

potami, as indicated by its feeble pelvis, but less specialised than the Sirenians. It would not be far from the truth to say, from our present knowledge of the animal, that *Mœritherium* is an offshoot of the Proboscideo-Sirenian stock, with *slightly* nearer kinship to the elephants than to the Sirenians.

The distinctive peculiarities of *Palæomastodon* are that its eyes are in the position typical among mammals, that is, above the first true grinders. The reason that they appear to be so far back is that the lower jaw is extended unusually far forward. The upper jaws, on the other hand, recede, practically terminating at the sides in the very sharp, laterally compressed tusks, which at this stage were chiefly developed as fighting or defensive weapons, while only indirectly of value as feeding organs. It is noteworthy that when the upper and lower lips are restored in such a manner as to enable the animal to close the mouth, the upper tusks are so largely covered that they are not especially prominent.

In contrast with *Mœritherium*, the nasal bones and openings deeply recede; thus a very wide space is left to be filled by a large retractile upper lip, which could undoubtedly be raised or lowered. The question now

power of the anterior portion of the lower jaws, these parts having receded and disappeared. The elephant thus presents the widest possible contrast with *Palæomastodon*, in which the most prominent part of the face is the projecting lower teeth and jaw. It is obvious that the development of a proboscis took place step by step with the recession and loss of prehensile power in the lower jaw. If *Palæomastodon* had possessed an independent prehensile proboscis extending beyond the line of the mouth for the seizing of food, we cannot assign any function to these large and much worn lower incisors. A more probable view, therefore, seems to be that here presented in the model of the head and mouth parts, which were made directly upon a model of the skull itself. In the stages between *Palæomastodon* and the *M. (Trilophodon) angustidens*, the Lower Miocene elephant of Europe, the lower incisors have begun to transform into tusks to be employed in uprooting plants and smaller trees, just as the upper tusks are used by elephants now. With this change their prehensile function was gradually abandoned and assumed by the upper lip, which thus began its slow evolution into a freely projecting and prehensile proboscis.

All restorations contain a large element of conjecture;

we shall certainly never know how these most interesting animals of the Lower Oligocene rivers of the Fayûm actually appeared, but the first rule of restoration is not to be too much influenced by kinship, but to adhere to the evidence afforded by the hard parts themselves. This rule has evidently been broken by the writer in attributing a small elephantoid ear to *Palæomastodon*. Unfortunately, there is no means of even conjecturing the shape of the ear of this animal, except to exclude the small aquatic type of ear which may be attributed to *Mœritherium*.

H. F. OSBORN.

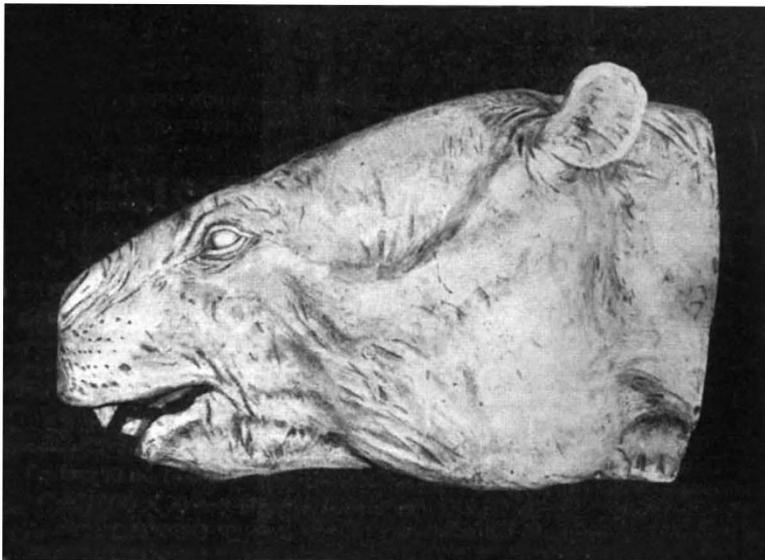


FIG. 2.—Side view of the head of *Mœritherium* with the eye and ear in position. The form and position of the nostrils is somewhat conjectural. Modelled by Mr. E. Christman under the direction of the writer.

