SCIENTIFIC IDEALISM

By Kenneth M. Gould

WE have been surfeited with autobiography of the great and the near great. This Freudian itch for self revelation seems to attack

with special malignancy the successful immigrant, and perhaps not without warrant. For the mutual impact of two diverse cultural traditions renders incandescent, like the cathode rays in a Crookes tube, elements invisible in either alone. Michael Pupin's Serb background is more fruitful of this contrast than Edward Bok's Dutch, if not so much so as Ludwig Lewisohn's German Jewish. But Pupin is far more kin to Bok than to Lewisohn in the sheer *savoir-faire* of his American rise. He had the profitable faculty of getting acquainted with "the best people". He had the fundamentally American virtues of industry, optimism, individualism, nationalism, and adaptability. He took things as he found them — the Franklins, Hamiltons, and Lincolns of American political legend, the Vanderbilts, Rutherfurds, and Carnegies of American plutocratic fact. Neither Tolstoyan pacifism nor Marxian economics could divert him from the lodestar of tangible physical science. That Pupin should be for forty years *persona grata* with the president and trustees of Columbia University is as natural and explicable a phenomenon as the opposite condition of a Sinclair and a Lewisohn.

From his graduation day in 1883 (he completed his naturalization the day before), nine years after he landed at Castle Garden without friends or money, Pupin's success was assured in whatever academic branch he should elect. He had the choice of fellowships in letters and in science, and one of his cronies in the greenhorn factory days — Bilharz, a German anti-materialist — had steeped him in a love for Gregorian chants and Homeric poetry. Had Pupin chosen the Olympian path, the world would have lost a brilliant physicist and gained perhaps an indifferent classicist. For, while the poetry of science radiates from his pages, his style has few flashes of creative art. It is verbose, at times tediously repetitious. The best passages are the narratives of Idvor, his native Serbian village, and of his early struggles in the New World.

The direction of Pupin's scientific bent was determined at Cambridge and Berlin, through contact with a few great personalities, some of them already dead: Faraday, Tyndall, Clerk-Maxwell, Helmholtz, Lagrange. It was his yearning over the question "What is light?" that finally brought him to the feet of Faraday, as interpreted by Maxwell in Britain, Helmholtz in Germany, and initiated him into the mysteries of electromagnetism. From it he passed to the study of Hertzian waves, upon which Marconi based his researches, paving the way for contemporary radio art. These varied aspects of the cosmos found their ultimate *raison d'être* in the "new" or electron physics of which Thomson and Rutherford at Cambridge are the world's leading exponents — the theory that all matter is composed of particles of positive and negative electricity circulating at incredible speed. Electronic theory has permeated every phase of physical science today. In a high vacuum tube it led to the X-rays of Roentgen. In substances like uranium and thorium it taught Madame Curie the secret of radioactivity. In the gravitational pull of the sun on starlight, it gave Einstein a clue to the general relativity theory.

Pupin was intimately connected with all this development of the past thirty years. Many of its principles in the electrical field he deduced and first applied. He invented an electrical "resonator" for adjusting the capacity

of a condenser to varied frequencies — the direct ancestor of the tuning knob on your fireside radio. He made the first X-ray photographs for surgical use in America by a shortened exposure process which he never patented. The Pupin inductance coil which made possible cheap long distance telephony he sold to the American Telephone and Telegraph Company, while the Marconi Company bought the rights to his wireless inventions.

"The main object of my narrative", says Dr. Pupin, "is to describe the rise of idealism in American science." By *idealism* he means the motive which informs the work of the "pure" scientist, in distinction from the commercial or applied; which built the Cavendish Laboratory at Cambridge and the pioneer American research centre at Johns Hopkins; which gave America men of the true lineage of Newton and Faraday in Henry, Gibbs, and Rowland. In an age when technology is in the saddle and the plaudits of the crowd go to the Edisons and the Bells — while the men whose patient digging out of theoretical mathematics, mechanics, and electricity was the essential prelude to the great inventions are forgotten — Pupin still holds aloft the banner of truth for truth's sake. In his own person he unites both sides of the shield, and the world is slowly coming to realize that the line between them is imaginary. The birth of the National Research Council and similar events give color to the hope that before long society will consciously share its surplus with research in "pure" science. For his sturdy championship of that ideal, Michael Pupin deserves his place among the immortals.

From Immigrant to Inventor. By Michael Pupin. Charles Scribner's Sons.