the front corner of the mandible and it also is continuous with the ventral strand of the basal ocular muscles (Figure 1). Along its length it is closely associated with the oesophagus and is also involved in the location of several other receptor systems, details of which will be described elsewhere. The receptor described here (called by us MPR 1, mouth-part receptor 1) is inserted on the ventral side of the main strand on a separate portion which lies below the main strip (nearer the anterior hinge of the mandible). This receptor strand does not appear to be muscular (having no striations) and is presumably elastic since it is stretchable.

The sensory cell bodies lie close to the strand. The axons proceed undivided to the circumoesophageal connective at the commissural ganglion. Peripherally the dendritic region is complex (Figure 2B). Each cell gives rise to a multiplicate dendritic tree which ramifies on the lower strand. The arrangement of dendritic branches is variable; some cells being classically bipolar with only distant dendrite branching; others being multipolar with one branch as axon and a variable number of other twigs innervating the receptor strand. This organization differs considerably from that of the familiar dendritic organization of the abdominal MRO[13], of leg receptors[5] and of coxo-thoracic organs[14]. Similar sensory cells are, however, well known in insects[15] and crustaceae[9].

The operative stimulus for this presumed mechanoreceptor is probably a movement of the mandible rather than of the adjacent oesophagus. Physiological investigations are in hand to determine the properties of the receptor neurones.

Zusammenfassung. Nachweis und Beschreibung eines propriozeptiven Sinnesorgans an den Mandibeln des Hummers (*Homarus vulgaris*).

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On the Brain of the Amazon Dolphin *Inia geoffrensis* de Blainville 1817 (Cetacea, Susuidae)[1]

The brain of the Amazon dolphin (Figure 1) has not yet been investigated. The central nervous system of 4 *Inia geoffrensis* (Table I) were prepared during an expedition in the tropical rain forest of Bolivia (Beni district).

Seen dorsally (Figure 2), the brain is trapezoid with rounded corners. It is widest in the posterior third of the cerebral hemisphere. The fissura sagittalis gapes at the caudal end allowing part of the dorsal cerebellum to be seen. Seen rostrally, the brain is dorso-laterally regularly rounded. The base of the fore-brain with the olfactory tubercle lies quite low towards the basal plane. The fissure of Sylvius forms an angle of 40–45° with the basal plane. Seen from the front, the temporal lobe is quite small and leaves most of the medial formations (amygdala, archicortex) uncovered. Seen caudally, the basal contours of the occipital brain form an angle of approximately 120° with the fissura sagittalis. The cerebellum extends horizontally. It is not as broad as the cerebrum and is flattened on the lower surface. The vermis cerebelli is separated

[1] Carried out with the support of the Swiss National Fund (Grant No. 4606). Contributions to the morphology of Cetacea: XXXV.

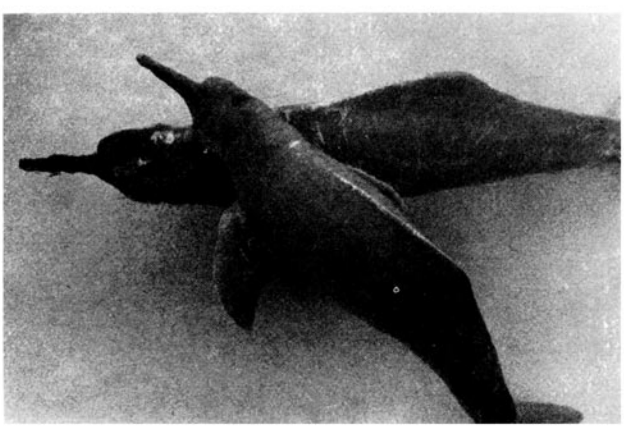

Fig. 1. *I. geoffrensis*, Photo G. PILLERI II. 1968.

