each given a total of 50 mg of this material intravenously without any observable therapeutic effect.

CONCLUSION

No therapeutic effect on blacktongue was observed from the intravenous administration of 50 mg of an impure preparation of diphosphopyridine nucleotide.

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THE NATURE OF THE MUCO-POLYSACCHARIDE OF SYNOVIAL FLUID[1]

THE viscous fluid bathing the joint surfaces and thought to be produced by cells of the synovial epithelium yields on acidification a stringy precipitate which has been called the synovial mucin. By a modification of the methods described for the isolation of chondroitinsulfuric acid from cartilage[2] we have succeeded in obtaining from bovine synovial fluid a sulfur- and phosphorus-free polysaccharide acid of high molecular weight, containing per equivalent weight one equivalent each of nitrogen, hexosamine, acetyl and hexuronic acid. It appears to be identical with hyaluronic acid, the polysaccharide isolated from bovine vitreous humor,[3] from human umbilical cord[4] and from hemolytic streptococcus.[5] This conclusion is based on the similar composition and rotation and on the hydrolysis at a similar rate by the "autolytic enzyme" of pneumococcus.[6] We have obtained about 200 to 250 mg of the acid per liter of cattle synovial fluid, and 225 mg per liter from 160 cc of a human knee exudate. Like other acid polysaccharides the carbohydrate in synovial fluid occurs as a salt and not bound to protein. Solutions of the isolated polysaccharide are extremely viscous and the substance apparently is responsible for most of the viscosity of the native fluid even though present in a low concentration. It is of interest that the same polysaccharide is elaborated by hemolytic streptococci (Group A, Lancefield), by the ciliary epithelium and by the synovial tissue. It may be of further interest that hemolytic streptococcal infection is frequently incriminated in inflammatory conditions affecting those tissues in which the polysaccharide is found.

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THE LAND-SNAIL AN INTERMEDIATE HOST OF THE CECAE FLUKE OF POULTRY

THE life history of *Postharmostomum gallinum* has heretofore been unreported. Experiments conducted during the past year have revealed that land snails, *Eulota similaris,* are the common carriers of this fluke under natural conditions. Snails collected in fluke-endemic poultry farms near Honolulu have been found heavily infected with larval flukes (adolescercariae); the largest of these flukes measured 0.87 mm long and 0.39 mm wide, and possessed well-developed suckers and ceca closely resembling those of the adult fluke. When three two-month-old laboratory-raised cockerels were fed such infected snails and killed one month later, adult *P. gallinum* flukes 5 to 6 mm long by 2 mm wide were recovered from the ceca. Control birds under the same laboratory conditions, but not fed infected snails remained free from all helminths. The results reported here are of importance from the control standpoint, in view of the common occurrence of these flukes in poultry in Hawaii.

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SCIENTIFIC BOOKS

LOW TEMPERATURE PHYSICS

Low Temperature Physics. By M. and B. RUHEMANN. Cambridge: at the University Press; New York: The Macmillan Company, 1937. ix + 313 pp. Price, $5.00.

KAMMERLINGH ONNES, the acknowledged father of low temperature research, frequently compared his investigations to a polar expedition. Lengthy and careful preparation was a preliminary. The actual work had to be carried on by a large group highly organized, a squad of technicians to operate the hydrogen liquefier, another for the helium liquefier, a group of observers at galvanometers, others at manometers and so on. Then, when the low temperature region was entered, it was a kind of "never-never" land in which the ordinary rules of behavior were suspended. Electrical and thermal conductivity took on outlandish values, radiation disappeared, and vapor pressures vanished.

It is this character found in all low-temperature

[1] From the Department of Ophthalmology of the College of Physicians and Surgeons, Columbia University, and the Institute of Ophthalmology of the Presbyterian Hospital, and from the Edward Daniels Faulkner Arthritis Clinic of the Presbyterian Hospital, New York.

[2] K. Meyer and E. M. Smyth, *Jour. Biol. Chem.,* 119: 507, 1937.

[3] Recently the identical polysaccharide has also been isolated from pig vitreous humor.

[4] K. Meyer and J. W. Palmer, *Jour. Biol. Chem.,* 114: 689, 1936.

[5] F. E. Kendall, M. Heidelberger and M. H. Dawson, *Jour. Biol. Chem.,* 118: 61, 1937.

[6] K. Meyer, R. Dubos and E. M. Smyth, *Jour. Biol. Chem.,* 118: 71, 1937.