

Abraham Fraenkel

Abraham Halevi (Adolf) Fraenkel (Hebrew: אברהם הלוי (אדולף) פרנקל; February 17, 1891 – October 15, 1965), known as **Abraham Fraenkel**, was a German-born Israeli mathematician. He was an early Zionist and the first Dean of Mathematics at the Hebrew University of Jerusalem. He is known for his contributions to axiomatic set theory, especially his additions to Ernst Zermelo's axioms, which resulted in the Zermelo–Fraenkel axioms.

Contents

Life

Mathematician

Awards

Published works

See also

References

External links

Life

Fraenkel studied mathematics at the Universities of Munich, Berlin, Marburg and Breslau. After graduating, he lectured at the University of Marburg from 1916, and was promoted to professor in 1922.

In 1919 he married Wilhelmina Malka A. Prins (1892–1983). Due to the severe housing shortage in post-war Germany, for a few years the couple lived as subtenants at professor Hensel's place.

Abraham Fraenkel



Adolf Abraham Halevi Fraenkel in the 1940s

Born	February 17, 1891 <div>Munich, Bavaria</div>
Died	October 15, 1965 <div>(aged 74)</div> <div>Jerusalem, Israel</div>
Nationality	Israeli

After leaving Marburg in 1928, Fraenkel taught at the University of Kiel for a year. He then made the fateful choice of accepting a position at the Hebrew University of Jerusalem, which had been founded four years earlier, where he spent the rest of his career. He became the first Dean of the Faculty of Mathematics, and for a while served as Rector of the University.

Fraenkel was a fervent Zionist and as such was a member of Jewish National Council and the Jewish Assembly of Representatives under the British mandate. He also belonged to the Mizrachi religious wing of Zionism, which promoted Jewish religious education and schools, and which advocated giving the Chief Rabbinate authority over marriage and divorce.

Mathematician

Fraenkel's early work was on Kurt Hensel's p-adic numbers and on the theory of rings. He is best known for his work on axiomatic set theory, publishing his first major work on the topic *Einleitung in die Mengenlehre* (Introduction to set theory) in 1919. In 1922 and 1925, he published two papers that sought to improve Zermelo's axiomatic system; the result is the Zermelo–Fraenkel axioms. Fraenkel worked in set theory and foundational mathematics.

Fraenkel also was interested in the history of mathematics, writing in 1920 and 1930 about Gauss's works in algebra, and he published a biography of Georg Cantor. After retiring from the Hebrew University and being succeeded by his former student Abraham Robinson, Fraenkel continued teaching at the Bar Ilan University in Ramat Gan (near Tel Aviv).

Awards

- In 1956, Fraenkel was awarded the Israel Prize, for exact sciences.^[1]

Published works

- 1908. "Bestimmung des Datums des jüdischen Osterfestes für die Zeitrechnung der Mohammedaner". In *Zeitschrift für Mathematik und naturwissenschaft Unterricht* (39).
- 1909. "Eine Formel zur Verwandlung jüdischer Daten in mohammedanische". In *Monatsschrift für Geschichte und Wissenschaft des Judentums*, vol. 53, issue 11–12.
- 1910. "Die Berechnung des Osterfestes". *Journal für die reine und angewandte Mathematik*, vol 138.

Alma mater	University of Marburg
Known for	Zermelo–Fraenkel axioms
Awards	Israel Prize (1956)
Scientific career	
Fields	Mathematics
Institutions	Hebrew University of Jerusalem
Doctoral advisor	Kurt Hensel

