Book Reviews

The Events at Dayton

The Great Monkey Trial. L. SPRAGUE DE CAMP. Doubleday, Garden City, N.Y., 1968. xiv + 538 pp., illus. $6.95.

This broadly inclusive, thoroughly documented narrative of the trial of John T. Scopes in Dayton, Tennessee, in July 1925 for violating the Tennessee "anti-evolution law" is without doubt to be rated as the definitive account of that episode in the cultural evolution of mankind. It is written in dramatic style with a flair for the "human interest angle" and is right in the middle of the truth-is-stranger-than-fiction category. It includes the events that led up to the trial, the curious atmosphere of bigotry, ignorance, and fear that spawned the legislation, the extravaganza of the trial itself, and its aftermath, with respect both to the lives of the principal participants and to the anti-intellectual crusade of which it was a part.

There are numerous interesting details not found in any of the half-dozen books previously written on the subject. These range in revelance from the smudge of soot on William Jennings Bryan's nose when he first arrived in Dayton and the flapper-style rolled stockings of Judge John T. Raulston's daughters to the death of the last of the jurors in 1966 at the age of 84.

De Camp deals adroitly with the fantasies and lurid exaggerations of such reporters as Henry L. Mencken and resolves most of the inconsistencies and contradictions in the spate of journalistic accounts in the contemporary news media. His reliance for the truly important facts was upon the official record of the trial in the Rhea County courthouse, the archives of the American Civil Liberties Union, and personal interviews with surviving participants and spectators in 1965 and 1966. So far as I can check his factual statements by my own recollection—I was in Dayton for only five days at the end of the trial—he is an impeccable and trustworthy historian.

In only one place did I find a statement that might possibly be misleading. On page 420, de Camp reports correctly the question raised by Attorney General A. T. Stewart concerning Judge Raulston's announced intention to assess a fine of $100 should the jury find Scopes guilty and not recommend a heavier fine. By way of explanation of Stewart's interruption of the judge, de Camp then adds: "He referred to" the article in the Tennessee constitution which forbids that particular procedure. That reference may well have been in Stewart's mind, but it was certainly not voiced in the courtroom; had it been, the lawyers for the defense would have been alerted to that obscure and unusual point of Tennessee law and would surely have done their best to prevent the judge from making the technical error that later permitted the State Supreme Court to thwart their plans to test the constitutionality of the "anti-evolution law" in the U.S. Supreme Court.

The extensive, painstaking, and obviously time-consuming research that undergirds this superb bit of historical writing is worthy of the highest commendation. The book is a significant contribution to the social sciences, although it avoids the jargon of those disciplines, and is a worthy source book for the historian of the life sciences. There are, however, more typographical errors than I would have expected in a Doubleday book. Most of these are obviously errors, but a couple of them that involve me are not. I was interviewed on 28 May 1965, not 1925 as stated on page 506 (the correct date is given twice on page 512); and my essay "Geology and Genesis" (it is "and," not "or") listed on page 521 was published in 1964, not 1954.

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Describing Particle Reactions

The Theory of the Scattering Matrix for the Interactions of Fundamental Particles. A. O. BARUT. Macmillan, New York, 1967. xiv + 350 pp., illus. $13.95.

The attempt to make a self-contained theory of particle reactions based on the *S*-matrix has occupied a large number of theoretical physicists for a long time. In spite of the great conceptual charm of this program, progress toward the ultimate goal has been distressingly slight. What has become clear along the way, however, is that whether or not independent machinery, such as quantum field theory, is needed to calculate the *S*-matrix, it evidently is a uniquely convenient language for discussing elementary-particle physics. For that reason, a book such as this one, which describes the properties of the *S*-matrix and how one attempts to make calculations with it, should be very useful.

The most successful and, in my opinion, the most useful part of the book is what one might call the study of the kinematic properties of the *S*-matrix. The dependence of a reaction amplitude on momenta and spins is determined in large measure by Lorentz invariance. To write down the correct forms for particles with spins greater than one-half is not a trivial task and requires a relatively powerful machinery derived from the properties of the Poincaré group. Barut's development of this machinery is elegant, intelligible, and complete. The pesky questions of zero-mass particles and gauge invariance are also given a proper airing. Indeed, after a study of the chapters in question one feels fully armed against the rigors of the kinematics of general particle reactions.

The next step in the development of a theory of the *S*-matrix is the establishment of the properties of analyticity and their connection with unitarity. Unitarity requires the presence of singularities which are directly connected to the scattering properties of physical states. If there are no other singularities, one can write down dispersion relations of various kinds which are essentially consistency conditions on *S*-matrix elements. The derivation of dispersion relations in a single variable is carried out in this book in a compact but intelligible fashion, and the important Mandelstam conjecture of double dispersion relations is introduced. From the pedagogical point of