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IN MEMORIAM: PAUL J. COHEN
1934–2007

Paul J. Cohen was born April 2, 1934, in Long Branch, New Jersey. He died victim of a rare lung disease, on March 23, 2007 in Palo Alto, California. He made two breakthroughs at an early age. The first, published at the age of 26, was his paper, *On a conjecture of Littlewood and idempotent measures*, ***American Journal of Mathematics***, vol. 82 (1960), pp. 191–212. For this he was awarded the Bocher Prize of the American Mathematical Society. The second, published at the age of 29, was, *The independence of the continuum hypothesis I*, ***Proceedings of the National Academy of Sciences***, vol. 50 (1963), pp. 1143–1148; *The independence of the continuum hypothesis II*, ***Proceedings of the National Academy of Sciences***, vol. 51 (1964), pp. 105–110. For this he was awarded the Field's medal of the International Congress of Mathematicians in 1966. He was awarded the National Medal of Science in 1967. He was a member of the National Academy of Sciences, the American Academy of Arts and Sciences, the American Mathematical Society and the American Philosophical Society. His most famous student was Peter Sarnak.

He graduated from Stuyvesant High School in New York City in 1950. After attending Brooklyn College for two years, he traveled to the University of Chicago to discuss aspects of papers of the great Polish analyst Antoni Zygmund with Zygmund. Zygmund had him admitted immediately as a graduate student in 1953, thus joining the circle surrounding Zygmund, including Eli Stein, who became a lifelong friend. Chicago was a very exciting place to be with Andre Weil, Marshall Harvey Stone, A. A. Albert, Saunders Maclane, Irving Kaplansky, Edwin Spanier, and Paul Halmos as mentors. Cohen obtained his master's degree at age 19 in 1953. He made a habit of asking the faculty and fellow students what the most important problems were in their fields because those were the only problems he wanted to solve. His dissertation, completed under Zygmund in 1958, was entitled "Topics in the Theory of Uniqueness of Trigonometric Series". It is noteworthy that this subject led Cantor to his theory of transfinite ordinals. As a graduate student Cohen's connection with logic were his friendships with a lively group of students who became logicians; Michael Morley, Anil Nerode, Bill Howard, Ray Smullyan, and Stanley Tennenbaum. For awhile he lived in Tennenbaum's house and absorbed logic by osmosis, for there were no courses in logic in the Chicago mathematics department. At Stanford he had as company Dana Scott, Solomon Feferman, and Georg Kreisel.

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In 1957–8 he was an instructor at the University of Rochester for a year. In 1958–59 he was an instructor at the Massachusetts Institute of Technology. In 1959–61 he was a member of the Institute for Advanced Study in Princeton. Cohen became an assistant professor at Stanford in 1961, an associate professor in 1962, a full professor in 1964, and was appointed to the newly created Marjorie Mhoon Fair Professorship in Quantitative Science in 1972. He retired in 2004.

J. Barkley Rosser said that when he and Kleene attended Gödel's lectures on the consistency of the axiom of choice and the continuum hypothesis, the person taking notes simply copied the blackboards as fast as he could. Gödel's many explanatory remarks were not reproduced, and the famous monograph simply reproduced the blackboards except for a few notes and corrections by Gödel. Perhaps this accounts for the formal opacity of his famous monograph. In 1963 in connection with his visit to Gödel, Cohen said that that when he read Gödel's monograph on the consistency of the axiom of choice and the generalized continuum hypothesis, the first chapters looked boring, so he started in the middle to get to the point. He was at first puzzled to see that after proving the axiom of choice for the constructible sets, in going on to prove the continuum hypothesis for constructible sets, Gödel starred theorems which did not require the axiom of choice. He guessed that Gödel had intended to use these lemmas in a program for proving the independence of the axiom of choice. Later Cohen used these lemmas for that purpose. In an early paper Cohen showed that, assuming strongly inaccessible cardinals exist, the Skolem Lowenheim construction yields a smallest countable transitive model of set theory. His plan was to adjoin to this countable model a new set of integers such that the transitive constructible closure of this model with the new set adjoined does not introduce any new ordinals, so that by absoluteness the new set is not constructible in the resulting model. He reasoned that if every property of every set in this extended model could be traced back to a finite membership condition (forcing condition) of integers being in or out of this new set, there was a good chance that no new ordinals would be introduced. He wrote down the inductive conditions that a finite condition forcing a statement involving the new set would have to satisfy, including the condition that "if p forces 'not A', then no extension of p can force A", and realized while driving to Nevada on a vacation that if this were made into a necessary and sufficient condition, he had the required definition. And thus his revolution in set theory commenced, leading to a half century of results by a myriad of brilliant mathematicians, with connections to almost every branch of mathematics and logic. Among his other works was an algebraic decision method for p-adic arithmetic, a result previously obtained by Ax–Kochen by logical methods. Cohen is survived by his wife Christina and three sons, Charles, Eric, and Steven.

ANIL NERODE