

about of the same length and area, when the morphological characters of the caudal fin would become approximately stable for any one species, as may be shown by measurements of a simple mechanical illustration, in which the interaction and composition of the forces which are brought into action are demonstrated. 4. The mechanical demonstration alluded to above, taken together with the fact that the primitive or ancestral form of the tail, which is typified by a temporary condition in fish larvae, when the myosomata are rudimentary, but still symmetrical, amounts almost to a demonstration of the principles first laid down by Lamarck, then elaborated by Spencer, and more recently applied to special cases by the author and Professor Cope.

In a communication on growth and death, Dr. C. S. Minot gave the results of ten thousand measurements of weight of growing guinea-pigs and other animals from birth to maturity. The rate of growth was found to steadily diminish from birth onward; so that the loss of power begins at once, and continues until death. The common views of death were discussed, and the current conceptions of animal individuality were attacked. The author then referred to the bearing of our present knowledge of senescence upon the theory of life, and the relation of life to a material substratum.

A paper on the osteology of *Oreodon* was read by Mr. W. B. Scott, in which this genus was said to belong to the Artiodactyla, although there are some strong resemblances to the Suidae. Vertebrae are ruminant, markedly in the case of the axis. Thoracic vertebrae have long prominent spines, and small bodies slightly amphicoelous. Lumbar, probably five in number, are heavy, with short spines and broad flat transverse processes. Sacrum contains two vertebrae which touch the ileum. The tail is long and slender, and the legs proportionally long. There are a short head and short metapodials, giving the animal a wolf-like appearance. The radius and ulna are distinct. The carpus consists of eight bones, including the pisiform. There are short unankylosed metacarpals. The ungual phalanges are long and pointed, as in *Hyopotamus*. A rudimentary pollex is present, this being the only artiodactyl with one.

Mr. J. Struthers, in a paper on finger-muscles in *Megaptera longimana*, and in other whales, records rudimentary flexor and extensor muscles in these animals, and shows that they are more or less used, as the muscular fibres are red and not degenerated.

Dr. G. M. Sternberg described his experimental research relating to the etiology of tuberculosis. The author repeated the inoculation experiments of Koch, with similar results. The experiments of Fornad to induce tuberculosis in rabbits by introducing into the cavity of the abdomen finely powdered inorganic material, have also been repeated with entirely negative results. The author held that Koch's bacillus was an essential factor in the etiology of tuberculosis.

Dr. C. E. Bessey, in a paper on the adventitious inflorescence of *Cuscuta glomerata*, stated that the

examination of young plants shows that the inflorescence is developed from numerous crowded adventitious buds, and not by the repeated branching of axillary flowering branches as commonly stated.

In a paper on the hitherto unknown mode of oviposition in the Carabidae, Prof. C. V. Riley records habits of *Chlaenius impunctifrons*, traced from the egg up. The eggs are laid singly in cells made of mud or clay, on the under surface of leaves.

Mrs. A. B. Blackwell read a paper on the comparative longevity of the sexes. The study was exhaustive, and made on statistics from all parts of the world; and the greater longevity of woman over man was established. In old countries the females preponderate, while males lead in newly settled ones. Up to eighteen years the males are in excess of the females: later the females predominate.

PROCEEDINGS OF THE SECTION OF HISTOLOGY AND MICROSCOPY.

THE attendance at this section was very small, partly because the other sections drew away not only many members, but many papers also; partly too, we imagine, because the American society of microscopists had held its annual meeting a short time previously. The future of this section is somewhat uncertain, especially because many of the members are unwilling to have their histological papers withdrawn from the section of biology. The abolition of the section was much discussed, not only among the members interested, but also in the section itself. As the number of communications and the attendance were both of the smallest, the feeling against the continuance of the section, with its separate organization and equal rank with the sections of physics, biology, geology, etc., became very decided with many of those most interested. Finally, Dr. C. S. Minot announced in general session, that he should bring up a motion to amend the constitution so that section G shall be abolished. This amendment will come up for consideration at the next meeting of the association.

Alexis A. Julien read a paper on an immersion apparatus for the determination of the temperature of the critical point in the fluid cavities of minerals. The extensive occurrence of carbon dioxide in minerals renders the determination of its critical point important; yet with the forms of apparatus hitherto described for this use, there have been sources of serious error. The author described a new device for raising a thin section of a mineral, mounted on a glass slide, to an accurately determinable temperature upon the stage of the microscope. The arrangement consists of a thin walled box heated by conduction from a taper through the copper plate which forms its bottom, and which projects beyond the stage. The thermometer has a scale ranging from 22° to 45° C.; each degree on the scale being two centimetres in length, and divided into tenths. The bore and length are so arranged as to bring that part of the scale near 30° on a level with the eye at the eye-piece, in order

to facilitate quick readings without moving the head. The box serves as a water-bath in which any objective from one-half to one-tenth may be immersed without serious loss to the objective's optical capacity. The critical point of the fluid may be readily determined in ten minutes by both the disappearance and re-appearance of the bubble within a twentieth of a degree. For further details the author referred to his earlier paper upon an apparatus for this purpose.

