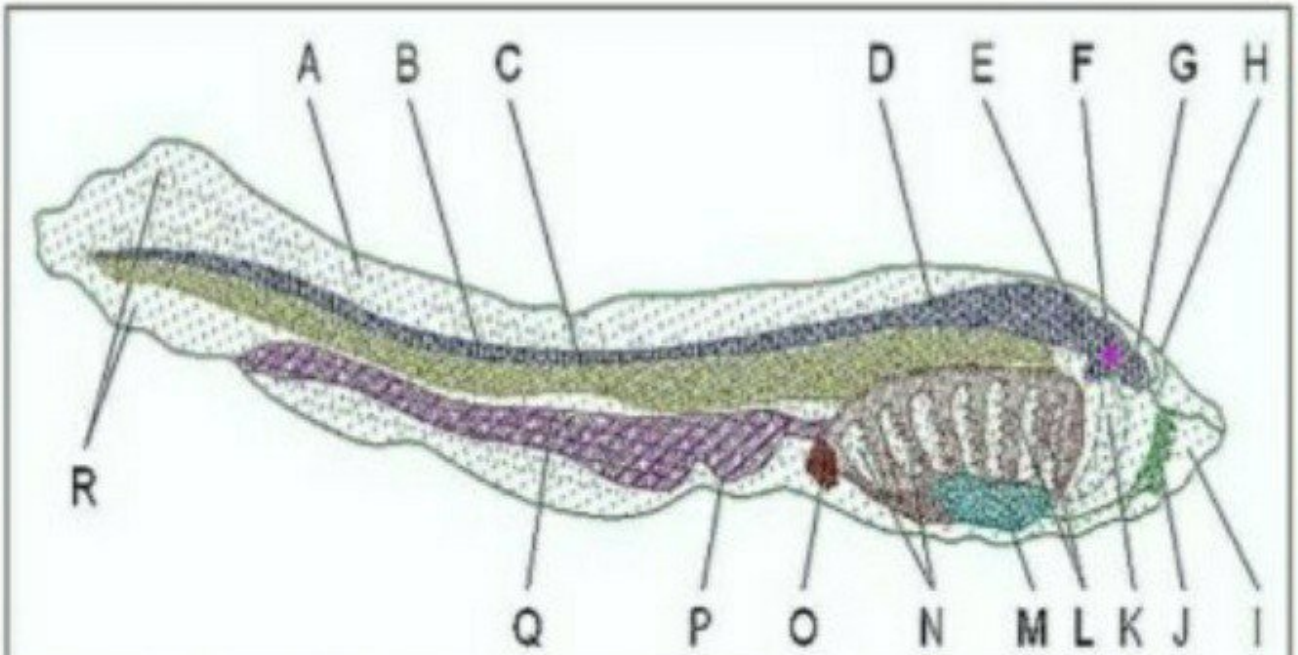
INTRODUCTION

- The larva stage formation of the primitive lamprey is known as Ammocoete Larva. It has many properties of ancient chordates and has some properties of the vertebrates like a dorsal nerve chord, primitive form of nervous system, gills slits , notochord and a brain with eyes. This larva is actually Petromyzon fish.
- Petromyzon is a rather unpleasant animal. Its life cycle includes two quite different phases. The larval phase called ammoceote is a freshwater, sedentary, filter feeding and microphagus creature remiscent of the lancelet or Branchiostomata. The adult fish live in the sea and is parasitic on fishes.

EVOLUTIONARY SIGNIFICANCE OF AMMOCEOTE LARVA

- The larval period last from 3–7 years, according to species during which they grow to about 170mm in length and become opaque.
- The Ammocoete larva is of great importance as it probably represent the most primitive and generalised vertebrate from intermediate between Cephalochordates and vertebrates.

