organ opening into the mouth, or else a glandular organ opening into the mouth." It seems to me that the facts of its development in Petromyzon negative this hypothesis. It is there seen to have no connection with the mouth; nor is this mode of development so entirely exceptional as it would at first seem. Of all known embryos of craniate vertebrates, the lamprey has perhaps the smallest brain and the least cranial flexure; which state of things allows space for a distinct invagination from without to reach the infundibulum. In the Amphibia this is seen to a less degree: the invagination for the pituitary body is formed before the appearance of the

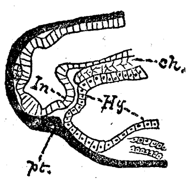


FIG. 4. — Section thro' head of embryo of Bombinator (after Götte). Letters as before.

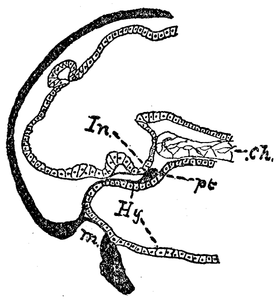


FIG. 5. — Section through head of young tadpole of Bombinator (after Götte). Letters as before.

mouth, and just above it; so that, when the mouth appears, the two have an apparent connection, being crowded together by the increased cranial flexure. In other types — such as the selachian, bird, mammal, etc. — the brain acquires a very great size in early embryonic stages, and the cranial flexure is consequently very much increased. In these cases almost the only possible way for an epiblastic invagination to reach the infundibulum is from the epiblast of the mouth. If the reader will compare the figures given above for the lamprey with those from Götte (figs. 4 and 5) for the amphibian and that from Balfour for the selachian (fig. 6), these progressive changes will at once be clear. If embryological evidence counts for any thing, it would therefore seem extremely probable that the connection of the pituitary body with the mouth is only a secondary one, brought about by the greatly increased cranial flexure in the higher types.

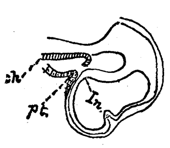


FIG. 6.—Section thro' head of embryo of Pristiurus (after Balfour). Letters as before.

Assuming that the invagination originally took place independently of the mouth, such a secondary connection would be almost a mechanical necessity of the great brain-growth.

Now, while I am not prepared to follow Dohrn in maintaining that the entire blind nasal sac below the olfactory capsule of Petromyzon really belongs to the pituitary body, yet I quite agree with him that the connection of the pituitary body with the olfactory organ is a secondary one. I have, in a former paper, stated the reasons for believing that the unpaired condition of the olfactory organ in the Cyclostomata is not primitive, but secondary, caused by the coalescence of two originally distinct pits. Now, if there were an independent invagination in the median line of the head, the causes which brought about the union of the two nasal sacs would also cause the latter to coincide with the pituitary involution. This is just what I conceive to have happened.

