To name only a few of those achievements, they include the determination of the distance of the Magellanic Clouds by Thackeray and Wesselink which had a capital effect on the estimates of the scale of the Universe; the series of papers on B stars and Cepheids by Thackeray, Wesselink and Feast, leading to precise parameters for the rotation and scale of the Galaxy; the studies of RR Lyrae stars by Kinman (and later others) and of the motions of the globular clusters also by him. This was also the period of the systematic photometry of the southern sky and especially of the nearby stars as well as the positional studies of stars in the southern sky.

The British establishment, with some noble exceptions who contributed mightily to these works, may have thought little of their British colleagues in the south but this did not extend to the international community. Though there were never as many as a dozen British astronomers working in South Africa at any one time, something like half that number were honoured by election to the presidencies of commissions of the IAU, in some cases to more than one, and to vice-presidencies of that body.

I am, Gentlemen,

Yours faithfully,

David S. Evans

Astronomy Department,
The University of Texas,
Austin,
Texas 78712-1083,
USA.

1986 November 17.

A lesson learnt from Eddington

Gentlemen,—

Recently, upon reading the centenary lectures commemorating the birth of A. S. Eddington[1], I was reminded of the now famous opening sentence of chapter XI of his *Philosophy of Physical Science*[2]. "I believe there are 15747724136275002577605653961181555468044717914527116709366231425076185631031296 protons in the Universe, and the same number of electrons." Eddington derived this number, N_E, in his quest for a fundamental theory[1,3]. He argued that the total number of particles, N_T, in the Universe might be important in determining the fundamental constants of Nature, and attracted by the fact that this number must be an integer, he evaluated it exactly:

$$N_T = 2N_E = 2\cdot 136\cdot 2^{256}.$$

According to Chandrasekhar[1], Bertrand Russell once asked Eddington if he had multiplied out this number himself. Eddington replied that he had done so during an Atlantic crossing.

Eddington was fascinated by large numbers throughout his life[1], insisting on occasion in writing them out with all their zeros. After all, he argued, Nature was mindful of their number. I was curious, however, upon this re-acquaintance with the Eddington number if anyone had ever checked its evaluation. As I was unable to find any referenced check, the challenge was seemingly on. Not having a sea cruise planned for the near future, I took the easy route and turned to my computer. The calculation itself is not difficult, just tedious, and is an interesting exercise in 'first principle' arithmetic programming. After 38 minutes of labouring the computer (*Apple IIc*) "spat out" the 80-digit evaluation of N_E, exactly as Eddington had formulated it.

Having finished the exercise, however, I was somehow left with the feeling that I should have known better. With a number so passionately derived and believed in, how could Eddington have made a slip in its evaluation, and how much more satisfying must it have been for Eddington in evaluating N_E by hand.

I am, Gentlemen,
Yours faithfully,
MARTIN BEECH

Astronomy Department,
The University of Western Ontario,
London,
Canada, N6A 3K7.

1986 November 1.

References

(1) S. Chandrasekhar, *Eddington: The Most Distinguished Astrophysicist of His Time* (Cambridge University Press), 1983.
(2) A. S. Eddington, *The Philosophy of Physical Science* (Cambridge University Press), 1939.
(3) J. D. Barrow & F. J. Tipler, *The Anthropic Cosmological Principle* (Clarendon Press, Oxford), 1986.

Derivation of $(B-V)$ from Strömgren $(b-y)$ and m_1

GENTLEMEN,—

In 1985 Cousins & Caldwell[1] gave equations for obtaining $(B-V)$ from measures in the Strömgren system. These were based on E-region stars[2] with preliminary transformations from the instrumental to the standard system. Since then the observations of Olsen's standard stars[3,4] south of the equator have been completed and the transformations have been revised. Equations (1) and (2) (and (1′) and (2′)) of the paper will be affected by the changes and can be rigorously adjusted to give the same values of $(B-V)$ with the revised values of $(b-y)$ and m_1[5] by adding a term in c_1. However, essentially the same results can be obtained with the following equations:

$$(B-V) = 1{\cdot}662\ (b-y) + 0{\cdot}860\ m_1 - 0{\cdot}134 \qquad ((B-V) < 0^{\rm m}{\cdot}05) \quad (3)$$

$$(B-V) = 1{\cdot}520\ (b-y) + 0{\cdot}604\ m_1 - 0{\cdot}092 \qquad (0^{\rm m}{\cdot}05 < (B-V) < 0^{\rm m}{\cdot}70) \quad (4)$$

Few values of $(B-V)$ are changed by more than $0^{\rm m}{\cdot}002$ by using these, instead of the more rigorous, equations. Most of the larger differences are the result of ignoring colour excesses. The corrections for colour excess are $-0{\cdot}027\,E_{B-V}$ for (3) and $-0{\cdot}015\ E_{B-V}$ for (4). These are smaller than before.

While the original equations (1′) and (2′) are satisfactory when applied to the measures of Grønbech & Olsen[6] they give rise to a 'Balmer dip' when used with Olsen's standards[3] and the revised Cape results[5]. The dips disappear when equations (3) and (4) are used. There may be systematic differences between different lists of Strömgren photometry just as there often are for $(B-V)$.

I am, Gentlemen,
Yours faithfully,
A. W. J. COUSINS

South African Astronomical Observatory,
PO Box 9, Observatory 7935,
South Africa.

1986 November 15.

References

(1) A. W. J. Cousins & J. A. R. Caldwell, *The Observatory*, **105**, 134, 1985.
(2) A. W. J. Cousins, *MNASSA*, **44**, 54, 1985.
(3) E. H. Olsen, *A. & A. Suppl.*, **54**, 55, 1983—Table XIII.
(4) E. H. Olsen, Computer print-out marked "current list", includes D. L. Crawford & J. V. Barnes, *A.J.*, **75**, 978, 1970—Table II.
(5) A. W. J. Cousins, *MNASSA*, **45**, 103, 1986.
(6) B. Grønbech & E. H. Olsen, *A. & A. Suppl.*, **25**, 213, 1976.