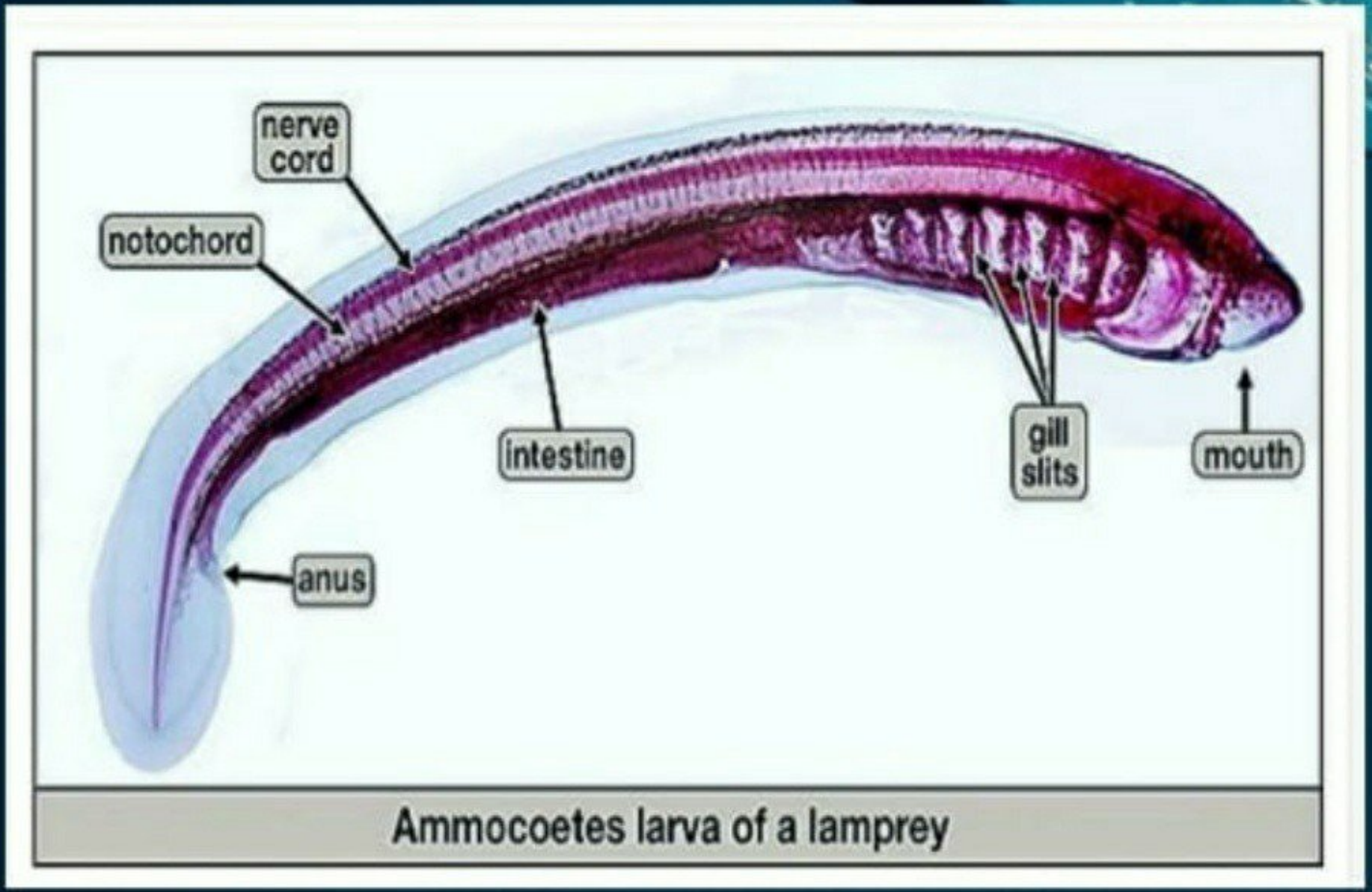
EVOLUTIONARY SIGNIFICANCE OF AMMOCEOTE LARVA



A) DORSAL FIN	G) OLFACTORY LOBE	M) SUBPHARYNGEAL GLAND
B) NERVE CORD	H) MEDIAN NOSTRIL	N) PHARYNGEAL GILL SLITS
C) NOTOCHORD	I) ORAL HOOD	O) HEART
D) MEDULLA	J) ORAL TENTACLES	P) LIVER
E) OPTIC LOBE	K) VELUM	Q) INTESTINE
F) EYE	L) PHARYNGEAL GILL BARS	R) CAUDAL FINS

