

To the Editor of the *Mathematical Gazette*

DEAR SIR,—Every generation must make its own discoveries. The “Stroud” system of denoting physical quantities by letters was fully ventilated in the *Gazette* for 1924, as your correspondent Mr Copley states. A note on this matter was Prof. C. Godfrey’s last contribution to the *Gazette*. In it he says “the elementary convention may be cast aside at the right stage if good reason is shown. As a matter of fact, books are very far from consistent in its use. In geometry, lengths are constantly distinguished by small letters without units; in trigonometry, we find $a = 1.54''$ —the very Stroud! In scholarship work no-one troubles about the elementary convention at all. . . .” After 35 years the position would appear to have remained unchanged. Prof. Lodge, in a later note, tilts at the “lamentably erroneous statement that 1 lb weight = g poundals, which is found even in some text-books”. Indeed it is! In the very latest text-book on Mechanics this statement is displayed, a few pages after we are told that g is the value of the acceleration due to gravity and is 32 ft./sec^2 in British units, and 980 cm./sec^2 in metric units. Now what are we to do? To be consistent, we should write 1 lb weight = $1 \text{ lb } g = 1 \text{ lb} \times 32 \text{ ft./sec}^2 = 32 \text{ pdl}$, but probably few of us would dare to do so, not because we think it necessarily difficult, but because we do not trust ourselves to be consistent about it. For myself, I am a modified Stroudian; I would preserve letters (standing for physical quantities) as long as possible throughout a problem, and insert numerical values in a consistent system of units at the end. But when the resistance to motion of a train is given as $v^2/200 \text{ lb. wt.}$ per ton, where v is in m.p.h., salvation would seem to lie in total obedience to the Stroudian Rule.

Yours etc., H. MARTYN CUNDY

P.S. Prof. Neville pointed out in 1924 that Everett introduced the “Stroud System” in 1879, whereas “forty-three years afterwards it was being put forward at the B.A. as unknown”. And now after 35 years more. . . .

OBITUARY

W. C. FLETCHER

There must be many mathematical teachers in Secondary Schools who do not realise the debt that they owe to W. C. Fletcher. He was born on May 13th, 1865, and was educated at Kingswood School, Bath, and St. John’s College, Cambridge. In 1886 he was 2nd wrangler, the senior wrangler being A. L. Dixon from the same school; in 1887 he was placed in division one of the first class of Part II of the Mathematical Tripos. He became a fellow of his college in 1887.

After spending nine years as a master at Bedford School, he was headmaster of Liverpool Institute from 1896 to 1904. In 1904 he was appointed to the newly created post of Chief Inspector of Secondary Schools at the Board of Education and there he stayed till his retirement in 1926. He was responsible for the organisation of the Secondary Branch of the Inspectorate and for the inauguration of the system of regular Full Inspection of Schools.

After 1926 he taught mathematics in a girls school of which his daughter was headmistress until she herself retired.

Just before he joined the Inspectorate he devised the famous trolley, which superseded Atwood’s Machine in vividness and accuracy, and is still widely used in the teaching of mechanics.

In 1910 he became a member of the Mathematical Association; he gave valuable contributions to the reports on Algebra (1924), Mechanics (1930),

Arithmetic (1932), and the second geometry report (1938). In committee, whenever he spoke, his criticisms were acute and carried the greatest weight. C. O. Tuckey, chairman of the committees responsible for these reports, said that of the many able men serving on them only W. C. F. wrote drafts of which no one wished to alter a single word.

He also contributed articles to the *Gazette*: Non-Euclidean Geometry (May 1923), Lorentz Transformation (May 1925), Geometrical Congruence (about Relativity) (Jan. 1927), Napier and Logarithms (Jan. 1931), Euclid (Feb. 1938) and a most noteworthy article on English and Mathematics (March 1924) which every teacher of elementary mathematics should read and read again.

In 1939 he was appointed President of the M. A. and, owing to the war, he remained president until 1943 but his presidential address was never delivered; however, he wrote an article "Premature Abstraction" (*M. G.* May 1940) embodying the material which would have formed the basis for his address.

Here are the first few lines of the article.