- 1918. "Praktisches zur Universitätsgründung in Jerusalem". *Der Jude* 3:404–414.
- 1918b. "Mathematik und Apologie". *Jeschurun*, 5:112–126.
- 1919. *Einleitung in die Mengenlehre*. Berlin: Julius Springer.^[2]
- 1920. *Materialien für eine wissenschaftliche Biographie von Gauss*.
- 1921. "Die neueren Ideen zur Grundlegung der Analysis und Mengenlehre". In *Jahresbericht der Deutschen Mathematiker-Vereinigung*.
- 1922. "Axiomatische Begründung der transfiniten Kardinalzahlen I — Herrn K. Hensel zum sechzigsten Geburtstag" (<http://www.digizeitschriften.de/dms/img/?PID=GDZPPN00236669X>). *Mathematische Zeitschrift*. **13**: 153–188. 1922. doi:10.1007/bf01485286 (<https://doi.org/10.1007%2Fbf01485286>).
- 1922b. "The notion of 'definite' and the independence of the axiom of choice". In Jean van Heijenoort, 1967. *From Frege to Gödel: A Source Book in Mathematical Logic, 1879–1931*. Harvard University Press: 284–289.
- 1922c. "Zu den Grundlage der Cantor-Zermeloschen Mengenlehre" (<http://gdz.sub.uni-goettingen.de/dms/load/img/?PID=GDZPPN002268760>). *Math. Annalen*. **86**: 230–237. 1922. doi:10.1007/bf01457986 (<https://doi.org/10.1007%2Fbf01457986>).
- 1924. "Die neueren Ideen zur Grundlegung der Analysis und Mengenlehre". In *Jahrsebericht Der Deutschen Mathematiker-Vereinigung*, Vol 33, 97–103.
- 1924. "The Jewish University in Jerusalem (From the Viewpoint of Orthodoxy)". *Jewish Forum*, January: VII (1), 27–31.
- 1924b "The Jewish University in Jerusalem (From the Viewpoint of Orthodoxy)". *Jewish Forum*, May: VII (5), 299–302.
- 1925. "Leben, Natur, Religion". *Jeschurun* 12:337–348.
- 1927. *Zehn Vorlesungen über die Grundlegung der Mengenlehre*. B. G. Teubner.^[3]
- 1930. "Georg Cantor". In *Jahresbericht der Deutschen Mathematiker-Vereinigung* 39, 189–266. Also appeared separately as *Georg Cantor* Leipzig: B. G. Teubner and is abridged in Cantor's *Gesammelte Abhandlungen*.
- 1930–1931 (5691). "אמונות ודעות לאור מדעי הטבע". Part 1 in *ההד* VI(8) 16–19, part 2 in *ההד* VI(9). Reprinted together as a monograph by *ההד* in 1931 Reprinted in 1987-8. Translated by Mark Zelcer in *Hakirah* vol. 12.
- 1930–1931b. "Die heutigen Gegensätze in der Grundlegung der Mathematik." In *Erkenntnis* vol. 1.
- 1935. "Zum Diagonalverfahren Cantors". *Fundamenta Mathematicae* 25, 45–50.
- 1935. "Concerning the Method of Number Pairs". *Philosophy of Science* 2 (1).
- 1938. "Alfred Loewy (1873–1935)". In *Scripta Mathematica* vol. V(1).
- 1939. "Natural Numbers as Cardinals". In *Scripta Mathematica* VI (2).
- 1940. "Natural Numbers as Ordinals". In *Scripta Mathematica* VII (1–4).
- 1941. "מכתב למערכת". In *הצופה* September 12, p8.
- 1943. *הילודה בישוב ובעיותיה*. Jerusalem: D. B. Aaronson.
- 1943b. יצחק ניוטון 1642–1942: דברים שנאמרו על-ידי ד"ר י.ל. מאגנס, ... , א.ה. פרנקל ... י.רקח ... בחגיגת ניוטון שנערכה באוניברסיטה

העברית בירושלים, ביום ג' אדר תש"ג [1943]. ירושלים : חברה להוצאת ספרים על-יד האוניברסיטה העברית