Ammocoete larva showing general internal structure

AMMOCOETES LARVA OF A LAMPREY



Ammocoetes larva of a lamprey

EVOLUTIONARY SIGNIFICANCE OF AMMOCEOTE LARVA

- Its body is eel like but it differs from the adult in several respects.

1. It has a continuous single median dorsal fin.
2. It is a blind, toothless and non parasitic filter feeder.
3. Feeding and respiration are like those of Branchiostoma.
4. It has no suctorial buccal funnel but a semi circular upper lip or oral hood around the mouth, similar to that of branchiostoma.
5. Mouth also has a transverse lower lip.

EVOLUTIONARY SIGNIFICANCE OF AMMOCEOTE LARVA

- It emerges at night, from its burrow to feed on the burrow to feed on the button organic.
- Ooze, containing unicellular algae and bacteria, which are caught on the floor of pharynx in mucous strings secreted by a tubular endostyle.
- A velum made of a pair of muscular flaps, regulates the entry of water current into the pharynx which is continued posterior into the oesophagus.

EVOLUTIONARY SIGNIFICANCE OF AMMOCEOTE LARVA

- Seven pairs of gills pouches are present, each with its internal gill slit into pharynx and external gill slit to the exterior.
- Branchial basket supporting the pharyngeal wall alternately expands and contracts, drawing water through mouth into pharynx and pumping out through external gill slits.
- Thus, water circulation is by muscular activity and not by cilliary activity, as in branchiostoma, this is probably a necessary evolutionary development for engulfing larger pieces of food.

