has been developed in the course of several of my publications, beginning with "On the simplicity of ideas" [*J. Symbolic Logic* 8, 107 (1943)] and including chapter 3, sections 3–7, of *The Structure of Appearance* [Harvard Univ. Press, Cambridge, Mass., 1951]. The most recent articles, and those most closely followed here, are "Axiomatic measurement of simplicity" [*J. Philosophy* 52, 709 (1955)] and "Recent developments in the theory of simplicity," in *Philosophy and Phenomenological Research*, in press.

6. I shall often abbreviate such a locution as "the complexity-value of the kind of basis that consists of one two-place predicate" to "the complexity-value of two-place predicates" or to "the complexity-value of a two-place predicate."
7. A discussion of these will appear in "Recent developments in the theory of simplicity," in *Philosophy and Phenomenological Research*, in press.
8. On this topic, see I. Scheffler, "Inductive inference: A new approach" [*Science* 127, 177 (1958)] and N. Goodman, *Fact, Fiction, and Forecast* (Harvard Univ. Press, Cambridge, Mass., 1955).

Richard Goldschmidt, Biologist

On 12 April 1958, Richard Goldschmidt was 80 years old. He was recovering from a nearly fatal illness which had struck a few weeks earlier. Letters from friends and well-wishers arrived from many lands, praising his achievements as a biologist, a zoologist, and a geneticist, expressing amazed admiration for his continued scientific productivity, and professing warm personal feelings of affection. That birthday, quietly spent with his family, was a happy day in a period of years in which physical pain and fear that the body might force the mind into inactivity were ever-present. Less than two weeks later, on 24 April, the end came.

Richard Goldschmidt's ancestors belonged to respected families who had lived for centuries in Frankfurt am Main. He received an excellent education at the Gymnasium and at an early age decided to become a naturalist. In 1896 he entered the University of Heidelberg where, to use his own words, he "had such glorious teachers as Bütschli, Gegenbaur, Kühne, V. Meyer, Kossel, Rosenbusch." After a short period in Munich under Richard Hertwig, he returned to Heidelberg and obtained the Ph.D. degree in 1902. From 1903 to 1913 he worked and taught in Munich. In 1914 Goldschmidt was selected by Boveri to join him as a member of "the newly founded . . . wonderful Kaiser Wilhelm Institut für Biologie, Berlin-Dahlem." Soon after, for reasons of health, Boveri had to give up his projected move to the Institut. Goldschmidt accepted his appointment, which extended over 22 years; for the last 15 of these he served as a director. In 1936, after the passage of the "Nürnberg Laws," he was invited to join the zoology department of the University of California. "This turned out to be one of the most happy events of my life, crowned by becoming an American citizen in 1942"—thus he wrote in an autobiographical sketch filed, by request, with the National Academy of Sciences in Washington (1948). By then he had, according to American custom, included a middle name in the by-line of his publications—Richard Benedict Goldschmidt.

In Berkeley he taught genetics and cytology for more than a decade and uninterruptedly continued his research for 22 years. Reports on experiments and books on wide-ranging subjects followed one another. Even after his death two papers appeared in print.

Goldschmidt's work covers nearly 60 years of tireless productivity. When, in 1954, he compiled a list of his 17 books and approximately 250 papers, he divided the latter into the following classes: protozoology (1904–07); cytology (1902–50); embryology (1900–35); histology and neurology (1903–10); acrania (1905–33); gynandromorphism (1922–37); intersexuality (1911–51); general sex determination, sex-controlled heredity (1910–53); genetics and evolution (1911–53); genetics: Mendelian analysis and general (1913–54); physiological genetics (1916–52); human heredity (1927–53); biographical, popular science, *varia* (1916–53).

He listed his books under "technical," "textbooks," "popular," and "travel." Among these were such books as *Die quantitativen Grundlagen von Vererbung und Artbildung* (1920); *Mechanismus und Physiologie der Geschlechtsbestimmung* (1920); *Physiologische Theorie der Vererbung* (1927); *Die sexuellen Zwischenstufen* (1931); *Physiological Genetics* (1938); *The Material Basis of Evolution* (1940); *Theoretical Genetics* (1955); *Einführung in die Vererbungswissenschaft* (first edition, 1911; fifth edition, 1928); *Ascaris, eine Einführung in die Wissenschaft vom Leben* (first edition, 1921; third edition, 1953); and *Neu-Japan* (1927). Translations of his books appeared in English, French, Hebrew, Japanese, Polish, Russian, Spanish, and Yugoslavian. His latest volume, the charming *Portraits from Memory, Recollections of a Zoologist* (1956), is in the process of being translated into German. An autobiography went to press this spring.

