Book Reviews

Dramatis Personae

Lawrence and Oppenheimer. NUEL PHARR DAVIS. Simon and Schuster, New York, 1968. x + 384 pp. $7.50.

As we approach the 25th anniversary of Hiroshima, the time span that symbolically marks the passing of a generation, it is appropriate to look at how the event itself and its complex repercussions are recorded for posterity. Not that this will constitute the final story. There will be the inevitable revisionist periods when reliability of witnesses is challenged and new evidence garnered from the vast technical literature and the voluminous official record. But however the historiography of the bomb develops in years to come, and whatever the shape that events may have for, let us say, our descendants in the 22nd century, the corpus of testimony and interpretation now assembled will form a special category of nearly contemporary evidence to which chroniclers of the period must pay particular attention.

What do we have? Very few books thus far from the professional historians whose job it is to evaluate evidence, but these few include excellent accounts of British and American nuclear developments through 1945 and 1946: Margaret Gowing's *Britain and Atomic Energy,* and Hewlett and Anderson's *The New World,* both so distinguished as to disarm the criticism usually leveled at official histories. Fine scholarly work has been done on early "atomic diplomacy," and the abortive discussions of international control and the more productive negotiations for a nuclear test ban treaty have been carefully studied.

The classic Smyth report and S. A. Goudsmit's *Alsos* show how successful scientists themselves can be as narrators of events, but they have had no successors. Only a few participants have recorded their experiences in perspective. Circumstances inhibit the flow of memoirs. The pace and secrecy of wartime work, as well as censorship of mail and the official ban on journal keeping, reduced the volume of contemporary personal records, and what did exist in office files of Manhattan Project workers was commandeered at the end of the war and consigned to government repositories, where it remained for a time unsorted and is to this day not freely accessible. Only retired people with special status in the project such as A. H. Compton, General Groves, and Vannevar Bush have had the time and temerity to surmount these barriers and turn historian.

The novelists who have tackled the subject are few in number, and their efforts, with the exception of Dexter Masters' *The Accident,* have been signally unsuccessful. Failure to catch the idiom of scientists' thought and speech has been their main fault, but they were handicapped from the start in that the actual events were so fantastic and so fanciful that writers in an age of literary realism could scarcely hope to make fiction compete with fact.

It is perhaps for this very reason that the journalists have thus far dominated the field of atomic history. Indeed, the subject has been a journalist's dream—world-shaking impact, vivid personalities, novelty, terror at times, and implications for almost every field of human endeavor. They have produced some splendid first-hand reporting, and the term "journalistic," so often used to denigrate, may be a compliment in the field pioneered by William L. Laurence's New York *Times* story of the Alamogordo test and further explored by Daniel Lang's articles in *The New Yorker.*

As historians between hard covers, the journalists have been less consistently successful. Some have embraced untenable theses, such as Robert Jungk's claim in *Brighter Than a Thousand Suns* that moral scruples kept German scientists from developing an atomic bomb. Some have distorted their stories for sensational effects, as Lansing Lamont did in giving Klaus Fuchs so prominent a place in *Day of Trinity.* At least one good book, Stephane Groueff's study of the engineering side of the Manhattan Project, is marred by a too facile style. But on the whole the journalists' books represent an impressive amount of conscientious research. By looking for newsworthy topics they have rescued from oblivion important material that the professional historians would have neglected till too late. They have recorded reminiscence and dialogue that would never have been caught by oral-history projects. They have exposed the general reader to a lot of simplified science and technology. And through their interest in individuals they have effectively dispelled any nonsense about scientists' being inhuman automata.

