

and thereby the subsequent formation of the supposed polysaccharide, or it activates the breakdown of the latter. In the former case potassium might be bound chemically, while in the latter case it might be adsorbed by the polysaccharide (having probably colloidal properties). In both cases potassium would be liberated again as soon as this compound breaks down.

It must remain for the future to ascertain which of these two possibilities agrees with experimental facts, and to find out the detailed mechanism of the potassium effect for yeast cells as well as animal cells.

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- <sup>1</sup> Pulver, R., and Verzá, F., *NATURE*, **145**, 823 (1940).  
<sup>2</sup> Lasnitzki, A., and Szörényi, E., *Biochem. J.*, **29**, 580 (1935).  
<sup>3</sup> Lasnitzki, A., *Biochem. Z.*, **264**, 285 (1933).  
<sup>4</sup> Lasnitzki, A., *Protoplasma*, **22**, 274 (1934).  
<sup>5</sup> Ashford, C. A., and Dixon, K. C., *Biochem. J.*, **29**, 157 (1935).  
<sup>6</sup> Dickens, F., and Greville, G. D., *Biochem. J.*, **29**, 1468 (1935).

### Advantages of Uranium Fixation in Modern Cytological Technique

AN attempt to use uranium as a fixing agent was apparently made as early as 1882 when Schenk<sup>1</sup> noticed that uranium acetate had a mild fixing action and a high degree of penetration. The nitrate and acetate have since been used for special purposes by Cajal<sup>2</sup>, Nebel<sup>3</sup> and others. Uranic acid as a substitute for osmic acid was introduced in this laboratory some years ago. Catcheside<sup>4</sup>, who kindly carried out a number of tests with this reagent, finally came to the conclusion that, although good fixation could be obtained, the effects were rather erratic, and La Cour<sup>5</sup> later confirmed the views expressed by Catcheside. Semmens<sup>6</sup> first gave a systematic account of the value of uranium as a substitute for osmium in fixatives employed for plant cytology; he also indicated the theoretical grounds for the use of this metal. In a later paper<sup>7</sup> he further pointed out that the erratic fixation previously recorded appeared to be due to the variable composition of the so-called uranic acid of commerce. To overcome this difficulty he proposed the use of sodium diuranate ( $\text{Na}_2\text{U}_2\text{O}_7$ ), a compound that is much easier to standardize.

There has been a marked tendency in recent years towards the use of more simple mixtures than those previously employed for fixing purposes. It may be as well to point out here that simple fixatives will leave the situation much less obscure for those who wish to attempt a biochemical interpretation of cytological results. Extensive trials with numerous types of plant material in this laboratory have led to the decision that Levitsky's<sup>8</sup> chrom-formalin, used for root-tips, gives fixation every bit as good as anything obtained with the more complicated mixtures which include osmic acid. Chrom-formalin, however, does not give such good results with pollen mother cells or with pollen grain divisions, for which the Flemming type of fixative is as a rule more satisfactory. It is a matter of common experience that osmic acid, owing to its high cost, cannot be used for smear preparations made on an extensive scale. For pollen grain divisions and for meiotic material it has been found that sodium diuranate can be very advantageously used in place of osmium tetroxide. 1 per cent chromic acid in which is dissolved 2 per cent of uranium diuranate is now

considered to be the most effective mixture and has been used in this laboratory with excellent results.

In the development of the rapid smear methods<sup>9</sup> involving the use of Feulgen light green technique<sup>10</sup>, we have tried various combinations of fixing fluids, and as a result of such trials have found that the chrom-uranate mixture not only gives uniform and satisfactory fixation of pollen grains and pollen mother cells but also considerably improves the nucleolar staining, possibly due to the additional mordanting action of the sodium component. It has also been found that this mixture, followed by Newton's gentian violet technique with subsequent chromic mordanting, gives far better preparations which are also more permanent than those obtained by the ordinary method. We therefore strongly recommend the use of sodium diuranate in place of osmium tetroxide in fixing fluids for material that is to be stained by either the Feulgen light green or the gentian violet techniques.

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- <sup>1</sup> Schenk, "Bolles Lee", p. 51 (1937).  
<sup>2</sup> Cajal, R. Y., "Bolles Lee", p. 320.  
<sup>3</sup> Nebel, B. R., *Z. Zellf. mikr. Anat.*, **16**, 251 (1932).  
<sup>4</sup> Catcheside, D. G., *Genetica*, **17**, 313 (1935).  
<sup>5</sup> La Cour, L., *Bot. Rev.*, **3**, 241 (1937).  
<sup>6</sup> Semmens, C. S., *Microscope*, **1**, 29 (1937).  
<sup>7</sup> Semmens, C. S., *Microscope*, **3**, 1 (1939).  
<sup>8</sup> Levitsky, G. A., *Bull. Appl. Bot.*, **27**, 175 (1931).  
<sup>9</sup> Bhaduri, P. N., *J. Roy. Micro. Soc.*, 50 (1940).  
<sup>10</sup> Semmens, C. S., and Bhaduri, P. N., *Stain Techn.*, **14**, 1 (1939).

### Books and Periodicals for Interned Scientific Men

THE Government's policy with regard to aliens has resulted in the internment of a very large proportion of the refugee scientists who were in Great Britain. It should be remembered, as has been recently pointed out by the Prime Minister, that though there may be enemies of the country among them, by far the majority are genuine victims of Fascism and amongst its bitterest opponents. Many refugees have made valuable contributions to science whilst in Great Britain, and some of them were actually engaged in work of national importance at the time of their detention.

We are not able to judge the wisdom or value of this indiscriminating internment, but there is one way by which we can lighten the misfortunes of our fellow scientists and mitigate any feeling of bitterness which might arise. This is by supplying them with the books and periodicals which will enable them to keep abreast of new developments in science and play their part efficiently in the reconstruction of the post-War world.

Those in internment camps are only allowed to receive new books and publications direct from the publishing offices, and individuals could arrange for books to be bought and sent to scientists in the camps. Newly published books and periodicals can also be sent to the camp libraries, and learned societies might consider sending copies of their journals to these libraries through the Y.M.C.A.

Such action would be a valuable demonstration of that international spirit of science on which all true scientists set so much store for the future of humanity.

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