Dr. Theobald Smith presented an account of Salmon's culture-tubes; but as it has not yet been revised by Dr. Salmon, we postpone notice of it.

Prof. Henry F. Osborn's paper upon a microscopic method of studying the amphibian brain was valuable. The brain is hardened in 'Müller's fluid,' the ventricles being fully injected. After the usual alcoholic treatment, the brain is placed for one week in a carmine solution, then for twenty-four hours in acetic acid. The embedding mass is prepared by shaking the contents of an egg with three drops of glycerine. After soaking in this mass, the brain is placed in position, and hardened in the vapor of boiling eighty-per-cent alcohol. The mass is then placed for one week in absolute alcohol. Section is made under alcohol with a Jung's microtome. The sections on the slide are arranged, covered with old-fashioned blotting-paper (cigarette-paper was suggested as better by Dr. C. S. Minot), and treated with alcohol and oil of cloves through the paper, a device which may prove convenient in many cases.

Dr. H. G. Beyer reported one of his observations made during his still uncompleted researches on *Lingula*. In his abstract he says, "One of the points that I should like to demonstrate from one of my sections is a probable communication of the so-called segmental tubes with one of the diverticula (liver) of the alimentary canal of the animal, by means of a convoluted tubule;" certainly an important observation if verified.

Dr. R. H. Ward described a couple of neat contrivances, — one, a new illuminating arrangement called the iris illuminator; the other, a long-armed lens-holder. Prof. William A. Rogers gave a description of the various steps by which a centimetre or an inch may be produced from a standard metre or a standard yard respectively.

The remaining papers contained almost no new original matter, but were chiefly accounts of methods or apparatus well known to professional workers.

PROCEEDINGS OF THE SECTION OF ANTHROPOLOGY.

THURSDAY forenoon was occupied by the general meeting, leaving only time for the organization of the sections. In the afternoon the address of the vice-president, Prof. E. S. Morse, was delivered to a very attentive and interested audience. As we have already given this address in abstract, no analysis need be added here.

The real work of the section began on Friday morning, with a paper by Rev. S. D. Peet, upon emblematic mounds, their uses and purposes. The author, hav-

ing carefully studied many of the mounds, has reached the conclusion that from them much may be learned as to the symbolism of the people who made them, and through this of the people themselves. He thinks that certain animal forms were used for specific localities. For example, turtle mounds were placed upon high ground where a lookout would be stationed; eagle mounds, near bluffs; panther mounds stood guard over village sites. He believes that the mounds indicate the totems of the tribe which made them. The paper was illustrated by charts, and was followed by an extended discussion. Many of the archeologists present were evidently unable to identify some of Mr. Peet's mounds, as represented in his diagrams, with known animals, so confidently as he did; and some of the outlines seemed quite unlike those of any animal, though of most the animal form was evident. The discussion soon turned upon symbolism in general. Mr. La Flèche, an Omaha Indian, and member of the section, spoke of some of the symbols common among his people. Dr. Syle of China referred to similar symbols common among the Japanese and Chinese, and noticed the very remarkable resemblance which existed between current symbols in eastern Asia and western America. Dr. E. B. Tylor spoke of the totem system as wide spread, being found not only in North America, but as well in South America, Micronesia, and among the hill tribes of India.

Then came a paper by Miss A. C. Fletcher, upon child-life among the Omahas. It was such an account as only one who had lived among the people, and with hearty sympathy entered into their daily lives, could have given; and the earnest, clear, tender treatment of the subject was most delightful. We were told how, when ten days old, the child received a sacred name given with impressive ceremonies; how its cradle was prepared, and how lovingly the little one was tended, often by father as well as mother. This cradle is a flat board, to which the child, laid on its back, is swathed; the bandages for girls being different from those used for boys. Because of this treatment, most Indians exhibit a peculiar flattening of the occiput. The child is not kept constantly on the board, but at times is allowed to kick about at will; and after the sixth month it is rarely used, a hammock then taking its place. The crying of the child seems very unpleasant to them, and if it occur they use every means to quiet it. When the child is three years old, the solemn ceremony of cutting its hair generally takes place, though all the children do not receive this. Before this, the hair is allowed to grow. At this time, if the parents desire, a new name may be given to the child. Each gens has its own style according to which the hair is cut. The home life of Omaha children was shown to be pleasant and joyous, and the child is very much attached to it. Toys, games, and story-telling abound. After early childhood has passed, various duties are assigned to the children, — to the boys, the care of the ponies, the use of the bow and arrow, etc.; to the girls, the care of younger children, and later tilling the ground, dressing skins, and cooking, and until a girl is profi-