Book Reviews

Biographical History of Science

Dictionary of Scientific Biography. CHARLES COULSTON GILLISPIE, Ed. Vol. 1, Pierre Abailard–L. S. Berg; xiv, 626 pp., illus. Vol. 2, Hans Berger–Christoph Buys Ballot; xii, 628 pp. Scribner, New York, 1970. $35 a volume.

A man who undertakes to review an encyclopedia or a dictionary is an ass. I have been such a man on two occasions and am now caught by my own folly in a third. The temptation is obvious, but the false position is patent: after a certain age only reference books give one the sense of unlimited exploration; but a reviewer should be able to say he has scanned every one of the entries and imply in a well-bred way that he is competent to pass upon all.

In the first two volumes of the *Dictionary of Scientific Biography* the entries do not range very far down the line—Abailard to Buys Ballot (*sic*), but even so—it goes without saying—the scope of subject matter far exceeds my knowledge. I can only report on the quality of the work as it appears from random dipping *plus* the indefinable atmosphere that an experienced searcher learns to recognize. Tone, scale, style, form, apparatus—all disclose the directing mind, and even if one did not know beforehand that Gillispie was an admirable scholar one would soon be sure of it from the evidence of editorial choice and control that marks every page of these biographies.

The strategy of each article is clear and effective; the scientist is identified, his early circumstances and first achievements are tersely recited, and one plunges then into a detailed and critical account of his original contributions. The B's in any field are always an interesting lot, but if one wants to have one's early impression of competence confirmed, one should begin with the superb essay on Aristotle. It is by several hands, as befits the diversity of subjects to be treated, but it maintains a uniform high level of clarity and judgment, disposing at every point of the conventional untruths and easy gibes, some of them given currency (as I vividly remember) by Bertrand Russell in his guise of irresponsible publicist.

Similarly satisfying is the entry on Avogadro, that typical instance of neglect and rediscovery due not to personal but to historical reasons. And to stay one more second on the A's, [D']Alembert is a good "life" too, though marred by unfortunate typos in the French spellings. It is a surprise, by the way, to find him in this volume instead of under D: he is often spelled Dalembert without apostrophe — his name being supposititious—and certainly he is never spoken of as Alembert.

These are small matters. The next letter raises more substantial questions, but always within the bounds of the high competence that I at least found wherever I turned. By way of generality I would suggest that the form short biography, then life's work, leads to repetition. It need not do so, but not every contributor to this work has had the skill to avoid it. Given these repetitions, which take up space, one would wish that the distillation of matter had been less strict. These are *scientific* lives, to be sure, but they are also lives. Take Beddoes, whom it is a pleasure to find included. His work is well described, but would it not be illuminating of the man and his times to hear that he was regarded as eccentric because (as Stock tells us) he would move his tubercular yeomen to the barn, where he knew the winter temperature would stay more even?

Again, in the Becquerel article it is a pity to see the usual confusion about Pierre Curie. Because his wife long survived him he has a walk-on part in history: did he or did he not do any interesting work? If he did, what is it? If not, let us leave him out. As an example on the other side, that is, the relevant use of incident or character, let me cite the article on Berzelius, where his stubbornness with advancing age and its effect on his work are appropriately exploited.

We may be grateful that the editorial board which planned these volumes gave up the topical treatment by sciences in favor of essays about individual scientists. The scheme permits retrospective and comparative judgments quite as easily. But this judgment is not always sure. The Buffon article, for instance, is splendid in its recognition of his innovative and philosophical genius but it wobbles badly about his being or not being a transformist. Yet it is perfectly clear in the *Natural History* that Buffon's denial of evolution after setting out all the arguments for it is *pro forma*: the only argument against is Scripture. In this same entry, which cites the essay on Style as important, a reference to Buffon's qualities and methods as a writer would have been welcome.

To return to the historian as judge of work done, the article on Josef Breuer displays an uncertainty much like the Buffon. The writer is fair to Breuer, gives him credit for the fundamentals of psychoanalysis, then seems at the end to transfer it to Freud by way of the "method of free association." A more convincing consideration would have been Freud's resolve to carry on where Breuer left off and the resulting bulk of research and publication.

In a number of the articles that held me entranced and either refreshed or amplified my knowledge I kept wishing for the presence of certain facts, small in themselves, perhaps, but to my mind evocative of whole periods. And I missed them particularly because it is clear that the intent of this noble work is to set science and scientists in their native environment—the milieu of family, education, and contemporary thought. Science is not trapeze work over the void, one discovery or hypothesis leaping to the next without contact with common life. For this reason, then, there might have been a reference to Zola in the article on Claude Bernard, a sentence or two about tar water in the Berkeley (as well as a word on the truly miraculous Commonplace Book of his 19th year), a mention of the "Anthropological Decades" of Blumenbach, which were so attractive and influential, and a requoting of Büchner's (temporary) motto: *Ohne Phosphor, Kein Gedanke.*

These are mere illustrations of a tendency worth pursuing, for it is already

present. Indeed some of the useful side comments could be picked on for slight inexactitude: Beddoes's son was not a famous poet, however he may now be rated, nor was Büchner's brother a famous playwright—both had a long wait after death before recognition. Again, Bergson did not "influence" William James; the two worked on converging lines, as did Samuel Butler and Nietzsche. And I may add that it is a pity Butler was omitted. He belongs to the history of science as much as Alexander Bain, who is included.

