Explanation of Plates

Plate 1

Parasagittal section of the hypophysial region of the Koayu, *Plecoglossus altivelis* (land-locked form), reared under the artificially photoperiodic regime, to show general appearance of the islands of gonad stimulating (GS-) cells. Since all specimens were stained with paraldehyde fuchsin (AF)-azan trichrome, the neurosecretory substance stored in the neurohypophysis and mucopolysaccharide substance in the GS-cells are demonstrated as black or dark color in these pictures. Short photoperiodic regime-8 hours every day. Long photoperiodic regime-16 hours every day.

1. Specimen fixed on July 10, 1966, at the time of beginning of the experiment. No marked differentiation of GS-cells is detected in the proximal pars distalis of the adenohypophysis. ×60
2. Control specimen fixed on August 10, 1966, one month after the onset of experiment. A slightly indication of the differentiation of GS-cells is seen. ×60
3. Specimen of 8 hour-photoperiod fixed on August 10, 1966. Notice a considerable number of GS-cells. ×60
4. Control specimean fixed on September 10, 1966, two months after the onset of experiment. The GS-cell islands are now notable. ×60
5. Specimen of 8 hour-photoperiod fixed on September 10, 1966. It is very remarkable that most of the proximal pars distalis is occupied with GS-cells. ×60
6. Specimen of 16 hour-photoperiod fixed on September 10, 1966. Even in this time, merely a slight differentiation of GS-cells is recognized. ×60