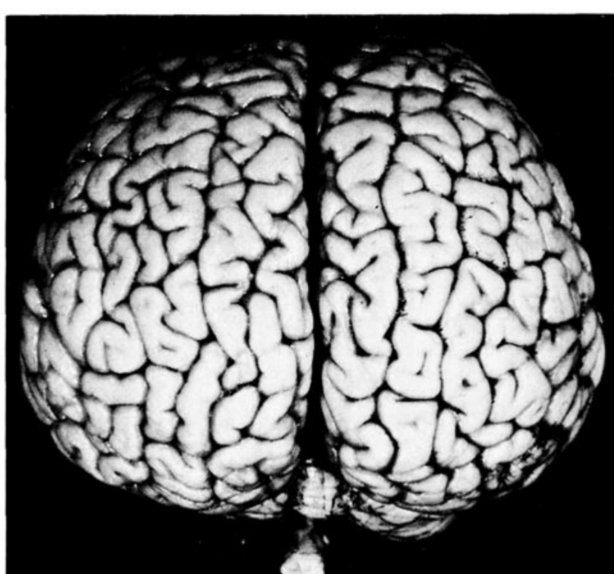

Fig. 2. Dorsal view of the brain (T 417, Collection of the Brain Anatomy Institute Waldau/Berne).

Table I.

No.	Sex	Date and place of catch	Body length (cm)	Body weight (kg)	Brain weight (g)
417	♂	Rio Iboré, Puerto Almacén (Beni), 7.2.1968	163	28.00	460
418	♀	Boca Axojo, Arpiri House, Rio Iboré (Beni), 8.2.1968	208	57.20	645
419	♀	Puerto Almacén, Lagoon, Toribio canal (Beni), 8.2.1968	216	67.60	590
420	♀	Toribio canal to Rio Mamoré (Beni), 8.2.1968	150	26.00	505

Table II. Arithmetic mean ($\bar{x}$), standard error ($\delta_{\bar{x}}$) and variability coefficient (V) of the body length (cm), body weight (kg) and the brain weight (g) of *Inia geoffrensis*

	$\bar{x}$	$\sigma_{\bar{x}}$	V%
Body length (cm)	184.25	± 16.27	17.67
Body weight (kg)	44.70	± 10.44	46.71
Fresh brain weight (g)	550.00	± 41.57	15.11

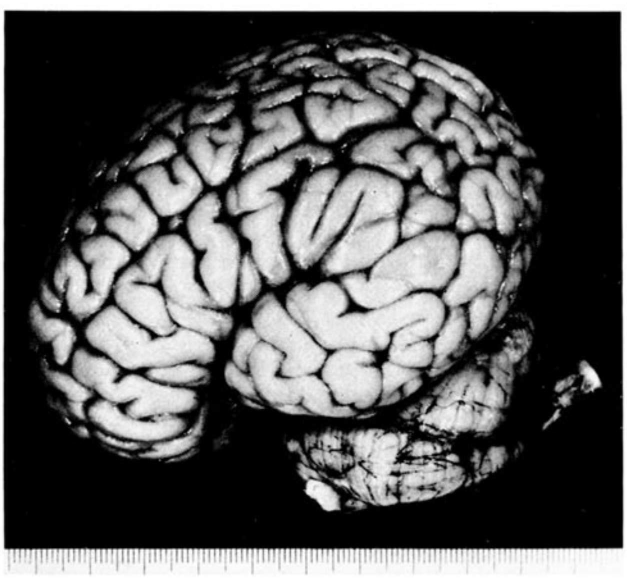

Fig. 3. Lateral view of the brain.

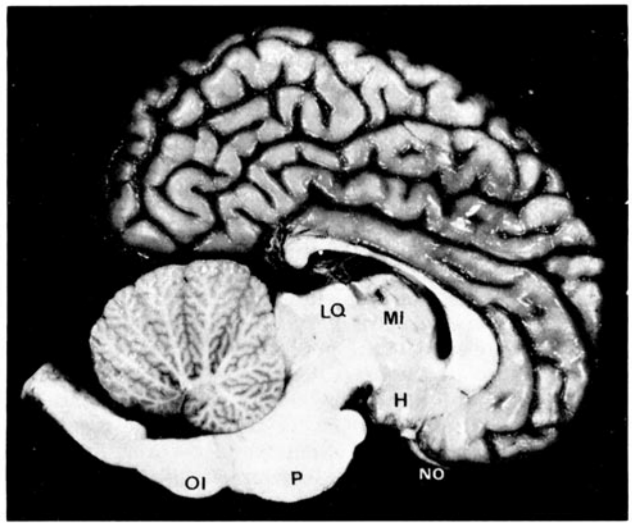

Fig. 4. Medial surface of the brain. H, hypothalamus; LQ, lamina quadrigemina; MI, massa intermedia; NO, nervus opticus; OI, oliva inferior; P, pons.

