immobilization, and the histochemical studies on the immobilized muscle also reveal changes in the properties of the muscle fiber types.

According to Price[23], the branched-out structure of the normal adult neuromuscular junction represents the postsynaptic membrane or the secondary synaptic clefts of the sarcolemmal membrane lined by an amorphous substance. Hence the profusely branched-out neuromuscular junction observed in this study might be due to changes in the sarcolemma and in fact Cooper[6], in his ultrastructural study on the immobilized muscle, observed an infolding of the sarcolemma.

Thus it is obvious that inactivity of a muscle for a longer period results in pale staining and profusely branched-out larger neuromuscular junctions. Cole[11] failed to observe any such alteration in the morphology of the junctions after 3 weeks of pinning the limbs, but in the light of the present experiment this seems to be rather too short a period for any marked changes to be produced. In fact the differences observed in the mean diameter between the control and experimental neuromuscular junctions were found to be statistically significant only after 8 or more weeks of immobilization, though they appeared paler and larger even in the earlier stages of immobilization.

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Quick plastic micropipettes and stainless steel microneedles for tissue manipulation

D. Troyer and B. Wollert

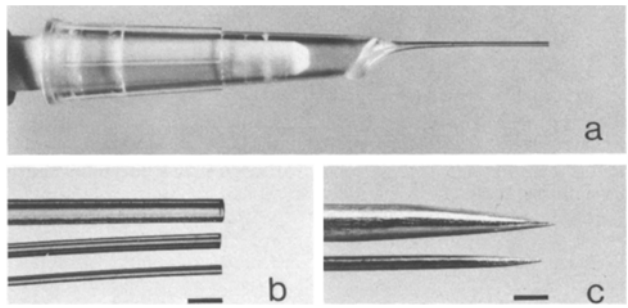
Institut für Biologie, Medizinische Hochschule Lübeck, D-2400 Lübeck 1 (Federal Republic of Germany), June 18, 1982

Summary. Simple methods for making fine, non-wettable plastic pipettes and for hand-sharpening stainless steel microneedles are outlined.

Small pieces of fixed or living tissue are usually destroyed if they happen to stick to the inside of non-siliconized glass micropipettes or to tungsten microneedles during preparation.

Mollenhauer[1] suggested using ordinary disposable plastic pipette tips to avoid tissue loss due to sticking, because these are non-wettable and hence not so sticky as glass pipettes. Such tips are too big for transferring minute tissue pieces, small organisms or single cells directly. However, they can be made into quite fine micropipettes by warming them locally and judiciously in a small flame, pulling them slowly as the plastic hardens and then cutting off the old tip with a sharp razor blade (fig., a). Before warming begins, a length of small diameter silicon rubber tubing is slipped over the original tip to provide a convenient finger hold away from the flame. Micropipettes with tip inside diameters down to about 50 µm can be made easily (fig., b). The piettes can be used directly with a 20 µl pipetter to transfer biological material in volumes as small as a few µl without much danger of loss due to sticking.

Stainless steel needles are more suitable for microdissection than tungsten ones, because they are less inclined to stick to tissue. Microneedles in stainless steel can be made by



a Plastic micropipette in place on a 20 µl pipetter, and *b* higher magnification views of 3 plastic micropipette tips. The smallest has an inside diameter of 50 µm. *c* Two hand-sharpened microneedle tips made from stainless steel wire. Bar: 0.5 mm.

dipping wire or insect pins mechanically in and out of an electrolytic bath, but special equipment is needed and the procedure takes 1-2 h^2. Such needles can be made quickly and simply by hand. A piece of wire is melted into the end of a glass rod. The wire is sharpened by drawing the rod along fine emery paper away from the wire while rotating the rod between strokes. A good needle can be made in about a minute from 0.2 mm diameter wire using 360 and 600 grit papers (fig., c). Perfectionists may want to obtain a finer finish by further sharpening with 1200 grit paper followed by a few strokes through a little silverware polish spread on a smooth surface.

We have used these microneedles to tear open the gelatinous cocoons of the tiny marine archannelid *Dinophilus* and the micropipettes to transfer the living, ciliated male, which is only 50 µm large, from one microscope slide to another.

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Announcements

USA

5th international congress of Laser medicine and surgery

Detroit, MI, October 7-9, 1983

The congress will be held at the Sinai Hospital in Detroit. Information by the Registration Supervisor, c/o Charles B. Slack, Inc., 6900 Grove Road, Thorofare, NJ 08086/ USA.

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1st international conference on Biointeractions 84

London, January 4-6, 1984

The conference 'Biointeractions 84' on materials/interactions will be held at the City University, London. Information may be obtained from Mary Korndorffer, Conference Organizer, Butterworth Scientific Ltd, Journals Division, P.O. Box 63, Westbury House, Bury Street, Guildford, Surrey GU2 5BH, England.

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