## Semi-in-vivo?

SIR,—Dr Green advocates (*Nature*, **229**, 142; 1970) dispensing with the terms *in vivo* and *in vitro* which he notes are often misused as adjectives and only retain usage as adverbial phrases in the pen of the *cognoscenti*. Surely this is not the case—trained scientific writers use these and other terms correctly and ought not to be dubbed as *cognoscenti* for so doing.

He states that some editors "are prepared to turn a blind eye to the terms' suspiciously foreign sound and are prepared to admit them as current English usage. Others, more severe, by clapping the terms in italics, clearly still regard them as aliens against whom the innocent reader must be warned". Surely the italics are used for the reason that in many publications all Latin terms enjoy italics.

He says that "'semi-in-vivo' experiments have recently been threatened". It is an interesting question—perhaps Dr Green or some other reader may be able to suggest a suitable term for use when reporting results of effects obtained when human or animal tissue cultures are used in contradistinction to those obtained from direct clinical application.

Yours faithfully,

DEIRDRE C. O'DONOGHUE-MAGUIRE

*Connaught Medical Research Laboratories,*
*1755 Steeles Avenue West,*
*Willowdale, Ontario*

## Expensive Meat

SIR,—The figures for the costs of tissue cell culture media given by Dr Moore (*Nature*, **230**, 133; 1971) need amendment. Our work[1-3] has resulted in the development of defined media which makes the culture of suspended mammalian tissue cells much more predictable, and capable of much higher cell population densities and yields than was previously the case. Also, the abolition of serum from the medium has removed the most expensive ingredient which was a major obstacle to large scale culture.

A comparison of the costs of media is given in the Table.

Our costs are based on that of fine laboratory chemicals, hence for large scale usage the cost could be very much less. Also we know that yields could be considerably increased. Whether or not these costs would be comparable with that of best beef is at least debatable. On the grounds of rates of production there would be an enormous gain by the use of cell culture. Under optimum conditions in continuous-flow culture the cell mass will reproduce itself in 4 days in defined medium, whereas I believe it takes about two years to produce a crop of bullocks. Dr Moore also seems to imply that there would be an ethical problem about meat production by tissue culture. But surely tissue cell culture could be the only solution to the ethical problems raised by modern battery production of farm animals.

Yours faithfully,

S. J. PIRT

*Microbiology Department,*
*Queen Elizabeth College,*
*University of London*

1 Birch, J. R., and Pirt, S. J., *J. Cell Sci.*, **7**, 661 (1970).
2 Blaker, G. J., and Pirt, S. J., *J. Cell Sci.*, **8** (1971).
3 Blaker, G. J., Birch, J. R., and Pirt, S. J., *J. Cell Sci.* (in the press).

| | This laboratory | | Dr Moore | |
|---|---|---|---|---|
| | Mouse LS cells | Human HeLa cells | Human lymphocytes | Mouse cells |
| Maximum cell concentration (g wet weight/l.) * | 4.4† | 4.4† | 0.8 | 2 |
| Cost/kg wet cell weight * (£ sterling) | 35.3 | 72.2 | 1,040 | – |

* I take it that Dr Moore's mass data refer to wet cell weights.
† 0.8 g dry weight.

# Obituaries

## Dr Geoffrey Bourne

GEOFFREY BOURNE, physician and cardiologist of St Bartholomew's Hospital, London, and author of a number of medical books, died in December 1970 at the age of seventy-seven.

After entering St Bartholomew's Hospital in 1912 with an entrance scholarship in arts, his very great ability was immediately shown when he won almost all the scholarships and prizes that were available. His distinguished career at the hospital continued until his retirement in 1959, and can best be summed up by the final words of his own book, *We Met at Barts* (1963), as "forty-seven years of association with an institution that had given me countless blessings, no regrets, wonderful friends and a professional experience beyond price".

As a physician and cardiologist, Geoffrey Bourne wrote many original papers contributing to the advancement of medical knowledge. He also sensed that heart patients would benefit from an explanation in lay terms of the problems of heart disease—his book *Heart Disease* has been a great help to many people. In addition, his qualities as a physician included a great ability to observe and remember the patients of the hospital.

