
Volume 1, Number 1 of *Mathematics in School* way back in November 1971, contained a feature entitled: 'Puzzles, Pastimes and Problems'. Since then, almost every issue has contained another PPP and Donald Eperson's popular series has become an intrinsic part of *Mathematics in School*. After over 100 contributions, each complete with a full set of solutions, one is bound to ask: "How did he do it?" Part of the answer lies in his wealth of experience gained over very many years' teaching and we are privileged to be able to share a little of it. Consequently, the Editors were delighted to receive this cameo from his past.

Educating a Mathematical Genius

Alan Turing at Sherborne School

by **Canon D.B. Eperson**,
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Two conflicting biographies and a BBC TV programme about Dr Alan Turing—the pioneer designer of the electronic computer, *ACE*—describing his activities from his schooldays until his mysterious early death, have prompted me to record my recollections of the budding mathematical genius during this time at Sherborne School.

Mrs Sara Turing wrote a biography of her son shortly after his death at the age of 42 years, which she regarded as "accidental". In 1983 Andrew Hodges published a much more detailed book, entitled: "*Alan Turing: the Enigma*", motivated by his interest in mathematics and in the Gay Liberation Movement. His verdict was that Turing's death was suicidal: "*The story of Alan Turing's*



Fig. 1 Turing (right) and Mermagen in their last year at Sherborne (photo: D.B. Eperson, previously unpublished)

life...does show intelligence thwarted and destroyed by its environment".

This opinion may or may not be valid as regards his adult life, but is certainly not true that when a boy at Sherborne School his intellectual development was hampered by his public school environment. The author of the biography did not conceal his prejudice against public school education, and his criticism of a distinguished headmaster and his staff at the time when Turing was at Sherborne School were extremely biased. It would be unfortunate if present-day mathematicians accepted his view that Turing was adversely affected by his experience at a boarding school, whereas his mother was completely satisfied by the intellectual and moral training he received.

The author's criticism of my colleagues was also unfair: some of them had made critical remarks on Turing's attitude towards subjects other than Science and Mathematics, but photocopies of his school reports and School Certificate Examination results show that his all-round ability was recognised.

In the biography there are several references to me as Turing's mathematical tutor: although they do not err on the side of flattery, they are devoid of the venom of his remarks about other masters.

In September 1927, I joined the school staff and taught

sets of boys of all ages, including a group of six who were beginning their study of the syllabus of Higher School Certificate mathematics. The most promising was Christopher Morcom, who obtained 85 per cent of the marks in the examination I set at the end of a year.

I first met Alan Turing in the Summer term of 1928, at the end of which he took the School Certificate Examination. My end of term report stated that "*He has been reading for the Additional Mathematics papers more or less on his own, and should do well*".

Having passed the School Certificate Examination with flying colours, Turing joined the select group of budding mathematicians, and in December I reported that "*This term has been spent, and the next two terms will have to be spent, in filling in the many gaps in his knowledge, and organising it. He thinks very rapidly and is apt to be 'brilliant' but unsound in some of his work. He is seldom defeated by a problem, but his methods are often crude, cumbersome and untidy, but thoroughness and polish will no doubt come in time*". The Headmaster added the comment: "*This report is full of promise*".

In January 1929 an older boy, Pat Mermagen, joined the group after he had won a Cambridge Scholarship. They all took the Higher School Certificate Examination in the following July, when the marks obtained were:- Morcom 1436, Mermagen 1365, Turing 1033 and some "also rans".

All three continued in September, as Mermagen had elected to stay on as Captain of the School and Captain of Rugby and Cricket. Morcom took the Cambridge Scholarship Examination in December and was awarded one at Trinity College, but he died tragically in the following February after an operation. In July Mermagen obtained 1140 marks, and Turing 1079 in the HNC Examination.

Turing shared my admiration for the undoubted talent of Morcom, his senior by one year, and hoped to emulate him by gaining a mathematical scholarship at Trinity College, Cambridge. Their friendship had been a source of mutual benefit, and Morcom's influence on the young genius was all to his good.

1930-31 was Turing's final year at school, during which he gained a scholarship at King's College, Cambridge. I was glad that the examiners were able to perceive his talent, since on paper his solutions were often unorthodox. In July his HSC marks reached only 1079; these figures show that Turing, though potentially a gifted mathematician, never did really well in the conventional HSC topics.

In one sense he was difficult to teach, as he preferred to make his own independent investigations. He was reputed to have "discovered" Gregory's series $\pi/4 = 1 - 1/3 + 1/5 - 1/7 + \text{ad inf.}$, without using calculus during his early school days. He was less interested in studying textbooks and developing a good style.

On the other hand he was an industrious member of the class, who needed no stimulus to exert himself mentally, and he could readily appreciate the solution that I showed him to any problem that he could not solve by the light of nature, i.e. by discovering his own alternative method.

I believe that my deliberate policy of leaving him mainly to his own devices, and standing by to assist when necessary, allowed his mathematical genius to progress uninhibited. I cannot recollect that he ever made use of my classroom library of books on a variety of mathematical and scientific topics, but obviously he read and understood books and advanced topics, such as Relativity.

Out of school I had little contact with Turing, as I do not think that he showed any interest in school games or in music-making, or in the activities of the school Archaeological Society and the Gramophone Society that I organised. His friendly rival Morcom came regularly to the record recitals in my rooms on Sunday afternoons, whilst other boys helped me to run the Cinema Society, and to



Fig. 2 Turing in later life

operate the formidable apparatus that HMV produced at my request to fill the school hall with sounds from records.

When at Sherborne I soon realised the value of "*Recreational Mathematics*" in the classroom, and so "side-tracks" such as Astronomy and Space Travel were occasionally explored. I still have the notebook that I compiled during 1927-39 containing topics such as Dissections, Magic Squares, Knight's Tours on a Chessboard, exotic Envelopes, Recurring Decimal Patterns, Factorising Symmetrical Determinants and Indeterminate Equations of the 1st and 2nd degrees. By word and by example I encouraged boys to investigate problems and puzzles on their own, and to enjoy their mathematical activities.

I certainly enjoyed my own varied activities as a younger master, both inside and outside the classroom, and have pleasant recollections of the friendly attitude of boys and colleagues. I can endorse the opinion of another master, A.J.P. Andrews, quoted in Mrs Turing's book, that Christopher Morcom and Alan Turing were the most brilliant boys that it was our privilege to teach at school.

Sherborne School should be given credit for providing an environment in which a budding scientifically minded mathematician was happy, and could develop his talents and grow in knowledge and maturity. ☒

References

Hodges, A (1983) *Alan Turing — The Enigma*, Burnett Books.

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