acidity. The results obtained thus far mainly tend to emphasize the relation between the length of stay of the metal in the digestive tract and the degree of erosion. Thus, 100 small pieces of aluminum, which generally pass out of the stomach rapidly, have been given from time to time to rats without showing any loss in weight. Pieces of iron and steel, which remain longer in the stomach than aluminum, lost from about 0.1 per cent. (average of 200—1/16 inch stainless steel ball-bearings) to over 5.0 per cent. (average of 100 pieces of No. 18 gauge soft iron rod). Those pieces of iron and steel that remained longest in the stomach (up to 10 days) obviously lost much more weight than the average. A factor that also enters here is that, after the metal has been roughened by the initial erosion, further erosion proceeds at a faster rate. In one rat that was given a large amount of gold and silver in addition to some aluminum, a few pieces of aluminum rod (No. 20 gauge) remained about 3 days in the stomach and were eroded to the breaking point. At the usual gastric acidity of 0.5 per cent., or less, of HCl, aluminum resists erosion more than some kinds of steel and much more than soft iron. Hence, one might expect a fishhook to erode quite completely in a few weeks. Either these observations on mammals are not applicable to fish or Dr. Hurst's allowance of a year's time makes his report a typical fish story.[4]

FREDERICK HOELZEL
DEPARTMENT OF PHYSIOLOGY,
UNIVERSITY OF CHICAGO

POLYDACTYLISM IN MICE

IN a strain of mice which carried factors for posterior duplication Danforth, in the *American Journal of Anatomy,* v. 45, 2, 1930, recorded the occurrence of extra toes on a number of animals. His investigations did not show any indication that the factor which governed the polydactylous manifestations was in any way distinct from that which governed the more pronounced effects (double feet, double legs and finally double posterior halves of the body). Rebaud, in Paris, 1919, reported polydactylous animals in a stock of mice which had an abnormal luxation of the posterior feet. The manner of the inheritance was not determined.

From a study of the literature which deals with visible characters in mice these are the only reports which have come to my attention that record the inheritance of polydactylism in stocks other than those which had been previously subjected to experimental treatment with roentgen rays.

Within the last few months polydactylism has expressed itself in a six-toed condition of the posterior feet in thirty-seven animals of a highly inbred strain of control mice in these laboratories.

The strain from which the polydactylism has arisen, as reported in SCIENCE (1931, 73, p. 482), recently underwent a mutation in hair color from chocolate brown to "leaden." At the time of the color mutation only one six-toed animal had ever been observed in the stock. This polydactylous individual was in the direct line with that of the color mutation but left no polydactylous progeny.

Among animals of the last few generations, however, the polydactylism has occurred eight times in the original stock mice, twenty-three times in pure stock mutants, and six times in the progeny from outcrosses between mutants and four unrelated strains in which the six-toed character has never been observed.

Polydactylism has been studied rather extensively in humans, guinea-pigs and poultry, and from these observations the condition is regarded as being inherited as a dominant character, expression of the character being controlled by certain unknown modifying factors. This nucleus of inbred mice offers a new species on which to investigate the method of inheritance of the character. From the preliminary matings between polydactylous mice it has already been shown that the six-toed condition does not breed as a simple recessive.

JOSEPH M. MURRAY
ROSCOE B. JACKSON MEMORIAL
LABORATORY,
BAR HARBOR, MAINE

TOXICITY OF SODIUM NITRATE FOR A SPECIES OF MOSS

IN an extensive series of experiments in Hampshire and Worcester Counties, Massachusetts, in which upland permanent pastures were top-dressed with Chilean sodium nitrate and other fertilizer materials, it was observed in 1929 and further confirmed in 1930 and 1931 that the nitrate was toxic to *Polytrichum commune,* a species of moss. This moss is common on "run-out" upland pastures of the New England states, the amount of moss present apparently being inversely proportional to the amount of available plant nutrients in the soil. The nitrate was used in amounts equivalent to 30, 60 and 90 pounds of nitrogen per acre. Toxicity was not as severe with 30 pounds of nitrogen in the form of nitrate as it was with 60 and 90 pounds. No definite evidence of direct toxicity from the use of limestone, hydrated lime, 16 per cent. superphosphate or muriate of potash was observed in 1930.

In 1931 a new experiment was begun in which were used the following materials: (1) Chilean nitrate of soda; (2) Arcadian nitrate of soda; (3) calcium

[4] M. Dobreff, *Pflüger's Archiv,* 217, 221, 1927, reports the finding of as high as 0.69 per cent. free HCl in the stomach of sharks.