ABSTRACTS.

SECTION OF ANATOMY AND PHYSIOLOGY.

Friday, January 8, 1915.

PROFESSOR J. M. PURSER in the Chair.

Some Experiments on Cardiac Reflexes.

PROFESSOR D. J. BARRY read a paper, illustrated by lantern slides, on the above subject. See page 429, *ante*.

Friday, March 26, 1915.

PROFESSOR THOMPSON in the Chair.

Demonstrations.

A Test for Nitrites in Organic Solutions.

DR. W. G. SMITH demonstrated some tests for the detection of nitrites in organic mixtures.

(*a*) The oldest and simplest test is the liberation of iodine from an acidified solution of potassium iodide.

This answers excellently for many purposes, but is not so useful for such complex mixtures as urine or saliva, because some free iodine is " bound " by the organic matter present.

(*b*) Meta-phenylene-diamine (meta-diamido-benzol) test (Griess). An acidified solution of the reagent develops with nitrites a brown colour (Bismarck brown). Very delicate, but the solution must be freshly prepared.

(*c*) Griess's double test—

(i.) Sulphanilic acid, dissolved in acetic acid (1 grm. in 300 cc.).

(ii.) α–Naphthylamine, dissolved in acetic acid (0.2 grm. in 300 cc.).

Add a little of the mixed solutions to the suspected liquid. Fine red colour. Extremely sensitive. Limit = 1 in 500 millions.

The test reacted with filtered saliva and with freshly expressed groundsel juice.

PROFESSOR THOMPSON stated that he was under the impression that there was a small amount of nitrites in urine, but did not know that this was due to bacteria, as suggested by Dr. Smith.

The Influence of Temperature on the Secretion of Sweat.

DR. O'CONNOR reported on experiments on the influence of temperature on the secretion of sweat, which show that active sweating appears in the anæsthetised cat when the body temperature reaches about normal or the subcutaneous temperature of a portion of the body rises to about 43° C.

A Suggested Reconstruction of the Mandible of Piltdown man.

PROFESSOR A. FRANCIS DIXON exhibited a proposed reconstruction of the lower jaw of the Piltdown man. He believed that it was not necessary to assume a complete absence of the mental eminence, or an enormous development of the incisor teeth. Further, he did not think that the fragment indicated that the molar-præmolar series of teeth was more nearly parallel to the mesial plane than is often the case in recent specimens. He had obtained the mandible believed to belong to a native of one of the Melanesian Islands, which exhibited many resemblances to the fragment discovered at Piltdown. From this specimen a portion corresponding to the Piltdown fragment was carefully cut away and a cast of the Piltdown fragment was fitted to the remaining part. The manner in which the cast and actual bone so united form a nearly symmetrical "*mandible*" is very striking. The

alveolar part with the sockets for the teeth formed a symmetrical curve, and there was space enough for the recently discovered canine tooth, should it prove to belong to the Piltdown skull. The actual model of this tooth will not fit into the existing socket, but there is room enough to enlarge the socket sufficiently to hold the tooth without encroaching unduly on the neighbouring teeth. In the compound "mandible" formed in the manner described, as was to be expected, a considerable want of symmetry exists in the region behind the lower part of the symphysis. Yet the difference on the two sides is not very striking. On both sides the lower edge of the bone widens out very much as we approach the symphysis, but the horizontal backward shelf-like projection on the side formed by the cast is distinctly more marked.

As the fragment of the mandible is the only part of the Piltdown skull which exhibits very striking peculiarities, when the specimen is compared with the skulls of existing peoples, and as upon it alone the facial part of the Piltdown skull can be reconstructed, it becomes of supreme importance not to exaggerate its anthropoid characters. The reconstruction exhibited by Professor Dixon showed that these characters are not necessarily as marked as has been supposed.

In reply to a query by PROFESSOR THOMPSON, PROFESSOR DIXON said that the suggested reconstruction did not fit in with either Dr. Keith's or Dr. Smith-Woodward's.

Papers.

After Effects of the Activity of Organs.

PROFESSOR BARCROFT read a communication on the above subject. He confined his remarks to the subject of skeletal muscle, stimulated so as to produce short tetani, and showed that the blood flow was increased for some hours after the exercise, and that the amount of oxygen consumed by the muscle also increased, but this increase did not last so long as the vascular change, though the maximum of each occurred at the same time.

A Method of Determining the Content of Replaceable Hydrogen Ions in the Urine and the Bearing of this Content on Metabolism.

PROFESSOR COLLINGWOOD read a paper on the above subject, and, in reply to questions, stated that the amount of CO_2 in the urine was negligible. He used phenolphthalein as an indicator.

Friday, May 28, 1915.

MR. P. T. CRYMBLE demonstrated the new *x*-ray apparatus and showed many beautiful plates; a series of demonstrations on students who had had a bismuth meal at varying periods within the previous twenty-four hours attracted much interest, and incidentally showed that the rate of progress of the bismuth through the alimentary canal varied with the nature of the food with which it was mixed.

