

lines, of which a few characteristic individuals were mapped with difficulty. These were afterwards found in the spectrum of calcic chloride, with which some gas-carbon electrodes had been impregnated; but with electrodes of a different material the lines did not reappear. Perfectly pure titanic chloride, however, readily furnished them; and titanium was also obtained, by a chemical process, from the ash of the coal which had yielded the gas-carbon. A direct comparison of the numerous and delicate titanium lines with those of Fraunhofer, under high dispersive power, left no doubt whatever that titanium must now be added to the list of solar metals.

PHYSIOLOGY

Gases of the Secretions

PFLUGER has investigated the gases of urine, milk, bile, and saliva. The quantity of nitrogen gas is very much alike in all, being in urine .9, in milk .75, in bile .5, in saliva .75 per cent. in volumes. The quantity of oxygen, on the contrary, varies much more, being in urine .075, in milk .095, in bile .1, in saliva .5 per cent. Pflüger attributes the larger quantity of oxygen in saliva to the fact that in the much less rapid secretions of bile, &c., the epithelium of the secreting passages consumes, during secretion, a large portion of the oxygen contained in the secreted fluid. In the more swiftly secreted saliva, the oxygen escapes in a large measure this consumption. The quantity of carbonic acid varies according to the reaction of the secretion. In alkaline, bile, and saliva, it reaches 56.1, and 64.7 per cent.; in neutral or acid urine, milk, and bile, it sinks as low as 13.7, 7.6, 5 per cent. respectively.—[Archiv. für Physiol. ii. 156.]

According to Bogoljubow, the carbonic acid of the bile depends largely on the quality and quantity of food taken. It seems to diminish during the stay of the bile in the gall bladder.—[Centralblatt f. Med. Wissen. 1869, No. 42.]

Changes in Milk

KEMMERICH brings forward observations to show that in standing milk, especially at blood-heat, an increase of the *casein* takes place at the expense of the *albumen*. He also confirms the statements of previous observers, that in milk (and cheese) the quantity of fat increases on keeping. He attributes, however, this "ripening of the cheese," to the action of fungi.—[Archiv. für Physiol. ii. 401.]

Effect of Alcohol on Animal Heat

CUNY BOUVIER affirms as the result of experiments on rabbits (apparently carefully conducted with due sense of sources of error) that alcohol lowers the temperature of the body, in small doses to a slight in large doses to a very marked degree.—[Archiv. für Physiol. ii. 370.]

Metamorphosis of Muscle

O. NASSE, extending the previous observations of MacDonnell and others, affirms that *glycogen* is a normal constituent of muscle, the quantity existing in frog's and rabbit's muscle amounting to 3—5 per cent. of the wet mass. He also states that in living quiescent muscle sugar is totally absent, or present in inappreciable quantity only. The conversion of glycogen accompanies rigor mortis, whether natural or artificial, and is also brought about by muscular contraction. Nasse further shows that muscular contraction and rigor mortis are accompanied by a consumption of the total carbo-hydrates of the muscle. The amount of sugar (or glycogen) lost under these circumstances is insufficient, however, to account for the acid (paralactic) produced at the same time; indeed the two processes run by no means parallel, and apparently are not connected.—[Archiv. für Physiol. ii. 97.]

Vertebrate Epidermis

F. E. SCHULTZE describes various modifications of the uppermost layers of the epidermis in vertebrata, distinguishing between *cuticular thickenings* of living cells and *cornification* of dead ones. In particular he describes curious laminated cuticular thickenings of the epidermic cells of various species of *hippocampus*. These cells he proposes to call *flame-cells*, from their curious resemblance to the flame of a candle.—[Max Schultze's Archiv. v. 295.]