He was an active member of the British Cardiac Society, an interest that continued until the time of his death. His long association with the United States, which started with a Rockefeller Fellowship and which was strengthened by his happy marriage to Margherita Contonio of New Orleans, led him to found the Horseshoe Club to promote Anglo-American fellowship and the interchange of medical men between the two countries.

As a teacher of medicine, Geoffrey Bourne won great affection. His skill and interest are exemplified in his book *The Principles of Clinical Pathology in Practice*. His insight into the teaching methods of others made him concentrate on establishing his own diagnoses on fundamental principles and his affection for his students made him give much time to the Barts Journal.

Outside the realms of medicine he was equally outstanding. His interests included music and painting and his performance in both these spheres gave much pleasure to others. He was a keen fly fisherman and his interest in natural history and country lore was centred largely round the cottage in Sussex where he spent many happy months over a period of fifty years. At the time of his death, he was finishing a book about this part of his life. An earlier book, *Return to Reason* (1942), showed his desire to bring sanity into politics.

After the death of his first wife in 1952, he married Patricia McCready who brought further happiness to his home life and who helped him to write the books for which they will both be so well remembered. In recording his skill, understanding and love for future generations, these books will temper the sense of loss shared by the thousands who were lucky enough to have been in personal contact with him.

## Mr C. R. Barber

MR C. R. BARBER, a leading authority on temperature measurement and one of the principal architects of the Inter-

national Practical Temperature Scale of 1968, died on March 12, at the age of sixty-one.

Mr Barber's entire career was spent at the National Physical Laboratory. Joining it 44 years ago in a junior grade, he studied part-time for a degree and graduated in 1932. His early work was on the establishment and reproducibility of the 1927 International Temperature Scale at high temperatures. During the war he was involved in a range of difficult practical problems of temperature measurement. For example, he established that the rotating blades in the early Whittle jet engine were operating at unexpectedly high temperatures, a factor contributing to blade fracture. His interest in a "quick-immersion" thermocouple technique for measuring the temperature of molten steel led to his publishing extensive reference tables, still in use today, for platinum/platinum–rhodium thermocouples.

In the late 1940s Barber was appointed a member of the Consultative Committee for Thermometry (one of the advisory committees of the International Committee of Weights and Measures). In the following years he demonstrated, for example, the greater reproducibility of temperature at the triple point of water compared with the ice point; this led to the triple point being adopted internationally as the single defining point of the temperature scale. He designed a new platinum resistance thermometer of low time-constant and excellent stability, and played a major part in developing an improved form of Smith bridge, a bridge for the measurement of the resistance of platinum resistance thermometers. Copies of the new bridge were subsequently installed in numerous standardizing laboratories throughout the world.

Although Barber was to become increasingly involved in international comparisons and in committee work, both at national and international level, he remained active in experimental studies. For example, in 1955 he started a programme leading to the establishment of a low temperature scale based on helium gas thermometry. This work and related studies elsewhere provided the basis for the extension of the International Scale downward from 90.18 K to 13.81 K in the IPTS-1968. In the last few years Barber headed a research section at the NPL active on a wide range of studies in thermometry and related fields. He was awarded, in 1969, the Callendar Medal of the Institute of Measurement and Control in recognition of his life-time's work in thermometry.

Unassuming by nature, always friendly and helpful, Barber was a man who was universally liked and highly regarded and whose death is a great loss to the subject of thermometry. His wife survives him.

# Announcements

## University News

**Professor K. Keohane,** Chelsea College of Science and Technology, has been appointed Royal Society Leverhulme visiting professor to the **Universidade Federale da Bahia,** Brazil.

**Professor R. I. Mateles,** Massachusetts Institute of Technology, has been appointed professor of applied microbiology at the **Hebrew University—Hadassah Medical School,** Jerusalem, and director of the Fermentation Unit, which is operated jointly by the University and by the Israeli Government.