arises, How far had this lip begun to transform into a proboscis? Was there a free projecting proboscis as represented in several previous restorations? A negative answer appears to be furnished by the structure and mode of wear of the lower incisors. Together these form a broad, protrusive, spoon-shaped feeding organ, which is invariably greatly worn on the upper surface and somewhat less at the ends. This worn upper surface seems to prove that in the prehension of food the edge of the upper lip was constantly pressed downward against these teeth, thus, with the aid of fine particles of grit and sand, which were occasionally taken in, causing wear. In brief, the food appears to have been seized between the upper lip and the spoon-shaped lower teeth. *Palæomastodon* was a browser, and this lip could be turned up and retracted effectually to pull down smaller branches, but there is no reason to suppose that it had the free curling and independent prehensile power which characterises a true proboscis. If we critically consider the theory of the animal possessing a proboscis of considerable length, we find it rests upon the idea of kinship with the elephant rather than upon careful study of the mouth parts themselves.

If, now, we consider the elephant, we find that one of its many unique features is entire loss of the prehensile

Royal Commission within the space of a few paragraphs to present a comprehensive review of the varied topics which came up for discussion in the different sections, and embraced anything from the treatment of tuberculosis to that of trade effluents, and from the ventilation of cowsheds to the hygiene of the mouth.

Although many of the views expressed, especially in the recently formed child-study section, were of a tentative nature and the result of incomplete experience or of individual opinion, a striking feature of the congress was the earnestness displayed by those participating in it, a remarkable fact when one considers how much of the work connected with sanitary matters is self-imposed, largely unofficial, and purely disinterested.

It seemed appropriate that the president, an old Leeds citizen, should have referred in his opening remarks to the sanitary improvements of the town, which had nearly halved the death-rate in fifty years; but the greater part of his address was devoted to a general survey of the growth of public interest in and control of sanitation, and the present-day problems of urban life. Among the present-day problems he referred to the continued high mortality from phthisis, pneumonia, and diphtheria, and the heavy death-rate among children. Although the presi-

### THE HEALTH CONGRESS AT LEEDS.

THE Royal Sanitary Institute and the Royal Institute of Public Health combined this year, for the first time, to hold under the auspices of the Corporation and University of Leeds a joint session.

No more fitting person than Colonel T. W. Harding could have been selected to fill the presidential chair, who fills at the present moment the important office of chairman of the

on Sewage Disposal. It is difficult

dent pointed to the great advances which have been made in sanitary reform in nearly every direction, he raised the important question as to whether the present system of elementary education is wholly good. "We are spending," he said, "large sums in elementary education; would it not be well to pause awhile and see if we are moving on right lines? We are cramming young minds in frail and half-fed bodies with all the information we can get into them, and most of it will soon be forgotten. By all means let us teach what we can, but without impairing physical development, which is much the most important work to be seen to."

In Mr. J. T. Quinton's (Liverpool) address to the conference of sanitary inspectors we were introduced to the inner working of the local sanitary machine and to the difficulties encountered by sanitary inspectors by the self-interest of those in the council whom they serve. He further touched on the subject of alcoholism, welcomed the introduction of systematic instruction in public elementary schools on its effects, and deprecated the view advanced by some that alcohol constitutes an article of food. He demanded further State interference in the matter of alcoholism, and the repeal of the exemption of patent and proprietary goods from the Food and Drugs Act.

