Book review

Alfred Tarski: Life and Logic
by Anita Burdman Feferman and Solomon Feferman
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If you ask a well-educated person for the names of the three most prominent logicians in the twentieth century, he will undoubtedly come up with Gödel, Tarski and Turing. While well-known biographies about the first and last have been published —and their tragic deaths attracted peoples' sympathetic attention— no account of Tarski's life has appeared until recently. The book under review fills this gap excellently by providing a marvelously readable, informative and gossipy account of his life and work. Thus the book is far from being a dry account of Tarski's achievements. On the contrary. Tarski was a bon-vivant par excellence and by delving into this part of his personality the authors transcend the genre of a customary scientific biography.

Before I proceed further, let me clarify my, admittedly very feeble, connection with Tarski and the second author of the book. This may explain my position of an interested yet impartial bystander.

In 1974 I defended a PhD thesis in Mathematical Logic in Warsaw as the last PhD student of Andrzej Mostowski, who in turn was the first PhD student of Alfred Tarski. A year earlier the renowned Banach Center in Warsaw organized a Logic Semester which brought to Warsaw several luminaries in Mathematical Logic. One of them was Solomon Feferman. He probably does not remember that I was the student who guided him on his first day from the Center to the neighbouring Mathematical Institute of the Polish Academy of Sciences. I have never met him afterwards and never met his wife, the first author.

When I took up reading this book I never expected to find so much surprising material in it. It reads like a fascinating history of a huge fragment of mathematical logic in the twentieth century. The reason for this is the enormous influence that Tarski has wielded on the subject. After the Second World War he built in Berkeley almost single-handedly an extremely successful school of logic that attracted and educated many of the best and smartest logicians in the world.

In contrast to Gödel and Turing, Tarski had many PhD students, 24 to be exact. Also, he influenced throughout his career a large number of logicians. One can honestly say that the strength of mathematical logic in the United States is, to a very large extent, due to his efforts.

The authors trace in detail Tarski's life since his birth in 1901 in Warsaw, then in the part of Poland ruled by Russia, until his death in 1983 in Berkeley. Tarski was of Jewish origin and his original name was Tajtelbaum. In 1924 he changed it to Tarski and officially converted to Catholic religion even though he remained an atheist. In this way he hoped to circumvent the difficulties facing scientists of Jewish origin in the newly reestablished Poland.

Tarski was quickly recognized as a brilliant scientist. At the age of 23 he received a PhD degree from the Warsaw University. Soon after that he and Banach proved the famous result on the sphere decomposition, now called the Banach-Tarski paradox.

In 1929 he married Maria Witkowska with whom he had two children. Their marriage survived the 6 years long war separation (the book includes a remarkable reproduction of a short note about the family reunion from the *Oakland Tribune* from 6 January 1946) and several crises caused by his numerous love affairs with other women.

While I was a PhD student in Warsaw, I heard that Wanda Szmielew, a renowned expert in the logical analysis of geometry, was emotionally involved with Tarski. Little did I know that it was just a tip of an iceberg about which the authors make no secret. The authors also go to great length in describing numerous Tarski's romances with various co-authors, PhD students, and secretaries and the book features photos of many women who fell under the apparently irresistible charm of Tarski. Wanda Szmielew even lived for a year in the house of Tarski's family in Berkeley, while having a relationship with him. All this did not contribute of course to a successful family life of the Tarskis. His wife emerges from the book as an almost angelically patient person who sacrified her life to help her husband to foster his career.

Eventually she moved out of their house to another place in Berkeley where she started renting rooms to ... logicians visiting her husband. Tarski's life-style also did not help much in fostering warm contacts with his two children. The authors discuss a striking scene in the lobby of an imposing Europejski Hotel in Warsaw in which Tarski was to meet during his brief visit to Poland in 1964 his son Jan. The meeting was spoiled by the unexpected appearance of Wanda Szmielew.

In spite of his change of name and his excellent mathematical record Tarski never succeeded in getting a professorship in Poland. He left Poland for a short visit in the United States on 11 August 1939, on the same ship as the brothers Adam and Stanisław Ulams. Adam became later a brilliant historian of Russia and the Communism, while Stanisław became one of the most famous American mathematicians, involved in an essential way in the Manhattan project. Because of the outbreak of the Second World War on September 1 Tarski (and the Ulams) had to remain in the United States.

