

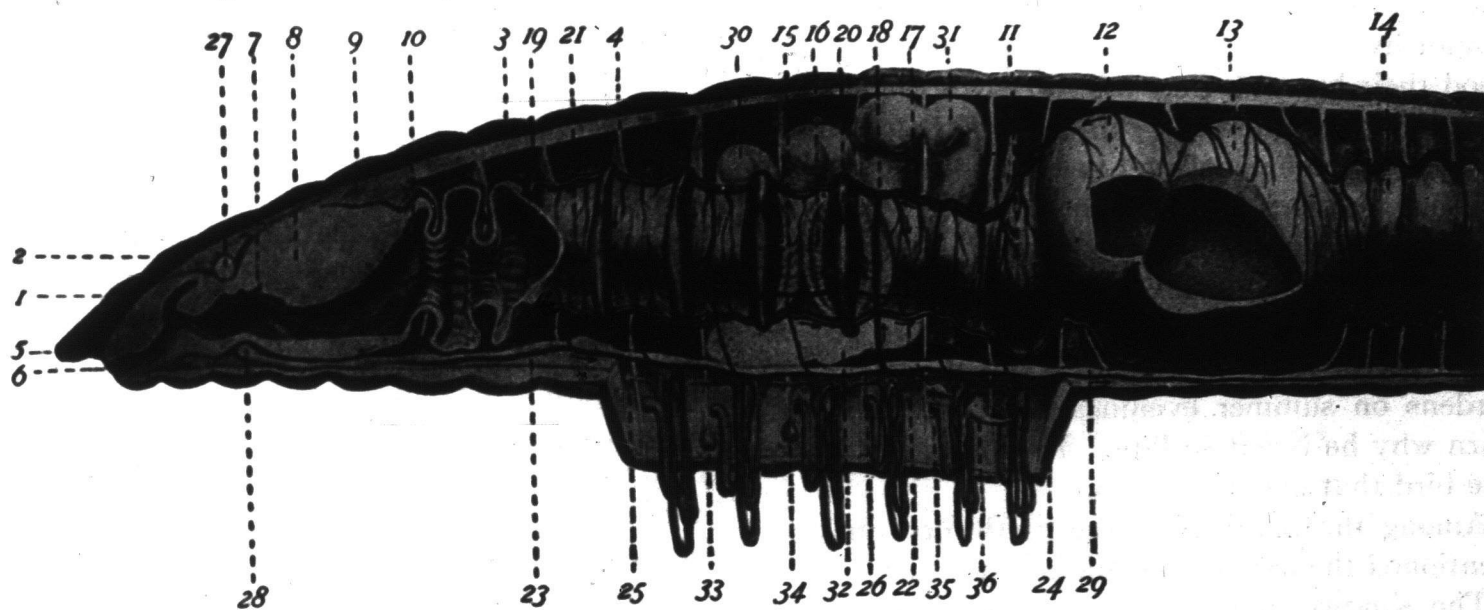
contraction and expansion of these muscles produce the motion waves already mentioned.

Inside the body wall is the body cavity or coelom, through the centre of which extends the alimentary tract with its digestive cavity. Note that these two cavities, the body cavity and the digestive cavity, are always present in the higher animals. In many of the lower animals the body cavity is wanting: in some forms, like the clam, it is almost obliterated; in others, like the hydra, it is never formed.

In earthworms the body cavity is divided up into a series of small chambers by vertical partitions called septa, corresponding to the external divisions into segments. Compare this arrange-

ment with what we find in the higher vertebrates, in which a pericardial cavity, a pleural cavity, and a peritoneal or abdominal cavity are all derived from a simple embryonic body cavity.

The main nerve cord consists of a connected series of ganglia, one for each segment, and runs in a median line along the ventral side, internal to the body wall. The anterior ganglion of this chain



Disection of the Anterior End of the Earthworm. X4

1 first segment; 2 second segment; 3 seventh segment; 4 septum; 5 prostomium; 6 mouth; 7 pharynx; 8 wall of pharynx; 9 retractor muscle of pharynx; 10 and 11 œsophagus; 12 crop; 13 gizzard; 14 intestine; 15 and 16 calciferous glands; 17 dorsal blood-tube; 18 parietal blood-tube; 19 and 20 first and fifth hearts; 21 lateral blood-tube; 22 and 23 ventral blood-tubes; 24 body wall; 25 internal end of nephridial (kidney) tube; 26 external end of kidney tube; 27 bilobed ganglion or brain (super-pharyngeal ganglion); 28 most anterior ganglion of ventral chain (sub-pharyngeal ganglion); 29 ventral nerve-chain; 30, 31 and 32 seminal vessels; 33 and 34 seminal receptacles; 35 ovary; 36 oviduct.

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The mouth, pharynx, œsophagus, crop, gizzard and intestine are well shown in the accompanying illustration, and require no further mention.

At the bottom of the illustration a portion of the body wall is turned down showing coiled kidney tubes (nephridist tubes). Each little section of the body cavity is provided with two of these tubes, one on each side. They correspond in function to the kidneys of higher animals.

In the mature earthworm a thick band, consisting of a thickened glandular portion of the body

is in the fourth segment, and this is connected by a nerve girdle around the pharynx to a bilobed ganglion or "brain" in the dorsal part of the third segment. Find these parts in the illustration.

The blood of the earthworm consists of a red plasma, in which are suspended a great many colorless corpuscles. Its color is due to a coloring matter called haemoglobin, which is dissolved in the plasma. In vertebrates the same pigment is located in red corpuscles. This coloring matter is the oxygen-carrier of the blood.

Along the dorsal side is a dark red streak, which is quite plainly seen in some specimens. This is the dorsal blood tube. Watch it as the animal expands and contracts when in motion. Through