When vitamin C in large quantities similar to those which had been fed (6 to 8 "cevita" tablets in H_2O) was injected intraperitoneally into guinea pigs, or rabbits, a sharp rise (3 to 20 fold) in urinary excretion occurred, usually on the second or third day of injection. When the injections were stopped, the reduction in urinary concentration was often quite gradual. These experiments suggest that in these species a certain amount of destruction of vitamin C occurs in the digestive tract, or that the degree of intestinal absorption of the vitamin is limited.

Conclusions. It would appear that under ordinary nutritional conditions, vitamin C is not excreted in appreciable amounts in human urine and is excreted only in very low concentration in the urine of guinea pigs, rabbits and rats. In the human species (children) ingestion of excessively large amounts of vitamin C leads to urinary excretion after the body stores have become completely saturated. In the other species, urinary excretion can be raised only by injection of the vitamin. There is no difference in urinary excretion of vitamin C between species which do and those which do not require a dietary source of the vitamin.§

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Studies in the Repair of Bone.

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The supremacy accorded the periosteum in osteogenesis has led to an almost complete neglect of the rôle played by other bone elements. Work on epiphyseal tissue has indeed been very scant, but there is both clinical and experimental evidence that cancellous bone plays an important rôle in bone repair, while the osteogenic properties of bone marrow and endosteum though often mentioned have been little studied.

Epiphyseal Tissue Transplants. A set of experiments were car-

§ Since the completion of this paper, an article has appeared by L. J. Harris, S. N. Ray, and A. Ward in the *Biochemical Journal* (Volume 27, page 2011) entitled "The Excretion of Vitamin C in Human Urine and Its Dependence on the Dietary Intake". The authors conclude that in adult urine after the ingestion of a single very large dose of orange juice, the urinary excretion of vitamin C rises to a maximum which is reached after three hours.

ried out on 6 immature dogs. A quarter inch extraperiosteal resection of each fibula was filled on one side with ground epiphyseal tissue while on the control side the defect was filled with ground whole bone. The defects were bridged across in each case. The epiphyseal tissue invariably produced a large thick spongy callus. Serial slides of X-rays were presented to illustrate this callus at different stages of development, Fig. 1.

Cancellous Bone Transplants. Experiments were done on 5 adult dogs. Cancellous bone was removed from the condyle of the femur and transplanted into extraperiosteal and subperiosteal defects of the 2 fibulae respectively on each dog. These defects bridged across in each case even where there was no existing periosteum. Slides of

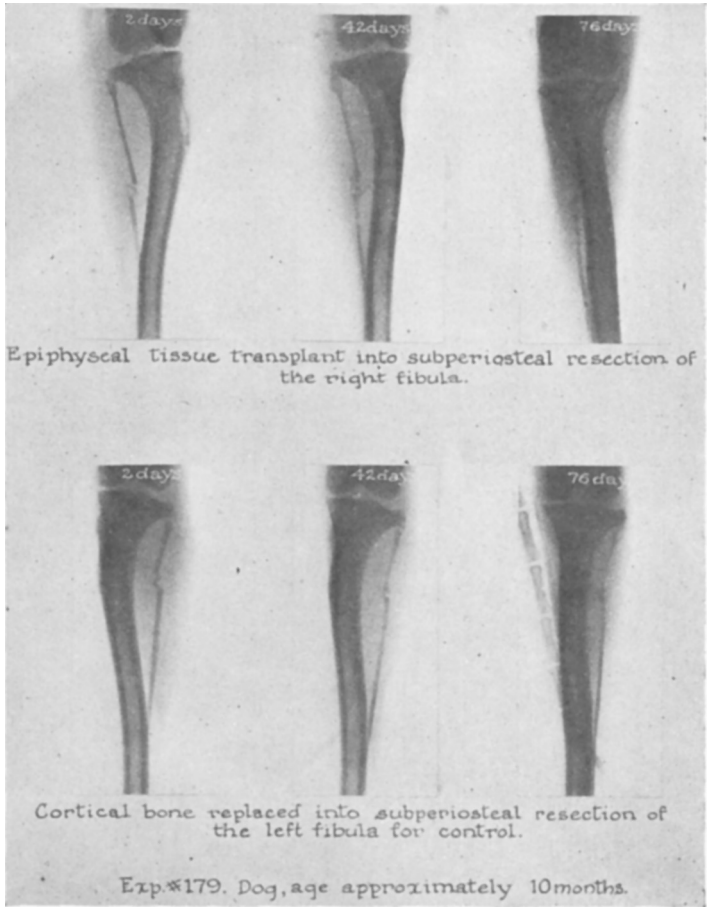

FIG. 1.

serial X-rays were presented to illustrate how rapidly cancellous bone grafts regenerate new bone. (Fig. 2.) On the side of the subperiosteal resections the favorable presence of intact periosteum is well illustrated in a more rapid regeneration.