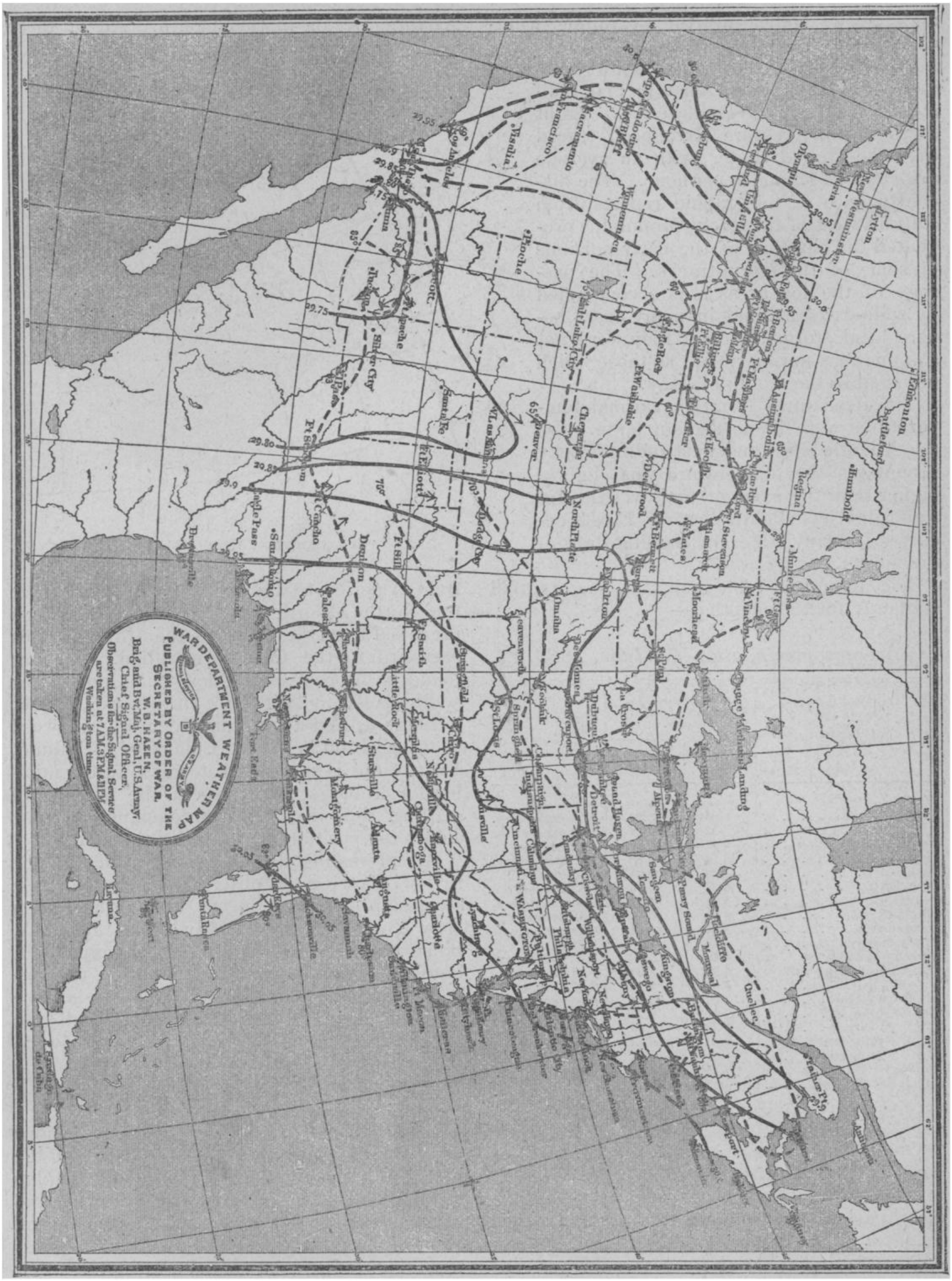
If the above reasoning be correct, the fact would seem clear, that the pituitary body is the remnant of some originally independent organ, which opened, not into the mouth, but on the surface of the head. Almost certainly this organ belonged to the invertebrate ancestor of the vertebrates. What its function was, is a difficult problem. Dohrn's hypothesis that it was formed by the coalescence of a pair of gill-clifts is untenable, not only for the reasons already given, but on account of the invariable epiblastic origin of this organ, while gill-clefts always arise in the vertebrates as outgrowths of the hypoblast. Perhaps we may modify Balfour's suggestion, and assume tentatively that it was a sense organ or gland which, having lost its function, has become rudimentary. At all events, it will be a step gained if we can establish the fact that the pituitary body is an organ originally independent both of the mouth and of the olfactory apparatus. W. B. SCOTT.

Morphological laboratory, Princeton, N.J.,
July 5, 1883.

THE WEATHER IN JUNE, 1883.

THE monthly weather review of the U. S. signal-service contains in usual detail reports from all portions of the country of the weather conditions which characterized the month of June. There were no unusual meteorological features; the month exhibiting the 'average weather,' as far as this term can be realized. The destructive floods in the lower Missouri River, and in the Mississippi River between St. Louis and Cairo, the unusual rainfall in that section, and severe local storms in many of the states, are the special events of note.