Plate 1

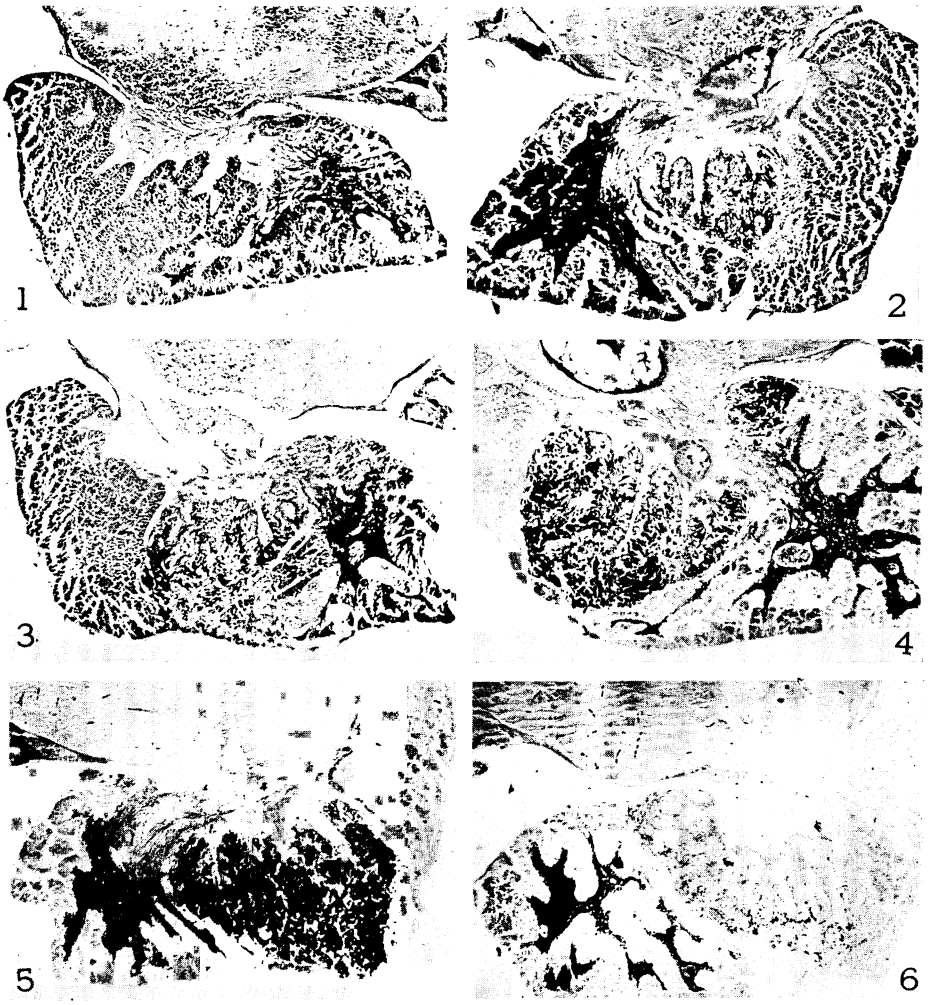

Plate 2

1-4. Parasagittal section of the proximal pars distalis of the adenohypophysis in the Koayu reared under the artificially photoperiodic regime, to show the rate of differentiation of GS-cells. AF-azan triple stain.

1. Specimen fixed on July 10, 1966, at the time of beginning of the experiment. A few cyanophil cells considered roughly as GS-cells are found in the margin of glandular tissue bordered by the neural tissue. It is noticed that merely the basal part of these cells have an affinity for dyes. ×400
2. Control specimen fixed on August 10, 1966, one month after the onset of experiment. The number of GS-cells under the differentiation increases moderately. ×400
3. Specimen of 8 hour-photoperiod fixed on August 10, 1966. A rapid differentiation and increse in the number of GS-cells is notable. ×400
4. Specimen of 16 hour-photoperiod fixed on August 10, 1966. A slight indication of the appearance of GS-cells is detected. There found a remarkable inhibition of the rate of differentiation in GS-cells. ×400

5-8. Parasagittal section of the region of the nucleus lateralis tuberis in the Koayu reared under the artificially photoperiodic regime. All pictures presented here were stained with azan trichrome.

5. Specimen fixed on July 10, 1966. ×400
6. Specimen of 8 hour-photoperiod fixed on September 10, 1966, two months after the onset of experiment. Notice many small vacuoles in the perikarya of the cells. ×400
7. Specimen of 16 hour-photoperiod fixed on October 2, 1966, three months after the onset of experiment. The perikarya are stained well with acidic dyes. ×400
8. Specimen of 8 hour-photoperiod fixed on November 5, 1966, four months after the onset of experiment. A recovery phase of the secretory activity is reached in this time, accompanying an increase in the amount of neurosecretory products. ×400