Bone Marrow and Endosteal Transplants. The next group of experiments was carried out on 6 adult dogs. Each fibula was resected extra-periosteally. On each side the defect was filled with endosteum and bone marrow removed from the tibia with a small curette. No regeneration occurred on the control side where no grafts were placed, while on the side containing endosteum and bone marrow rapid and complete reformation of dense bone oc-

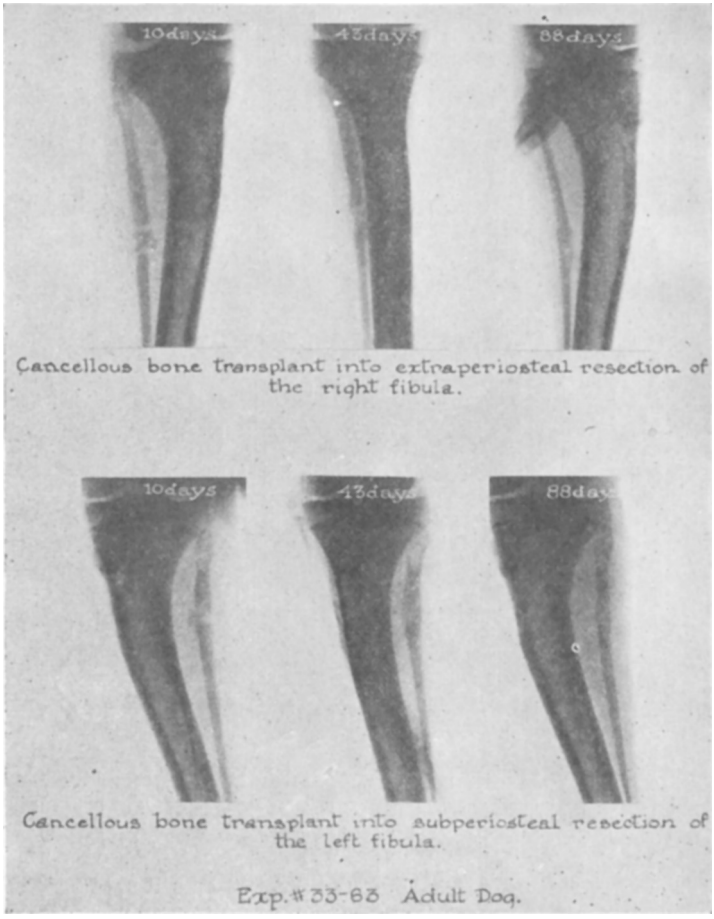

FIG. 2.

curred. Slides of serial X-rays were shown to illustrate this rapid osteogenesis. (Fig. 3a.) A photomicrograph was presented to show the new bone callus. **(Fig. 3b.)**

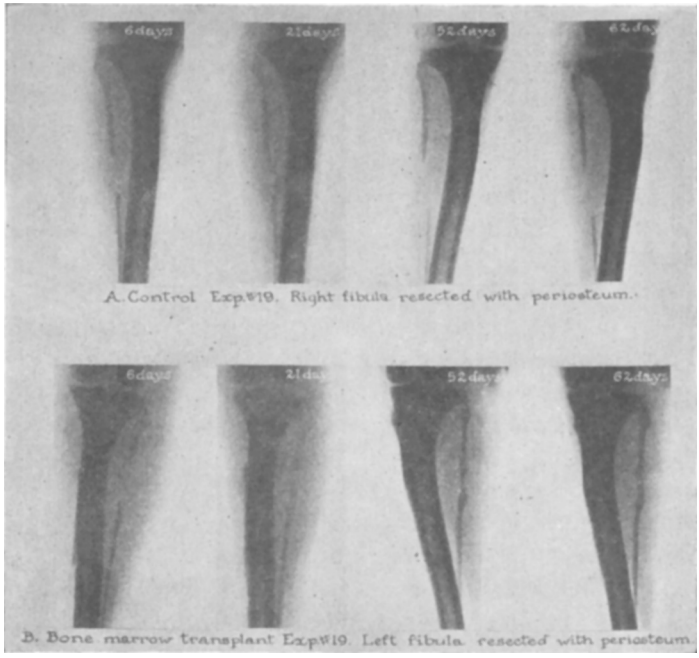

FIG. 3a.

Conclusions. 1. Epiphyseal tissue will regenerate new bone in immature dogs. 2. Cancellous bone will bridge bony defects without

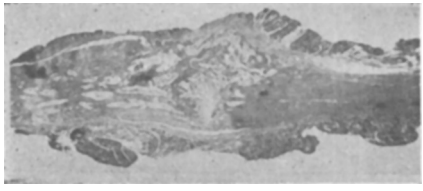

FIG. 3b.

the aid of periosteum. 3. Periosteum will hasten callus formation of cancellous bone grafts. 4. Free bone marrow and endosteum will bridge bone defects without the aid of periosteum with a rapid forming callus. 5. The clinical use of bone marrow and endosteum is suggested in bone grafting.