Some readers are bound to feel that with Nuel Pharr Davis' *Lawrence and Oppenheimer* this process of humanization has gone too far. Although the author is not a journalist but a university English professor of 20 years' standing his book invites comparison with this category of writing for a number of reasons. He is more concerned with situations that represent tension than with providing the historian's, or the biographer's, mass of factual detail. He has looked for, and found, much hitherto unpublicized raw material of human relationships—unacknowledged antagonisms, roots of future bitterness, and suspected power plays. He is careful to relegate to occasional footnotes and a glossary any facts that might allow the reader's attention to lag. And finally, although Davis has made wide and meticulous use of printed documents—he cites no classified material—he relies heavily, as a journalist does in day-to-day reporting, on verbal statements. The perils of recollected history are obvious, in this case the distortions introduced by years of rationalization and of reading and listening to others, but Davis has used the method well. His success lies in the authenticity of the dialogue on which his story is so largely based. However he got it, on tape, by shorthand, or by skillful note-taking, it is almost always credible, and in some cases, in fact, nostalgically evocative.

Lawrence and Oppenheimer is an interesting exercise in dual biography, covering the quarter century during which the lives of these men touched one another and concentrating on that segment—a vital one for them both—where their professional paths, their

policies, and their personalities overlapped and interacted. Everyone recognized the two as natural opposites, representing different styles in science, different styles in leadership, and different attitudes toward politics. But the general public, and even many professional colleagues, did not think of them as antagonists in a direct confrontation as they did of Oppenheimer and Teller. Davis takes a different view. Developing the theme of a once-active professional friendship that failed to put down roots, of uneasy wartime collaboration, followed in the ensuing decade by gradually sharpening disagreement on every major policy decision where science was involved, he brings the relationship to a bitter climax.

According to Davis' thesis, it was over the biggest of Lawrence's big machines, the Materials Testing Accelerator, built between 1947 and 1950 and stubbornly opposed by Oppenheimer as Chairman of the AEC's General Advisory Committee, that the battle was finally joined. The MTA episode has had little public notice, and acceptance of Davis' thesis will rest to a large extent on whether he has described it fairly. From then on, Davis charges, Lawrence felt implacable anger against Oppenheimer which he communicated to most of his associates at Berkeley, who joined him in 1954 in bringing about the withdrawal of Oppenheimer's clearance. Davis' assignment of responsibility for this decision is far more general, and therefore perhaps more plausible, than theories that make villains of Strauss or Teller. Davis has a good deal to say about the coterie surrounding Lawrence. He says little about the wave of support for Oppenheimer that swept the scientific community. It might have been worth noting that with all his articulate defenders, which included both distinguished and devoted friends, Oppenheimer never managed, in fact characteristically did not try, to mobilize them into the effective task force that Davis sees as operating out of Berkeley.

The story closes with Oppenheimer's security hearings, which ended "his strong, often successful seven-year endeavor to turn the country to sane nuclear courses." The aftermath of Chevalier's writings Davis dismisses as "clamorous but insignificant." The investigation must, he says, be put into "its proper, dismally small perspective in order to gain any comprehension of Oppenheimer as a scientist, American, or human being." He might have added that nothing helped this process more than the dignity with which Oppenheimer accepted this change of fortune. "Spent behind his blank wall," Davis continues, "he saw Lawrence dominant. [The] Fermi award and the Sylvanus Thayer award together amounted to the greatest recognition ever given to a scientist by the government. Lawrence dictated appointments at will to the governmental scientific establishment. . . ." But the strain, and waning success with the big machines, took its physical toll from Lawrence. "By 1956 he too was spent. No longer imperious, he became the philosophical master tinkerer again who had long ago inspired graduate students at Berkeley."

Oppenheimer outlived Lawrence by 11 years. His own Fermi award was to have been presented by President Kennedy in early December of 1963. I chanced to see Oppenheimer the day after Kennedy was shot. He read one sentence from the brief acknowledgment he had prepared: "I think it is just possible, Mr. President, that it has taken some charity, and some humor, and some courage for you to make this award today." Accepting the award from President Johnson ten days later, he no doubt had in mind more than the changed circumstances when he mentioned only charity and courage.

Davis has ordered his copious material with considerable skill, integrating new anecdotes with old and interweaving his double themes by showing what Oppenheimer was doing while Lawrence holds the stage and vice versa. His minor figures—many of them major ones in the total picture—move in and out with their memories and their afterthoughts. Character is often summed up in an apt phrase or two that will delight constant readers of the atomic energy saga, but there are also instances where a few sharp words from Davis or one of his informants throw a whole career out of focus.