One of the most thoughtful and comprehensive of the sectional addresses was that delivered by Dr. Newsholme (principal medical officer of the Local Government Board) to the preventive medicine section on some conditions of social efficiency in relation to local public administration, which can only be appreciated by a full perusal. Dr. Newsholme began by showing how closely interrelated are the social and sanitary problems, and how a more accurate knowledge and wider outlook will enable social problems to be seen more nearly in their correct perspective. By way of illustration he pointed out that "if the avoidable loss of life and health from communicable diseases were realised by the members of the sanitary authority, they would be less likely to build extravagant town halls while the water supply of the town is impure, or to provide municipal Turkish baths while backyards and streets remain unpaved. . . . And this more accurate knowledge and wider outlook means the abandonment of the old hand-to-mouth and empirical method of dealing with social evils. The conception of poverty and destitution as an element when it is, in fact, a complex compound will disappear, and with it will disappear administration which supplies doles to relieve the symptoms of destitution, without making efficient efforts to investigate its varying causation and to initiate preventive measures against its recurrence." "We have to realise the close interdependence of social evils, which often form a vicious circle where evil effects become, in their turn, sources of evil." As sickness is one of the main causes of sickness, poverty is one of the most potent causes of poverty. The growing tendency is to stop disease, whether communicable or not, at its source, the prompt and early treatment being one of the chief means of securing social efficiency, and the better organisation for the treatment of the sick, from whatever disease, must be regarded as a chief object of the preventive medicine of the future. The monetary value of lives lost, including cost of sickness, through phthisis, enteric fever, and other diseases, is so large that measures of prevention may be regarded as the best possible investment for the community. In the latter part of this suggestive address Dr. Newsholme pointed out the insecurity of tenure of medical officers, who are re-elected for periods of one to five years, and, unlike district medical officers, relieving officers, and vaccination officers, can be removed without the consent of the Local Government Board. He further referred to the overlapping and waste produced by the great variety of authorities dealing with closely related conditions.

In the presidential address to the engineering and architectural section, by Mr. G. F. Bowman (Leeds), reference was made to the question of back-to-back houses, and a strong case was made out for the erection of buildings of the modern type already existing in Leeds; but whether in this connection the working classes "should be the best judges of what is best for themselves" is a dictum open to grave criticism.

Dr. Newman (principal medical officer of the Board of

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Education) chose for the subject of his address in the child-study section child mortality. He began by pointing out that, of the annual half-million deaths in England and Wales, one-third occur under the age of fifteen years, and of this third 85 per cent. are under five years of age.

Whereas the death-rate at all ages above one year shows a steady decline, there is no such indication below that period. The first two years of life "form a veritable fire through which we pass the vast majority of the children of the nation, losing in the process approximately 150,000 of them every year, and marking many of the survivors with the signs of the flame." The three primary causes, then, are the physique of the mother, infant mismanagement, and exposure. "It is idle," said Dr. Newman, "to patch up children at school age if we first make them all pass under damaging and devaluing conditions at the beginning of their lives."

In the industrial hygiene section Dr. Whitelegge (London), as president, gave an address on the relation of health to industry. He began by referring to the improvements in industrial conditions brought about by the combined action of employers and employed, and to the responsibilities thrown upon local authorities in respect to initial construction of buildings. He pointed out the difficulties which attend an investigation into the causes affecting health in certain complex trade processes unless the different operations are separately grouped, and he further emphasised the importance of keeping safety appliances in an efficient state. In this connection he mentioned the importance of permanent local exhibitions of safety appliances, such as exist abroad, especially in textile centres, in metal and mining localities, and in the Potteries. Thus, in the removal of dust, as in metal grinding, there is no source of information, and unless expert advice is taken costly mistakes may result. There are standards of ventilation, of humidity, and of soluble lead in which employers and employed should have opportunities for instruction. Lead poisoning from glazing has been reduced by three-quarters in the last twelve years, but phthisis, or "potters' rot," from dust inhalation is still prevalent. Clearer definitions as to factory lighting and temperature in reference to humidity are required, and further information should be obtained in reference to fatigue in different arduous employments. The welfare of operatives in certain industries is affected by demands on the part of consumers. A large section of the public had grown accustomed to phosphorus matches, and it was not until the match manufacturers agreed unanimously to the prohibition of phosphorus, coupled with prohibition of import, that the Government was able to put an end to this needlessly dangerous branch of industry.