Plate 2

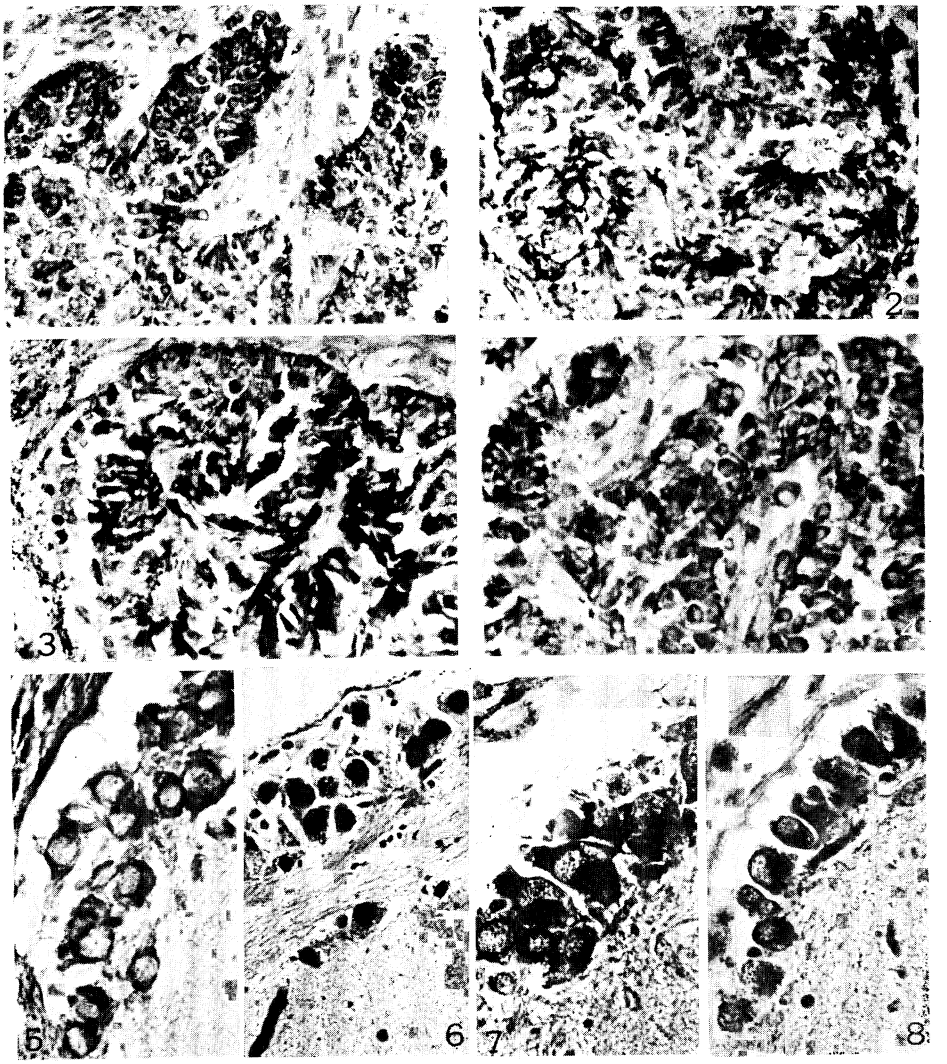

Plate 3

Parasagittal section of the region of the nucleus preopticus in the Koayu reared under the artificially photoperiodic regime. All pictures presented here were stained with AF.

1. Specimen fixed on July 10, 1966, at the time of beginning of the experiment, showing a rich secretory substance in the perikarya of the cells. ×400
2. Control specimen fixed on August 10, 1966, one month after the onset of experiment. The perikarya of the cells are occupied with neurosecretory substance stained deeply with AF. ×400
3. Specimen of 8 hour-photoperiod fixed on August 10, 1966. Notice the neurosecretory substance condensed into large granules. ×400
4. Specimen of 16 hour-photoperiod fixed on August 10, 1966, showing a rich neurosecretory substance in the perikarya. ×600
5. Control specimen fixed on September 10, 1966, two months after the onset of experiment. This picture shows a preoptico-neurosecretory cell with rough granules or rather globules and beaded fiber (=axon). ×600
6. Same specimen as in Fig. 5, to show some cells under depletion of neurosecretory granules. ×600
7. Specimen of 8 hour-photoperiod fixed on September 10, 1966. Notice a prominent depletion or almost complete lack of the neurosecretory substance. ×400
8. Specimen of 16 hour-photoperiod fixed on September 10, 1966. This picture shows the AF stainable globules in the perikarya and juxta-somal axons of the cells. ×600

