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Quick Decalcination of Teeth.

By

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In the methods usually adopted for the histological examination of teeth the long time generally needed for the preparation is a great inconvenience. As an example may be mentioned partly the decalcination with 5 % trichlor-acetic acid, which takes $1^1/_2$—2 months, partly the mounting, which is most frequently done in celloidin and takes from some weeks to a couple of months. The teeth embedded in celloidin are easily cut but it is difficult to produce sections sufficiently thin for a more detailed histological, or rather, cytological examination. The sections of the tissue may be obtained somewhat quicker if the teeth are imbedded in paraffin, a method which, however, is less commonly used than embedding in celloidin.

On the basis of a series of investigations an account will here be given of a method which renders possible a quicker decalcination of teeth and which has proved practicable with paraffin as the embedding medium. The procedure adopted can be briefly summed up as follows:

1) Fixation in 4 % formalin	48 hours
2) Decalcination	48—96 hours
3) Washing in distilled water	24 hours
4) 96 % alcohol	18—24 hours
5) Absolute alcohol	2—6 hours
6) Xylol	$^1/_2$—1 hours
7) Embedding in paraffin (melting point 54°)	24 hours
8) Mounting—cutting—staining.	

As to 1. Numerous experiments showed that fixation in 4 % formalin was quite as effective as fixation in 10 % formalin which is the usual procedure.

As to 2. The composition[1] of the decalcination fluid used is Sol. ferrialuminium sulphate (iron alum) 3 %: 20 g. Nitric acid 5 %: 500 g.

This decalcination fluid can be made in large quantities and, if anything, is improved by standing for some time.

The decalcination time varies greatly, teeth from younger individuals requiring a shorter time than teeth derived from older individuals. The incisors usually require only half the time of the molars. The third molar is the tooth requiring the longest decalcination time.

During the experiments with this technique, fixation as well as decalcination in a thermostat (37°) was tried. It turned out that a fixation at 37° involved great dangers. For if left to stand for too long the teeth will »totally dissolve»; every form of structure will then perish. It must be said, therefore, that warm decalcination can only be employed when the preparation is under constant supervision, otherwise it is better to take another day or two about it and let the decalcination take place at room temperature.

As to 3—7, we have here the usual technique in making histological preparations;[2] it must be pointed out, however, that better results are obtained in the cutting of the preparations if the mounted preparations are kept in an ice box (4°) some time before cutting.

During the cutting of these preparations it turned out that teeth might be found in which the decalcinated areas were easy to cut, while the pulp fell out. This accident has likewise been in decalcination of bones, from which the medulla has fallen out during cutting. According to our experience in this laboratory it may be referred to the failure to carry out a careful dehydration of the preparations. Being kept too short or too long a time in the last instance depends on personal experience, and the times stated must therefore only be taken as indications of the lines along which the preparations should be treated.

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[1] The composition of this decalcination fluid in its original form is derived from the University Institute for Pathological Anatomy where the then prosector Dr. H. OKKELS worked with various decalcination fluids. It has since been handed down orally and undergone various modifications until it received its present form in this laboratory. I tender my sincere thanks to Professor OKKELS M. D. for permission to publish the, later modified, method used by him.

C. M. P.

[2] The treatment with xylol may, if desired, be altered to $2^1/_2$ hours.

With the technique here adopted it will be possible with some practice to produce sections of teeth of a thickness of 5—7 μ, in which the individual cells can easily be examined.

No inconvenience has ever been observed from the use of this decalcination fluid in spite of its content of nitric acid. If well dehydrated, the preparations stained easily, and the individual cell structures did not seem to have been injured by the quick decalcination.

Summary.

An account of the method by which one can produce quickly (from 6—7 days) histological preparations of teeth. A solution of nitric acid to which ferrialuminium sulphate has been added is used as a decalcifying fluid.

Zusammenfassung.

Es wird über ein Verfahren berichtet, mit dem man rasch — im Laufe von 7—8 Tagen — von Zähnen histologische Präparate herstellen kann. Als Dekalzinierungsflüssigkeit wird mit Ferrialuminiumsulfat versetzte Salpetersäure verwendet.

Résumé.

Communication d'un procédé permettant de faire rapidement — en 7—8 jours — des préparations histologiques des dents. Pour la décalcification on se sert d'acide nitrique additionné de sulfate double de fer et d'alumine.

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