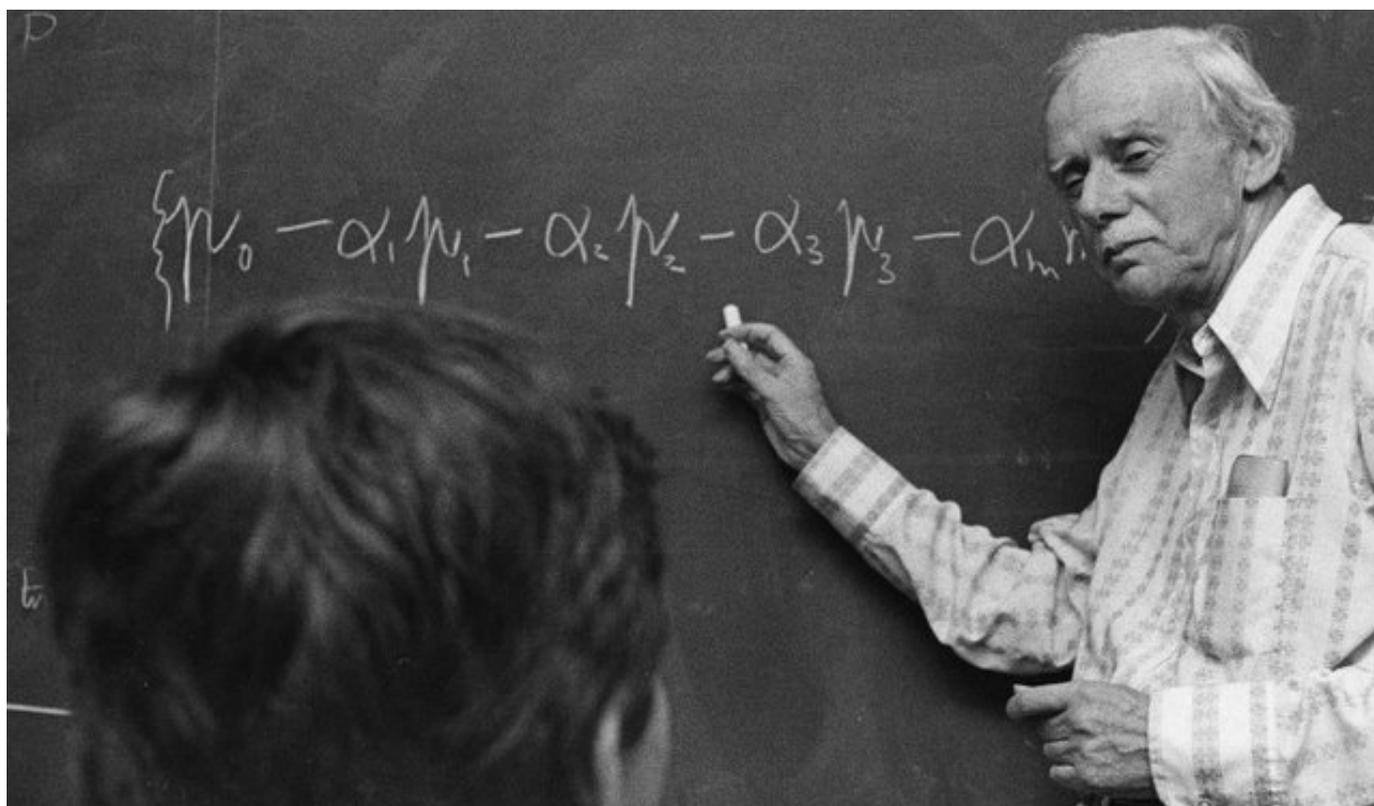


Paul Dirac: Breaking the Silence

pauldirac (40) ▾ (/@pauldirac) in introduceyourself (/trending/introduceyourself) • 7 months ago

Paul Dirac (1902-1984)