PROFESSOR SYMINGTON showed a series of casts of the endocranium arachnoid and brain to illustrate the degree to which the convolutions and sulci impress the inner surface of the skull.

Additional Observations on the Estimation of the Degree of Brain Development from Endocranial Casts.

DR. SYMINGTON read a paper on the above subject. He also showed and described a new method of illustrating cranio-cerebral topography. The method adopted was to make an accurate cast of a coronal section through the head, and then to photograph the section absolutely to scale and place the print on the plaster cast.

The Action of Rennin.

PROFESSOR T. H. MILROY read a paper on the above subject. See page 447, *ante*.

Electro-Cardiographic Method of Estimating the Condition of the Heart Muscle.

Dr. J. E. M'Ilwaine read a paper on the above subject, embodying the result of two years' experience.

Heart Block produced by Yohimbine and Quebrachine.

Dr. J. M. Gibson read a paper on the above subject. See page 450, *ante*.

The Effects of Racemic Arginin on the Execretion of Creatine and Creatinine. (Preliminary Communication.)

Professor W. H. Thompson read a paper on the above subject, and said arginin was used prepared from herring milt and racemised according to the procedure followed in Kossel's laboratory. Four experiments were performed—three with rabbits and one with a dog. In the latter the addition of 2 grms. per day to the food (two days) gave an increase of 2.6 per cent. subcutaneous injection of the same amount, an increase of 195 per cent. to the total output of creatine-creatinine in the urine. The preformed creatinine was not increased, or only to an extent (2 per cent.) which lay within the errors of observation. In the rabbits the increase of urinary creatine was less marked, varying from .04 to .1 mgms. per hour during a period of six hours following injection *via* the jugular vein. There was, however, in two of these (in which the creatine of muscle was determined) an increase of .0341 and .0178 grms. per cent. respectively in the fresh muscle. In the latter the increase amounted to .0870 grms. per cent. of the dried solids. A control experiment on a rabbit with the same anæsthetic (urethane), but without arginine, gave a decrease in the preformed urinary creatinine of 1 mgm. per hour, a decrease in the total urinary creatinine of 0.6 mgm. per hour, and a relative increase in the latter of 0.5 mgms. per hour. The creatine of the muscle was also increased—namely, to the extent .0067 grms. per cent. for the fresh muscle and 0710 grms. per cent. as calculated for the

dried solids—that is to say, almost as large as the increase observed after the injection of the racemic arginine. The results, so far as they go, point to the formation of creatine from lævo-arginine in the dog, and do not support the theory of a "wash-out" or expulsion of preformed creatine from muscle. Further experiments, which are in progress, are however required before a final decision on this point can be reached.

Some Further Observations on a Urinary Acid Index.

Professor B. J. Collingwood read a paper on the above subject.

Chemical Temperature: Regulation in Anæsthetised Animals.

Dr. J. M. O'Connor read a paper on the above subject, and said in anæsthetised cats and rabbits shivering occurs if the body temperature and the subcutaneous temperature are below a point which is fixed for that particular animal. The oxygen consumed by the animal when not shivering is approximately a simple function of the body temperature. When shivering, more oxygen is consumed than at the same body temperature in the absence of shivering. This excess is directly proportional to the extent to which the subcutaneous temperature has fallen below the fixed point referred to.

Some Applications of Electrolytic Reduction.

Dr. J. A. Milroy read a paper on the above subject. He said a cathode consisting of purified sheet lead was used for the following experiments. Lead was selected because it is a metal on the surface of which the hydrogen is developed at a relatively high tension, and therefore exerts a correspondingly intense reducing action. In this respect zinc and mercury are superior to lead, but are less convenient to use.

The reduction was carried out in an electrolytic cell consisting of an inner porous porcelain pot, containing the

solution of the substance to be reduced, enclosed by an outer vessel containing dilute sulphuric acid. The cathode was immersed in the solution in the inner vessel and the anode in the dilute acid in the outer vessel. The current was derived from 4-8 accumulators placed in series.

The following are some of the results obtained:—(1) Oxalic acid is reduced successively to glyoxylic acid and glyoxal. (2) In the hope that this reaction might be applicable to other dibasic acids, the reduction of saccharic acid was tried. Only a small amount of a substance which reduces Fehling was formed, and so far I have not obtained the glycuronic acid which might have been anticipated as the earliest reduction product. (3) Hæmatin dissolved in 70 per cent. alcohol containing sulphuric acid is transformed first into a pigment resembling hæmatoporphyrin; later on the solution becomes yellow and has the spectroscopic characters of a solution or urobilin. Still later the solution becomes practically colourless, but on standing exposed to the air it becomes yellow. This acidation is more rapid in ammoniacal solution, and the resulting pigment has similar characters to those of urobilin, having a similar spectrum and giving a marked green fluorescence on the addition of ammoniacal zinc hydrate. It may, therefore, be concluded that the final product of reduction is a chromogen of a pigment resembling urobilin.