of "Interesting Animal Surgery" is noted an operation for cataract performed on the Indian rhinoceros, "Mogul." A Census of American Bison gives a total of only 2,047 on January 1, of which 969 were in captivity in the United States and 41 in Canada: these figures are now different owing to the sale to Canada of the Pablo herd. As a supplement to the bulletin F. A. Lucas has an article on "The Passing of the Whale," noting that the number of whales are being rapidly lessened and that unless protective measures are taken one or two species are in danger of actual extermination.

Bird-Lore for July–August contains articles on "The Fish Hawks of Gardiner's Island," by Frank M. Chapman; "The Return of the Snowy Heron," by Herbert R. Sass; "A Little Blue Heron Rookery," by M. Harry Moore, and the fifth paper on "The Migration of Flycatchers," by W. W. Cooke. The Educational Leaflet is by Mabel Osgood Wright and devoted to the tree swallow. The report on The Audubon Societies notes steady progress, but as the result of continuous work, and the vast numbers of birds sold for "plumes" shows the necessity of further hard work.

THE LIQUEFACTION OF HELIUM[1]

In his communication to the Amsterdam Academy concerning the liquefaction of helium Professor Onnes describes in considerable detail the steps that led up to that achievement, the complicated apparatus employed, and the difficulties that had to be surmounted. The narrative conveys a vivid impression of the obstacles that have to be overcome in order to lower temperature a very few degrees in the neighborhood of the zero of absolute temperature. In spite of the most elaborate and comprehensive preparation and ample supplies of liquid hydrogen, not only was the whole apparatus, with its subsidiary arrangements, tested to its utmost capacity, but the physical energies of the professor and his assistants were well-nigh exhausted by the prolonged struggle.

The constants of helium, while showing some important points of difference, are found to agree very remarkably with the predictions made by Dewar on theoretical grounds in his presidential address to the British Association in 1902. After a correction of two tenths of a degree the boiling point of the liquid is found to be 4.5 degrees Centigrade. By exhaustion to below one centimeter, and probably below seven millimeters of pressure, the professor considers that the temperature was reduced to about 3 degrees without, however, affecting the mobility of the liquid.

The density of the liquid helium is 0.15, or about double that of liquid hydrogen; and the proportion between the density of the vapor and that of the liquid is as 1 to 11. The critical pressure is in the neighborhood of two or three atmospheres, which is relatively low in comparison with the figures for other gases.

Professor Onnes deduces a critical temperature not much higher than 5 degrees Centigrade. But with regard to this and all the other figures he says that more careful measurements and calculations must be made before any certain and final conclusion can be reached. At temperatures so near to the absolute zero there is always room for doubt in the application of laws deduced from the behavior of bodies in more normal conditions, and for the present we must apparently be content to accept the values of the helium constants as provisional.

[1] From the London *Times*.

SPECIAL ARTICLES

A NEW GROUP OF PERMIAN AMPHIBIANS

More than thirty years ago the late Professor Cope described from the reputed Permian, of Illinois, three small vertebræ which he considered reptilian and which he made the type of the genus and species *Lysorophus tricarinatus*. Six years ago Professor Case recognized in certain material—a considerable series of connected and more or less intertwined vertebræ—which he had collected from the Permian of Texas, the same genus, and, possibly, the same species. He reached the conclusion that the animal was