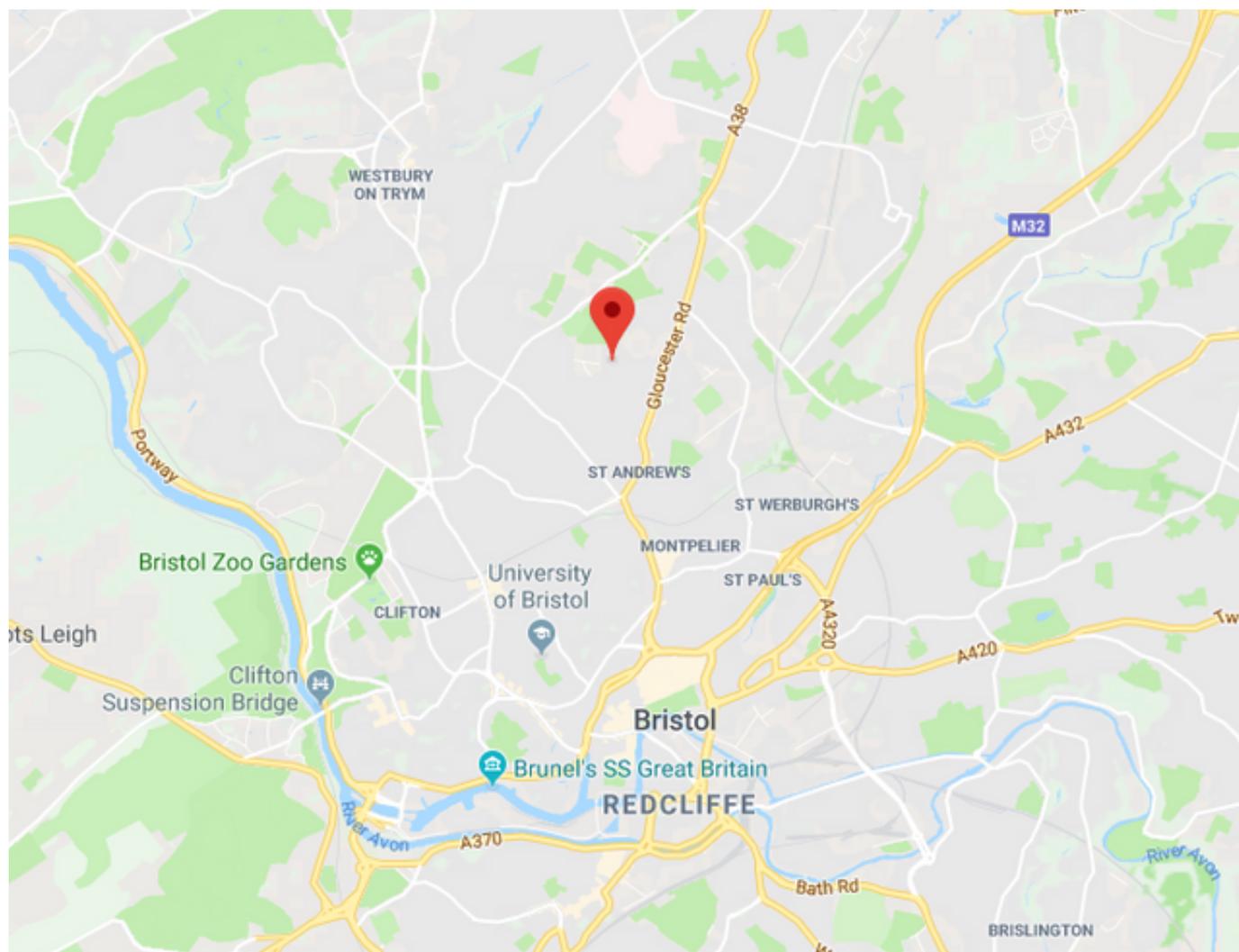


[Source]

Paul Dirac was considered one of the best theoretical physicist. In which Bohr would later describe Dirac as, "*purest soul of them all*" [1] .

Between the ages of 23 and 31 he unveiled an original and powerful formulation of the theory, a primitive but important version of quantum electrodynamics , the relativistic wave equation of the electron, the idea of antiparticles , and a theory of magnetic monopoles .

Dirac was born on August 8, 1902 in a suburb of the city of Bristol specifically in Bishopston.



Bristol Area

His father was from the Valais region of Switzerland and emigrated to England in the 1880s while his mother came from Liskeard in Cornwall in UK. The "silence" surrounding the life Paul dates back to his childhood, as he would recall,

My father made the rule that I should only speak to him in French. He thought it would be good for me to learn French in that way. However, since I found I couldn't express myself in French, it was better for me to stay silent than silent than talk in English. So I became very silent at that time - that started very early.

