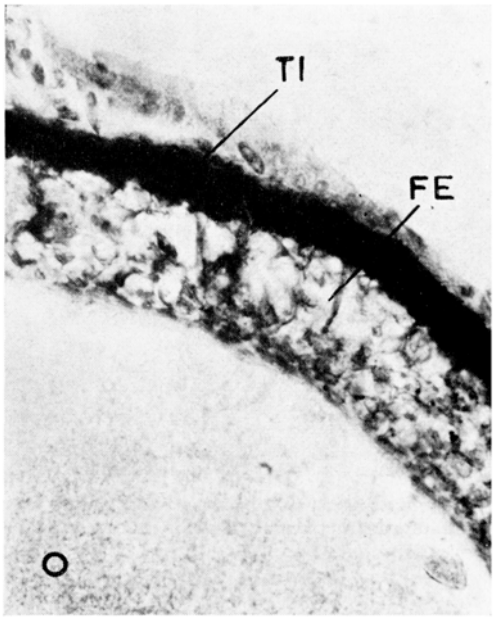

Fig. 1. Photomicrograph of portion of normal developing follicle of *Hemidactylus*, showing strong alkaline phosphatase activity in the theca interna (TI). Note the light positive reaction of the ooplasm (O) and follicular epithelium (FE), which continues to persist in the control sections. × 280.

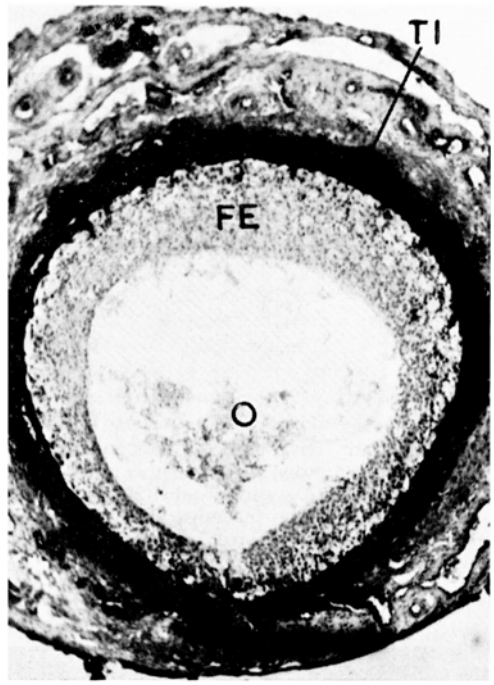

Fig. 2. Degenerating follicle of *Passer*, showing very prominent alkaline phosphatase activity in theca interna (TI). × 70.

The sites of localization of AP activity are highly vascularized, indicating some close physiological relationship between the enzyme and blood vascularity of ovarian compartments. The AP activity present in the theca interna, interstitial gland tissue and corpora lutea must be, therefore, involved in the transference of nutrient and secretory materials or waste products across the cellular membranes of blood vessels and adjacent tissue; it is probably done by the breakdown of phosphate esters. Thus, the AP plays an important role in facilitating the transport of substances across the cellular membranes in the vertebrate ovary. A similar suggestion has also been made by other workers because AP is always found to be associated with the brush borders of the small intestine, kidney tubule cells, and the peripheral portions of nervous elements and a variety of other cells or tissues[5,16–19].

Zusammenfassung. Es zeigt sich, dass die Wirkung der alkalischen Phosphatase in der Theca interna, im interstitiellen glandulären Gewebe und im Corpora lutea liegt und eine bedeutende Transportfunktion bei den ovariellen Zellmembranen der Wirbeltiere hat.

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Relationship Between the Pars Intermedia and the Pars Nervosa in the Hypophysis of an Antarctic Seal

Using light microscopy, fibres coming from the pars nervosa have been described to be present in the pars intermedia of various species. These fibres sometimes have neurosecretory characteristics. In 1949 Bargman[1] working with cats and dogs, found colloidal drops and Herring bodies in some zones of the pars intermedia and suspected them of being of axonal nature. The pars intermedia of fishes seems to be closely related to the pars nervosa, because it has been shown by Scharrer[2] and Meurling[3] that there is an important number of neurosecretory fibres amongt he glandular cells.

Vasomotor fibres in amphibia were described by Green[4]. Although Hild[5] did not find fibres in the pars intermedia of these animals, they were found and identified as neurosecretory by Dawson[6]. In reptiles Hild[5] observed Gömöri positive granules in the pars intermedia near the neurohypophysis.

