

Ich kann diese Arbeit nicht schließen, ohne meinem hochverehrten Lehrer, Herrn Prof. Dr. F. E. Schulze, in dessen Institut dieselbe gefertigt wurde, meinen ergebenen Dank abzustatten für die mannigfachen, mir von ihm gegebenen Anregungen und das Interesse, das er durch Gewährung der Hilfsmittel des Institutes für sie an den Tag gelegt hat.

II. Mittheilungen aus Museen, Instituten etc.

1. Chloretone (Acetonchloroform): an Anaesthetic and Macerating Agent for Lower Animals.

Von Harriet Randolph.

eingeg. 21. Juni 1900.

Acetonchloroform known commercially in America¹ as Chloretone, whose hypnotic and anaesthetic qualities are being recognized in medical practice², may also prove valuable in the zoological laboratory.

Chloretone is a white crystalline compound having a camphoraceous odour. Its action is supposed to be slightly preservative. It is soluble in cold water in about the proportion of 1 : 150.

By the use of Chloretone solutions of appropriate strength the activity of rapidly moving microscopic animals can be reduced to the desired extent. Such a degree of anaesthesia can be produced as to make possible the fixation of some sensitive forms in a well-extended condition. If, however, these are transferred from the Chloretone solution to water again, an apparently complete recovery of the normal condition takes place. This suggests that Chloretone may be used to advantage in grafting and other experiments that require delicate manipulation.

In solutions too weak to produce anaesthesia the animals in every case remained apparently in a normal condition for several days, until removed from the solution. Strong solutions in some cases bring about violent contraction followed by the disintegration of the animal. By this method fine maceration preparations can be obtained. In Chloretone solutions the transparency of such animals as *Daphnia* and Roti-

¹ A one per cent solution of acetonchloroform has been used for some years in Europe as aneson.

² a) »Recent Advances in the treatment of Insomnia«, Reynold Hebb Nilcox M. A., M. D., L. L. D. Medical News April 14th 1900. — b) »Chloretone: a New Hypnotic and Anesthetic«. E. M. Houghton Ph. C., M. D.; and T. B. Aldrich Ph. D. Press of Parke Davis & Co., Detroit, Mich., U. S. A.

fers is perfectly preserved, so that details of structure can be studied with great ease and thoroughness. By bringing about a considerable degree of narcosis in earthworms and fresh-water mussels in a short time Chloretone lessens the time hitherto needful for the preservation of these animals in an extended condition.

In the following experiments Chloretone was used in solution in spring water in the proportions of 1 : 100 (in which not all the crystals are dissolved), 1 : 200, 1 : 300, 1 : 1000, 1 : 1500, 1 : 2000, and 1 : 5000. One set of experiments made with distilled water yielded results similar to those obtained with spring water.

These solutions were used upon *Amoeba*, *Paramaecium*, *Hydra* (green and brown), *Planaria*, *Oligochaeta*, *Rotifera*, *Mollusca* (snails and fresh-water mussels), *Crustacea* (*Daphnia*, *Ostracods*, *Copepods*) and Tadpoles.

Amoeba. In solutions of 1 : 100 and 1 : 200 the amoebae contracted into balls. In 1 : 300 and 1 : 1000 the formation of pseudopodia was accentuated, but the rate of movement remained the same.

Paramaecium: In even the weakest solutions that took effect the paramoecia remained contracted.

Hydra. *H. viridis* was at first not affected by the weaker solutions, while in the stronger (1 : 100, 1 : 200, 1 : 300) it was strongly contracted. After 18 hours in the solution of 1 : 1000 there was slight contraction and beginning of maceration in the tentacles. In 1 : 1500 and the weaker solutions there was a slight degree of contraction and a little movement.

H. fusca (?) in solutions of 1 : 100, 1 : 200 and 1 : 300 became at once greatly contracted and the contents of the digestive cavity were ejected. The animals then began to disintegrate. In this way fine maceration preparations can be obtained.

The solution of 1 : 2000 caused the greatest extension. After eleven days the hydras in the solution of 1 : 1000 were dead and their tentacles were falling to pieces. In the solutions of 1 : 1500, 1 : 2000 and 1 : 5000 the hydras were still living and on treatment with hot mercuric chloride they all contracted slightly, the contractility being greatest in those in the weakest solution. They were, however, fixed in a relatively extended state; and sections show that the endoderm cells are much less vacuolated than after treatment with some other anaesthetics.

Planaria. In the strong solutions the worms were greatly contracted, while in the weaker solutions they became after the first instant greatly relaxed and soon began to disintegrate. In the solution

of 1 : 200 after twenty-four hours they were macerated so that the different systems of muscle fibres could be recognized.