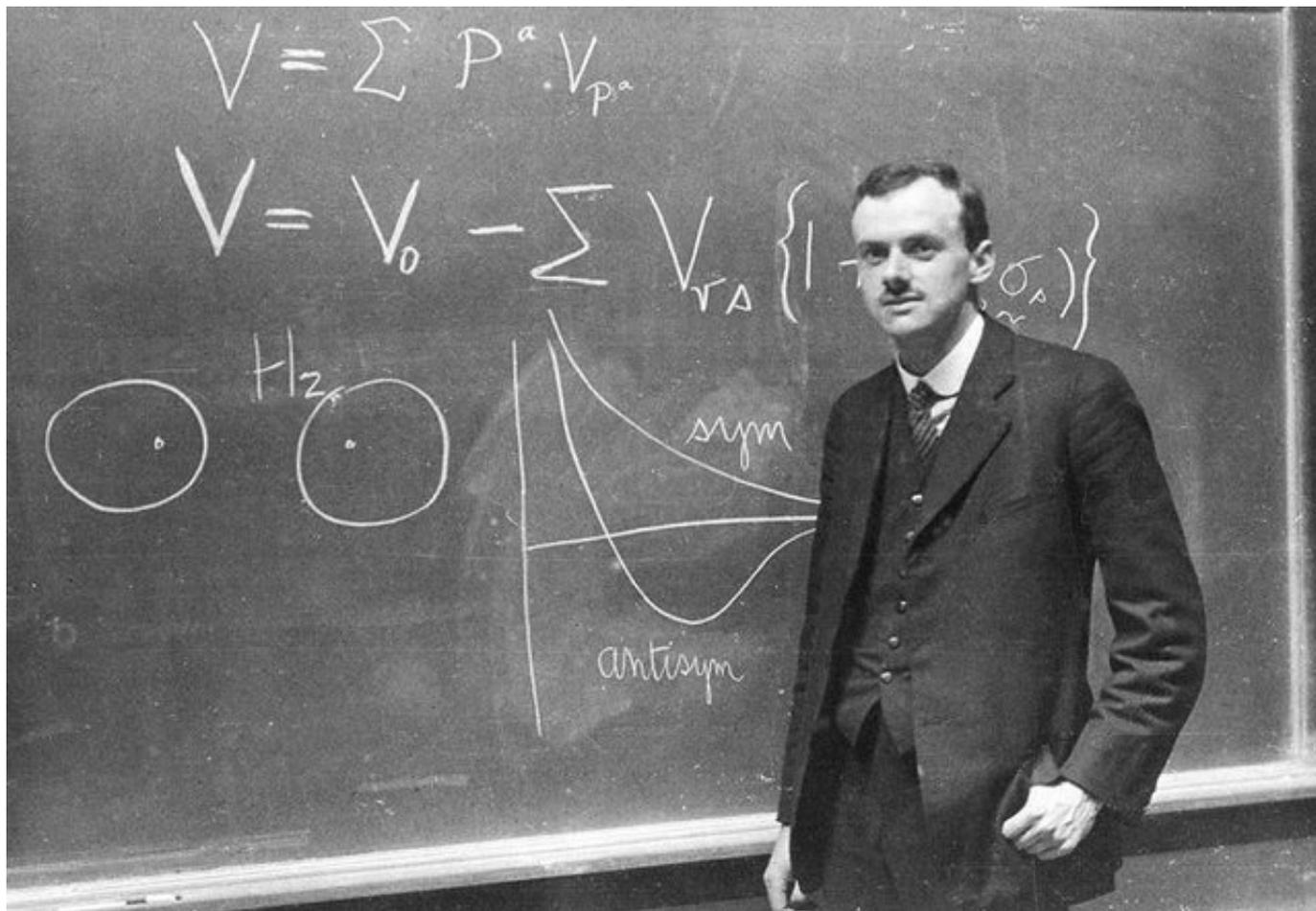
Paul Dirac's family has a sad story to tell. Paul's father was an outstanding linguist but was also good at alienating his sons. At age of twenty four, Reginald, the elder brother of Paul, committed suicide. He wanted to be doctor but was forced to take up mechanical engineering.

