

BOOKS & JOURNALS

A SPECIAL REPORT

European physics in America

Illustrious Immigrants: The Intellectual Migration From Europe 1930-41

By Laura Fermi

440 pp. U. of Chicago Press, Chicago, 1968. \$7.95

The Intellectual Migration: Europe and America, 1930-1960

Donald Fleming, Bernard Bailyn, eds.
748 pp. Harvard U. P., Cambridge, Mass., 1969. \$12.95

Reviewed by HARRIET ZUCKERMAN

Between 1930 and the beginning of the second world war, some 600 000 immigrants made their way to the US. More noteworthy than their numbers was the variety and concentration of talent in the group. Albert Einstein, Arturo Toscanini, Thomas Mann, Paul Tillich, Bela Bartok and Jacques Lipschitz were only some of those whose reputations were already made before coming to America. There were also younger men, then relatively obscure, who were to shape the intellectual environments of their fields. The ways in which they did so and their experi-

ences in the new world are examined in two books, Laura Fermi's *Illustrious Immigrants* and the collection edited by Donald Fleming and Bernard Bailyn, *The Intellectual Migration*.

Both books address themselves to much the same questions but differ in the strategies they adopt to answer them. Mrs Fermi's book is a survey of accomplishments of the immigrants, numbering 1900, she considered intellectuals. In covering such diverse fields as architecture, biology, art history, mathematics, psychoanalysis and physics, she is more interested in identifying the immigrants' achievements than in analyzing their substance. As a member of the immigrant community and as biographer of her husband, Enrico Fermi, and of Mussolini, she is personally and professionally suited to the task. And she takes it seriously indeed.

Fleming and Bailyn, both Harvard historians, take a different tack. Rather than attempt systematic coverage of the immigrants' contributions, they seek instead to identify the immediate effect of the personal presence of the émigrés through three types of accounts—memoirs of individ-

ual participants, portrayals of groups by expert observers and more thorough appraisals of contributions to particular fields. Each essay explores a distinctive feature of the immigrant episode, for example, the reestablishment of European physics in America, the impact of physicists on the emergence of molecular biology, the confrontation between European psychoanalysis and American empirical research in psychology and the later history of the *Wiener Kreis*.

If these volumes differ considerably in strategy and style, they do, as I noted, converge on many of the same issues. Four of these issues are worth commenting on here. First, what social and cultural conditions made for the efflorescence in European thought in the 1930's and for the disaster that followed? Although Mrs Fermi's comments are made in passing, Peter Gay, acknowledged expert on Weimar, brilliantly addresses himself to this question in his portrayal of the period between the wars when "outsiders" took center stage in German culture.

Second, did social processes operate so as to make members of the immi-

IMMIGRANTS at Los Alamos in 1943. Left to right, Emilio Segrè, Enrico Fermi, Hans Bethe, Hans Staub and Victor Weisskopf. Seated are Erika Staub and Elfriede Segrè.



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grant group more able and more adaptable than those who remained behind, or were they no different from the rest? Mrs Fermi asserts that immigrants were more suited to the rigors of migration and Charles Weiner shows, in his examination of the physics community, how criteria of scholarship and personal capacity were applied in decisions on which scholars were to receive aid. Weiner notes with no little irony that, for younger scholars, not to have published was to perish.

Third, would the immigrants' achievements have been of the same quality had they remained in Europe, even if the war had not occurred? Although it is impossible to answer questions of this sort, they do lead one to identify the conditions in the US that facilitated work for the émigrés and the ones that stood in their way. And last, what sorts of adjustments, personal and intellectual, were required for the émigrés and to what degree did these vary according to their fields and scholarly dispositions?