- 1943c. "Problems and Methods in Modern Mathematics – 1". In *Scripta Mathematica* IX (1).
- 1943d. "Problems and Methods in Modern Mathematics – 2". In *Scripta Mathematica* IX (2).
- 1943e. "Problems and Methods in Modern Mathematics – 3". In *Scripta Mathematica* IX (3).
- 1943c. "Problems and Methods in Modern Mathematics – 4". In *Scripta Mathematica* IX (4).
- 1944. "Problems and Methods in Modern Mathematics – 5". In *Scripta Mathematica* X (3–4).
- 1945. "זכרון לנשמת הרב אברהם יצחק הכהן". In Y. L. Fishman (ed.) *יזכורנו לנשמת הרב אברהם יצחק הכהן*. Jerusalem Mossad HaRav Kook. קוק למלאות עשר שנים לפטירתו, קובץ תורני-מדעי.
- 1946. "Address by Abraham A. Fraenkel". In *Founder's Day: The Dropsie College for Hebrew and Cognate learning. Addresses: The Honorable Herbert H. Lehman, Professor Abraham Fraenkel*. Philadelphia: Dropsie College.
- 1946. "The Recent Controversies about the Foundations of Mathematics". In *Scripta Mathematica* XII(4).
- 1947. "The Hebrew University and the Regulation of Secondary Education in Palestine". In *Jewish Education* 18:2.
- 1947. "The recent controversies about the foundation of mathematics". In *Scripta Mathematica* XIII, pp 17–36.
- 1951. "On the Crisis of the Principle of Excluded Middle". In *Scripta Mathematica* XV (1–2).
- 1953. *מבוא למתמטיקה: בעיות ושיטות מן המתמטיקה החדשה*. Ramat Gan: Masada Publishing.
- 1953b. *Abstract Set theory*. Amsterdam: North Holland Publishing Co.
- 1955. *Integers and the Theory of Numbers*. New York: [*Scripta Mathematica*], Yeshiva University.
- 1955b. "על סדר התפילות בקיבוץ הדתי". In *שי לישעיהו: ספר יובל לר' ישעיהו וולפסברג בן הששים*. Y. Tirosh (ed.). Tel Aviv: Merkaz LeTarbut Shel HaPoel Mizrahi; 193–194.
- 1958. "משום מתיא – משום ירקיא". In Shimon Braunstein and Gershon Chorgon (eds.) *ספר יובל לכבוד שמואל קלמן מירסקי*. New York: Vaad HaYovel; 248–250.
- 1960. "Jewish mathematics and astronomy". In *Scripta Mathematica* XXV, pp 33–47. (Appeared in Hebrew in *Tekhnika Umada*, Tel Aviv, 1947. Footnote 12 of the *Scripta Mathematica* version claims that the essay was written in the 1930s.)
- 1960. "Epistemology and logic". In *Synthese* 12, pp. 333–337.
- 1960. "Theory of Sets". In *Encyclopædia Britannica*.
- 1961. *Essays on the foundations of mathematics, dedicated to A. A. Fraenkel on his seventieth anniversary*. Y. Bar-Hillel, E. I. J. Poznanski, M. O. Rabin and A. Robinson, eds. Jerusalem, the Hebrew University: Magnes Press.
- 1966 (1953). *Abstract Set Theory*. North Holland.
- 1966. *Set Theory and Logic*. Addison-Wesley.
- 1966. "עיבור שנים וקידוש החודש". In *אמונה, דת ומדע*. Jerusalem: Misrad HaChinuch VeHaTarbut.
- 1967. *Lebenskreise: Aus den Erinnerungen eines jüdischen Mathematikers*. Deutsche Verlags-Anstalt.

- 1969. "הלוח העברי". *Encyclopedia Hebraica*, vol 26.
- 1973 (1958). (with Yehoshua Bar-Hillel, Azriel Levy, and Dirk van Dalen) *Foundations of Set Theory*. North Holland.
- 2016 *Recollections of a Jewish Mathematician in Germany* (<https://www.springer.com/us/book/9783319308456>). Translated from the German 1967 edition by Allison Brown. Edited by Jiska Cohen-Mansfield. Basel: Springer Birkhäuser History of Science.

See also

- List of Israel Prize recipients
- Frankel

References

1. "Israel Prize Official Site - Recipients in 1956 (in Hebrew)" (http://cms.education.gov.il/EducationCMS/Units/PrasIsrael/Tashyag/Tashkab_Tashyag_Rikuz.htm?DictionaryKey=Tashtaz).
2. Pfeiffer, G. A. (1921). "Review: *Einleitung in die Mengenlehre* by A. Fraenkel" (<http://www.ams.org/journals/bull/1921-27-07/S0002-9904-1921-03439-2/S0002-9904-1921-03439-2.pdf>) (PDF). *Bulletin of the American Mathematical Society*. **27** (7): 333–334. doi:10.1090/s0002-9904-1921-03439-2 (<https://doi.org/10.1090%2Fs0002-9904-1921-03439-2>).
3. Wilder, R. L. (1929). "Review: *Zehn Vorlesungen über die Grundlegung der Mengenlehre*, by A. Fraenkel" (<http://www.ams.org/journals/bull/1929-35-03/S0002-9904-1929-04758-X>). *Bulletin of the American Mathematical Society*. **35** (3): 405–406. doi:10.1090/s0002-9904-1929-04758-x (<https://doi.org/10.1090%2Fs0002-9904-1929-04758-x>).

External links

- O'Connor, John J.; Robertson, Edmund F., "Abraham Fraenkel" (<http://www-history.mcs.st-andrews.ac.uk/Biographies/Fraenkel.html>), *MacTutor History of Mathematics archive*, University of St Andrews.
-

Retrieved from "https://en.wikipedia.org/w/index.php?title=Abraham_Fraenkel&oldid=912903426"

This page was last edited on 28 August 2019, at 16:36 (UTC).

Text is available under the Creative Commons Attribution-ShareAlike License; additional terms may apply. By using this site, you agree to the [Terms of Use](#) and [Privacy Policy](#). Wikipedia® is a registered trademark of the [Wikimedia Foundation, Inc.](#), a non-profit organization.