Oligochaeta. Earthworms, probably small specimens of *L. terrestris*, were washed in water and then transferred to solutions of different strengths. In the stronger solutions they become motionless after from one to five minutes and at the same time greatly relaxed and elongated. After from ten to twenty minutes they were put into alcohol (35%) when they began slowly to contract. The contraction is most active in the posterior region and stops by the time or before the worm has reached its normal length. By this method the anterior fourth of the worm is preserved in a very well extended condition — quite equal or perhaps superior to the best specimens obtained by slow alcoholic narcotization. For the study of the anatomy of the worm this method can be recommended. In the weaker solutions (1 : 1000 and 1 : 1500) the worms retained their power to move and remained alive for days.

Rotifera. This method was tried especially with *Lacimularia socialis* (probably an allied species). In the stronger solutions the animals were neatly relaxed and eventually came out of their cases. In weaker solutions they were fairly well expanded.

Mollusca. Young fresh-water snails are made more transparent than in their normal state. They as well as older individuals in solutions from 1 : 300 to 1 : 1000 eventually fall out of the shell in a fully relaxed condition, with the tentacles in some cases nearly twice their normal length. In strong solutions Anodons open their shells in a few hours. By this method fine specimens may be obtained and the labour of preserving them lessened.

Crustacea. Daphnia, Ostracods and Copepods become more than normally transparent in Chloretone solutions of from 1 : 200 to 1 : 1000. In Daphnia all the parts are relaxed, the heart beats normally and there are feeble movements of the appendages, sufficient only to show their position. In 1 : 200 after twenty-four hours the body hangs out ventrally from the shell bringing the appendages into full view. The effect upon Ostracods resembles that on Daphnia. Copepods, however, are more resistant.

Tadpoles. In solutions of all strengths movement ceases in a few seconds. In strong solutions the heart stops beating. In solutions of from 1 : 1000 to 1 : 2000 almost any degree of anaesthesia can be produced depending upon the time of immersion, and the animal can be brought again to a normal condition. The tail can be operated upon without causing a return of consciousness; and when the tadpole is put into water again its actions subsequently appears to be normal.

In the solution of 1 : 5000 the tadpole is at first slightly affected. After a few minutes it regains power to move and can live for days swimming about actively in the Chloretone solution.

Bryn Mawr College, Bryn Mawr, Pennsylvania, June 8th 1900.

2. Zoological Society of London.

June 19th, 1900. — The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of May 1900, and called special attention to a young female Cape Hunting-Dog (*Lycaon pictus*), obtained by purchase on May 4th. — The Secretary exhibited a cast of a portion of the jaw of an *Ichthyosaurus* (taken from a specimen obtained at Flinders's River, Queensland), transmitted to the Society by Mr. J. Lane Huxley, of the Land's Department, Brisbane, Queensland, and read some notes upon it prepared by Mr. C. W. Andrews, F.Z.S. — The attention of the Meeting was called to an article by Mr. E. C. Stuart Baker, F.Z.S., which had lately appeared in the 'Asian', concerning the Gaur (*Bos gaurus*) and the Gayal (*Bos frontalis*). The author, after lengthened studies, had come to the conclusion that the Gayal was merely a domesticated form of the Gaur. — Mr. G. A. Boulenger, F.R.S., exhibited and made remarks upon a remarkably large specimen of a Bornean Tortoise, *Brookia Baileyi*, which had recently been obtained by Mr. Charles Hose in Lake Majang, Borneo. Its carapace measured 64 centimetres in length. — Dr. Walter Kidd, F.Z.S., read a paper on the significance of the hair-slope in certain Mammals, in which reference was made to previous investigations into the hair-slope on the extensor surface of the human forearm, and its bearing upon Weissmann's doctrine of the non-inheritance of acquired characters. Details were given of further observations as to the hair-slope on the nasal and frontal regions of certain Mammals. The ordinary type and the exceptional type of slope were described, and lists of animals conforming to the two types were given. These results were held to be opposed to the doctrines of Weissmann, and to be attributable to the habits of the animals in question. — Mr. F. E. Beddard, F.R.S., read a paper on the anatomy of *Bassaricyon Alleni*, based on an examination of a specimen of this Mammal that had recently died in the Society's Gardens. The result arrived at was that this genus was clearly referable to the family Procyonidae, as had been usually supposed, and allied, especially in external form, to *Cercopithecus*, but distinguished by well-marked characters. — Mr. W. F. Lanchester, M.A., read the first part of a paper on a collection of Crustaceans made at Singapore and Malacca by himself and Mr. F. P. Bedford, F.Z.S. It contained a list of the Brachyura comprised in the collection, some notes on the nature of the collecting area, and on the habits of certain of the species, together with descriptions of twelve new forms. — A communication was read from Dr. Einar Lönnberg, of Upsala, on the structure and anatomy of the Musk-Ox (*Ovibos moschatus*). It contained an account of the development of the horns, descriptions of the hoofs and skull, and a comparison between the skull of the Musk-Ox and that of the Takin (*Budorcas*). — A communication was read from Mr. A. L. Butler, F.Z.S., containing the description of a supposed new species of Mountain-Antelope from the Malay Penin-

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