Plate 3

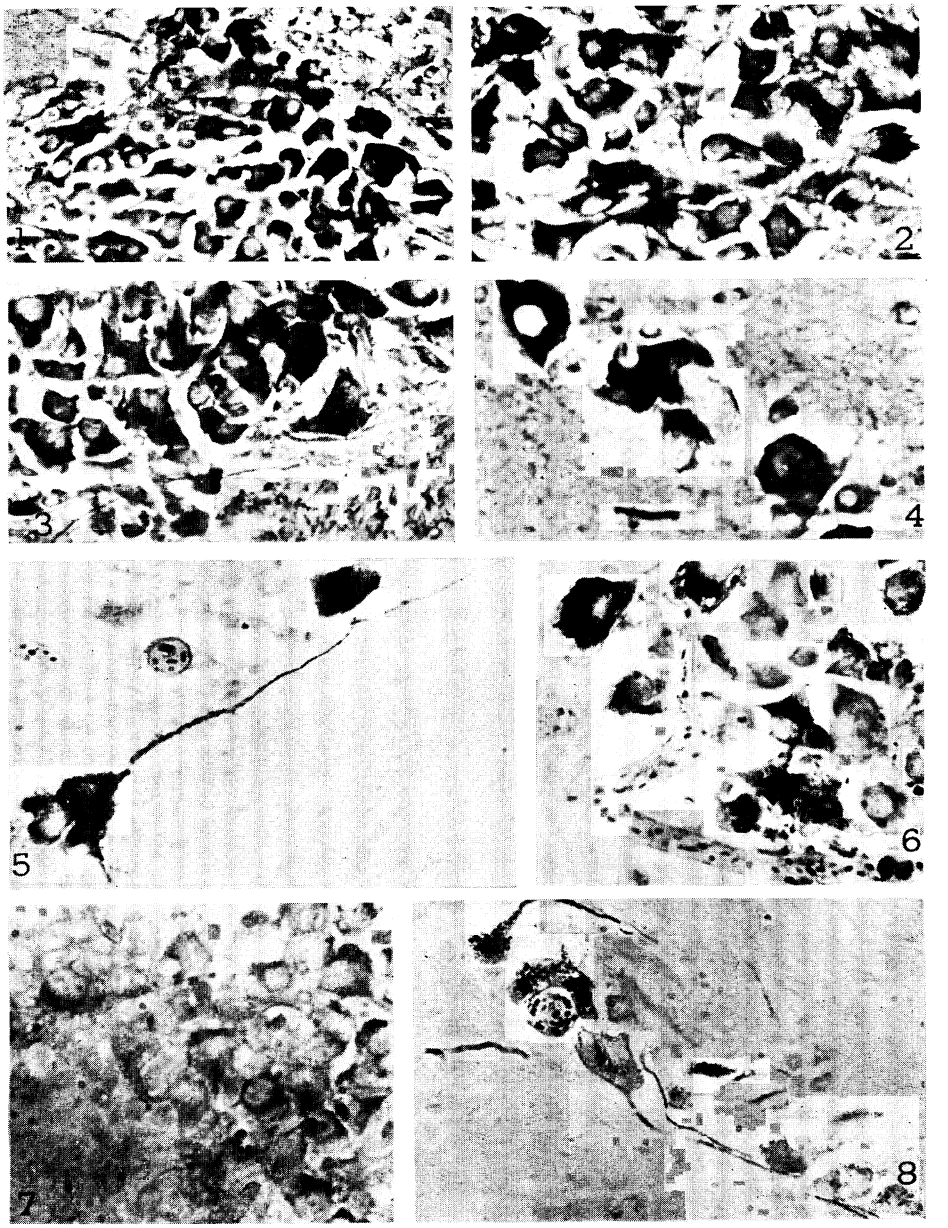

Plate 4

1-6. Parasagittal section of the region of the nucleus preopticus in the Koayu reared under the artificially photoperiodic regime.

1-5. AF stain.

6. Bodian's protargol stain.

1. Control specimen fixed on October 2, 1966, three months after the onset of experiment. It is noticed that the AF stainable granules gathered around the nuclei of the cells. ×600
2. Specimen of 8 hour-photoperiod fixed on October 2, 1966. It is found a few amount of the secretory substance in the perikarya. ×400
3. Specimen of 16 hour-photoperiod fixed on October 2, 1966. The cells contain moderately amount of neurosecretory substance consisting of fairly large granules. ×400
4. Control specimen fixed on November 5, 1966, four months after the onset of experiment. The cells with neurosecretory globules around nuclei, and the cells in the state of depletion are seen in this period. ×400
5. Specimen of 16 hour-photoperiod fixed on January 22, 1967, more than a half year after the onset of experiment. A fairly large amount of neurosecretory substance is recognized in the perikarya of the cells of the fish that have survived beyond the normal life-span. ×600
6. Control specimen fixed on December 4, 1966, five months after the onset of experiment, to show the direction of the axons originated from the nucleus preopticus. Bodian's protargol impregnation. ×300.

7-8. A bundle of the axons from the nucleus preopticus just above the nucleus lateralis tuberis, impregnated with Bodian's protargol method.

7. Specimen of 16 hour-photoperiod fixed on September 10, 1966, two months after the onset of experiment. Notice the juxta-somal axon projected from the cell of the nucleus lateralis tuberis. ×400
8. Control specimen fixed on September 10, 1966. It seems that the beaded axons indicate an active transportation of the neurosecretory substance. ×400

Plate 4