THE INFLUENCE OF PARATHYROID HORMONE UPON BONE FORMATION IN *Xenopus Laevis*, *by J. T. Irving and C. M. Solms* (*Joint Dental Research Unit of the Council for Scientific and Industrial Research and the University of the Witwatersrand, Johannesburg; and the Department of Physiology, Medical School, University of Cape Town*).

This communication and the next report work which is a continuation of that previously published [Fox and Irving, 1950a, b].

Forty-nine female *Xenopus* weighing approximately 60 g. were used. They were injected once intraperitoneally with "Lilly" parathormone in doses of 1/10, 1/5, 1/2, 2 or 3 units in equal volumes of solution, and were killed 3 hours to 12 days subsequently. Control animals were injected with the same volume of saline. Blood was taken for Ca estimations and the femora were removed, decalcified and stained after longitudinal section with haematoxylin and eosin.

The blood Ca levels did not change significantly throughout the whole of the experiment compared with those of the controls. An osteoclast response was observed in several bones in the parts of the femoral shaft normally undergoing resorption. This response occurred with one exception from 6 to 48 hours after injection at all dose levels, and while evident, was not nearly so pronounced as has been reported in mammals. The osteoclasts were large multinucleated cells, situated against the bone face and usually in Howship's lacunae, and often containing orange staining material.

Both Jordan [1925] using *Rana pipiens*, and Fox and Irving [1950a] working with *Xenopus*, found either no osteoclasts or excessively few in the bones of adult animals. Schlumberger and Burk [1953] injected 100,000 or more i.u. of vitamin D into *Xenopus* and observed osteoporosis and Howship's lacunae with osteoclasts in the femora. They also gave 10 units of parathyroid extract to *Rana pipiens* and obtained an occasional small focus of osteoclastic activity. It would thus appear that amphibia are not very sensitive to mammalian parathyroid extract, and it may well be that amphibian parathyroid hormone differs chemically from that of mammals. Amphibia are, however, able to form osteoclasts, an excessively rare cell in adults, if the stimulus is sufficiently great. In the present experiments the parathormone was tested on rats and found to be active in raising the blood Ca level.

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THE INFLUENCE OF OESTROGEN UPON BONE FORMATION IN *Xenopus Laevis*, *by J. T. Irving and C. M. Solms* (*Joint Dental Research Unit of the Council for Scientific and Industrial Research and the University of the Witwatersrand, Johannesburg; and the Department of Physiology, Medical School, University of Cape Town*).

Oestrogen is well known to cause medullary bone formation in birds [Bloom *et al.*, 1941] and mice [Gardner and Pfeiffer, 1938]. Pfeiffer [1951] at a conference on bone formation enquired if this action of oestrogen had been tested on *Xenopus*, and as far as is known this has not been done.

Two groups of *Xenopus* were chosen, young frogs taken two to four days after metamorphosis, and adult female frogs about 60 g. in weight. The young frogs

were chosen at a period when the erosion of the cartilaginous anlage of the bone by capillaries is very active [Fox and Irving, 1950] and it was felt that any action of oestrogen might be maximal at this time. It was impossible to distinguish males from females at this stage.

Oestrogen was given by intraperitoneal injection as oestradiol-m-benzoate crystals dissolved in arachis oil. Injection into the dorsal lymph sacs was followed by necrosis of the tissue and death. With the small frogs the injection was in 0.2 ml. of oil and varied between 0.1 and 0.8 mg. oestrogen injected weekly, the animals being killed and examined weekly up to four weeks. With the larger frogs, the dosage was 2 mg. or 5 mg. weekly in 1 ml. of arachis oil, and animals were killed fortnightly up to eight weeks. The feeding and management of the animals was the same as that adopted by Fox and Irving [1950]. Control animals were injected with an equivalent amount of Na benzoate in arachis oil. There was a high mortality in all groups. After the animals had been sacrificed, the femora were removed for histological examination and the oviducts and ovaries of the large frogs were weighed.

In no case, in either group, was any effect of oestrogen detectable, compared with the controls, upon bone formation. Nor were the weights of the oviducts or ovaries affected. Bone formation in amphibia differs fundamentally from that in birds and mammals, and thus the lack of reaction to oestrogen might not be unexpected. The gonads also appear to be unreactive to the oestrogen employed.

Shapiro [1939] has reported that oestradiol does not cause ovulation in *Xenopus*. It is possible that amphibian oestrogens differ from those active in mammals.

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PRE- AND POST-ABSORPTIVE SERUM PROTEIN-BOUND IODINE VALUES IN THE SUCKLING INFANT BABOON (*PAPIO URSINUS*), *by A. van Zyl* (*Department of Physiology and Joint Nutrition Research Unit of the South African Council for Scientific and Industrial Research and the University of the Witwatersrand*).

The object of the present investigation was to establish post-absorptive serum protein-bound iodine (PBI) values for the suckling infant baboon, subsisting exclusively on a milk diet and to compare these values with the preabsorptive level of serum PBI on the same animals. For the purpose of this study two postabsroptive periods of 7 and 17 hours were selected. Blood was drawn from four baboon babies immediately on removal from their mothers and again in the postabsorptive state. The results comprising 19 single pre- and 19 post-absorptive serum PBI estimates are summarized in the accompanying tables.

It is evident from the results in Table I that no significant difference in the mean preabsorptive serum PBI level of 6.70 μg. per cent could be detected when compared to the seven-hour postabsorptive mean value of 6.65 μg. per cent on the same animals. With a starvation period of 17 hours the values in Table II disclose, however, that there is a significant difference of 0.74 ± 0.44 between the mean preabsorptive value