"I have long been convinced that the teaching of mathematics suffers from the premature introduction of abstraction without adequate attention to the concrete facts from which the abstractions are derived."

When teaching in his daughter's girls' school, he was particularly interested in those girls who were not good at mathematics. At the end of his article "Premature Abstraction", he wrote "My own recent teaching experience has convinced me of what I long suspected that if the pace is adjusted to the individual there are few, if any, who cannot follow the early stages of mathematical teaching without being reduced to the state of disgust or despair which has been only too common."

Of his general work at the Board of Education I will leave it for others to speak, but I must mention the circulars he issued, in particular circular No. 711 of which I will say more later. These circulars had a profound influence on teaching; circular No. 711, though not signed by him, was almost entirely his own work; of other circulars on mathematical subjects he sent round early editions to a few people for criticisms and suggestions, which he frequently used in the final form of the circular.

I was appointed by him to take part in two Full Inspections under him and I was greatly impressed by the care and thoroughness with which they were done. Twice he brought a team of Inspectors to Harrow and on each occasion within 24 hours he showed a complete grasp of the mathematical situation here.

I have mentioned above circular No. 711. This was published in March 1909; it was the first authoritative statement suggesting that no attempt should be made to teach young pupils the (so called) proofs of the early theorems in geometry, but that their truth should be led up to and made obvious by intuition and experiment; then, with these theorems assumed as a solid basis, deductive geometry should be built up.

Though it was some years before examining bodies decided not to require proofs of these early theorems, the effect of the circular was very far-reaching and led up to the reforms that have since been made in the teaching of geometry.

The circular also suggested the lines on which graphical work in algebra should be developed: it said that the aim of such work should be to lead up to functionality and the calculus instead of the watered down analytical geometry which was the feature of most of the chapters on graphs which were being hastily added to existing algebra textbooks.

In spite of his somewhat gruff manner and deep voice, which frightened some teachers, he was a most kindly and lovable person. He was a man of

wonderful physical vigour : during the last few years of his life his eyes began to fail and he ceased to be able to read and write, but he was still very active in mind and body : after he was 90 he told me that he was busy sawing a tree into planks, though he regretted that he could no longer play his 'cello. And only a fortnight before his death he dictated a letter to me in which he said " I have been keeping very well : I get out of doors quite freely, though it will be different when the snow comes."

Last year he was made an honorary member of the Mathematical Association ; this gave him very great pleasure.

A. W. SIDDONS

A brief notice† enumerating the successive steps in the academic and professional career of W. C. Fletcher would in one sense be appropriate to the subject ; for Fletcher was a man of few words.

Yet a bold statement of facts could hardly do justice to an outstanding personality who made a noteworthy contribution to the standards of Grammar School education that we have in England to-day.

The Secondary Schools first recognised as such in Edwardian times by the recently created Board of Education had originated in these different ways. Some were " Board Schools " intended under (or in spite of) the old Elementary Code ; some had been recognised as Organised Service Schools by the South Kensington Department ; others were Endowed Grammar Schools not assisted by any government department up to that time. To these were added, in due course a large number of new foundations by Local Education Authorities under the Act of 1902. In assembling a staff for the care and oversight of this rather diverse group, Fletcher drew some from Whitehall—*i.e.* H.M. Inspectors of Schools under the Elementary Code. He took half of the " Twelve Apostles " of South Kensington. These were joined by others recruited like himself from " Public " and Grammar School staffs.

Under his leadership we soon became a band of brothers. The Full Inspection, which he instituted, was a far-reaching survey of school teaching and organisation taking cognizance of every aspect of school life. District Inspectors were combined in teams and joined by colleagues from Whitehall.

He was none the less a man of wide culture and deep religious conviction. In fact, he very warmly welcomed from the outset any invitation to inspect Religious Instruction as an element of the curriculum. He was as much at home in a Latin lesson as in a mathematical one. In music he was a student of Bach. He had a fine appreciation of English poetry but no small talk, and it may not be amiss to put on record a view he experienced in connexion with the writing of essays ; " When a child has nothing to say, he should be urged to silence and not to speech ".

JAMES STRACHAN

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