Harsanyi, John Charles

(29 May 1920–09 August 2000)

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Harsanyi, John Charles (29 May 1920–09 August 2000), theoretical economist, philosopher, and Nobel Prize winner in economics, was born in Budapest, Hungary, the only child of Charles and Alice Gambos Harsanyi, the owners of a pharmacy. His name in Hungarian was Harsányi János Károly. His parents converted to Catholicism from Judaism, and John was raised accordingly. Harsanyi attended the Lutheran Gymnasium in Budapest. An earlier alumnus of this prestigious high school was John von Neumann, who pioneered the theory of games as mathematical models of conflict and cooperation. Although game theory became Harsanyi's own field of scholarship, he never met von Neumann. Harsanyi graduated in 1937; that year he won the First Prize in Mathematics at a Hungary-wide competition, a prize he was proud of throughout his life.

After graduation Harsanyi was inclined to study mathematics and philosophy, but in deference to his parents' wishes he decided to study pharmacy; the decision also allowed him to defer military service. When the Nazis occupied Hungary in March 1944, he had to serve in a labor unit. In November he escaped deportation to a concentration camp and found refuge in a Jesuit monastery in Budapest until the end of the Nazi occupation.

In 1946 Harsanyi returned to the University of Budapest to obtain a Ph.D. in philosophy, with minors in sociology and psychology. He was awarded the Ph.D. in 1947 for his dissertation, "The Logical Structure of Errors in Philosophical Arguments." In the academic year 1947–1948 Harsanyi was a junior faculty member at the Institute of Sociology at the University of Budapest. There he met and befriended Anne Klauber, one of his students. He was forced to leave the university because of his outspoken anti-Marxism. Anne continued to study but was harassed because of her liaison with him. Harsanyi worked in his father's pharmacy, which was nationalized in 1950.

John Harsanyi and Anne Klauber, together with her parents, fled increasingly Stalinist Hungary in 1950, first to refugee camps in Austria and then to Sydney, Australia. There John and Anne were married on 2 January 1951. With his Hungarian degrees not recognized in Australia, Harsanyi supported himself and his wife with factory and clerical work during the day and took evening classes in economics at the University of Sydney. In late 1953 he obtained an M.A. in economics with a thesis entitled "The Research Policy of the Firm." Publications resulting from this work brought him a lectureship in economics at the University of Queensland in Brisbane. Harsanyi then immersed himself in the study of game theory.

Throughout his career Harsanyi's main work was in developing mathematical systems of group decision making. The underlying principle is called "Bayesian rationality." The participants are uncertain about aspects of their situation, which have "prior" probabilities according to how likely they seem to all participants. With additional information they update their beliefs about the situation and act accordingly. Harsanyi's philosophical work from the 1950s explored utilitarianism. One of his insights was to explain moral decisions by postulating a fictitious neutral decision maker who can with equal probability assume the

role of any individual. The decision maker is neutral in the sense that his preference represents in equal parts all individual preferences, which are thereby aggregated into a so-called welfare function for society. This allows for interpersonal comparisons, which others had thought impossible.

In 1956 Harsanyi obtained a Rockefeller Fellowship, which gave him the opportunity to spend two years in the United States at Stanford University. His Ph.D. adviser, the future Nobel laureate Kenneth Arrow, found Harsanyi a fully developed scholar, but Harsanyi wanted to obtain a Ph.D. in economics to further his academic career. His Ph.D. dissertation, published as a book chapter in 1959 and titled "A Bargaining Model for the Cooperative *n*-Person Game," concerns the "Shapley value," a central concept for cooperative games that expresses the bargaining power of a player.

In 1958 Harsanyi and his wife returned to Australia. Harsanyi got a research position at the Australian National University in Canberra but soon felt too isolated from research activity in game theory. With the help of both Arrow and the economist James Tobin he returned to the United States in 1961 for a professorship in economics at Wayne State University in Detroit. Harsanyi was a visiting professor at the University of California, Berkeley, in 1964–1965, and then in 1965 he accepted an appointment as a professor at the business school there; his appointment was later extended to Berkeley's economics department. Harsanyi stayed at Berkeley for the rest of his life. Harsanyi and his wife became American citizens in 1990; they had one son, who was born in Berkeley.

During 1965–1969 the U.S. Arms Control and Disarmament Agency employed a group of about ten young game theorists—pioneers of the field—as consultants, including Harsanyi. A major problem in arms-control negotiations is that each side is relatively well informed about its own position and attitudes but is poorly informed about those of the other side. In order to cope with this problem, Harsanyi developed his most important contribution to game theory, "Games with Incomplete Information Played by Bayesian players," published in 1967–1968 in three articles in *Management Science*. According to Harsanyi's construct, the uncertainty about the other side is modeled by an initial chance move, which determines the "type" of a participant. Each player knows his own type but has to keep guessing about the characteristics of the others, including what they think about him. This model is the now the workhorse for studying dynamic interactions such as imperfect competition, auctions, and other applications of "information economics." However, Harsanyi was primarily interested in building coherent theoretical systems, and he seems to have been oblivious to the practicality of his ideas.

Harsanyi's earlier work, such as his Ph.D., was in "cooperative" game theory, in which cooperation is taken for granted and the discussion is on how to split the spoils. His games of incomplete information belong to "noncooperative" game theory, which tries to explain the action of individuals solely by their personal motives. Cooperation should arise because it benefits the individual, as Harsanyi strove to explain with models of bargaining, thus trying to bridge the gap between cooperative and noncooperative game theory.

In 1994 the Nobel Prize in Economics was awarded to John C. Harsanyi, John F. Nash, Jr., and Reinhard Selten, "for their pioneering analysis of equilibria in the theory of non-cooperative games." Selten was the only coauthor that Harsanyi ever had, on an article and a book. Their joint work is on selecting an equilibrium, of which there may be many, by means of an adjustment procedure that starts from a prior probability distribution of what the other players may do.

Harsanyi's other honors include fellowships from the Econometric Society (1968) and from the American Academy of Arts and Sciences (1984), as well as several honorary doctorates. His pioneering work was on the fundamentals of human interaction, from a utopian perspective. Personally Harsanyi was shy, extremely modest and gentle, and somewhat frail. He died in Berkeley, California.

Bibliography

Tributes to John C. Harsanyi by other scholars, including five Nobel Prize winners in economics, appeared in *Games and Economic Behavior* 36 (2001): 1–56. These articles contain explanations of his work and a full bibliography. Two collections of Harsanyi's writings are *Essays on Ethics, Social Behavior, and Scientific Explanation* (1976) and *Papers in Game Theory* (1982). For a survey of his utilitarian ethics see John A. Weymark, "John Charles Harsanyi," in the *New Dictionary of Scientific Biography*, ed. Noretta Koertge (2008).

See also

von Neumann, John Louis (1903-1957), mathematician, mathematical physicist, and theoretical economist

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