archenteron and gradually occupy the whole body by enlarge-ment. Examples: Deuterostomia (e.g., Echinochordata, Hemichordata and Chordata). 3. Myocoel: This type of coelom origi¬nates in Phoronida in which the mesen-chyme rearranges to enclose a place called coelom (Marshall and Williams, 1972). It is an unusual method of coe¬lom formation. It is neither entero-coeloms nor schizocoelous. **Coelom in Different Groups:**

In Sipuncula, there are two coelomic cavities, one of which is a ring-like tentacu¬lar coelom which is situated at the base of the tentacles and extending three branches in each tentacle. Another is trunk coelom which is spacious and occupies the trunk region separated from the tentacular coelom. The coelomic fluid within the coelom is in constant circulation by the movement of cilia of the peritoneal cells and by the contraction of the muscular body. The coelomic fluid contains wandering leucocytes, disc-like haemerythrin containing cells, reproductive cells and excretory cells.

Like the sipunculans, similar types of coe¬lomic cavities are found in echiurans. The trunk coelom is spacious and uninterrupted. The coelom is fluid is circulated by muscular contraction of the body and by the cilia of the coelomic lining.

In priapulida, it is not clear whether the body cavity is a pseudocoelom or a coelom. The body cavity fluid contains amoebocytes and erythrocytes.

In Pogonophora, the coelom is compartmented and extended into tentacles. The coelomic fluid contains respiratory pigment and haemoglobin.

In Onychophora, the main body cavity is a haemocoel, not a true coelom. The body cavity is known as mixocoel. True coelom is restricted to the gonadal cavities and excre¬tory organs.

In some coelomate animals such as molluscs and arthropods the cavities of blood- vascular system become greatly enlarged and this enlargement

obliterates the perivisceral coelom and as a result the viscera lies in a spacious cavity filled with blood.

This blood-filled cavity is called haemocoel. In Mollusca, the coelom comprises a pericar¬dial coelom around the heart, a gonadal coelom, and paired coelomic ducts serve as excretory organs. In Arthropoda, the coelom is represented by the cavity of gonads and the excretory organs in some species. In annelids there is a pair of sacs—the right and left coelomic vesicles lying between each segment of the gut and the corresponding segment of the body wall. The cavities of the coelomic vesicles contain a fluid and corpuscles and are lined by peritoneum derived from mesodermic epithelium. Each segment of annelida has a dorsal mesentery, ventral mesentery and a transverse septum. Two sheets of peritoneum meeting in the mid-line above and below the gut form the dorsal mesentery and ventral mesentery re-spectively. The septum which is a screen between two successive segments is formed by the meeting of two peritoneal sheets at the boundary between the segments.

The mesentery is composed of a double-fold of peritoneum of coelomic epithelium. In rare exceptions, the septa and mesenteries form a complete series of transverse or longitudi¬nal partitions throughout the entire length of ‘ the body of the animal. In most cases the septa are perforated and the mesenteries are incomplete so that there exists a close com¬munication between coelomic vesicle and coelom.

In Echinodermata, the coelom in the adult echinoderms is represented as several distinct spaces. It develops as a pair of lateral pouches and becomes separated from the embryonic enteron.

These pouches represent the future coelomic cavity and the cells which comprise the pouch wall become the mesoderm. The two original pouches, one on each side, give rise by subdivisions to coelomic vesicles, arranged one behind the other and called respectively, the axocoel, the hydrocoel, and the somatocoel. These coelomic vesicles correspond to the protocoel, mesocoel

and metacoel of the hemichordates. The water vascular system arises from the hydrocoel. The two somatocoels convert into gut mesenteries and left axocoel transforms into the hydropore. Views Regarding the Coelom Formation: Regarding the origin of coelom there are four basic theories which have been dis¬cussed in details by Clark (1964).

1. **Enterocoel theory— First proposed by Lankester in 1877, supported by Lang (1881), Sedgwick (1884):** This theory states that the coelom may have originated by evagination as pouch-like structures in the wall of embryonic arch-enteron. This type of coelom formation oc¬curs in many existing enterocoelous animals. This concept was proposed by Lankester in 1877. Sedgwick (1884) suggested that the gastric pouches of anthozoans (Cnidaria) became separated from the main gastric cavity (gastrovascular cavity) and were transformed into coelomic pouches (Fig. 17.52).

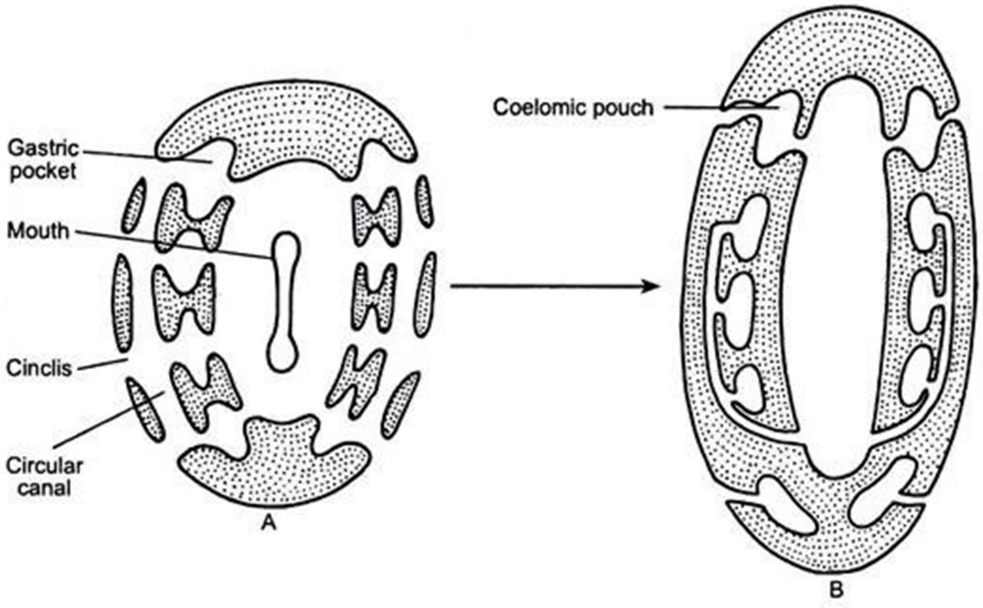

Fig. 17.52: Digrams showing the enterocoel theory of coelom formation. A. Diagramillustrating the gastric pockets of an anthozoan animal. B. Fig. shows the coelomic pouches after transformation of the gastric pockets of anthozoans.

2. **Gonocoel theory (HatSchek, 1877, 1878), Bergh (1885), Meyer (1890), Goodrich (1946):** The origin of coelom in favour of gonocoel theory is that first coelomic cavities arose from the mesodermally derived expanded gonadal