The viscera from the ventral part of the circumoesophagial ring. In Gastropoda and Cephalopoda the ganglia are fused into a solid ring. Whether this concentration has functional significance is uncertain. It may be responsible for the higly coordinated movements of Cephalopoda.

Sexes are separated and hermaphroditis is only found in specialized forms. Copulation only occurs in Cephalopoda, but fertilisation is always i ternal. The eggs are laid separately in all molluscs except Gastropoda and Cephalopoda, which deposit them in masses supported by very complex structures and capsules. In Gastropoda the eggs are incubated in the maternal body.

Primitive molluscs are aquatic. During Devon they populate fresh water, and in Carbon they invade the land. On land there has been since a rapid evolutionary diversification. Amphinuera and Cephalopoda are exclusively marine. They do not tolerate any reduction of salinity. The large terrestrial fauna is consituted mainly by Gastropoda. Gastropoda are highly successful on land. It is not understood why Cephalopoda have not invaded the land. The littoral Octopoda can move with great agility, so locomotion is not the reason. Probably the specialisation of muscular organs for pumping has deprived them from the capacity of breathing air.

Mollusc are cosmopolitan. They are found to depths of 3000 fathoms. Cephalopoda are specialized to live in great depts. Small Cephalopoda are adapted in adult life as plankton organisms. But the greater part of molluscs are sedentary.

Some Cephalopoda are large size and have predatory habits. They are unique among invertebrates as highly mobile and vigorous animals. They exceed vertebrates in this. The rest of molluscs is sluggish, and has vegetarian diet. The majority is encumbered in shells and relies on passive defense. Many are buried below the surface , and a considerable energy is required to burrow in a semi-solid medium. Gastropoda and Lamellibranchia include parasitic forms.

Mollusca are short-lived. Most are biannual, Streptopoda live for several years, and some Cephalopoda may live as long as 20 years.

Mollusca form a unified phylum. Despite great plasticity of the external parts the underlying structure remains unchanged. All classes tend to show similar modifications. For instance: in all mollusca the shell tends to become atrophied and covered by the mantle. Nevertheless there are two neat tendencies: toward Gastropoda and toward Cephalopoda. The Amphineura arethe most primitive. Each class has a very specific destiny, however.

Mollusca are probably descendent on Annelida. The common ancestor of Mollusca, (phylum 14) and Annelida, (phylum 18) may be Platyhelmia, (phylum 6). Thus the segmented organisation is somehow "overcome" by mollusca, and they represent a further stage.

Class 6: Cephalopoda:
- Subclass 1: Protocephalopoda
  - Order 1: Nautiloidea
  - Order 2: Ammonoidea
- Subclass 2: Metacephalopoda
  - Order 1: Octopoda
    - Suborder 1: Cirrata
    - Suborder 2: Palaeoctopoda
    - Suborder 3: Incirrata
  - Order 2: Decapoda
    - Suborder 1: Sepioidea
    - Suborder 2: Teuthoidea
    - Suborder 3: Belemnoidea.

A group of highly organized invertebrates of exclusively marine distribution. 150 genera, of which the octopus, the squid, and the cuttlefish are most familiar. The extinct forms attained very great diversity in late Palaeozoic. The extinct Cephalopod Ammonite is the best example

They have an elongated visceral mass covered with a mantle. The latter secretes a shell and encloses a cavity in which gills may be suspended. The alimentary canal is furnished with the characteristically molluscan rasping tongue. They differ from the rest of molluscs in that the head and foot are fused and the mouth is in the middle of the foot. The edges of the foot are drawn out into a number of arms and tentacles. The area above the foot, which in Gastropoda is the epipodium, produces a peculiar organ for locomotion, the funnel

They posses fins, and the

shell is degenrated. The dominant theme is organs for an aggressive mode of life unhampered by shell.

They attain a large average size, and the species Architheutis princeps, (giant squid), has a total length of 52 feet. (The largest animal). They are a dominant group of marine animals. They eat crustacea and fish and may fight whales. Their bizarre appearance and their sinister eyes have made them subject of legends. Their reputation of ferocity is merited, including attacks on humans.

The distinction between Octopoda and Decapoda is superficial. Sepiola have close affinities to Octopoda. Loligo has a chitinous shell and is still closely related to Octopoda.

The anatomy is characterized by the radical shortening of the foot, which decreases the length and increases the height of the body. The foot has advanced toward the mouth, and its edges have encircled it. This occurs in the embryo. Thus the "upper" and "lower" part of the body become "front and back". The viscera are covered with a dome-shape mantle, which is contact with the anteiror body, and open tward the back. It encloses the mantle cavity into which the kidneys and reproductive system open.

Below the viscera are the "mouth-foot", and together they form the body. The posterior side of the "head-foot" is the funnel. The arm encircle the mouth. The whole organisation favors existence in great depth.