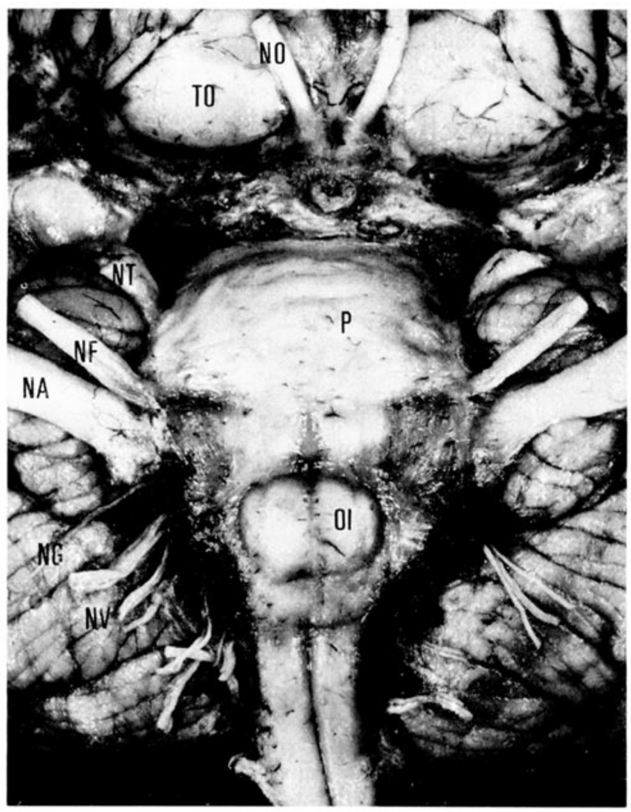

Fig. 5. Basis of the brain. NA, nervus stato-acusticus; NF, nervus facialis; NG, nervus glossopharyngicus; NO, nervus opticus; NT, nervus trigeminus; NV, nervus vagus; OI, oliva inferior; P, pons; TO, tuberculum olfactorium.

from the hemisphere by a well defined sulcus paramedianus. The medulla oblongata lies in a broad groove in the cerebellum. Seen laterally (Figure 3), the cerebrum appears to be longer than it is high. The temporal lobe is obviously underdeveloped and lies well above the basal plane, i.e. the connection between the lowest points of the fore-brain and the cerebellum. It ends in a point near the fissure of Sylvius. The fissure forms an angle, opening caudally, of 50° with the basal plane. Seen from below, the cerebrum is rounded on all sides. The temporal lobes are separated from the fore-brain and their poles lie at quite a distance from one another. The angle between the optic nerves is acute. The pons and the medulla oblongata are well developed and are well defined from one another. The median plane (Figure 4) shows a relatively narrow fore-brain and a well-developed parieto-occipital area. The corpus callosum is narrow. The rounded massa intermedia is 8 mm long. The third ventricle and the aquaeduct are slit shaped and extend vertically. There is no olfactory nerve (Figure 5). The optic nerve, corresponding to the size of the eye, is very narrow. The optic structures of the Ganges dolphin (*Susu gangetica* Lebeck) are even more reduced[2]. The oculomotor nerve is very thin and the trochlear and the abducens are absent. The trigeminal is thinner than the acoustic nerve. The latter runs parallel to a well-developed facial nerve. The eighth is the most well-developed of the cranial nerves. The hypothalamus is quite long, the mamillary bodies are minute and the anterior commissure can hardly be seen. The fornix on the sagittal section has a diameter of 10 mm. As is the case by other Cetacea[3], there is no epiphysis cerebri. There is a posterior commissure. The tuberculi optici of the lamina quadrigemina is underdeveloped, whereas the acoustic are well-developed. The medulla oblongata has very prominent olivary bodies. The average body length of the dolphins investigated is 184.25 ± 16.27 cm, the average body weight 44.70 ± 10.44 kg and the average brain weight 550 ± 41.57 g (Table II). The fresh cerebellar weight of No. 418 is 78.8 g which is 12.4% of the total brain weight (*S. gangetica* 6.5%, *Delphinus delphis* 16.4%). The relationship of the relative increase of the brain weight (y) to the relative increase of the body weight (x) is represented by the regression coefficient b. The slope of the regression line of *D. delphis* in a log-log plot is given by the significant regression coefficient $b = 0.3290$ that is 18°10′ (Figure 6). A significant regression coefficient for the 4 individual values of *I. geoffrensis* could not be calculated. However it is obvious from the individual values below the regression line of *D. delphis*, that a certain relative body weight of *Inia* corresponds to a lower relative brain weight than it does for *Delphinus* (Figure 6). Therefore it may be said that *Inia* belongs to a lower grade of cephalization than *D. delphis*.

