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USE OF ARBOCOLL H FOR THE PREPARATION OF DRY SPECIMENS

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The preparation of anatomical dry-specimens is a problem still not wholly solved. At present, mummified, paraffinized or glycerine-lacquered specimens are chiefly used. Plastic materials promise considerable development in this field. In our opinion, the material ideal for that purpose should posses the following properties.

A) In the monomeric state,

1. it should mix freely with water and formalin so that the specimen need not be dehydrated,

2. its diffusion rate sholud be sufficiently high (its viscosity low).

B) In the hardened (polymeric) state,

3. it must not shrink,

4. it must not be gluey,

5. it must not be fragile,

6. its consistency should approximate the original consistency of the tissues.

7. it should resist to heat, light, acid, and alkali, and should not be attacked by bacteria and fungi.

8. the specimen must not change its original colour ; if it does so it should stain well,

9. its price should be low and no special equipment should be needed for its handling.

Arbocoll H (manufactured by the Kőbánya Plastics Works), the material used by us for preparing dry specimens, is employed in industry for glueing wood and is a formalin-carbamide condensation product. It meets most of the above requirements. It is a honeylike fluid of high viscosity, of whitish, sometimes light yellow colour. Its dry matter content is 60 to 65 per cent ; its refraction index is $n_D = 1{,}4800—1{,}4900$; its specific gravity at 20° C, 1,25—1,35 g/ml; its viscosity, 1500—1900 cP. Stored in a cool place it keeps for six months. It contains a small amount, 1—2 per cent of free formalin and can be mixed with formalin and water up to 20 per cent. It takes up filling materials, such as rye flour, starch, chestnut flour or vetch meal. Its hardening (the development

of the three dimensional structure) takes place on the effect of 5 per cent ammonium chloride or 0,5 per cent oxalic acid. The rate of hardening depends on temperature ; it is more expedient to effect it at room temperature, because at a higher temperature the shirking of the organ parts is intensified and they assume a brownish colour. During the transition to its ultimate form the material loses water and shrinks. The rate of shrinking amounts to 10 to 25 per cent. Since the refraction index of the material corresponds to that of the tissues, it serves also for clearing. This property, however, is not favourable for our purposes, but can be eliminated by subsequent staining.

Our procedure for preparing dry specimens is as follows.

1. The fixed, prepared specimens are decolorised in a 3 per cent H_2O_2 solution. The duration of decolorisation is 1 to 5 days, according to size. Without decolorisation the specimens later assume a yellowish-brown colour.

2. 10, 20, 30, 40 per cent formaldehyde 1 to 5 days in each,

3. Arbocoll treatment three times. The first time a material containing 20 per cent formaldehyde is used, the second time a mixture containing 10 per cent concentrated formaldehyde. The duration of treatment depends on the size of the specimen. Each phase should last at least two weeks, since, owing to the high viscosity of Arbocoll, its diffusion progresses slowly.

4. After saturation the excess Arbocoll is allowed to drip off the specimen, its surface is wiped smooth, the organs are fixed in the required position, then placed into 0,1 per cent oxalic acid at room temperature for about one week.

5. After condensation has taken place, the specimens are removed from the solution, dried, dyed and placed on a stand. The specimens attain their final consistency a few months later, when they become stone-hard.

Our specimens (topographical, muscle-articular specimens) prepared with Arbocoll H and the procedure descibred are now about half a year old. Their shrinking amounted to 15 to 20 per cent. The specimens are unbreakable, their shape and form do not change. For establishing the real value of the method, several years will be needed. Experiments to the effect of reducing the rate of shrinking and of speeding up preparation, as well as of utilizing Arbocoll up for preparing brain and organ specimens are in progress.

The main advantage of the procedure is the following : It does not require a special equipment, dehydration is superfluous, the cost of production of one specimen is 1/10 of the cost of one paraffine specimen. The specimens are equivalent to those prepared with paraffine.

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