After holding a number of temporary positions Tarski joined in 1942 the Department of Mathematics of the University of Berkeley which remained his home institution until his retirement in 1968. The latter did not prevent him from being scientifically active, including supervision of several PhD students, till his death in 1983.

Tarski's fame steadily grew. Eventually, in 1965, he was elected a member of the National Academy of Sciences. Soon afterwards other prestigious high honours followed.

The book abounds in delightful anecdotes that reveal the magnetic personality of Tarski. He was a famously brilliant teacher and fast thinker, moreover an exceptionally demanding and persistent supervisor. It suffices to say that two of his students needed nearly twenty years to finish their PhD theses.

One of the stories concerns Dana Scott, a most renowned logician and recipient of the Turing Award in computer science, who, as a PhD student, was fired by Tarski for procrastinating with the corrections of an amateurish translation of a compendium of Tarski's early Polish texts. Scott subsequently left for Princeton where he finished his PhD thesis with Alonzo Church. Eventually Tarski and Scott mended fences and once Scott's reputation grew Tarski even suggested that he, Tarski, would call Scott his student.

Throughout his life Tarski was a workaholic, who slept little and worked till the wee hours, often relying on benzedrine (a variant of amphetamine). He was also a heavy smoker and occasionally indulged in marihuana. While in Berkeley he was regularly throwing lavish parties during which alcohol (notably his home made variant of slivovitz) would flow freely and *bigos*, a

Polish cabbage-based stew, would be served. The jolly atmosphere of these parties is exemplified in the book by mentioning a logician John Myhill who once sang during such a party, using as a libretto the statistics on male homosexuality from the just published *The Kinsey Report*.

Tarski's entourage was regularly exposed to his dictatorial behaviour. Chen-Chung Chang, who suffered from asthma, recalled on the pages of this book what his work as a PhD student of Tarski would typically look like. They would start working about 9 p.m. continuing till 4:30 a.m., sitting in clouds of cigarette smoke in a non-ventilated room at Tarski's house. Around 2 a.m. Tarski would inquire whether Chang would like a coffee and following his positive reply would yell his wife's name to wake her up so that she makes them coffee.

Tarski left a huge scientific legacy covering several areas of mathematical logic. After his death the *Journal of Symbolic Logic* published in 1986 and 1988 more than ten surveys discussing his life and research in various areas of logic. It is generally agreed that his most fundamental contributions are his formal definition of truth, his theorem on the decidability of the first-order theory of reals, and his work on relational and cylindric algebras. The book allows the reader to learn in reasonable detail about Tarski's contributions by means of six 'Interludes' interspersed throughout the text. These are highly readable accounts of the relevant background in mathematical logic and Tarski's contributions.

Tarski's work did also have a notable impact on computer science, especially his research on the decision procedures and his approach to semantics. An interested reader is referred to a very recent article by Solomon Feferman, see [1]. His work on the definition of truth, meta-mathematics and generalizations of first-order logic was influential in philosophy and linguistics. Also, the renowned Tarski's fixed point theorem (actually its weaker version, known as Knaster-Tarski theorem) became a standard tool in Mathematical Economics, see, e.g., the classic *Microeconomics Theory* of Mas-Collel, Whinston and Green (where Tarski is misspelled as Tarsky) and *Mathematical Economics* of M. Carter (where he is misspelled as Tarksi).

The authors took the trouble to check the spelling of the often confusing for 'westerners' Polish names. I was impressed to find that all Polish words, except two, were spelled in the book correctly, including those that contain non-ASCII characters. The book even contains a Polish Pronunciation Guide.

In summary, this is an excellent book from which one can learn a lot about the history of mathematical logic in the twentieth century, the remarkable influence of Tarski on this discipline, and, especially, about Tarski himself.

Reference

[1] Solomon Feferman. Tarski's influence on computer science. Manuscript available from `http://arXiv.org/abs/cs/0608062`.

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