

## Appointments

MR HUBERT E. SAUTER, at present deputy director, has been appointed director of the US Clearinghouse for Federal Scientific and Technical Information.

## Announcements

THE Agricultural Research Council has announced that Ditton Laboratory in Maidstone, Kent, will become a part of East Malling Research Institute, also in Maidstone, in April 1969. The new director who will take over from the two present directors—Dr R. G. Tomkins at Ditton and Dr R. F. Tubbs at East Malling—has not yet been named. The first move in the break-up of the laboratory at Ditton occurred about two years ago when research workers in the biochemistry department moved to the Food Research Institute in Norwich. The remaining staff will be split up between East Malling Institute and the Glasshouse Crops Research Institute in Sussex. Although East Malling and Ditton are essentially independent, some research work, on the conditions for the growth of fruit, has been shared for the past fifteen years.

DR A. G. FRASER, of the Department of Geology, University of Hull, has been awarded a Polar Medal in recognition of his survey work over a period of three years, two of which were spent in the Antarctic.

THE 87th annual general meeting of the Society of Chemical Industry is being held in Edinburgh during July 17–20, 1968. The chief feature of the meeting will be a two-day symposium on "The Future of the Petrochemical Industry". Further information can be obtained from Dr Magnus Pyke, Publicity Secretary, Scottish Grain Distillers, Ltd., Glenochil Research Station, Menstrie, Clackmannanshire, Scotland.

## Meetings

Low Temperature Physics, August 21–28, 1968, St. Andrews (The Conference Secretary, School of Physical Sciences, University of St. Andrews, North Haugh, St. Andrews, Scotland).

INDUSTRIAL Measurement Techniques for On-Line Computers, June 10–14, 1968, Institution of Electrical Engineers (Conference Department, IEE, Savoy Place, London WC2).

CODATA Conference on the Critical Evaluation of Numerical Property Values in the Physical Sciences, June 30–July 5, 1968, Arnoldshain, near Frankfurt/Main (Dr Guy Waddington, Executive Director, Central Offices, CODATA, c/o National Academy of Sciences, 2101 Constitution Ave. NW, Washington, DC).

FEDERATION of European Biochemical Societies, July 15–20, 1968, Prague (The Secretariat of the Fifth FEBS Meeting, Nám Krasnoarméjcu 1, Prague 1, Czechoslovakia).

PATTERN Recognition, July 29–31, 1968, National Physical Laboratory, Teddington, Middlesex (The Conference Department, The Institution of Electrical Engineers, Savoy Place, London WC2).

ERRATUM. In the second and third sentences of the article "Triads in Foetal Skeletal Muscle" by Sheppard M. Walker and G. Randolph Schrodtt (*Nature*, 216, 985; 1967) "the Z level of the line" should read "the level of the Z line". In the second line of the legend to Fig. 6 "right" should read "left".

ERRATUM. In the communication "Imidazole and Sequestration of Calcium Ions by Sarcoplasmic Reticulum" by B. P. Yu, E. J. Masoro and F. D. DeMartinis (*Nature*, 216, 822; 1967) the figures were wrongly num-

bered. Fig. 3 should be Fig. 5, Fig. 4 should be Fig. 3 and Fig. 5 should be Fig. 4. Text references to figures are correct for this revised numbering.

# CORRESPONDENCE

## Food Antioxidants in Tissue Culture

SIR,—Miss Milner has described some very interesting experiments on the effects of butylated hydroxytoluene (BHT) and related compounds on monkey kidney cells in tissue culture<sup>1</sup>, but it is a pity that she should have balked at the task of interpreting her findings in terms of the safety in use of BHT as a food antioxidant. Having spoken in three successive sentences of p.p.m. in individual items of food for human consumption, mg/kg body weight doses in animal experiments and p.p.m. in tissue culture media, without suggesting how these might be inter-related, she abdicates all responsibility by concluding that "... it is difficult to make a direct comparison with the *in vivo* experimental results because of the different effects measured".

Of course the selection of parameters to measure is at the discretion of the experimenter, but another source of difficulty in this instance is the absence of any data on the kidney concentrations of BHT in animals receiving BHT in the diet.

Because unchanged BHT is not excreted in the urine of rabbits receiving doses of up to 1 g/kg body wt<sup>2</sup> it seems unlikely that the kidney concentrates this compound. We are, however, in the process of investigating this aspect of BHT metabolism.

In the meantime, reported results from liver analyses may be of interest. Daniel and Gage<sup>3</sup> found that rats given 5,000 p.p.m. BHT in the diet averaged less than 2 p.p.m. BHT in the liver. Thus the amounts of BHT in the diet required to produce liver concentrations of 7.5–30 p.p.m. (those used by Miss Milner) would exceed the LD<sub>50</sub> of this compound in the rat<sup>4</sup>. Legal tolerances would allow an average BHT content of up to 4 p.p.m.<sup>5</sup> in the human diet. In fact, the present dietary concentration in Great Britain is unlikely to exceed 1 p.p.m. If the intake and liver content of BHT have the same relationship in man as they do in the rat, the human liver would currently contain about  $3 \times 10^{-4}$  p.p.m.

We hope that these comments may help in the interpretation of the tissue culture data<sup>1</sup> and in the design of further experiments to help us bridge the gap between animal studies and the human situation. But progress in this direction will only be possible if the results obtained with tissue cultures are considered against the background of toxicological data already in our possession.

Finally, one detail calls for correction. While it is true as stated<sup>1</sup> that BHT is permitted for use in butter, this permission only applies to butter for manufacturing purposes<sup>6,7</sup>; this means that the addition of BHT to butter for retail sale in Great Britain is illegal.

Yours faithfully,

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<sup>1</sup> Milner, Susan M., *Nature*, 216, 557 (1967).

<sup>2</sup> Dacre, J. C., *Biochem. J.*, 78, 758 (1961).

<sup>3</sup> Daniel, J. W., and Gage, J. C., *Fd. Cosmet. Toxicol.*, 3, 405 (1965).

<sup>4</sup> Deichmann, W. P., Clemmer, J. J., Rakoczy, R., and Bianchini, J., *A.M.A. Arch. Industr. Hlth.*, 11, 93 (1955).

<sup>5</sup> Gilbert, D., and Golberg, L., *Fd. Cosmet. Toxicol.*, 3, 417 (1965).

<sup>6</sup> Hinton, C. L., in *Fd. Addit. Control Ser. FAO*, 2, 27 (1960).

<sup>7</sup> *The Antioxidant in Food Regulations 1966 (SI 1966, No. 1500) (HMSO, London, 1966).*