Book Reviews

Oswald T. Avery

The Professor, the Institute, and DNA. RENÉ J. DUBOS. Rockefeller University Press, New York, 1976. x, 238 pp. $14.50.

During a remarkable career devoted to the study of pneumococcus, the bacterium causing lobar pneumonia, Oswald Theodore Avery made several discoveries of the utmost significance concerning the chemical basis of biological specificity. He was the first to show that substances other than proteins possessed specificity when, with Michael Heidelberger in 1923, he demonstrated the antigenicity of the polysaccharide in the pneumococcal capsule. In fact, in the days before antibiotics, the antiserums Avery helped to manufacture against the several types of capsular polysaccharide were a principal means of combating pneumonia. In 1944, capping an already richly productive career, Avery showed, with Colin MacLeod and Maclyn McCarty, that DNA possessed genetic specificity insofar as it was the substance responsible for hereditary transformation of capsular type. This discovery can truly be said to have opened the race to the double helix.

Yet Avery never received a Nobel Prize, a failure that has often invited speculation. Two recent explanations—that Avery was unaware of the broad significance of his discovery concerning DNA, and that the discovery itself was premature in that Avery's contemporaries did not appreciate its fundamental importance—are effectively scotched in this perceptive book by René Dubos. We are left with the simple but reasonable explanation that the Nobel committee, like all human institutions, is not infallible in its judgments.

Dubos was especially well equipped to write Avery's biography. Not only was he once a member of Avery's department at the Rockefeller Institute for Medical Research (now Rockefeller University), he also helped Avery directly at one stage by finding an enzyme secreted by soil bacteria that was capable of digesting the polysaccharide of type 3 capsules. Dubos is clearly a great admirer of Avery (as indeed seem to be all the persons who worked closely with him), and this biography is written not only with the lucid style we have come to expect in Dubos's books but with a wise and sympathetic understanding of an unusual man.

A bachelor, "Fess" (short for Professor) Avery could be socially charming and gracious, on the one hand, and resentful of intrusion into his privacy, on the other. An articulate and witty speaker, he came to eschew occasions for giving lectures, particularly of the formal variety. He refused honors when they would take him far from his laboratory: on fairly flimsy pretexts he refused to go to Germany to receive the Paul Ehrlich Gold Medal in 1933, to Cambridge University for an honorary degree in 1944, or to the Royal Society of London for the Copley Medal in 1945. When Avery retired in 1948 to Nashville, Tennessee, in the vicinity of his younger brother Roy, he quietly withdrew from the world of scientific affairs he had known to become, as it were, a country gentleman.

Until now we have had precious little information about Oswald Avery, except for his extraordinary scientific creativity. Avery probably preferred it that way. But now, thanks to Dubos, the veil of mystery has been pierced. We have access in Dubos's book to Avery's upbringing as the son of Baptist missionaries to New York's Bowery, to the years of changing interest from religion and humanities to scientific medicine, and finally to the ideas of Avery as he tested them on his colleagues in research and as he expressed them with greater finesse in his reports to the directors of the Rockefeller Institute.

The Institute emerges as a second hero of the book. Dubos draws a wonderful picture of what the Institute was like at its founding and in the exciting years (of Loeb, Van Slyke, Rous, Levene, and Landsteiner) that led up to the present university. The Institute proved a most congenial place for a person with the personality and talents of Oswald Avery: committed to helping the ill but impatient with any but a scientific approach to knowledge, Avery flourished in the medically oriented but scientifically heady atmosphere of the Rockefeller Institute. There he gained the chemical expertise, often through the collaboration of the experts who always seemed to be around, that enabled his subsequent successes with problems of which no one appreciated the profound significance better than he. Perhaps only at the Institute could a medical microbiologist make such a stunning contribution to the rise of molecular biology. A biographical study of Avery was long overdue, and we can be grateful to have this very good one at last.

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Regulation of Cell Growth

Multiplication and Division in Mammalian Cells. RENATO BASERGA. Dekker, New York, 1976. xiv, 240 pp., illus. $22.50. The Biochemistry of Disease, vol. 6.

Caveat emptor. This book is apt to charm the reader into believing that all is well in the study of mammalian cell multiplication, in that the major outlines for explaining the control of that multiplication are established. The book opens by noting that modern biology began with the discovery that deoxyribonucleic acid is the stuff of which bacterial transforming principle is made. Few would argue with the thesis that the molecular biology of the gene has been the most prominent theme of biological investigation in the past two decades. There are, however, phenomena to which it has little immediate relevance: quick metabolic responses to hormones, transmission of the nerve impulse, the mechanism of enzyme action, the control of transport. In other areas, where the lines are less clearly drawn, there is a great temptation to borrow explanations (and explainers) from that dominant big brother, molecular biology. The regulation of cell growth is an example. It seems natural to think of cell multiplication in terms of DNA and to think of other aspects of cell growth in terms of RNA and protein. The author makes his position clear when he states that the book "deals only with cellular processes strictly connected with the flow of cells through the cell cycle" and that "metabolic activities