The mean distribution of barometric pressure is illustrated by the accompanying chart, which also contains the mean isothermal lines,



MONTHLY MEAN ISOBARS, ISOTHERMS, AND WIND-DIRECTIONS, JUNE, 1883. REPRINTED IN REDUCED FORM BY PERMISSION OF CHIEF SIGNAL-OFFICER.

and arrows indicating the prevailing wind-directions. The pressure conditions are quite normal, the regions of highest mean pressure being the South Atlantic and Gulf states, and the North Pacific coast. Eight areas of low pressure have been traced over the United States, with an average velocity of 24.2 miles per hour. The discontinuance of telegraphic reports from stations west of the Rocky Mountains prevented the charting of the early portions of some of the storm-tracks. The passage of the low areas was accompanied by wide-extended and in many cases severe local storms, though they were not so numerous nor so violent as those which occurred in the month of May.

The departures from the normal temperatures were in no section large. On the Atlantic coast and west of the Rocky Mountains the temperature was slightly higher than the average, and over the interior districts slightly lower. Frosts occurred in many states in the first days of the month.

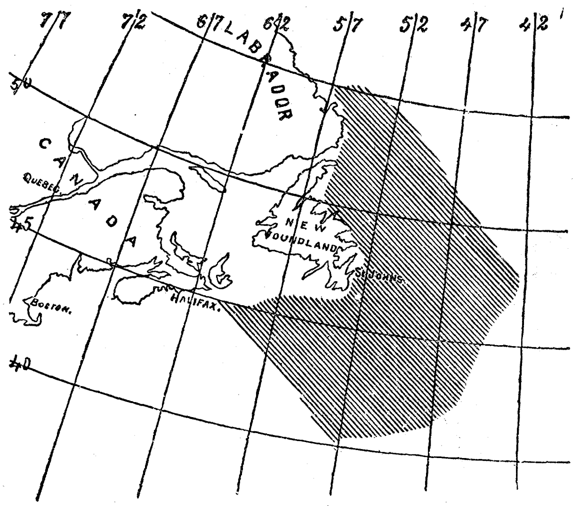
The following table contains the rainfall statistics for the month: —

Average precipitation for June, 1883.

Districts.	Average for June. Signal-service observations.		Comparison of June, 1883, with the average for several years.
	For several years.	For 1883.	
	Inches.	Inches.	Inches.
New England	3.60	3.36	0.24 deficiency.
Middle Atlantic states	3.52	5.22	1.70 excess.
South Atlantic states	4.57	6.49	1.92 excess.
Florida peninsula	5.70	4.80	0.90 deficiency.
East Gulf	4.29	4.91	0.62 excess.
West Gulf	3.37	3.73	0.36 excess.
Tennessee	4.34	3.49	0.85 deficiency.
Ohio valley	4.64	4.21	0.43 deficiency.
Lower lakes	3.26	4.04	0.78 excess.
Upper lakes	4.47	5.38	0.91 excess.
Extreme north-west	4.10	2.50	1.60 deficiency.
Upper Mississippi valley,	5.82	5.98	0.16 excess.
Missouri valley	5.06	7.98	2.92 excess.
Northern slope	2.53	3.43	0.90 excess.
Middle slope	2.01	2.27	0.26 excess.
Southern slope	3.26	1.70	1.56 deficiency.
Southern plateau	0.40	0.03	0.37 deficiency.
North Pacific coast	1.50	0.04	1.46 deficiency.
Middle Pacific coast	0.18	0.00	0.18 deficiency.
South Pacific coast	0.02	0.04	0.02 excess.

On account of the excess of rain in the Missouri valley, disastrous floods occurred in the latter part of the month. At St. Louis the river reached the highest point since the establishment of the signal-service station. Much delay was experienced by the railways centring in St. Louis and Kansas City.

Three depressions only are charted upon the Atlantic Ocean in this month. All of these are in the eastern portion, and none are traced



ICE-CHART FOR JUNE, 1883.

from America to Europe. The weather over the North Atlantic was fair; but dense fogs prevailed from the coast of the United States eastward to the fortieth meridian. Ice was found as far east as 42° longitude, and as far south as 40°.5 latitude. During the month, icebergs drifted about three degrees eastward of the position in May. Compared with June, 1882, there is a marked decrease in the number of icebergs, and also in the amount of drifting field-ice. The accompanying chart shows the position of the ice in the month.