The mantle, which in other mollusca has a passive role, becomes involved in locomotion. It draws water into the mantle cavity which is expelled by the funnel. The rapid expulsion of jets creates a retrograde movement. While the jet is under compression, the cartilage apparatus, (a ridge on the mantle and two corresponding studs on the head), adhere and seal the cavity. Additional motor appendages, fins and arms, are developed. They may become very large and propel the animal in fron The circumoral appendages are muscular, and are equipped with suckers that have toothed rims. These teeth may be modified into formidable hooks. Two of the arms are modified to capture prey.

All Cephalopoda have internal cartilageous coverings of the nervous ganglia. It forms a kind of skull. There are other skeletal supports of the arms, the base of the fins, and on the "neck".

There is a muscular bucal mass furnished with jaws and the rasping tongue. Followed by oesophagus, salivary glands, stomach, coecum, liver and intestine. Efficient mastication is secured by powerful manibles and sharp teeth. In Octopoda the oesophagus is expanded to form a biting crop. Often there is a "second stomach", a spiral. Near the anus there is a diverticulum which secretes a dark fluid, ("sepia"), which is forcibly discharged

The dark cloud thus formed can be shaped

by the animal, and serves to escape from enemies. This ink-sac is absent in certain deep-sea Octopoda.

The circulatory and respiratory systems are highly developed. The process of circulation and oxydation is highly concentrated in two cardiac auricles and two gills. The mechanism of respiration is the rhythmic contraction of the mantle providing circulation of water in the mouth. There are featherlike gills in the mouth, but in deep-sea Octopoda they are reduced in length. Excretion is carried out exclusively by the kidney.

The ganglionic centres are concentrated in the head and closely packed. The cerebral centres are subdivided in two halves, and so are the pedal centers. The sense organs are eyes, olfactory organs, (very numerous) organs for balance and tactile structures, (very numerous). The eyes are very complex, have retractive lenses, and are superior in efficiency to those of the Vertebrata.

Sexes are separate. There is sexual dimorphism. In Octopoda the male is much smaller than the female. Males have several specialized organs for copulation. The spermatozoa are transferred to the female in long tubes which penetrate the mouth of the female, while supporting copulatory organs enter the mantle cavity of the female. Those secondary organs are spoon-like. Other copulatory arms are used as means of stimulation of the female.

The skin has permanent color, but there are contractile cells chromatophora), which may change the color in specific parts or gegerally Those cells may contract individually or in concert. In deep-sea Octopoda and Decapoda there are light organs in the mantle, arms and head. The color of the light emitted can also be modified.

The eggs ha e an enormous amount of yolk and the embryo is localized at the end of the egg. In the embryo the foot travels toward the mouth, and the funnel is formed last. Thus the embryo reveals as much extreme specialisation from primitive mollusc forms as does the adult.

Phylogenetically the organisation of Cephalopoda follows the spiral str ucture of mollusc shells. There is a median exis around which the organisation coils. There are retograde "recapitulations" in fossils which show this. The phylogenitic tendency is toward "uncoiling". There has been a transfer of the center of gravity from a horizontal to a vertical position. The inner skeleton is phylogenetically unrelated to the atrophied shell.

Cephalopods do not tolerate fresh water. It is useless to speculate why this is so in such highly organized animals. It is however important to notice that they seem to procure <u>higher salination</u>. They are cosmopolitan, and the ocean divides do not affect them. The same species inhabit tropical waters and the Arctic and Antarctoc. There are littoral species, and others inhabit the abyss up to 3000 ~~feet~~ fathoms (more than 5000 m).

They always live near the sea bottom, and they either walk or swim. The Octopus Eledonella is known to walk in abyssal conditions. They seem to be sociable and gregarious. There groups cannot be accounted for by accidental factors. There are breeding seasons. The sexual habits are almost unknown. There is sexual display. Ink clouds may serve as advertising to partners. There are curious formations of fringed arms which have undoubtedly sexual importance. Nothing is known about egg-laying, except that there are complex brood-chambers in the shape of spira shells which are secreted by specialized arms of females. Those shells are not homogenous with true shells, however. Brooding over the eggs by both females and males is probably, and they are probably monogamous.

Cephalopoda are carnivorous. They feed on crustacea and fish, and some species are cannibals. They are prey to whales and dolphins. Fragments of cephalopoda, (mandibles and teeth), are found in their stomechs. The wax-like substance known as "ambergris" used in pefumery is cephalopods vomited by whales. But large cephalopods can struggle with whales and may kill them. Dead whales with sucker-rings inprinted in their skin and voided of blood have been found.

The color-changes in Cephalopod skins due to the contraction of chromatophores have been interpretaed as protective, but they no doubt also manfest emotions. Octopus is known to chaneg colors which have social meaning, though none to the human eye. The chief means of protection is provided by the expulsion of ink. But this is not a smoke-skreen behinf which the animal hides. The ink, when shot, remains as a definitely shaped object, a kind of "dummy". This engages the attention of the enem while the animal changes its color to become virtually transparent. This protective transparency, coupled with almost deliberate shaping of ink-clouds, characterizes Cephalopod behavior in the face of danger.

