ments relating to the subject, we may wind up this brief historical sketch of the changes of view respecting it, with the following quotation from our own paper published in 1866:[1]—". . . all the evidence at command tended to show that by an increased exercise of muscular power there was, with increased requirement for respirable material, probably no increased production and voidance of urea, unless, owing to excess of nitrogenous matter in the food, or a deficiency of available non-nitrogenous substance, or diseased action, the nitrogenous constituents of the fluids or solids of the body were drawn upon in an abnormal degree for the supply of respirable material."

In conclusion, although I fully agree with Voit, Zuntz, Wolff, and others, that there still remains much for both Chemistry and Physiology to settle in connection with these two questions of "The Sources of the Fat of the Animal Body" and "The Origin of Muscular Power," yet I think we may congratulate ourselves on the re-establishment of the true faith in regard to them, so far at least as the most important practical points are concerned.

THE GERMAN ASSOCIATION

THE fifty-third congress of the Association of German Naturalists and Physicians has been held at Danzig during the past week. At the first general meeting on Saturday, September 18, Dr. H. Abegg, who filled the post of president, in a brief speech of welcome to his colleagues expressed his pleasure at finding that the congress was so numerously attended. There had been fears that Danzig, owing partly to its somewhat isolated position, would have kept many from visiting it who would otherwise have come, had the point of meeting been fixed in a more southerly part of Germany. But these fears were wholly groundless; from far and near he was rejoiced to see additions to their body; and to all and each of his esteemed colleagues he bade hearty welcome.

Herr von Ernsthausen, Prof. Bail, and the Chief Burgomaster of Danzig, also gave short addresses, in which they confirmed the sentiments of the President.

So far as the reports in the admirable *Tageblatt* go, the following are some of the principal papers and lectures:—

The first paper read was by Prof. Hermann Cohn of Breslau, "On Writing, Type, and the Increase of Shortsightedness." Myopia, *i.e.*, shortsightedness, or the inability to distinguish objects at a distance, was, as he said, rarely or never born with the subject; it is generally induced by an injurious method of study which strains the eye during childhood. In 1865 the Professor began to collect statistics such as the schools in his own native town offered to him, and from these he was able to establish the following facts:—

1. That cases of shortsightedness occur rarely in village schools; their frequency increases in proportion to the demand made upon the eye in higher schools and colleges; so that in gymnasia myopia is most prevalent.

2. That the number of shortsighted scholars in all schools and colleges increases in proportion as one examines the higher grades or classes.

3. That the average of myopia increases from class to class; *i.e.*, those who are shortsighted become more and more so.

These conclusions have since met with universal confirmation. Among the causes which tend to increase the malady, the Professor specified school desks constructed regardless of hygienic principles, lesson-books of which the typography is cramped and indistinct, and badly and insufficiently lighted schoolrooms. All these as they now existed were more or less unsatisfactory, and could bear alteration with perceptible benefit to the scholar. Indeed to make reforms in this direction was, as he showed, the duty of the State; and he hoped that a Government commission might ere long be appointed to regulate the construction of school-desks, the typography of lesson-books, and the lighting of class-rooms. By this means the evil which was so rapidly increasing might be met, and the percentage of shortsightedness thereby reduced to a far lower minimum than was at present the case.

The next address was given by Prof. Eduard Strasburger of Jena, "On the History and the present State of the Cell Theory." Having sketched at some length the growth and the development of this theory, the learned professor remarked in conclusion:—

"The results of research into cell-structure are well adapted to teach us a great deal about the complicated nature of the fundamental substance of life; and complicated this must be, to produce such a series of phenomena in constant succession. We have merely to accustom ourselves to regard protoplasm, not as a simple substance, but, on the contrary, as a highly organised body, or we have otherwise no means of explaining the phenomena of life. It is at any rate a fact that a lump of protoplasm, the ovum, is capable, after union with another particle of protoplasm, of reproducing the entire parent organism in its complicated structure. That the properties of an egg are not essentially different from those of other protoplasm, but that rather only one part of the protoplasm in the egg is specially suited for reproduction is proved by the fact that other masses of protoplasm in the organism become often capable of reproducing it in a perfect form. The behaviour of *Begonia* leaves is specially striking; and I therefore submit a specimen of them to you. It is well known that new plants are engendered from such leaves. Microscopical investigation shows us that in these leaves there are separate epidermal cells which reproduce the whole plant; the protoplasm of a single such cell affords, therefore, the basis for an entirely new organism. Thus the process does not differ in principle from the formation of a germ from the egg.

