It is clear that, if Δx, Δy are corresponding increments,

$$df \neq \Delta y, \quad dg \neq \Delta x.$$

Thurston's paradox arises from his use of the same symbols, dy and dx respectively, for these pairs of unequal quantities. In doing so he disregards the fact that the equations he uses (equivalent to each other)

$$dy = f'(x)\, dx$$
$$dx = g'(y)\, dy$$

are *homogeneous* in dx, dy and thus specify only their ratio. The value of *either dx or dy*, but not of both simultaneously, is arbitrary. The relation $dx = \Delta x$ (in either equation) gives $dy = df$; $dy = \Delta y$ similarly gives $dx = dg$. In short, x and y cannot both vary independently at the same time.

Thurston's further troubles would seem to be due not to differentials in themselves but to the homogeneity of all relations between them. Does he find the same difficulties with homogeneous co-ordinates?

(ii) The superiority of first differentials over derivatives is that the former are invariant for a change of variable while the latter are not. In his article on " Units and symbols in Mechanics " Mr. Lowry (p. 24) makes a wistful plea for the mathematical representation of physical quantities by symbols which " include the units ". Such symbols bear to the corresponding measures a relation which is analogous to that of the differential of a function to its derivative. In fact the quantity-symbol is invariant for a change of units while the measure is not. This invariance enables the mathematician to meet slugs, poundals and whatever else the engineers and physicists may devise, with complete equanimity. May I, even more wistfully, add my plea to Mr. Lowry's?

Yours faithfully, W. G. L. SUTTON

The College of Technology,
Leeds 1.

[Note: Dr. Thurston's article has (not unexpectedly) caused some comment. If space allows, it may be possible to carry the discussion a little further later. E.A.M.]

DEAR SIR,—We should dearly like to interest your members in teaching at this College. We are at this moment short of teachers in elementary arithmetic and in first and second year mathematics—this covering the syllabus of the R.S.A.

Perhaps I should let you know something of the history of the College. It was opened originally in 1854 and is, I believe, the oldest adult education centre in England. Amongst its first teachers were Ruskin, Lowes Dickinson and Rossetti. Its aim has always been to place a liberal education within the reach of those who have been denied it. Thus we try to create a better understanding in the community by bringing together those who have been lucky enough to receive a university background with others less fortunate. Our teachers have therefore remained largely unpaid. Now, 100 years after our foundation, we continue our work and rejoice in a thousand or so pupils and

about 100 teachers. But we must have continual new blood to keep growing. Would it be possible for you to draw our needs to the attention of your members? We should be delighted to welcome them among our teachers.

Yours truly, ROBERT AUSTIN,
Dean of Studies

Working Men's College,
Crowndale Road,
London, N.W.1.

REVIEWS

Professor Selig Brodetsky: Scholar, Dreamer, Man of Action. By LOUIS ROSENHEAD. Pp. 21. 2s. 6d. 1963. (The Registrar, The University, Leeds 2)

Selig Brodetsky was Professor of Applied Mathematics in the University of Leeds from 1924 to 1948, when, at the age of sixty, he retired voluntarily from his Chair and was elected Professor Emeritus. From 1949 to 1951 he was President of the Hebrew University of Jerusalem. He died on May 18th, 1954. In 1958 the generosity of a private donor made possible the establishment of the annual Selig Brodetsky Memorial Lectureship in Leeds. The booklet here under review is a report of the fifth of these lectures, given in May, 1963, by Brodetsky's former pupil L. Rosenhead, F.R.S., now Professor of Applied Mathematics in the University of Liverpool.

Brodetsky was a man of vivid personality. So was (and still is) his senior colleague Professor W. P. Milne. Together they and their staff made the Leeds Department of Mathematics one of the liveliest in the country, as thousands of former students can testify. But although Brodetsky's interest in mathematics was constant and profound, and although he made interesting original contributions to astronomy, relativity, aircraft dynamics and the numerical solution of equations, he was a man of such wide-ranging knowledge and scholarship, as well as being a leading Zionist, that his qualities and activities almost defy description. He was born in a Russian ghetto and brought to England by his refugee parents at the age of 5. Brought up in the slums of the East End of London, he nevertheless won his way to Cambridge and was bracketed Senior Wrangler at the age of 20 in 1908. This, as Professor Rosenhead says, transformed him inadvertently into a political symbol for the Jewish communities of Great Britain. He never really wanted such fame, and in his posthumously published autobiography* he remarked wryly that he was " trapped into becoming a Jewish public figure ". Zionism was thus in a sense thrust upon him, yet it gave scope to his natural urge to serve others: he was tireless in his work for his students and colleagues as well as for his fellow Jews. He neglected no duty and drove himself unceasingly in a way that would have been impossible but for the devoted ministrations of his wife. Small wonder,

* S. Brodetsky: *Memoirs: from Ghetto to Israel* (Wiedenfeld and Nicolson, 1960).