Paul's life was not the same after that. Later on, when he was awarded the Nobel prize, though his father was proud of his son's achievement, only invited his mother to attend the ceremony in Stockholm.

Mathematical Abilities

Paul's skill in mathematics was early evident in his primary school. Paul was ahead of his class in mathematics that he was allowed to work largely on his own. Early on, he was recognized as a boy of exceptional intelligence.

In 1918, Paul entered Bristol University, where took up electrical engineering. After graduating in 1921, he was not able to find a work as an engineer. Fortunately, he was offered a tow years' free tuition by Bristol University to study mathematics. He excelled at the final examination and was further awarded by the government to take up a graduate study in Cambridge.



Paul was already publishing research in statistical mechanics and quantum mechanics. In Cambridge, his ability was recognized by his supervisor. In those times, Bohr-Sommerfeld quantum theory was the best theory of atomic phenomena but it was met with contradictions and shortcomings - this was an opportunity for Paul to apply his ability but unfortunately without success.

Paul Dirac first paper on quantum mechanics paralleled much of what was being done at the same time, but he followed it up with more innovative work that immediately attracted the attention of theoreticians everywhere. As Max Born would lament,

The day before I left there appeared a parcel of papers by Dirac, whose name I had never heard ... Never have I been so astonished in my life: that a completely unknown and apparently young man could write such a perfect paper.

Paul then spend some time in Copenhagen and then in Gottingen and Leiden, meeting Bohr in person, and enjoyed the informal atmosphere of the Bohr institute. At Gottingen he met Robert Oppenheimer, while in Leiden he worked with Ehrenfest.

In 1927, he was invited to the sixth Solvay conference, and had the opportunity to meet with some of the best theoretical physicist such as Einstein and Lorentz.



Sixth Solvay conference [Source]

At a young age of 28, he was elected to the Royal Society this was in 1930. Much of the following year, he went to the Institute for Advanced Study in Princeton. Upon returning to Cambridge, he was elected Lucasian Professor of mathematics.

In 1933, Dirac share the Nobel Prize with Schrodinger 'for the discovery of new productive forms of atomic theory' [4] . He wanted to refuse the prize but was later warned by Rutherford that it would attract greater publicity, the event that Dirac was trying to avoid.

On the seventh Solvay conference Dirac gave a talk on "Structure and Properties of Atomic Nuclei"

INSTITUT INTERNATIONAL DE PHYSIQUE SOLVAY
 SEPTIÈME CONSEIL DE PHYSIQUE -- BRUXELLES. 22-29 OCTOBRE 1933



Photo Benjamin Cuperle

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Seventh Solvay conference [Source]

In 1934 - 1935, while he was on leave, he return to Princeton and started to revise his textbook, *The Principles of Quantum Mechanics*. At Princeton, he meet and made friends with Eugene Wigner, along with Wigner's sister -

Margit Balasz.

Margit Balasz was quite the opposite of Dirac, and using some sort of mysterious face, there was a strong attraction between the two and so in January 1937 they were married in London.



Source

Dirac was blessed with two two daughters and two additional children, a son and a daughter, from Margit's first marriage, (they took the name of Dirac).

Most of his days was spend in Cambridge, except for some visits in Institute for Advanced Study in Princeton, the Tata Institute for Fundamental Research in Bombay and Moscow State University.

Although he had many offers from elsewhere, he focus his energy mainly in England to give a lead to young British theoreticians. However, in 1927, he tried to work a new life in Tallahassee campus of Florida State University.

In Tallahassee, he was on the campus all day, unlike in Cambridge where he tended his work mainly at home and only went to the university for classes and seminars. Gradually, his health fail and in October 20, 1984, he died at Tallahassee.



John Albright and Paul Dirac in Tallahassee [2]

References

[1] <https://www.fsu.edu/indexTOFStory.html?lead.dirac>

[2] <https://fsu.digital.flvc.org/islandora/search/?type=edismax&collection=fsu%3Adiracol>

[3] https://en.wikipedia.org/wiki/Paul_Dirac

[4] https://www.nobelprize.org/nobel_prizes/physics/laureates/1933/

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