Some familiar episodes acquire new dimensions. The known facts of Oppenheimer's selection as director of the bomb project are supplemented with gossip about alternative appointments. As Groves himself has already revealed, he wanted Lawrence but feared that the electromagnetic project (which in the end produced less uranium-235 than the other processes) would collapse without him. It is interesting to speculate what Los Alamos would have been like with so different a personality at the helm. But the chief modification of the Los Alamos legend is an account of Seth Neddermeyer's work on implosion and his initiating role in what later became known as the Christy bomb. The description of how the hunches stirring in Neddermeyer's mind gradually fell into place is very good, though if Davis is correct about Oppenheimer's sensitive understanding of Neddermeyer's problems, as one nonadministrator dealing with another, it is not entirely clear why Neddermeyer is among the dissenters on Oppenheimer's qualities as leader.

But the novelty of Davis' story relates chiefly to Lawrence, whom he pictures first at Yale, then at Berkeley, as matching his physical vitality and drive with an intensive concentration on certain goals in physics research and professional advancement. One story from the New Haven period escaped Davis. A fellow graduate student was discussing with Lawrence their respective futures. "I'm going to hit the glory road," said Lawrence. His friend looked puzzled. How did that fit the academic career that Lawrence planned? Lawrence explained: "That's where you get praised for your fame and you don't have to teach freshmen." The section on the growth of the Berkeley laboratory and of Lawrence's influence makes good reading, but it is laced with controversial judgments, made or implied, about Lawrence himself, the nature of his leadership, and more particularly about M. Stanley Livingston's dormant claim to a share of the credit for invention of the cyclotron.

Wherever the author's sympathies lay when he commenced his study, they were clearly with Oppenheimer when he finished it. But this is not the only reason the book seems so much harder on Lawrence. Oppenheimer's weaknesses have been mercilessly exposed so many times, whereas Lawrence's motives and actions, though often the subject of private comment, have never before been subjected to unsympathetic public scrutiny.

Lawrence and Oppenheimer, one must conclude, is a perceptive and at times shocking book. For some the shock will come from what they deem to be harsh judgments; for others in the frank portrayal of power struggles between onetime friends and colleagues. It is the public discussion of these things which may alarm older readers, cherishing the genteel tradition in personal and professional relationships. As in other contexts today, such as race relations or student-faculty confrontations, it is the ability to accept the open parade of raw human emotions that so often divides the gen-

erations. *Lawrence and Oppenheimer* will hurt and outrage many people. It may be some time before the scientific community makes its collective judgment upon the accuracy and justice of this book.

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Reproductive Processes

Reproduction in the Female Mammal. Proceedings of the 13th Easter School in Agricultural Science, Nottingham, England, 1966. G. E. LAMMING and E. C. AMOROSO, Eds. Plenum, New York; Butterworths, London, 1967. xii + 583 pp., illus. $32.

Biology of Gestation. Vol. 1, The Maternal Organism. N. S. ASSALI, Ed. Academic Press, New York, 1968. xiv + 507 pp., illus. $27.

It is a natural and generous impulse of participants in a successful multidisciplinary conference to wish to communicate the stimulus of the experience to a larger audience. It is, however, a very difficult thing to accomplish, for the spontaneity and nuances which are of the very nature of such conferences are largely lost when the transcript is "smoothed" into acceptable form for publication. Lamming and Amoroso, the editors of *Reproduction in the Female Mammal*, have overcome many of the difficulties of their assignment and have brought the proceedings into book form with unusual speed. The accomplishment is well worth the effort it doubtless cost them, for they have avoided the outmoding of data which is still another pitfall for editors of proceedings.