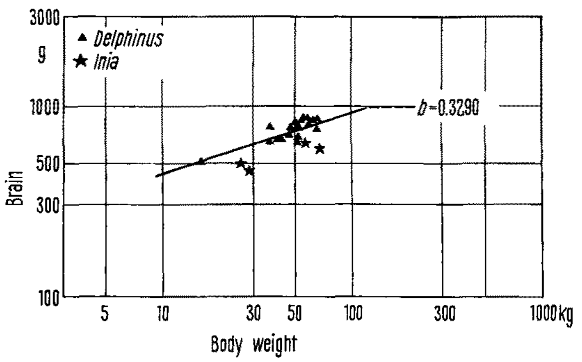

Fig. 6. Relationship between the brain weight and body weight of *D. delphis* in a log-log plot. Individual values of *I. geoffrensis* are also given.

Zusammenfassung. Bei einem durchschnittlichen Körpergewicht von 44,7 kg beträgt das mittlere Frischhirngewicht von *Inia geoffrensis* 550 g. Das Kleinhirngewicht macht 12,4% des Totalhirngewichtes aus. Das optische System von *Inia* ist sehr reduziert, das akustische System dagegen stark entwickelt. *I. geoffrensis* ist weniger zephalisiert als *Delphinus delphis*.

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Brain Anatomy Institute, 3072 Waldau/Bern (Switzerland), 22 April 1968.

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Use of a Combination of Metallic Compounds and Acetic Acid-Alcohol as Fixatives for Mammalian Tissue in Microspectrophotometry

It has been a fairly general procedure to fix tissues in acetic acid-alcohol (1:3) or in 10% neutral formalin for estimation of DNA by Feulgen microspectrophotometry. Acetic acid-alcohol fixation, however, appears to give a less strong Feulgen reaction, whereas formalin fixation yields better results and the nuclei are stained more intensely. The addition to the fixative of heavy metal compounds appears to vastly improve the binding of aldehyde molecules to the molecules of leucofuchsin. 3 such compounds have been tried: platinum chloride, uranyl nitrate and uranyl acetate. Presented here are DNA values of the rat kidney tissue fixed in acetic acid-alcohol fortified with each of the different metallic compounds separately and stained by the Feulgen procedure. The mixture contained in each case, 1 part of glacial acetic acid, 3 parts of absolute alcohol and 4 parts of a 1% solution of either platinum chloride, uranyl nitrate or uranyl acetate. Acetic acid-alcohol (1:3) was also used to fix part of the same tissue for purpose of comparison. Tissues fixed in the different fixatives were sectioned at 10 μ, stained simultaneously and also processed together. Measurement of the amount of DNA was carried out by a microspectrophotometer that has been described elsewhere by the author[1]. The measurements were made by the 2-wave-length method, the wave-lengths being 560 and 500 nm. Estimation of DNA-Feulgen was carried out in nuclei that were selected at random. However, care was taken to measure as many nuclei from the periphery as from the centre of the sections. The nuclei measured varied from 5.0–6.5 μ in diameter in all the cases. DNA values in arbitrary units were calculated according to MENDELSOHN[2].

Microscopic examination of slides stained after fixing with the 4 different fixatives revealed that perfect fixation took place in all the cases. The speed of staining reaction

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