Reconstitution of dried-up tissue specimens for histological examination

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Many histologists, however well organized their laboratories may be, must have had the unfortunate experience of discovering that an interesting or valuable specimen, set aside for future study, has dried up in its container. Such specimens usually appear rather grey or black, perhaps with an encrustation of salt if they have been stored in formol-saline, and rattly thin if the container is shaken. Despite these unpromising appearances attempted salvage for histological examination may be worth while.

Experience gained during the study of dried and mummified tissues from ancient Egypt, pre-Columbian Peru, the Canary Islands, etc., has shown the importance of preliminary rehydration of the desiccated material (Sandison, 1955, 1957, 1963). It therefore seemed logical to apply similar techniques to the recovery of accidentally dried up laboratory specimens.

METHOD

The dried tissue should be placed in a generous volume of rehydrating fluid made up as follows:—

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<th>Solution</th>
<th>Quantity</th>
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<tr>
<td>96% Ethyl alcohol</td>
<td>30 vol.</td>
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<tr>
<td>1% Aqueous formaldehyde</td>
<td>50 vol.</td>
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<tr>
<td>5% Aqueous sodium carbonate</td>
<td>20 vol.</td>
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This fluid is slightly modified from that recommended by Ruffer (1911). A light brown colour may diffuse into the liquid from the specimen. The period of treatment is entirely empirical: the specimen must be examined from time to time and as soon as it becomes pliable it should be transferred to 10% aqueous formal saline for 24 hours. The time of treatment in the rehydrating fluid is usually measured in hours and rarely requires more than one day. If rehydration is inadequate, subsequent cutting of sections will prove difficult; if the specimen is left too long in the rehydrating fluid it may disintegrate.

The specimen should be processed by a double embedding method using a five-day histokine cycle (Russell, 1956). Cutting sections should not be difficult but a softening fluid such as Mollifex (B.D.H.) may be used if necessary. All conventional staining methods may be attempted; if routine haemalum and eosin is not satisfactory latent detail may be brought out by the phosphotungstic-acid-haematoxylin or Heidenhain’s iron-haematoxylin methods.

Occasionally surgical biopsies are received from general practitioners in distant places in an unfixed and dried-up state and these may be treated in a similar manner. However, where drying is only superficial, it is simpler to treat...
by immersion in normal saline for an hour or so until the appearance returns to a more natural state. The specimen may then be transferred to fixative in the usual way (Lendrum, 1951).

RESULTS

The histological appearances of the dried-up specimen will approximate more or less closely to those commonly seen.

A piece of synovium from a patient with rheumatoid arthritis was mislaid for three years. When discovered it was black and quite unrecognizable. Nevertheless following rehydration for 24 hours the typical macroscopic frondose pattern of synovium was readily seen.

Sections stained routinely with haemalum and eosin showed in the fronds well-preserved blood vessels and focal inflammatory cells (Fig. 1). Higher-power examination revealed the characteristic appearances of plasma cells and even the chromatin pattern of the nucleus was seen to be maintained (Fig. 2). Clearly, if fixation has been adequate, even detailed structure may be well preserved after total gradual desiccation.

REFERENCES