The rate of increase in the area shown on the graph, representing fissipede evolution, changes in the Vindobonian, and the values obtained when represented as co-ordinates plotted against time provide a graphic expression of this phenomenon (Fig. 2).

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Induction of Triploidy in the South African Clawed Frog, *Xenopus laevis* (Daudin)

When amphibian eggs are exposed to a temperature shock a few minutes after fertilization, the second maturation division may be suppressed, and, by fusion of the haploid sperm with the diploid egg nucleus, triploid embryos may result[1,2]. In the earliest experiments of this type prolonged treatment with low temperatures (0° to +3° C.) was employed on eggs of *Triturus viridescens*[3], but exposure of freshly laid eggs to a hot shock varying from 35–37° C. for from five to fifty minutes was found to be equally effective in this species[4]. These techniques have since been employed successfully on several species of Urodela and Anura. To the list of triploids produced experimentally, *Xenopus laevis* has now been added. This Anuran species is particularly suitable for this research, since reproduction can be induced throughout the year under laboratory conditions, and the young are easily reared, reaching maturity in less than one year.

Mating and ovulation were induced by injection of chorionic gonadotrophin ('Ciba' *Op.* 776). The newly fertilized eggs, collected at 16–18° C., were submitted to a temperature shock in the range of 34–39·5° C. This treatment, lasting 5 min., was applied 1–10, 10–20 or 20–30 min. after oviposition.

The mortality attributable to the heat treatment increased with increased temperature.

After about two days at 20–22° C. the larvæ hatched and were swimming freely 2–3 days later. On the eighth to tenth day after hatching the tail-tips were amputated and made into permanent whole preparations according to Baltzer's tail-tip technique[5].

To find the degree of ploidy, I counted the number of nucleoli per nucleus in 100 epidermal cells of each tail-tip, and, where possible, also determined the chromosome number. In this way, I was able to show that in this species, as in the frog and the axolotl[6], the maximum number of nucleoli per nucleus corresponds to the number of chromosome sets.

Triploid *Xenopus laevis* are best obtained from eggs treated within 10 min. of oviposition with a temperature of 36·1–36·5° C., when about 54 per cent of the analysable larvæ are triploid. Altogether 339 triploids have been produced. Other heteroploids and chromosome number mosaics also developed from eggs exposed to temperature shock.

Triploids have been reared to maturity, but final results concerning their growth and physiology are not as yet available. A triploid male, approximately 2½ years old when mated to a diploid female, showed greatly reduced fertility, while two other triploids of the same age, showing female characters, did not spawn after injections of large doses of hormone. Gallien[7], and Chang and Witschi[8], showed that the female is heterogametic in this species. It appears, therefore, that the triploid homogametic males can be fertile, while the heterogametic triploid females have failed so far to produce eggs.

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Epimorphic Regeneration during Hibernation

It has always been considered that certain factors must be present for normal epimorphic regeneration, and increase in temperature and certain metabolic activities are primary conditions which accompany regeneration.

An adult female tortoise of that species most commonly imported into Great Britain from north-west Africa and south-east Spain, *Testudo graeca graeca* L., was noted in the summer of 1954 to have a necrotic condition of the mental and first infralabial cephalic scales, this condition increasing to destruction of the larger part of the two dentary bones which constitute the distal part of the lower jaw. The tortoise lived through a spasmodic hibernation and was seriously handicapped the following summer, being prevented from normal mastication. The oral cavity was thus open to the exterior by this wound as the distal part of the lower jaw was now destroyed.

At the commencement of the second hibernation in 1956 the extent of the wound was some 4 mm. in length. While still in hibernation it was noticed that there had been closure of the ends of the wound. By the completion of hibernation two months later there was complete regeneration of the formerly affected parts of the lower jaw.

This example of epimorphic regeneration is of interest in that it occurred during hibernation and thus the temperature, oxygen and food levels were lower than those necessary for activity and voluntary response, the latter being associated with hibernation in poikilothermic animals. The total period occupied some twenty-three weeks, and of this time the pre-tissue regeneration stage took three quarters. This is approximately the time ratio for amphibian epimorphic regeneration.

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