In his presidential address to veterinary surgeons, Mr. H. G. Bowes (Leeds) welcomed the recognition accorded by the President of the Local Government Board to the necessity of proper veterinary inspection of dairy cattle, though, he continued, "why the farce of the M.O.H. inspecting the cows, accompanied by a veterinary surgeon, should be kept up I don't know." nor why the inspection of cowsheds and byres should not be done by the same inspector. He further advocated the appointment of a veterinary adviser to the Local Government Board, whose advice in dealing with bovine tuberculosis would be invaluable. He emphasised especially the necessity for more rigorous treatment of this disease, which, it is unanimously agreed, is transmissible to, and a recognised cause of, disease in human beings. In view of the widespread nature of the disease at present, the slaughter of all tainted cattle would be impracticable, but a gradual weeding out of the worst cases as centres of infection might be initiated. A most important step has been taken in the Tuberculosis Order which comes into force on January 1, 1910, which requires compulsory notification and slaughter of all cattle obviously affected. He claimed further attention to the condition of cowsheds throughout the country, as exercising an important effect in diminishing the disease. In the conclusion of his address Mr. Bower referred to the abuse of tuberculin by the indiscriminate sale.

The treatment of sewage was among the subjects which came up for discussion at a joint meeting of the engineering, bacteriology, and chemistry sections, when interesting papers were contributed by Messrs. E. J. Silcock,

A. J. Martin, J. T. Thompson, and G. A. Hart. Mr. Silcock dealt with a new method now at work at Rothwell, in which, after removing grit, the sewage is pumped on to a revolving fine-mesh screen, then taken to deep percolating bacteria beds, then through sand filters, and discharged.

In the section of preventive medicine an important paper was read by Dr. Robertson (Birmingham) initiating a discussion on tuberculosis. He pointed out that more human suffering is due to tuberculosis than to any disease, that it was produced by infection derived from cases of phthisis, from milk, and possibly from meat, and developed slowly after the germ is taken into the system. He emphasised the importance of milk and meat in carrying infection, and pointed out that more than 30 per cent. of dairy herds are infected. In this connection more attention should be given to the ventilation of cowsheds. Dr. Woodcock (Leeds) followed with a paper on the physique of the phthisical as a means of diagnosis, whilst Dr. Trevelyan (Leeds) discussed the methods of preventing infection from those already suffering from the disease. An interesting discussion followed, and a resolution was passed "that the Health Congress wishes to direct the attention of agricultural societies to the great assistance which they might render to the community by making it one of their conditions in offering prizes for dairy cattle that the animals should be free from tuberculosis."

Subsequently papers were read on the protection of the food supply. Imported and canned foods were dealt with by Dr. H. Williams (London) and Dr. W. F. Dearden (Manchester), whilst Dr. Savage (Colchester) discussed the administrative measures for examining food supply in general, Mr. W. G. Barnes (London) advocated measures for eradicating tuberculosis from the milk supply, and Dr. Stedman explained methods of administering the "Dairies' Order." In the bacteriology section papers were contributed by Mr. J. Johnstone; on the significance of leucocytes in milk as indicating a need for detailed examination, by Dr. Savage (Colchester); on the catalase of milk as an indicator of disease, by C. Revis (London); and on the growth of the bacillus tuberculosis, by Dr. Moore and R. S. Williams (Liverpool). In the latter the important observation was made that the bacillus will only grow between certain definite limits of oxygen pressure, being equally stopped by absence of oxygen or by more than 60 per cent. To stop and kill the organisms completely about 70 per cent. of oxygen must be present, which does not interfere with the majority of other organisms tested. In the same section a joint paper was read by Prof. Grünbaum and Dr. M. Coplans (Leeds) on the selective action of preservatives, in which they discuss the effect of different preservatives on the growth of organisms. Papers were also contributed by Mr. J. C. G. Ledingham (Aberdeen), on the bacteriology of summer diarrhoea; by Dr. S. G. Moore (Huddersfield), on the advantages derived from its notification to the authorities; and by Dr. Buchan (St. Helens), on administrative measures for its reduction.

An interesting series of papers was read in the engineering and architectural section on water supply and treatment of trade water, and in the section on industrial hygiene lead poisoning, its pathology and prevention, abstracts of which, from want of space, cannot be given.

Sir Charles Cameron gave an attractive popular lecture on underground and overground air.

During the congress the University of Leeds took advantage of the occasion to confer degrees *honoris causa* on the president of the congress, Colonel T. W. Harding, and on Sir James Crichton-Browne, F.R.S., and Major Ronald Ross, F.R.S.