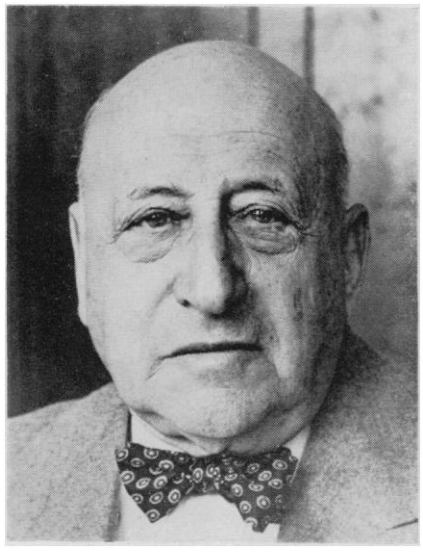
Goldschmidt's influence on the biology of the 20th century rested on observation and experiment as well as on the theory-building sweep of his imagination. His outstanding experimental accomplishment was the long series of crosses between geographical races of the gypsy-moth *Lymantria*. It led to an analysis of the phenomenon of intersexuality which went far beyond the framework of classical genetics. He had early trained himself to be a revolutionary of science. He reached his height in his endeavors to build a dynamic physiological genetics on the static and material basis which Mendel and Morgan had laid, and which he admired, as such, without reservation. He raised his voice in warning of a too ready acquiescence in apparently established concepts of the gene and some widely held genetic interpretations of evolution. He was willing to face the strong opposition to his unpopular ideas, but he lived to see them move into the forefront of contemporary thought.

He lectured before thousands of eager listeners—students, colleagues, men of other professions, and interested lay people—in Europe, America, Asia, and Australia. Three periods which he spent

in Japan were historic events in the history of genetics of that country. Among his students, pre- or post-doctoral, were men and women like Buchner, Rhoda Erdmann, Gardner, Aloha Hannah-Alava, Masui, Minouchi, Nachtsheim, Popoff, Seiler, and Süffert. In a wider sense, the circle of his disciples encompasses biologists everywhere.

Goldschmidt's interests went greatly beyond his "beloved zoology." Until middle age he excelled in various sports. He molded his life after Goethe, and, only recently, he and his wife systematically read again all of Goethe's works. His main avocation was that of a connoisseur and collector of art. The home which he and Mrs. Goldschmidt created became a treasure house of paintings, statues, and other objects, each of which had been acquired with love and insight. The art of the Orient was his particular area of pleasure and understanding. The many visitors whom Mrs. Goldschmidt and he welcomed gained lasting impressions from these occasions.

The life of Richard Goldschmidt was woven into the framework of his time. As a young man he served in the army of his native country. When World War I kept him in the United States, where he had come from Japan, he at first enjoyed the hospitality of American scientific institutions, but, when America entered the war, his professed loyalty to Germany led to his internment as an enemy alien. When, in 1919, he returned to the Kaiser Wilhelm Institut, he soon rose to a commanding position among the great scientists who upheld the tradition of intellectual achievement of their country. When that tradition broke, in 1933, he had to prepare to leave Germany, to build up anew his life's activities, and to take root again in a different country. Bitter, he resumed his tasks at the age of 58. His reception in America, though warm in a personal way, was cold, scientifically. The breadth of his biological wisdom was appreciated little, and the iconoclasm of his views was regarded as the irritating fancy of a man



Richard Goldschmidt

of the past. But slowly recognition came again. Following the numerous honors which had earlier been Richard Goldschmidt's share, his election to the National Academy occurred in 1947, when he was 69 years old. In 1950 the Genetics Society of America celebrated the "Golden Jubilee of Genetics," and Goldschmidt was asked to give the opening address. The Cold Spring Harbor Symposium on Genes and Chromosomes, in 1951, chose him as the first speaker. In 1953 he was elected president of the 9th International Congress of Genetics in Bellagio.

A reconciliation came in his attitude to Germany. He had never broken the bonds of personal friendship, and he and his wife had sent many CARE and other packages to the devastated postwar country. While he could not bring himself to visit his homeland again, he was willing to accept, on the occasion of his 75th birthday, honorary membership in the Deutsche Zoologische Gesellschaft and an honorary degree from the Freie Universität Berlin. And in his last year he addressed a German audience when he spoke, with his Frankfurt accent, over the Süddeutsche Rundfunk on "Aus der Geschichte der Vererbungswissenschaft."

He never attained old age. He could have been the grand old man of more than a half century of biology—and yet he never was given that retrospective title. People corresponded with him and visited him as the contemporary leader.

He knew his worth—how could he help it! He openly, and with relish, leveled his critique against those whose views he opposed. Only a few years ago he chose the pungent title "Pricking a bubble" for a polemic. But he could also write about his nonconformist views under the modest title "Evolution, as viewed by one geneticist." He charmed his adversaries, when he met them in person, with his ability to divorce the intellectual points of divergence from the appreciation of the fellow scientist. He inspired awe by his achievements and by his often forbidding appearance. Yet his kindness and solicitude became apparent to those who approached him. His assistants he treated as fellow scientists. To his friend the late Oberpräparator Aigner, he dedicated a paper in *Naturwissenschaften*. "In Ph.D. examinations," one colleague wrote him, "we depended on you to bring forth the most favorable side of the candidates' performance, and I always thought of you as the aspiring students' 'Advokat.'" Another letter read: "How impressed I was [on the boat to Stockholm in 1948] with your thoughtful interests in us young unknowns!!" "The guardian angel of the small people" he was called in 1927.

Richard Goldschmidt made his existence into a work of art. It had the classical features of comprehensiveness, depth, and achievement. It had the modern features of expressionism where emphasis broke the bounds of beauty conceived too narrowly. Like any mortal, he did not attain perfection—nor did he aspire to it. Like few mortals, he achieved greatness.

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Note

This biographical sketch appears simultaneously in *Experientia*.