Development of Grey Matter of Brain

ACCORDING to Arndt, the grey matter of the convolutions of the rabbit at birth consists of nuclei imbedded in a protoplasmic matrix, studded with granules, and very faintly fibrillated. After birth the matrix becomes increasingly fibrillated, the granules

partly coalesce and partly become dispersed. The nuclei become separated through a greater development of the matrix, and a nucleolus appears in them by coalescence of previously existing nucleolini. Part of this differentiated matrix is directly gathered round various nuclei to form the ganglionic cells and their branches, other parts become arranged in strands to form the axis cylinders of nerves, while the rest remains as the permanent granular faintly fibrillated matrix of the adult brain. Arndt tries to accommodate the "Cell theory" to these new facts.—[Max Schultze's Archiv. v. 317.]

Regeneration of Spinal Cord

MASIUS and VAN LAIR assert that if strong frogs be operated on in early or mid winter, complete reparation of structure with restoration of powers takes place, even when sections of the whole spinal cord 1–2 mm. in length have been removed. Degeneration occurs first at either cut surface: the central end swells by deposition of new tissue into a hollow cup-shaped bulb; the peripheral contracts into a cone fitting into the former; and so union takes place.—[Centralblatt, Med. Wissen. 1869, No. 39.]

SOCIETIES AND ACADEMIES

Syro-Egyptian Society, Nov. 2.—Mr. W. H. Black, F.S.A. in the chair. The latest communication from Dr. Livingstone, that he has found what he believed "to be the true sources of the Nile, between 10° and 12° south (latitude) or nearly the position assigned to them by Ptolemy," was received with much satisfaction; and the passages in the Greek text of Ptolemy's geography, relative to "the mountain of the moon," from which the lakes "of the Nile receive the snows," twice placed by him in 12½ south latitude, were read; and the old traditional maps, showing a mountain range of about 10° of longitude in extent, with streams running northward into two lakes (as published in the Amsterdam edition of 1605), were compared therewith. A resolution was then passed, sympathising with Dr. Livingstone in his laborious researches, and congratulating the present age on this confirmation of ancient scientific literature by means of modern exploration.

Mr. Black described the results of his own recent application of the symbolic and mathematic teaching of the great pyramid to the geometric geography of Africa; stating the full conformity of that monument to the geodetic laws and uses of other uninscribed megalithic monuments in Asia and Europe, which have been erroneously assigned to religious and superstitious purposes. He promised to illustrate the subject further, and to demonstrate by diagrams the results then verbally described, at a future meeting of the society.

Anthropological Society, Nov. 2.—Dr. Beigel, V.P., in the chair; the following new members were announced:—*Fellows*.—Captain G. J. D. Heath; Dr. Samuel E. Munsell, R.A.; Messrs. Thomas Milne, M.D.; E. W. Martin; Robert Watt; Horace Swete, M.D.; Lieut. Wm. Francklyne; and Wm. Pepper. *Hon. Fellow*.—M. Le Baron d'Omalius d'Halloy. *Corresponding Member*.—Professor Dr. August Hirsch.

Mr. Pike read a paper on the Methods of Anthropological Research. He considered it useless to speak of methods of research without some previous definition of the objects of research. The real difficulty in anthropology was to know what to observe, and how to verify. He believed that the science could advance only by a double method of observation—the observation of mankind individually and in masses, and that the conclusions suggested by the observation of masses, races, or nations must be verified by the observation of individuals, and *vice versa*. For this reason he thought it was a mistake to speak of ethnology as a science, as it consisted only of a series of disjointed observations without conclusions, and without the means of verifying conclusions if made. Mr. Pike then reviewed at considerable length the ramifications of Anthropology into anatomy, physiology, psychology, and the various subdivisions of those studies, suggesting that all kinds of unsuspected correlations were yet to be discovered by a rigorous application of a scientific method. The relations of mind to body, of faculty to faculty, of one part of the body to another, were still removed but little from the realms of mystery from which only anthropology could thoroughly drag them away. Mr. Pike concluded by describing anthropology in one of its aspects as the only kind of philanthropy which could be of service to mankind—philanthropy founded upon science.