adapis with the Whales, in the elongation of the anterior part of the brain-cavity, corresponding to the *tractus*, no instance of a similar reptilian-like conformation of the brain is known to me amongst Mammalia, if I except the *Amblypoda*, especially the *Dinoceratidæ*, the brain of which "was proportionally smaller than in any other known Mammal, recent or fossil, and even less than in some reptiles. It was, indeed, the most reptilian brain in any known Mammal. . . . The cerebral hemispheres did not extend at all over the cerebellum or the olfactory lobes."*

EXPLANATION OF PLATE.

FIGS. 1—3.—Figures of cast of brain-cavity of *Globilemur Flacourti*, Major, Pleistocene, near Nossi-Vé, S.W. Madagascar. Original specimen preserved in the British Museum (Natural History). 2/3rds natural size.

FIG. 1.—View of brain, seen from above.

,, 2.—Side view of same (*s.f.*, Sylvian fissure).

,, 3.—View of same, seen from beneath (*o.n.*, optic nerve). All drawn 2/3rds natural size.

FIGS. 4—6.—Figures of cast of the brain-cavity of *Megaladapis madagascariensis*, Major (2/3rds natural size); Pleistocene, Amboulisatra, S.W. Madagascar.

FIG. 4.—View of brain, seen from above (*b*, beak-like projection in front).

,, 5.—Side view of same.

,, 6.—View of same, seen from beneath (*o.n.*, optic nerve). All drawn 2/3rds natural size.

FIG. 7.—Brain of *Indris* (seen from beneath), recent (*o.n.*, optic nerve); copied from Grandidier.

,, 8.—Brain of Alligator (seen from beneath), recent (*o.n.*, optic nerve).

"On the Occlusion of Oxygen and Hydrogen by Platinum Black. Part II." By LUDWIG MOND, Ph.D., F.R.S., WILLIAM RAMSAY, Ph.D., F.R.S., and JOHN SHIELDS, D.Sc., Ph.D. Received July 21, 1897.

(Abstract.)

The heat of occlusion of hydrogen in platinum black was determined by saturating the platinum black with hydrogen, extracting as much of this as possible at 184° C. by means of the pump, and then readmitting it again whilst the experimental tube was placed in an ice calorimeter. By proceeding in this way, errors due to the pre-existence of oxygen in the platinum black were avoided, and it was

* O. C. Marsh, "Dinocerata. A Monograph of an extinct Order of gigantic Mammals," 'Monographs of the United States Geological Survey,' vol. 10, Washington, 1886, pp. 53, 54.

found that 68·8 K (6880 *g*-calories) were evolved per gram of hydrogen occluded. It is shown that the arguments put forward by Berthelot in favour of the existence of the compounds $Pt_{30}H_2$ and $Pt_{30}H_3$ are not justified. According to Favre there is a difference between the behaviour of palladium and platinum to hydrogen, inasmuch as when hydrogen is admitted fractionally, in small portions at a time, the heat evolved in the former case is constant, whilst in the latter it becomes less and less. This difference is apparent only and not real, and is due to the presence of oxygen in the platinum black.

In order to determine the heat of occlusion of oxygen in platinum black, a great many experiments were made to try to remove the oxygen, which is always present, without destroying the occlusive property of the platinum, and so obtain platinum black which would *per se* occlude oxygen directly at the temperature of the calorimeter, and thus eliminate all corrections for the simultaneous occurrence of other reactions. Several reducing agents were employed, including sulphur dioxide, carbon monoxide, ammonia, methyl alcohol, and formic acid in the state of vapour and in dilute solution, and it was found that, although the oxygen was removed, the reducing substance or its products of decomposition were occluded by the platinum black, and were just as difficult to remove as the oxygen itself; and, further, the volume of gas given off, derived from the reducing agent or its decomposition products, was approximately equal to the volume of oxygen originally contained in the platinum black. In most cases this was about 100 volumes.

An extended series of experiments is described showing how platinum oxygen and platinum hydrogen can exist in the presence of each other. If the quantity of hydrogen which is theoretically necessary to remove all the oxygen in the form of water be admitted to platinum black, then, instead of removing all the oxygen first with formation of water, the hydrogen only removes the oxygen from the platinum black with which it first comes into contact, and immediately takes its place.

The heat of occlusion of oxygen in platinum black was finally measured both directly and indirectly in the following ways. Platinum black fully charged with hydrogen was exhausted at 184° C. to remove as much of this gas as possible. The experimental tube was then placed in the calorimeter, and oxygen was added in small quantities at a time. From the experiments on the co-existence of platinum oxygen with platinum hydrogen, the heat evolved during this process was known to be partially due to the formation of water and partially to the occlusion of oxygen. The vacuum in the apparatus remained perfect up to a certain point, when the presence of a slight excess of oxygen caused the pressure to increase. On now admitting oxygen up to full atmospheric pressure, a further small quantity of oxygen was

occluded, and the heat evolved represented the true heat of occlusion of this quantity of oxygen.

Indirectly, the same value was obtained by charging the platinum black up fully and alternately with hydrogen and oxygen, and finally with oxygen. The amount of oxygen really occluded in the last charge, and independent of that which had gone to form water, was then found by exhausting *in vacuo* at a red heat. The difference between this quantity and the total amount of oxygen used is a measure of the oxygen which formed water with twice as much hydrogen by volume. Knowing these quantities, the total heat evolved, the heat of formation of water, and the heat absorbed on the removal of hydrogen, we have all the data for calculating the heat of occlusion of oxygen.

In a similar way the amount of heat *absorbed* per gram of oxygen *removed* was calculated from the data obtained during the penultimate charge.

The mean value for the heat of occlusion of oxygen, from the direct and indirect measurements, which did not differ much from each other, is +11·0 K (1100 *g*-calories) per gram. This value referred to 16 grams of oxygen is +176 K, which is almost identical with Thomsen's measurement of the heat of formation of platinous hydrate $Pt(OH)_2$, viz., +179 K.

This agreement suggests the possibility that the two phenomena may in reality be identical, the necessary water being always present in platinum black dried *in vacuo*.

The paper concludes with some speculations on the nature of the occlusion of gases.

"On the Appearance of the Cleveite and other New Gas Lines in the Hottest Stars." By J. Norman Lockyer, C.B., F.R.S. Received June 15,—Read June 17, 1897.

Introductory.

In my recent paper on "The Chemistry of the Hottest Stars,"* I left for future discussion the spectra of those stars apparently at or near the apex of the temperature curve, for the reason that in them the lines of known gases do not show very great variations, while the enhanced lines cease to be of service as a criterion of temperature. I pointed out, however, that there were several lines, as yet of unknown origin, which are strong in some of these stars and weaker in others, and that the study of these might eventually help us in classifying such stars and arranging them in temperature

* 'Roy. Soc. Proc.,' vol. 61, p. 185.