"The attributing of all the functions of life to protoplasm is to be looked upon as a great advance in science; although it is impossible for us, so far, even to form hypotheses with regard to the forces which are at work in the protoplasm. It will be the task of the future to throw light upon this side of the question. Shall we ever be able to gain a deeper insight into the final, the invariable causes of life? At the present it were futile to attempt this. The progress which science has made in the last ten years, often yielding quite unexpected results, leads us to hope for yet further advance; and in the seeking for knowledge, rather than in its final acquisition, it is that our highest pleasure lies."

In the sectional sitting for Mathematics and Astronomy held on the following Monday, September 20, Director B. Ohlert read a paper "On the Rapid Motion of the inner Moon of Mars in the light of Laplace's Theory." He pointed out that the fact that the inner moon of Mars passes round the planet in a far shorter time than the latter needs for rotation on its own axis would seem to be in contradiction to the hypothesis of Laplace on the origin of our planetary system. The lecturer further showed that there was nothing very remarkable in the *rapidity of the motion of this moon*, which, owing to the slight distance from Mars, was wholly in agreement with the third law of Kepler; but rather that an explanation was needed of the *slow axial motion of the planet itself*, and similarly of the other planets. And hereupon Prof. Ohlert adduced proofs from which, according to his view, and in conformity with the assumption of Laplace, the rapidity of the axial motion of the planets in the final period of their formation would of necessity become diminished.

Dr. Franz then followed with a paper "On the Observation of Double-Stars made at the Königsberg Observatory, and on certain Peculiarities of the Königsberg heliometer."

The Section for Anthropology and Prehistoric Research held a sitting on the same day, with Dr. Stieda in the chair. Dr. Anger of Elbing exhibited a rich collection of anthropological specimens, chiefly illustrating the antiquity of the district.

In the Botanical Section Prof. Bail read a valuable paper "On Underground Fungi," in which he stated that the several species and varieties of these in Germany must certainly exceed the usually accepted number.

Prof. Moebius of Kiel, in the Section for Zoology and Comparative Anatomy, read (also on the same day) an interesting monograph "On the Importance of the Foraminifera for the Doctrine of Descent."

He began by quoting Dr. Carpenter's view that the genera and species of the Foraminifera cannot be determined after the usual method, but that the only natural classification of the great mass of different forms is to arrange them in accordance with their degree of relationship. Prof. Moebius himself had come to the conclusion from his researches among the Foraminifera which he had collected in Mauritius in 1874 that the repeatedly occurring peculiarities among the Foraminifera may serve and must serve us in forming an idea of their nature and zoological position.

The sarcode of the Foraminifera behaves with regard to the formation of the skeleton and shell just as does the protoplasm of the eggs of the Metazoa to the formation of the germs and of all organs proceeding from them. Like the protoplasm of the egg, it possesses a quite definite and hereditary capacity for self-development.

[1] Food in its relations to various exigencies of the animal body.—*Phil. Mag.*, July,

As confirmatory of Darwin's theory of descent, they possess a value neither greater nor less than that of all other animal classes. The lecturer's forthcoming work on the Foraminifera of Mauritius will contain much detailed evidence in support of his views.

In the discussion which followed, Herr Wacker suggested that the point of difference between Carpenter and Moebius lay in the fact that Carpenter had regard to the sarcode rather than to the skeleton, to which latter Moebius attached the greater importance.

The second paper was given by Dr. Gabriel, whose subject was "The Classification of the Gregarinæ." He objected to Stein's classification, hitherto the sole and undisputed one, on the grounds that it no longer fully represented the existing state of our knowledge. This view he was able to support, which he did at some length, and submitted to his hearers a new classification of his own.

In the Section for Anatomy and Physiology Prof. Tauber of Jena lectured upon "Two New Anæsthetics," with which he had experimented upon frogs, rabbits, and dogs. Both anæsthetics produced a scarcely appreciable change in the pulse and respiration, on which account they might be of great value for surgery. And in demonstration of their action Dr. Tauber proceeded to experiment upon a pigeon and a rabbit.

