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SAWING OF OTOLITHS AS MECHANICAL AID FOR OTOLITH READING

by

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In serial no. 1103, document no. 32 of the annual meeting - June 1963, B.C. Bedford describes a grinding/polishing machine. The purpose of this machine is to obtain an almost standard section of at least one half of the otolith, a section, which crosses the centre of the otolith and guarantees a good and flat surface.
Since 10 years we no longer break otoliths, but we saw the otoliths by means of a special sawing machine. We are convinced, that this method has some advantages.

1. We obtain from one otolith two almost standard sections with very flat surfaces without striations, as the section can pass the centre more or less accurately (as a guiding mark we use the "V"shaped interruption of the sulcus acusticus), and the saw-blade is only 0,07 mm thick. The sawn otolith can be read without any further preparation (no xylene). No striations and no dust impair the reading.
2. We only need one otolith of each fish. This means reduction of personnel and work. We need only one man on the fish market for collecting otoliths (no second man is needed for the paper bags). Each otolith represents a fish and is put into the appropriate hole of an otolith box according to the length of the fish. After sampling or when returned to the institute, the otoliths are put into paper bags. All otoliths of fishes of equal length are put into one paper bag (saving of bags). Prior to sawing, the otoliths of each cm-group are numbered twice on the concave side, in order to be able to recognize the two halves of each otolith after sawing. To save time the last otolith of each paper-bag is not numbered.

3. The otolith is sawn from the concave side. If the section does not cross the centre a small, thin slice may be cut off. Just before the otolith is totally sawn, it breaks. The small very flat fracture at the sulcus acusticus does not hamper the reading of the otolith.

4. The details of the machine are:

Motor: 0.18 KW, 0.25 H.P., 1400 R.P.M.

Power Transmission to the sawing device by means of a rubber belt. Gear-ratio 1 : 2.5, i.e. revolution of the saw blade 2.5 times the revolution of the motor.

Saw-blade: copper-beryllium, diameter 73 mm, 0.07 mm thick. The outer edge of the blade is impregnated with diamond-dust (Winter Diamantkorn D 30 B). The diamond-dust mixed with olive-oil is pressed into the outer edge of the saw-blade by means of a grooved steel-roll, while the machine is running. 1 carat diamond-dust is sufficient for about 6000 otoliths. Exchange of saw-blade after sawing of about 600 - 800 otoliths. New impregnation after sawing of about 250 - 300 otoliths.

Water-pump with rotating water feeding and continuously flowing water during sawing.

Holding-device for otoliths, operating in 4 directions by 2 spindles.

Sawing performance 300 - 400 per day.

5. Basing on our experience with the exchange of otoliths, we would like to suggest not to use no broken otoliths for the exchange, but only sawn ones, because only a completely smooth surface permits a satisfactory and quick judgment. Another pre-condition is, that the otoliths to be exchanged should only be mailed, carefully protected, in strong boxes. Moreover, it is defenitely necessary - this remark may be allowed here - that the otoliths of re-captured tagged fish are also dispatched in strong boxes. Unfortunately, some institutes are still sending otoliths unprotected in single envelopes. Even the enveloping in cotton wool has not proved sufficient. Unfortunately, the otoliths are so much pressed during mailing, that otoliths not sent in strong boxes often arrive in the form of unvaluable otolith-meal.