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A RAPID METHOD FOR PRODUCING SERIAL UNDECALCIFIED SECTION OF BONES

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Studies on structure of bones with special reference to tetracycline staining, autoradiography and microradiography necessitate the preparation of undecalcified sections. Many techniques have been described for the preparation of undecalcified sections (*Jowsey* 1955, *Arnold et al.* 1954, *Roofe et al.* 1949, *Kropp*, 1956, *Villanueva & Santoro* 1962). Unfortunately, these techniques entail the use of elaborate apparatus or are not sufficiently satisfactory to produce thin serial undecalcified sections. With this in mind, the following technique was devised and has been found very useful in producing thin serial sections of undecalcified bones 30-50 μ thick.

MATERIALS AND METHODS

Bones are embedded in Tensol Cement No. 7 (I.C.I., England) as described in a previous paper (*Raman* 1966). This is a low acrylic cement that hardens within 8-10 hours. The sectioning apparatus consists of a workshop lathe and a small electric motor (Figure 1). The lathe could be any type found in good technical workshops and the motor is obtained from a small table fan. The motor is mounted on an iron block as shown in the figure so that it can be moved transversely or longitudinally by manipulating the appropriate threading mechanisms. The saws used are thin steel ones 0.004 inches thick and 1½ inches diameter available from Buck and Hickman (U.K.) Limited. The embedded bone is mounted in the lathe chuck and the iron block with the motor is moved longitudinally until contact is made between the saw and the bone. The bone is then ready for sectioning.

Not much heat is liberated during the cutting process because of the rotation of both the bone and the saw. However, if this is found to be a problem, the saw may be moistened during the cutting process with a camel hair brush dipped in cold

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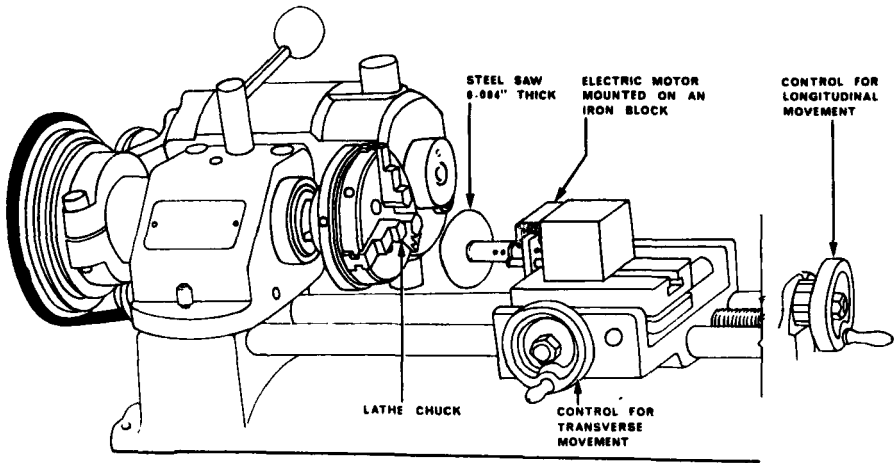


Figure 1. Bone cutting apparatus. The embedded bone is not shown.

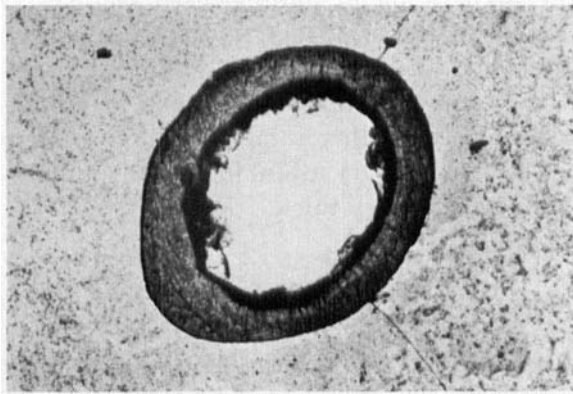


Figure 2. Photomicrograph of a section of rat femur prepared by the technique described. (Magnification $\times 25$).

water. Sections as thin as $100\ \mu$ are obtained and the loss between sections is only $100\ \mu$. The cut sections are then published on a very fine waterproof Silicon carbide paper no. 400 grit and mounted for microscopic and other studies (Figure 2).

DISCUSSION

The above method has been used with great success to study the growth of bones in rats using the tetracycline marking technique (Raman 1965). The apparatus does not entail much expense or upkeep and the results compare favourably with other methods that are used. As many

as 20 sections can be made in one hour and the technique is especially suitable for rodent bones which are usually very brittle.

SUMMARY

A rapid and cheap bone sectioning technique capable of producing thin serial undecalcified sections 30–50 μ thick is described. The method has been found ideal for making sections of rodent bones.

RESUME

Une technique rapide et bon marché de section des os, capable de produire des séries de minces coupes de 30 à 50 μ d'épaisseur d'os décalcifiés est décrite. Cette méthode a été trouvée idéale pour faire des coupes d'os rongés.

ZUSAMMENFASSUNG

Eine rasche und billige Knochenschnitttechnik, die es ermöglicht dünne, 30–50 μ dicke, unentkalkte Serienschnitte zu erhalten, wird beschrieben. Die Methode wurde als ideal zur Herstellung von Schnitten von Nagetierknochen befunden.

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