Using electron microscopy, these findings were confirmed in fishes by Bargman[7]. Knowles[8], also working with fishes, affirms to have distinguished 2 types of fibres in the pars intermedia: one, with elemental granules, similar to those of neurosecretion, and the other contain-

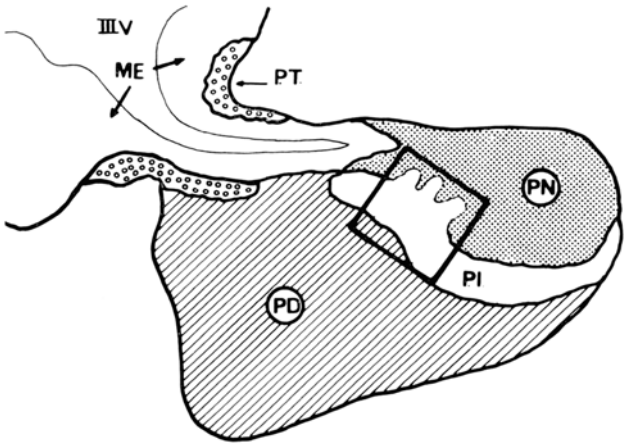

Fig. 1. Diagrammatic drawing of hypophysis of the Weddell seal (*Leptonychotes weddelli*). P.D., pars distalis; P.I., pars intermedia; P.N., pars nervosa; P.T., pars tuberalis; M.E., median eminence; III V., third ventricle. The selected area shows a region of pars intermedia which protrude into the pars nervosa.

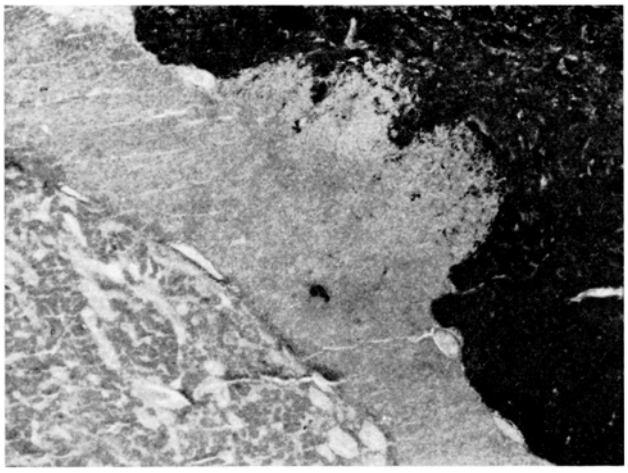

Fig. 2. Microphoto of the selected area of Figure 1.

ing granules similar to those found in autonomous fibres. With regard to mammals, a report by KUROSUMI et al.[9] shows terminals which have no neurosecretory granules between the epithelial cells and one intracitoplasmatic axon which was suspected of being of neurosecretory nature. In amphibia, ITURRIZA[10] points out that he could only find axons with typical sinaptic vesicles. It has not yet been clarified whether the pars intermedia in mammals receives innervation from the neurohypophysis. From this point of view it is important to carry out comparative studies on the neurosecretory systems of the mammals. Working with the Weddell seal (*Leptonychotes weddelli*), we observed a particular relationship between the pars intermedia and pars nervosa in the hypophysis of this Antarctic Pinniped. In these animals the pars intermedia is so highly developed that it occupies a considerable volumen of the gland. It is separated from the neurohypophysis by a septum of connective tissue which contains some vessels. This septum is interrupted in one or more spots. In this zone, where no connective tissue is present, cellular masses of the pars intermedia protrude into the interior of the pars nervosa (Figures 1 and 2).

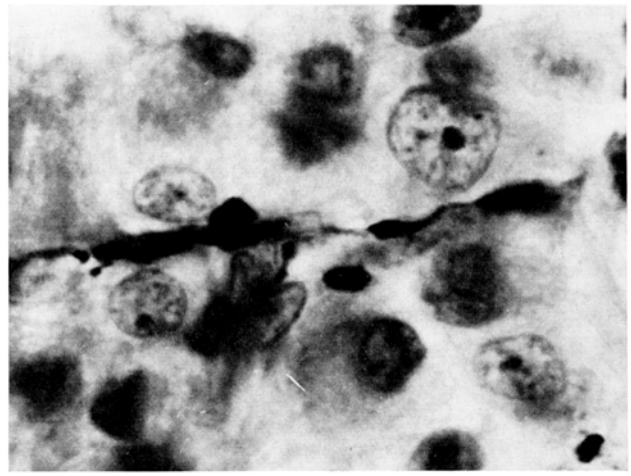

Fig. 3. Beady fibre with GÖMÖRI positive material among the epithelial cells of pars intermedia.

This is not a diffuse cellular invasion, as can be observed in some other species including man. These trabeculae are well separated from the surrounding nervous tissue and are in turn invaded by fine fibres which contain granules of some positive GÖMÖRI material. They are similar to those offered by typical neurosecretory axons of the pituitary stalk. These fine beady fibres are interwoven with the epithelial cells of that region of Pars intermedia which corresponds to the trabeculae.

They take various shapes and are much more abundant in the zones adjacent to the pars nervosa. They were found in no other region of pars intermedia or pars distalis (Figure 3)[11].

Resumen. La pars intermedia de la hipófisis de la foca de Weddell (*Leptonychotes weddelli*) presenta trabéculas que irrumpen en la Pars nervosa. En estas trabéculas epiteliales se encuentran grumos y fibras de material GÖMÖRI positivo. Este material no fué hallado en ninguna otra región de la adenohipófisis.

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