The 28 essays, grouped into seven large categories, are reproduced as formal papers without interruption. Each is immediately followed by the comments made upon it in discussion. Each comment has been cast as a single short paragraph with the essayist's reply beside it. Much of the color lost through this formal method of reporting is restored by Amoroso in the concluding chapter, "Symposium in perspective." This chapter transcends the usual "closing remarks" in that Amoroso, with his accustomed kindly wit and urbane philosophy, synthesizes the material presented throughout the four days of the conference as well as summarizing it. One obtains a sense of the vigorous expressions of opinion which enlivened the meeting and catches some of the sparks generated by nascent ideas and enthusiastic championship of new concepts. Amoroso does not hesitate to note that, to some extent, the symposium sacrificed depth for the sake of expanse, but he recognizes the inevitability of this when so broad a topic is covered in so short a time.

Although the scope of the conference was indeed disconcertingly broad, individual essays are specific and down to earth, in large part reporting, with appropriate background, the work of the essayist and his associates. For potential readers wishing to know what they may expect to find in a book with so all-embracing a title, the seven categories into which the presentations were grouped may be listed: Hypothalamic Control of Reproductive Processes; Separation, Purification and Immuno-Assay of Gonadotrophins; Cyclic Variation of Gonadotrophin Secretion and Release; Comparative Aspects of Reproduction in Poultry; Interrelationships between the Pituitary Gland and the Corpus Luteum; Artificial Control of Reproduction; Hormonal Control of Uterine Reactions.

It can be seen that endocrinology, in its physiological and pharmacological aspects and particularly the currently active field of neurological-endocrinological relations, was the focal point of the symposium. The 160 participants represented countries throughout the world. Academic affiliations were largely to institutions of veterinary medicine and animal husbandry, with faculties of human anatomy, physiology, biochemistry, and pharmacology also represented. Sheep, swine, cattle, and poultry led among the experimental animals studied—the last, though a nonmammal, included because it is the source of much germane information.

As an encyclopedic source book the volume is exceedingly valuable, surpassing the usual "year book" because of the frank evaluation of data which emerges from the discussions and the thought-provoking hypotheses cautiously advanced by competent authorities. To those who might consider such a work too far removed from the problems of human reproduction to have medical pertinence, the dictum of Donald Barron of Yale, voiced elsewhere, may be cited: "Animal experiments are carried out to obtain *vistas* and to get ideas of the *mechanisms of biological operation*" (italics are the reviewer's).

This thought forms an appropriate transition to the second work under review. Although, with a single exception, all of the authors of papers in the Assali volume are obstetricians or affiliated with obstetrical departments, and the focus is upon human gestation, the monographs composing the volume concentrate upon the basic science aspects of gestation. Indeed, an initial thought which strikes the reader is how far the progressive modern obstetrician has come from the not-too-distant day of the classic "baby doctor." The 13 authors have all done significant research in the fields of which they write, and their monographs exhibit comprehensive scholarship and wide personal contacts with colleagues in many related disciplines.

Since one of the purposes of the book is to "provide a source of basic information to the clinician," it is no small satisfaction to discover that all of the authors are skilled teachers knowing how to present such complicated matters as "The Stockholm concept of estrogen biosynthesis in the fetoplacental unit at midpregnancy" in comprehensible form and, even more important, knowing what complicated matter to include and what, tactfully, to omit.

A second purpose is served: "to interest . . . the student, the research worker, and the academically oriented individual in the general field of reproduction and in the specific fields of obstetrics and pediatrics." The coupling of those two specialties is significant and illustrates the enlightened attitude pervading the book. Not only is the "feto-placental-maternal unit" stressed over and over again both anatomically and physiologically, but emphasis is given to the overlap in spheres of clinical responsibility: the obstetrician's role extending on into neonatal life, the pediatrician's interests reaching far back into antenatal life.

The opening chapter deals with a subject rated as one of the major preoccupations of the Easter School conference, "The neural control of ovulation." In addition to a good review of currently available information, a final section dealing with "certain critical questions [which] are totally unanswered" provides a stimulating counterpart to the first section of the Easter School volume. The second chapter, "Gametogenesis to implantation," provides another parallel between the two volumes, but with the third, "Morphology of the placenta," Assali's group commences consideration of later stages of gestation than the Easter School dealt with. Physiology and hormones of the placenta come next, followed by