**Professor J. N. Walton,** professor of neurology in the Department of Medicine, has been appointed dean of medicine in the **University of Newcastle upon Tyne.**

## Miscellaneous

**Dr Ira E. Puddington,** director of the Division of Chemistry, National Research Council, Ottawa, has been awarded the Montreal medal of the **Chemical Institute of Canada.** The Institute's Merck Sharp and Dohme lecture award has been won by **Dr J. B. Stothers,** University of Western Ontario.

The Symons memorial gold medal of the **Royal Meteorological Society** has been awarded to **Mr J. S. Sawyer,** director of research, Meteorological Office, for his contributions to synoptic and dynamical meteorology. The Fitzroy prize has been awarded to **Dr R. C. Rainey,** the L. F. Richardson prize jointly to **Dr A. J. Gadd** and **J. F. Keers,** and the Darton prize to **Dr W. T. Roach.**

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CORRIGENDUM. In the article "Late Australopithecine from Baringo District, Kenya" by J. Carney, A. Hill, J. A. Miller and A. Walker (*Nature*, **230**, 509; 1971), the comments on tooth wear (p. 514) should read as follows: "$M^2$ has only the tips of the metacone and hypocone worn, and $M^3$, although fully formed, is unerupted".

ERRATUM. In the article "Implications of Torsional Potential of Retinal Isomers for Visual Excitation" by B. Honig and M. Karplus (*Nature*, **229**, 558; 1971), the following corrections should be made. The second sentence in the fourth paragraph of the first column of p. 560 should read: ". . .; the calculated values are $-2{,}016$ $cm^{-1}$ relative to the distorted 11-*cis*, 12-s-*cis* retinal and . . . ". The fourth sentence of the same paragraph should read: "The series of reactions

$$\text{11-}cis\text{, 12-s-}cis \xrightarrow{h\nu} \text{11-}trans\text{, 12-s-}cis \xrightarrow{\text{thermal}}$$
$$\text{(Ib)} \qquad\qquad \text{(Ic)}$$
$$\text{11-}trans\text{, 12-s-}trans \text{ (all-trans)}$$
$$\text{(Ia)}$$

would correspond to the observed changes in the visual pigment spectrum . . .". In the caption of Fig. 1, the second sentence should read: ". . . with respect to rotation about $C_{10}$–$C_{11}$ and $C_{11}$–$C_{12}$; . . . ". In text figure (*a*), the H at positions 9 and 13 should read $CH_3$, and in text figure (*b*) the CH at position 13 should read $CH_3$.

# British Diary

## Monday, May 10

**High-Frequency Cables** (5.30 p.m.) Professor H. E. M. Barlow, University of London, in the Botany Theatre, University College London, Gower Street, London WC1.

**Some New Observations on the Pathology and Immunology of Mucous Membrane Infections with Particular Reference to *Bordetella pertussis*** (5 p.m.) Dr L. B. Holt, University of London, at St Mary's Hospital Medical School, Wright-Fleming Institute, Norfolk Place, London W2.

**The Future Development of Power Semiconductor Switching** (2.30 p.m. discussion) Institution of Electrical Engineers, at Savoy Place, London WC2.

**The Scope of Zoology** (5 p.m.) Professor D. Bellamy, University College Cardiff, in the Botany Lecture Theatre, Main College Building, University College, Cathays Park, Cardiff. (Inaugural Lecture.)

## Tuesday, May 11

**Quantum Electrodynamics and other Fields** (5.30 p.m.) Professor T. W. B. Kibble, University of London, in Lecture Theatre A (Mechanical Engineering), Imperial College of Science and Technology, London SW7.

**Social Policy in Drug Dependence** (8 p.m.) Professor Morton Miller, Institute for the Study of Drug Dependence, jointly with the Society for the Study of Addiction, at the Botany Theatre, University College London, Gower Street, London WC1.

**Some Contributions of Radioautography to the Cytochemistry of the Aminergic Neurons** (5.30 p.m.) Professor J. Taxi, University of London, in the Anatomy Theatre, University College London, Gower Street, London WC1.

**Some Observations on Badgers under Controlled Conditions,** Mr P. Drabble; **The Ecology of the Adder,** Mr Ian Prestt; **The Seals of Macquarie Island** (film) Zoological Society of London, at the Zoological Gardens, Regent's Park, London NW1.