These volumes might best be examined in tandem for their differences make them complementary. Where Mrs Fermi explicitly asks, for example, how much immigrant physicists contributed to the winning of the war (a great deal, she reports; but they were by no means responsible for radar, the war's most important technological development), Szilard's memoir, full of his characteristic wit and robustness, covers similar territory from the perspective of a participant. The difference between the two is a difference in angle of vision and knowledge. Even in physics, Mrs Fermi is an outsider, and this defect becomes especially pronounced in her treatment of psychoanalysis. She has, it appears, little or no familiarity with the development of psychoanalytic thinking in the US, which leads her to overemphasize the establishment of analytic institutes at the expense of intellectual substance. Major figures in American psychoanalytic theory, Heinz Hartmann or Ernst Kris, for example, receive little attention in her lengthy chapter on the analysts.

At the same time, she does rather well in other fields. At the expense of being parochial, I can testify that the section on my colleague, Paul Lazarsfeld, is both succinct and correct. One misses the intimacy of his own memoir in the Fleming-Bailyn collection and his account of the es-

tablishment of large-scale social research in America, but Mrs Fermi's treatment is competent enough for her purposes.

Each volume then succeeds in its own way. Mrs Fermi's is the more comprehensive and superficial, the less subtle and luminous. She has, however, made an effort to bring together materials that exist nowhere else and to juxtapose them so as to reveal patterns that would otherwise be invisible. For this, we should be grateful. Where Mrs Fermi's work is earnest and responsible, several essays in the Fleming-Bailyn volume are dazzling, both in their scholarship and their literary grace. Collections of this sort are inevitably uneven in quality, but Fleming's own piece on the role of physical thinking in the development of molecular biology more than compensates for some of the more routine companion papers. Even physicists who have followed the emergence of molecular biology should learn some-

thing new on the contributions by Bohr and Schrodinger via the onetime physicist Max Delbrück, now Nobel laureate and patron saint of the "Phage Group."

Appended to Weiner's paper on the physicists are reproductions of several documents of considerable historical interest: the most striking is from *The Manchester Guardian* (May, 1933) listing, day by day, the names of German professors dismissed from their posts. It is a chilling reminder of those days.

The Fleming-Bailyn book has already been celebrated by several prizes, and Mrs Fermi's book has received good notices as well. Physicist readers should find both deserving of their attention.

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Topics in Atomic Collision Theory

By Sydney Geltman

247 pp. Academic, New York, 1969.
\$13.00

Atomic physics, that staple of sophomore physics courses, remains incompletely understood despite more than a half century of study. True, we do possess the laws of interaction between the electrons and nuclei composing atoms, laws that we lack in more recently accessible energy domains. But the practical difficulties that impede our understanding of any many-body system are present in atomic physics as in other areas.

We are forced to rely on approximation schemes in computing cross sections for collisions between even the simplest atoms. Continued refinements of experiments and computational techniques permit us to probe ever finer details of collisions, and it is a continuing task for theorists to provide adequate formalism for atomic-physics calculations.

Motives for refining the theory of atomic collisions are not hard to find. Atomic physics *per se* continues to interest many people. Astrophysicists seek more accurate rate coefficients to use in constructing more realistic models of astronomical gases. Still others are concerned with excitation and ionization phenomena in the earth's at-

mosphere (a euphemism for study of ballistic-missile reentry).

The present book examines selected aspects of the quantum mechanics of binary encounters between nonrelativistic particles. Specifically, it discusses scattering of a spinless particle from a real potential (part 1), scattering of electrons by hydrogen and other atoms (part 2) and atom-atom collisions, including rearrangements (part 3). As the book title suggests, this is a collection of topics taken from the very large and rapidly growing domain of atomic physics; it is not intended to provide either a complete discussion of atomic collisions (as was earlier done by N. F. Mott and H. S. W. Massey, *Theory of Atomic Collisions*, Cambridge U. P., 1965) or a compendium of results (as has been recently published by B. L. Moisewitsch and S. J. Smith, US Government Printing Office, NSRDS-NBS 25).

The selection includes major standard topics, such as the analytic behavior of potential scattering amplitudes, the continuum Hartree-Fock equations for electron-atom scattering and the Landau-Zener curve-crossing model for atom-atom collisions. Both the choice of topics and the presentation reflect the origin of the book as a course of graduate lec-