are scarcely any or no osteoblasts in the periosteum. This structure when removed and transplanted does not reproduce bone. The periosteum is of value in carrying vessels to the bone and aiding in its nourishment. The real cause of regeneration of the bone is the osteoblasts that are brought to the surface of the bone from within the bone and find space to grow and proliferate in the loose subperiosteal tissue. When bone is stripped of its periosteum osteoblasts will appear in the injured area. These osteoblasts will infiltrate into the loose tissue of the adjacent muscle. All this goes to prove the minor part played by the periosteum in the formation of bone. When periosteum finds its way between separated portions of bone it prevents bony union and fibrous union results. The presence of the periosteum limits the growth and spread of the osteoblasts. In the case of a fracture, with separation of the periosteum freely, the callus will form abundantly, and invade muscle, tendon, or other tissue.

If a ring of periosteum of an inch in extent be removed from a bone and the uncovered bone be encircled with a silver ring, in time the ring will be embedded in new bone. This proves that the bone without its periosteum can form bone. This ring experiment, with the periosteum on the bone, was formerly thought to prove that the periosteum formed the bone. The foregoing sets this view aside.

Small portions of bone without periosteum will grow in muscle and tendon. This shows that the bone is regenerated from osteoblasts in the bone itself. In the ends of bones the growth is from the cartilage, with its osteoblastic cells. It would thus appear that the growth in the diaphysis and epiphysis is of the same nature. In young animals, with a plentiful supply of cartilage in the bones, the formation of osteoblasts is free and rapid.

The illustrations are numerous and excellent. There are 61 full-page plates. We can most heartily recommend this book as the outcome of much patient study, clinical observation, and experimentation. The author merits high praise for his work on this subject.

WELLCOME TROPICAL RESEARCH.

Second Review of Some of the Recent Advances in Tropical Medicine, Hygiene and Tropical Veterinary Science. Being a supplement to the Fourth Report of the Wellcome Tropical Research Laboratories at the Gordon Memorial College, Khartoum. By Andrew Balfour, M.D., B.Sc., F.R.C.P., Edin., D.P.H., Camb., Director; Captain R. G. Archibald, M.B., R.A.M.C., Pathologist and Assistant Bacteriologist; and Captain W. R. O'Farrell, L.R.C.P. and S.I., R.A.M.C. Published for Department of Education, Soudan Government, Khartoum, by Bailliere, Tindall & Cox, 8 Henrietta Street, London, 1911.