EVOLUTIONARY SIGNIFICANCE OF AMMOCEOTE LARVA

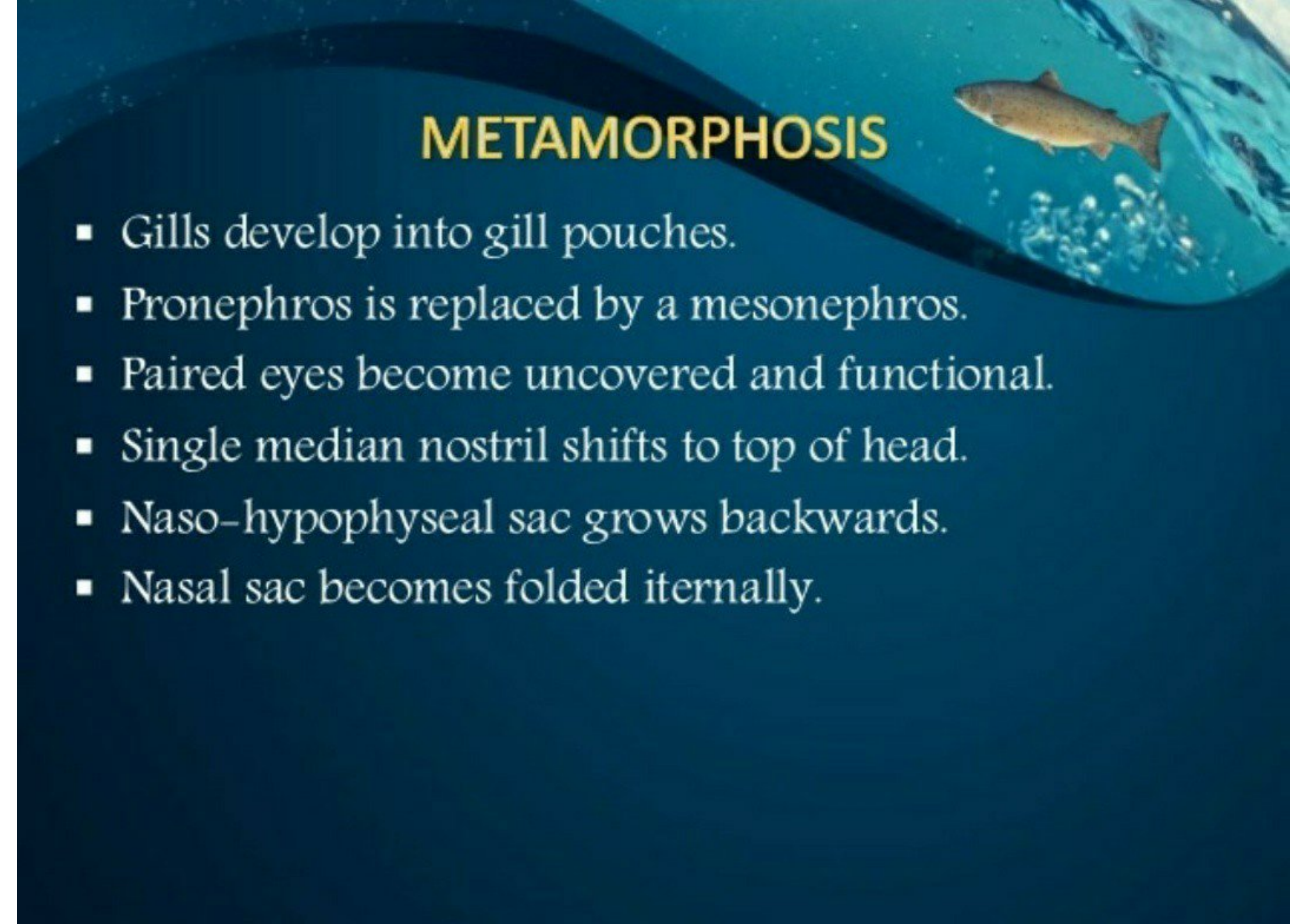
- Liver, bile duct, gall bladder and protonephros (kidney) are present. Pericardial cavity enclosing heart connects with coelom.
- Paired eyes remain hidden under thick skin and muscles.
- Unpaired median pineal eye is well developed but hypophysial and nasal sacs are poorly developed.

METAMORPHOSIS

- It is a dramatic changes in habit, habitat, morphology, physiology and behavior of larva so that it is transform into an adult entirely different habit and structure.
- After a prolonged larval life of 3–7 years, ammocoetes undergo several radial structure changes to metamorphose into the semiparasitic adult form.

METAMORPHOSIS

- Oral hood is replaced by a suctorial buccal funnel with strong and sharp teeth, tongue, rounded mouth and complex musculature.
- Endostyle changes into a thyroid gland below pharynx.
- Velum becomes reduced to guard the opening of respiration pharynx only.
- Oesophagus seperates from respiration pharynx which becomes a blind sac.
- Gall bladder and bile duct disappear.



METAMORPHOSIS

- Gills develop into gill pouches.
- Pronephros is replaced by a mesonephros.
- Paired eyes become uncovered and functional.
- Single median nostril shifts to top of head.
- Naso-hypophyseal sac grows backwards.
- Nasal sac becomes folded iternally.

METAMORPHOSIS

- Continuous dorsal fin becomes divided into two.
- Pericardial cavity becomes completely cut off from coelom.
- Spinal cord becomes dorso-vertrally, flattened.
- Skin colour changes from yellow-brown to mottled greenish brown.

METAMORPHOSIS

- After metamorphosis, the young lampreys swim down to the sea where they remain for 3 or 4 years before reaching maturity, when they once again migrate to streams or rivers to spawn and die. Gonads become mature at that time when adults return river for spawning.