On Tuesday, September 21, at the second general sitting, Prof. Moebius of Kiel read a paper "On the Food of Marine Animals." In the sea therefore is generated by far the greater number of animal types, and these again in quantity and in bulk are throughout regulated by the existing supply of nourishment. This in its turn depends upon the organic matter of plants, which in the sea also supply nourishment to its inhabitants. In our own seas, the North Sea and the Baltic, marine grasses are discoverable near the coast, while twenty to fifty metres lower are other kinds of plants; deeper still, if we search, we shall find few or none. Loose strips of plants that have been torn away from their roots have been brought up from a depth of some hundred metres; in the Baltic and the North Sea these form a dark, soft, spongy mass. Nothing living is visible in this if placed in a tub; but if strained through a sieve, tiny mussels, snails, and crustacea become visible. In the depths of the sea-mud lining the bottom are countless worms, mussels, and little animals which feed upon the spongy mass. Flounders and other fish penetrate into these mud-depths and devour the animals that are there. Where the sea-bottom however is formed of soft clay, nothing beyond a few worms here and there will be found. Thus in the deeper portions of the Mediterranean, otherwise so rich in animal life, nothing at all is discoverable. The Professor in the course of his remarks went on to show that the supply of nourishment to the inhabitants of the sea was now and would be hereafter undiminished; and thus that the propagation of animal life in the sea would continue unchecked, so long as the mighty ocean itself should last.

SCIENTIFIC SERIALS

Bulletin de l'Academie Royale des Sciences (de Belgique), No. 7.—A Hyperoodon captured on the strand at Hillion (Côtes-du-Nord, France) in December, 1879, by M. van Beneden.—On Mysticetes with short fins, from the sands in the neighbourhood of Antwerp, by the same.—On determination of albuminoid substances of the blood serum by circumpolarisation (modified method of Hoppe Seyler), by M. Fredericq.—Contribution to a study of the *rôle* of insects in the pollinisation of heterostylous flowers (*Primula elatior*), by Mr. MacLeod.

SOCIETIES AND ACADEMIES

PARIS

Academy of Sciences, September 20.—M. Wurtz in the chair.—The following papers were read:—On the odours of Paris, by M. Sainte-Claire Deville. He analysed some of the moist black earth exposed in a trench in the Rue St. Jacques. The amount of salts in the impregnating liquid indicates considerable concentration (which can be easily explained). The dust from horses' shoes and from wheels of vehicles is thought to be the origin of sulphides and protoxide of iron, and of the dark coloration. The escape of gas, estimated at about a tenth of the gas circulating in the pipes, furnishes part of the sulphur, the carbonated hydrogen and the coal-tar which abounds. Through this escape the sub-soil is rendered wholesome (in the author's opinion), and cannot exhale any dangerous odour. There is a slight smell of sulphuretted hydrogen (not worse than that from sulphurous mineral waters), and a smell of healthy empyreumatic products.—M. de Tchihatchef presented a work of his on Spain, Algeria, and Tunis, but treating chiefly of Algeria. Such questions as the material and moral results of the annexation to France, the mode of action of the new administrative and social institutions, the assimilation of the Arab and the Christian elements, &c., are treated; the author has also studied the geology and botany of the country.—Observations of the new planet Coggia (287) at the Paris Observatory (equatorial of the western tower), by M. Bigourdan.—On a new experiment for showing the direction of the rotation communicated by bodies to polarised light, by M. Govi. A pure spectrum is produced with rectilinearly polarised light, and a plate of rock crystal is interposed, giving a dark band; also an analyser. The spectrum and analyser have a joint movement of rotation (one end of the spectrum being at the centre of the circle of which the spectrum represents the radius). The dark band moves along the spectrum (during rotation) one way or the other according to the nature of the quartz plate (dextrogyrous or lævogyrous). If the motion be sufficiently rapid for the impression on the eye to be continuous, one may trace out in space, or on a screen, opposite spirals. Curious variations are obtained by interposing plates of mica, gypsum, &c.—Study of telluric lines of the solar spectrum (Nice Observatory), by M. Thollon. With his powerful spectroscope, he has resolved the telluric groups B, D, and α of Ångström into their simple elements, separating these elements from each other, and from the other metallic lines.—On the liquefaction of ozone and on its colour in the gaseous state, by MM. Hautefeuille and Chappuis. They passed some highly ozonised oxygen (prepared by their new process) into a Cailletet apparatus. From the first strokes of the piston the capillary tube appeared azure blue. With several atmospheres' pressure the gas became of an indigo blue, the mercury meniscus looking steel blue through it. Sudden liberation from 75 atm. produced a mist, indicating liquefaction (300 atm. were necessary in the case of oxygen). Ozone is a little less easy to liquefy than carbonic acid. If the ozonised oxygen be not compressed slowly and in cold, the ozone is decomposed, giving a strong detonation and a yellowish flash. Thus the mixture contains an explosive gas.—On Brunton's tunnelling machine, by M. Biver. This gives an account of results with the machine as used in the lignite pits in the Fuveau Valley. It appears, *inter alia*, that of 51 horse-power of the motor only 12·4 was transmitted to the machine, 38·6 being lost.—Telescope with double action for pointing long-range guns, by M. de Broca.—On losses in manufacture of vinegar, by M. Garcin.

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