An interesting diagram is published in the review, showing the observations made on the steamship Assyria during her voyage from New York to Bristol, May 27 to June 11. Some of the symbols used are unexplained, however. The marked features are the rise in temperature immediately after leaving the Atlantic coast and the corresponding fall east of the fiftieth meridian, the agreement between the temperature and pressure curves, and the agreement between the temperatures of the air and sea-water.

Minor displays of auroras at various stations were reported during the month, and on the 30th an extensive but not brilliant display was noted. The number of sun-spots and groups was large. The record of halos, mirage, and meteors is large; and two water-spouts were reported, — one on Lake Erie, the other on Lake Monroe, Fla.

The verification of the tri-daily indications shows the average of 85.1 %. Of the cautionary signals displayed, 80.4 % were justified by winds exceeding twenty-five miles an hour at or within one hundred miles of the station.

THE FALL OF A BALLOON.[1]

IN the August (1882) number of *l'Aeronaute*, accounts were given of the different ascents made on the 14th of July of that year. Among these ascents that of Cottin and Perron was of especial

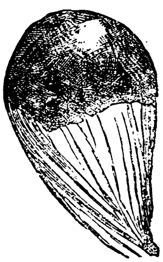


FIG. 1.

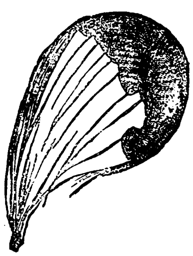


FIG. 2.

interest, not because of the length of the voyage, but from its brevity, and on account of the fall which ended it. The balloon had barely started from Paris when a rent was formed in the upper part, and the balloon descended at Saint-Ouen. This occurrence is not entirely unknown; but that which does not

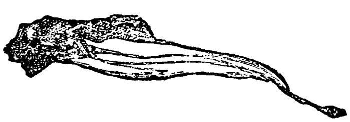


FIG. 3.

happen often is, that an artist, Mr. Jacque, chanced to be at his window, and was able to make rapid drawings of the balloon during its descent, and Mr. L. Gillon viewed the accident from the Place Wagram, and made three drawings.

Mr. Cottin, thinking that the aeronauts had not attached sufficient importance to his ascent, has published an account of it in a brochure, illustrating it with the drawings of Jacque and Gillon. He begins his statement, "It was sixteen minutes past four. The wind was blowing violently from the south-east. The temperature was 28° C. At starting, the voyagers felt nervous, and noticed some excitement in the movements of those who were assisting. Nevertheless, they started, saluting the crowd, who responded as only a sympathetic Parisian crowd knows how. They rose over the building which forms the corner of the Place Wagram. Thirty kilograms of ballast was thrown out; and, relieved of this weight, the balloon shot up. With one bound it was four hundred metres; another, and it had reached a height of six hundred metres. At this time it was just twenty-four minutes past four. The aeronauts felt that the balloon seemed to stop. They were told afterwards that they began to turn. Cottin felt a trembling of the basket. Some seconds passed. Then the noise of the flapping silk was heard."

FIG. 4.

The balloon was torn when at a height of seven hundred and three metres, as shown by a pocket barometer which Cottin had with him, and saved in good condition. For the first hundred and twenty metres of the fall the motion was regular. Then a swinging motion began, and finally the fall

FIG. 5.

increased in speed. The oscillations increased enormously, and the basket swung through the air with a dizzying velocity. At times the balloon took up an almost horizontal position in the direction of the wind. This swinging continued till a point within a hundred and twenty or a hundred and thirty metres of the earth was reached. From this point the fall was nearly vertical, as the silk had formed itself into a parachute. During this period Mr. Perron threw out the last of the ballast, the guide-rope, and cut the cords of the anchor. Led by Perron's example, Cottin threw over a bottle of cold coffee, which, he remarks, 'might have injured or even disfigured them.'

[1] Taken, with the illustrations, from *l'Aeronaute*, June, 1883.