Basset hounds; but with this exception the important law advanced more than a dozen years ago has not, up to this time, received a careful analysis of a large number of pedigrees, of three or more generations.

Our work was carried on with data obtained from the American Kennel Club Stud Books and includes 390 dogs, of the pointer breed, of which 660 parents, 1,367 grandparents, 1,361 great-grandparents and 978 great-great-grandparents are known. Four sets of color characteristics, namely, liver or no liver, black or no black, white or no white, and 'ticked' or not 'ticked,' were considered. By the method used no substitutions were needed to fill the gaps left by unrecorded ancestors of the first four degrees. The results showed an almost perfect harmony, in each instance, between the facts and Galton's law, the greatest real deviation being only 1.1 per cent., while the least was .4 per cent.

Astrosphere and Centrosome in the Fertilization of the Egg of Phascolosoma (P. vulgare and P. Gouldii): J. H. Gerrould.

The Larval Development of Phascolosoma: J. H. Gerrould.

On the Ova of Ophidia: E. L. Mark and C. A. Crowell.

A System of Abbreviations for the Lettering of Anatomical Figures: E. L. Mark.

The Circulatory System of Lamellibranchs: G. A. Drew.

By careful injections, preparations and dissections, the vascular system of the large northern scollop, *Pecten tenuicostatus,* has been found to be extensive and definite. In the mantle, for example, the blood vessels branch repeatedly and form a very fine network that in appearance is much like a capillary plexus. From this plexus the blood is collected directly by vessels that join to form the vein that, in common with the efferent vessels from the gills of the corresponding side, returns the blood to the heart. Inasmuch as some of the coloring matter of the injecting fluid finds its way out of the vessels and into the surrounding tissue, it seems quite possible that the blood may function directly as lymph. Large lacunæ, such as are generally supposed to be present in Lamellibranchs, have not been found. The vessel that supplies the foot is capable of great distention, and offers the same for the protusion of the foot, but the vessel is very definite in shape and is not comparable to a lacuna. The course taken by the blood in its circulation is essentially the same as has been described for other forms, but the vessels seem to be much more finely branched, and the circulatory system much more nearly 'closed' than has generally been supposed to be the case with Lamellibranchs.

On the Anatomy of a Double Monster: H. L. Osborn. (Read by title only.)

A calf born near Minneapolis, Minn., in 1901, and which lived only a few minutes, came to my notice and proved interesting as a nearly complete twin formation. There is a single umbilical opening and cord, there are two functional hind legs and a single anus, but there are two tails and a third hind leg carried in the mid-dorsal line, and projecting backward. Anteriorly there are two complete animals, two heads, thoraces and two anterior abdominal regions completely developed. There is a single abdominal cavity posteriorly, but most of the viscera are double. There are two spinal columns, each sacrum articulates externally with a complete half pelvis, and these meet below, forming a symphysis, and on its opposite side each sacrum articulates with an ilium which meets a very imperfect ischium, so that here the division of the embryonic

material has not gone to a finish. The small intestines meet not far from the pylorus and communicate transversely, and a single piece continues thence to the anus, a distance of about seven feet. There is no distinction of small and large intestine, except a sudden enlargement at which two cœca are located (one for each component of the calf). There are two nearly complete circulatory systems but an umbilical artery is lacking from each side (the inner), and the internal iliac veins join and fuse in the middle line. There are two pairs of kidneys, and there are two bladders; one is in front of the other. They communicate at the fundus. The urethras are not developed; the hinder bladder has the urachus open and both bladders discharged by this passage. The ureters are symmetrically related to the two bladders; those of the outer kidneys, one from each body, discharging into the hinder bladder, while those of the two inner bladders communicate with the anterior bladder. There are two pairs of testes; the outer pair had descended, their vasa deferentia communicating with the hinder bladder, while the inner pair are still beside their kidneys and in communication with the anterior bladder.

Notes on the Trematodes of Lake Chautauqua, N. Y.: H. L. OSBORN. (Read by title only.)

Studies made in the biological laboratory of the Chautauqua College of Liberal Arts have shown that the adult stage of *Distomum (Microphallus) opacum*, Ward, is of frequent occurrence in the stomachs of the black bass, and its earlier stage in the crayfishes, where, instead of frequenting 'the space in the cephalothorax above the heart and sexual organs' (Ward, *Am. Mic. Soc. Trans.*, XV., p. 79, 1894), it is found invariably in the liver, whose effective area is frequently greatly reduced by the cysts. A second distomid occurs in the stomach of the black bass, though less frequently. It has been seen elsewhere by Wright and Linton and referred by them to *Distomum (Bundera) nodulosum*. It is not, however, identical with the European form and will very likely need to be recognized as a new species. It is characterized by a difference in the lateral lobe of the oral apparatus. Its earlier stages were found abundantly in crayfishes of the lake. They are found in nearly every crayfish examined, and occur encysted in the heart, gonads, muscle and surrounding spaces of that region. Two other species of distomids are frequent in fishes of the lake; one, an undetermined distomid of very minute size, occurs in the nearly digested slimy chyme gathered about the entrance to the small intestine, appearing like numerous minute black elongate specks scattered through the slime, and proving to be sexually mature forms, the black color due to the embryos filling the uterus. This species has not yet been located, and it seems to be not well known. Another little known and possibly new species occurs encysted in round black spots a millimeter in diameter in the skin of the fins and of the body generally, in rock bass and darters. Another distomid, unknown in the adult, was previously reported on from this locality (*Zool. Bull.*, p. 301, 1898) as occurring in *Anodonta plana* and causing the salmon-colored deposit on the inner surface of the valves of the shell. The *Anodontas* also always contain one or more individuals of *Cotylaspis* adhering to the surface of the kidney (*Zool. Bull.*, p. 85, 1898.) An extended article on these is now in course of publication. There is to be found encysted in the liver of the sunfishes a form that has not as yet been sufficiently studied to ascertain more than that it is a *Diplostomum*, or nearly related to it. Fur-