

reviewed recently in your own columns by Osorio (1967) and Clark (1967).

If thyroid scanning is required, better pictures may be obtained with a lower dose of radiation to the patient by using technetium (^{99m}Tc) instead of ^{131}I . Although the ^{131}I thyroidal uptake remains a convenient and valuable technique, especially in centres where the newer methods are not yet available, these more specific and radiation-free tests of thyroid status appear likely to replace it, as it previously replaced the measurement of basal metabolic rate.

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REFERENCES

- Clark, F. (1967). In *Symposium on the Thyroid Gland, J. clin. Path.*, **20** (suppl. 1), 344.
 Ekins, R. P. (1960). *Clin. chim. Acta*, **5**, 453.
 Hamolsky, M. W., Stein, M., and Freedberg, A. S. (1957). *J. clin. Endocr.*, **17**, 33.
 Murphy, B. P. (1965). *J. Lab. clin. Med.*, **66**, 161.
 Nauman, J. A., Nauman, A., and Werner, S. C. (1967). *J. clin. Invest.*, **46**, 1346.
 Osorio, C. (1967). In *Symposium on the Thyroid Gland, J. clin. Path.*, **20** (suppl. 1), 335.
 Robbins, J., and Rall, J. E. (1957). *Recent Progr. Hormone Res.*, **13**, 161.

SIMPLIFIED METHOD OF FILLING THE WELLS ACCURATELY IN GEL IMMUNODIFFUSION PLATES

Precise measurement of very small volumes of biological fluids and their accurate application to immunodiffusion gels can be greatly facilitated by the use of Microcaps (Drummond Scientific Co., Broomall, Pa., USA). These are micropipettes so manufactured from fine capillary glass tubing that their inherent error is of a remarkably low order (less than 1%).

Microcaps can be filled very easily by capillary action, and may be emptied by use of the rubber-bulbed auxiliary pipette attachment supplied by the makers with each packet. The contents are thus delivered by squeezing the bulb after occluding its vent with a moist finger tip. However, full control of delivery when using the auxiliary

pipette requires an almost inhumanly nice delicacy of touch. Warming the auxiliary pipette barrel between two fingers of the other hand allows better control than does compressing the bulb, but even so it is difficult for the most exact of operators to avoid occasional bubbles and overflow when filling small wells, especially with the smaller Microcaps.

A different method of discharging these micropipettes has been found which, compared with the auxiliary pipette technique, has proved at once much simpler, less laborious and time consuming, and at least as accurate and reliable.

After cutting out the pattern of wells as usual, the immunodiffusion plate is replaced precisely under the mask, and the two are clamped or otherwise fixed together so that the mask apertures and corresponding gel wells remain in accurate alignment. The tip of each charged Microcap is then guided into its particular well via the corresponding mask aperture. The Microcaps are left standing thus supported by the mask in a more or less vertical position, and the whole apparatus is placed in a moist chamber at room temperature. Over the subsequent two or three hours absorption by the gel leads to complete emptying of the micropipettes. Development of the precipitin patterns may then proceed as usual and, unless the mask is required again for immediate use, the empty micropipettes need not be removed until the plate is examined for reading.

The success of this method depends upon adequate absorptive capacity of the agar gel. It has been found that the minimum adequate agar concentrations are 2.2% for Ionagar no. 1 (Oxo Ltd, London, EC4) and 1.6% for Ionagar no. 2. At these concentrations and in gel layers of 1/16 in. thickness as much as 10 microlitres of neat serum is completely absorbed within three hours, while smaller volumes or dilutions are taken up even more rapidly.

The simplicity of the method is such that a previously inexperienced operator can achieve maximum accuracy and avoid all artefacts after only two or three days' practice.

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