Some Cephalopods may shoot out of the water and fly for short stretches. Some may inhabit descarded shells of Tunicata like Salpa, as if those were "houses". Some may live parasidically on other animals of the same species, and they then evolve specialized suckers.

Order 1: Octopoda: Eight-armed Cephalopoda of which there are 36 genera, (Eledone, Cirrotheutis, Argonauta etc.). The Genus Octopus itself, (in the strict sense), is characterized by the presence of two rows of suckers on each arm. It contains 140 species from the Arctic to the Antarctic. Their sucker-bearing arms, formidable jaws and sinister appearance have conferred on them the fame of ferocity which is fully deserved.

They walk on several arms, (3-5) on the sea bottom, they swim with fins and arms, and the propell themselves with the funnel. Some species live permanently in the abysses of below 4000 m. They feed on crustacea. Before killing, they paralyse them with a poison secreted by salivary glands. They may attain a size of 20 m.

The species Octopus vulgaris is common in Europe and is eaten. The species Octopus appolyon attains 10 m, and is common in the United States. The abyssal species are badly known.

Most species lay eggss in grapelike clusters covered with complex structures. The female of Octopus vulgaris broods over the clusters, holding them in a membraneous expansion of its arms; and syringing them with jets of water from its funnel.

It has been recorded that octopus in captivity will devour its own arms, even if it is amply supplied with normal food.

Vampyroteuthis infernalis

G. E. Pickford demonstrated that the black octopus-like animal, encountered by several deep-sea expeditions, and apparently a common animal at great depths in tropical latitudes, is not an octopus, but the last survivor of a Jurassic group of cephalopod molluscs, differing radically from both the octopod and decapod types, though rather more closely related to the ten-armed cuttlefishes than to the Octopoda

cuttlefish – Tintenfisch – [illegible] calamar – Seiche

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Peut-on critiquer un texte scientifique ? Dans la mesure où il est vraiment scientifique, il ne peut y avoir de "critique" dans l'absolu puisque celle-ci devrait être de nature logique et que le mot : "scientifique" veut exclure précisément tout recours à l'illogique qui serait une entorse aux règles du jeu. L'exploration du champ des possibles entre précisément dans ce jeu. Mais certes, on peut toujours critiquer un texte sur le plan rhétorique : il est trop long, il est trop court, il est peu lisible, il est trop facile, autant de "critiques" que se permettra le lecteur toujours distrait, toujours paresseux. Humain, trop humain, il n'est jamais à la hauteur de l'image idéale que l'auteur se fait du consommateur de pensée.

Pour l'auteur qui rédige cet article d'Encyclopédie, se familiariser avec le Vampyrotheutis, voudrait signifier que le lecteur prend contact avec une connaissance -qui est de jure indépendante du nom de l'auteur de l'article-. Nous n'avons rien à savoir de Vilem FLUSSER en apprenant ce qui se passe au fond des océans, nous n'avons à connaître que du fond des Océans et de l'organisation des synapses. Et certes, nous ne doutons pas que ce texte sera, abondamment, critiqué par les biologistes sous prétexte d'invraisemblance, par les philosophes sous prétexte d'incohérence, par les écrivains sous prétexte de lourdeur, et par les humoristes sous prétexte de légèreté : c'est leur affaire, disons que c'est leur tâche.

Mais il n'est pas superflu de marquer que l'esprit critique ne peut s'exercer qu'au niveau même où la pensée créatrice, en suivant difficultueusement les arcanes de la logique, s'égare dans leur dédale et qu'on peut, donc, lui reprocher une quelconque faute de rigueur dans sa trajectoire.
La critique qui porte sur le créateur ne peut être de même essence que celle qui porte sur la chose créée. C'est pourquoi nous devons ignorer comment le Vampyrotheutis, avant ou après être né dans les profondeurs de l'abîme, est né dans l'esprit d'un philosophe. Il n'y a pas épistémologiquement, de rapport entre celui qui créé par les hasards heureux de son esprit limité et l'adéquation plus ou moins grande de la description qu'il fait du monde des possibles, dans le texte qu'il réalise. Nous savons que toute critique qui mélange l'un et l'autre est confusion de la pensée. Un texte de ce genre se veut en soi valable par la seule somme des réflexions qu'il cause sur la fiction qu'il présente et par là des corrections qu'il peut susciter.

Mais certes, et sur un autre plan, essentiellement séparable du précédent, l'auteur lui-même est sujet de réflexion quant au processus qui a animé son esprit. Il est un cas particulier -ici remarquable- d'un processus heuristique dont il est légitime de se demander -c'est une question qu'il pose au froid métaphysicien- s'il ne serait pas l'amorce d'une nouvelle méthode de la pensée philosophique.

Abraham A. MOLES