5932

Production of Osteitis Fibrosa with Overdoses of Vitamin D.

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Irradiated ergosterol in corn oil was used as a source of vitamin D in the production of *Osteitis fibrosa* in guinea pigs. Seven groups of adult guinea pigs were given graded doses of activated ergosterol daily. Each group contained 7 pigs weighing in the neighborhood of 500 gm. One group was kept as a control. Complete studies of the serum calcium, inorganic phosphorus, and protein were made previous to autopsy. Sections of the long bones and the chondrosternal junctions of the ribs were fixed in Zenker's fluid and stained with phloxine and methylene blue.

No changes were present where small doses (0.75 mg. to 2 mg. daily) were used. The earliest change visible was a thickening of the fibrous layer of the periosteum of the long bones in the group that had received 5 mg. of irradiated ergosterol.

Changes simulating an *Osteitis fibrosa* were first seen in the group that received daily doses of 10 mg. of irradiated ergosterol. In 14 days slight fibrous stimulation was present with ingrowth into the marrow cavity. At 25 to 28 days there was resorption of the bony trabeculae together with an increase in the size of the lacunar spaces. These were lined by numerous osteoclasts and showed the presence of fibrous connective tissue ingrowths. The chondrosternal junctions of the ribs were thickened and the osseous portions showed fibrous changes similar to those seen in the long bones.

The group that received 15 mg. daily showed the greatest degree of fibrous change and presented a picture similar to that reported by Jaffe and his workers following the administration of parathormone. In 5 days the chondrosternal junction of the ribs showed fibrous proliferation. With the advance of time in the administration of the oil the bones showed thinning of the corticalis, widespread fibrous connective tissue replacement, and areas of hemorrhage in the marrow cavities. In 36 days resorption of the hemorrhagic areas were seen with the production of cyst-like spaces.

The symptoms manifested by the animals were those of *Osteitis fibrosa cystica* (von Recklinghausen) rather than of a toxic hypercalcemia. Loss in weight, apathy, and muscle weakness were marked. No gastro-intestinal disturbances were present. The

highest rise in the blood calcium occurred in one of the 15 mg. pigs, which reached 13 mg. per 100 cc. of blood. The production of *Osteitis fibrosa* in the guinea pig by the use of toxic doses of activated ergosterol was probably due to the ability of that animal to eliminate calcium with sufficient rapidity to prevent a fatal hypercalcemia. The animals were carried along until a true *Osteitis fibrosa cystica* was produced. Additional groups of animals on basal diets, receiving toxic doses of ergosterol are now under study.

The similarity of vitamin D and of the hormone of the parathyroid gland in the production of *Osteitis fibrosa* appears to be further strengthened by these observations.

5933

Magnesium and Potassium Anesthesia in Amoeba.*

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It is well known that the magnesium ion may serve as an anesthetic for many organisms. Magnesium salts are generally considered the best of all anesthetics for most types of marine invertebrates, and are also used to anesthetize the tissues of higher animals. Potassium likewise serves as an anesthetic, especially for certain types of muscular tissue. It is therefore evident that 2 of the commonest cations of the living substance may prevent its activity. Concerning the nature of the action of magnesium or of potassium, there is almost no information, and the usual theories of anesthesia offer little help.

Both magnesium and potassium ions act as anesthetics for the common *Amoeba proteus*. Of the 2, potassium has the more pronounced anesthetic action. When amoebae are placed in dilute solutions of potassium salts, the pseudopodia are retracted, the amoebae round up, and movement ceases completely. In solutions of magnesium salts, the effect is not so pronounced. When amoebae are placed in dilute solutions of magnesium chloride or magnesium sulphate (after a preliminary washing in the solution), movement apparently ceases. Actually a very slow change in form may persist, but there is nothing that even approaches in speed the normal

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