One final bit of carping: it is too bad that no indication is given of a man's functional first name when he is blessed with several. One has to know that it is Ludwig Büchner, and not Friedrich, Karl, or Christian. Italics or parentheses would easily make the point for those who go to the work without earlier preparation.

The publishers have done their part in fitting fashion: design, print, paper, and binding are all to be commended. They might, however, reconsider that part of the blurb which says of "the narrative" that it is at once "accurate and sophisticated." That last word has a scientific meaning they do not seem to suspect.

In any event, I await the next installment with lively expectation of renewed pleasure, and hope indeed to live long enough for the volume "Uexküll to Zwicky," to say nothing of the Supplement, where Boucher de Perthes, nicely done here, will mysteriously occur again.

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Peasant Economics

Subsistence Agriculture and Economic Development. An outgrowth of a seminar on Subsistence and Peasant Economics, Honolulu, Feb.–March 1965. CLIFTON R. WHARTON, JR., Ed. Aldine, Chicago, 1969. xiv, 482 pp. $12.50.

Subsistence agriculture, as opposed to commercial agriculture, occupies 40 percent of the total land area under cultivation and supports over half the world's population. The importance of this very substantial portion of the agricultural sector is obvious, but for equally obvious reasons relatively little is known about it. The interrelatedness of subsistence production and family consumption, the mixture of social and agricultural sciences required to understand peasant societies, and the recency of interest in the modernization process have combined to limit severely what is known about how the other half lives.

Subsistence Agriculture and Economic Development is an important step toward filling this gap. Based mainly on a conference held in Hawaii in 1965, the volume contains contributions from 40 leading specialists of 11 countries and a half-dozen disciplines. As a result of the interdisciplinary approach, the book provides a broad base for all those concerned with the development of poor countries. Unavoidably, the volume also underscores the communication difficulties that still remain between the different branches of the social and agricultural sciences. For, as a colleague of mine has suggested, in interdisciplinary gatherings such as these someone must learn to dance backwards, and in some sections it is not altogether clear who is leading.

As is often the case with conference compendia, there is some unevenness among essays, and there is no easy way of summarizing the main conclusions. Indeed, one of the most useful aspects of this collection is the diverse opinions that it brings together on such issues as the role of tradition versus economic rationality in the decision making of peasants, and on the productivity of labor in subsistence agriculture. The book's major strength is its rich detail on how peasant societies are organized and operate at the farm and village level. It is less good on sectoral and intersectoral issues and on the specific development policies needed to modernize peasant societies within an economy-wide framework. In each of the volume's five sections—social organization, the economics of production, theories of change, execution of development programs, and research—there are two or three major papers, supplemented by thoughtful comments from other contributors. In terms of regional focus, there is a relative concentration on Asia; however, the judicious combination of case studies, expository essays, and analytical models provides a scope that should prove helpful for understanding subsistence agriculture in most parts of the world.

A number of interesting features derive from the fact that nearly five years elapsed between the conference and publication of the volume. Few specialists in the field of agricultural development will find much that is new in the book, several of the more important essays having been published elsewhere. The intervening five years have also seen several of the articles and ideas, such as those of Jorgenson and Nicholls on the role of the agricultural sector in economic development, become near classics. Moreover, the development profession has now generally agreed upon answers to some of the questions which were open in 1965. For example, the issue of economic rationality and the response of peasant farmers to economic stimuli now seems largely to be settled: most subsistence farmers trade a portion of their output and appear to be able to count, even if they cannot read.

The time lag has also shown that some of the fears expressed in 1965 were exaggerated, and that some facets of modernization untouched at the conference were more important than they were then thought to be. In the former category, the overriding concern with lagging agricultural production has been eased somewhat. Largely because of advances in the biological sciences—in particular the development of fertilizer-responsive seed varieties—there is currently less concern about imminent world famine. This green revolution, which occupied only a few thousand acres in 1965, had covered some 30 million acres by 1969. The rapidity with which many peasant farmers accepted the new technology, and the renewed hope that these developments have given a number of countries, particularly in Asia, are hardly touched upon in the volume.

Largely as the result of the green revolution, the same group of authors meeting today would undoubtedly also spend much more time on questions of income distribution and the broader political-economy aspects of agricultural organization. Whereas the earlier focus was on growth and on moving subsistence farmers into the commercial sector, the recent production successes have shown that development, stability, and economic growth are hardly synonymous terms. Of particular concern now (as it was to V. M. Dandekar even then) is the employment question, and the policies required to keep people productively occupied in rural areas in the face of population growth rates that are often in excess of 3 percent a year. This population expansion, plus the possibilities of borrowing agricultural technology that is labor displacing, such as the tractor, are creating enormous strains on the countryside. It is not surprising that more than one author