#### LANCASHIRE FISHERY INVESTIGATIONS.<sup>1</sup>

THE report of the Lancashire Sea-fisheries Laboratory at Liverpool for 1908 gives evidence of sustained investigation into problems that demand several years' work for their solution. The articles are in almost every case continuations of those contributed to the report of 1907, and it is therefore unnecessary in a brief review to do

<sup>1</sup> Report for 1908 on the Lancashire Sea-fisheries Laboratory at the University of Liverpool and the Sea-fish Hatchery at Piel, No. xviii. Pp. 366+9 plates. Drawn up by Prof. Herdman, F.R.S., assisted by Andrew Scott and J. Johnstone. (Liverpool, 1909.)

more than summarise the findings of the several workers on the fishery questions with which they have been so long occupied.

Prof. Herdman gives a further instalment of results obtained by tow-netting with modern nets in the Irish Sea. This method of obtaining the floating or drifting organisms is now becoming more delicate, and the catching power of the nets is more accurately known than was formerly the case. The object in view being an exact determination of the distribution and fluctuation of the "plankton," no trouble is too great and no determinations are too laborious to deter the director of the fisheries work. Accordingly, this paper contains an immense amount of data both as to methods and results with regard to the seasonal and local variations in this fauna, and also with reference to the influence of conditions upon its abundance and behaviour. The statistical work involved in such a report is very great, and the credit of these laborious tables is due to the zeal of Mr. Andrew Scott. On the whole, the results of 1908 show the correctness of the conclusions arrived at in the previous contribution to this "intensive study" of plankton round the Isle of Man, but they also demonstrate some seasonal divergences which are in all probability of considerable importance to fishermen, as affecting the arrival of spring or autumn migrants. The only criticism that we feel justified in making upon such a heavy and valuable undertaking is the absence of any analysis of the light-factors that influence plankton, but we hesitate to press this criticism, as Prof. Herdman has not published the whole of his results.

Of the more striking fishery papers, attention may be directed to Mr. Johnstone's important experiments on quarantining mussels. Mr. Johnstone has determined the degree of bacterial pollution in a number of shell-fish taken from Welsh and Lancashire bays, and finds that the contamination, though, as a rule, not serious, is probably due to general contamination of the water or sea-bed in these districts. In some cases, however, the pollution is more serious, and, by transferring these heavily infected mussels to cleaner open water, Mr. Johnstone finds that in four days' quarantine the maximum amount of sterilisation is effected. The bare fact, of course, has long been known, for oysters infected by typhoid, for instance, but this report is a continuation of that more extended investigation which is needed in order to enable fishermen themselves to increase a healthy supply of shell-fish near the larger towns. Mr. Johnstone also contributes papers on the temperatures of the Irish Sea, on the growth and migration of plaice, on parasitic growths in flat fish, and a joint paper with Capt. Weigall on the outfit of the fine new boat, *James Fletcher*, which the Lancashire Sea-fisheries Committee commissioned recently. In addition to these papers, the wider aspects of biological investigations are not overlooked, and we are glad to see that Dr. Bassett has continued his hydrographical study of the Irish Sea by a further analysis of its salinities. It is to be hoped that aid will be forthcoming to provide the Lancashire committee with a member of staff specially devoted to such work.

Lastly, reference must be made to an excellent *résumé* of the method for finding the coefficient of plankton-nets (in regard to catching power) by Mr. Dakin. This gentleman's elaborate study of Pecten, forming an appendix to this report, has been noticed already in these columns (May 6, p. 273), and we may merely, therefore, refer to it as an example of the good results obtained by bringing different methods to bear upon the study of an organism.

#### ORIGIN AND RITES OF GYPSIES.

IN the *Journal of the Gypsy-love Society* for April Miss D. E. Yates publishes a translation of a paper by Prof. R. Pischel, originally published in the *Deutsche Rundschau* for 1883, on the home of the Gypsies. Reviewing various references to the origin of this race, he comes to the conclusion, on the evidence of philology, that the Gypsy dialects are closely connected with those of Dardistan, and he accordingly fixes this region as the original Gypsy home. This view is based largely on materials collected by Drew, Biddulph, and Leitner. It is unfortunate that this opportunity was not taken to