The Tainos is an historically important book. It is the culmination of half a century of research on a region whose archaeological complexity is compounded by the complexity of its political, social and linguistic diversity. Furthermore, its publication date, 1992, makes this book an significant addition to the body of literature published to commemorate the momentous events which resulted from the Spanish landfalls in the Caribbean. Unlike many contributions to that body of literature, this book explicitly attempts to construct an understanding of the long history of those Native American populations which felt the first blows of European socio-economic expansion into the New World.

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Radiocarbon After Four Decades: An Interdisciplinary Perspective, edited by R(oyal) E. Taylor, Austin Long, and Renee S. Kra, Springer-Verlag, New York xviii + 596 pp. ISBN 0-387-97714-7. $89.00 (Cloth).

by

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Topics of the 35 papers included in this volume from the June 1990 conference cover a wide range of areas germane to archaeology. Some are exclusively technical, some review the most recent state of the art for a disciplinary area, and others, of most interest to the readers of this *Bulletin*, provide historical insights into the development of the field.
Paul E. Damon suggests a five phase model for the development of radiocarbon assays. Phase I was the first measurements of natural C-14, and the first published date list in 1951. Phase 2 was the addition of seven more labs between 1952 and 1955. Phase 3 covers 1956 to 1962, with the determination of a more precise half-life, and the first recognition that the secular variation of radiocarbon would require calibration of the radiocarbon time scale to convert radiocarbon ages to calendar years. For Damon, Phase 4 covers from 1962 to 1986, with the first attempts to develop calibration curves, and the concerted effort to understand the root causes of secular variation. Phase 5 begins in 1986 and continues to the present, defined by the addition of AMS dating, and the coordination of labs for defining a single calibration curve back to the last glacial period.

Damon's first phase is covered by the paper by James E. Arnold and Robert L. Schuch, which offers a glimpse of the initial demonstration of the viability of radiocarbon dating in Willard F. Libby's lab from 1946 to 1948. As of 1946, we discover that the half-life of radiocarbon was extremely poorly identified, being surmised to be somewhere between 1,000 and 25,000 years; estimates of the cosmic flux which produce atmospheric radiocarbon were at best poor; and the distribution of the isotope in the natural world was unknown. The National Science Foundation had not yet been established, so getting funds to investigate proved difficult. James Arnold was a post-doc in Libby's lab; when he went home at Christmas of 1946, he mentioned the need for some test samples. By the time Arnold returned from Christmas break, his father had arranged for 10 Egyptian samples to be provided by a friend, Ambrose Lansing of the Metropolitan Museum in New York. The next year, Libby picked up a new Ph.D student, Ernest Anderson. Libby assigned Anderson the Ph.D. problem of verifying the specific activity of radiocarbon in living things around the world. Anderson subsequently was responsible for bringing Robert Schuch into the effort as senior lab technician. "Libby was a stern believer in the principle now known as "if it ain't broke, don't fix it."'(Arnold and Schuch, p.7). Thus much of the early apparatus was cumbersome at best, often of dubious reliability. Schuch re-engineered the equipment, permitting Arnold and Anderson to conduct the first practical demonstration of the validity of the method, which up to that point had been theoretical. In the summer of 1948, the first radiocarbon assay was run on a sample of wood from the step pyramid of Zoser at Sakkara.

Hans E. Suess picks up the Damon's next stage, in a paper discussing early attempts to set up new labs in the 1950s, utilizing techniques other than solid carbon. Suess established an acetylene lab for the United States Geological Survey in 1953, and in 1954 moved west and established a similar lab at La Jolla. Suess employed acetylene to avoid the problems of carbon dioxide sensitivity to electronegative impurities. This early work solved some of the problems with the solid carbon method of Libby (solid carbon being also used at that point at new labs at Yale and Columbia Universities). More importantly, by dating redwood (Sequoia gigantea) samples, Suess was able to show that there was a need to calibrate "Libby" radiocarbon ages to reach true calendrical ages.

Bernd Becker's article on the history of dendrochronology and radiocarbon calibration continues a discussion of the calibration issue. A. E. Douglass' identification in 1929 of the 'missing link' between the floating prehistoric pueblo samples and his back-dated sequence of living trees introduced the method to archaeology. In 1953, Edmund Schulman, a coworker of Douglass at the Tree-Ring lab, identified bristlecone pine stand as having significant potential, and began extending the sequence. By 1969, C. W. Ferguson had been able to extend the sequence back 7,104 years. In Europe, Bruno Huber was working on a sequence of German and Swiss oaks, and by 1966 had developed a 6,000 year long oak sequence. Other researchers continued work on the European Holocene oak calendar, working on oaks from Irish peat bogs, and additional northern European samples. By 1986, the European sequence was 9,925 years long, and the bristle cone sequence was 8,691 years long, allowing radiocarbon labs to employ dendrochronologically dated samples to refine the 'correction' calibration curve for radiocarbon determinations.

A review of the beginnings of accelerator mass spectrometry (AMS) is presented by H. E. Gove. Almost simultaneously in May and June of 1977, the first AMS determinations were conducted by a group at the University of Rochester and a group at Simon Fraser University, both using tandem Van de Graaff electrostatic accelerators, and a third group at the University of California at Berkeley, using a cyclotron. None of the groups was aware of the other group's efforts at the time. Rapidly a series of advances was made in the techniques of AMS work at several research facilities in Europe and North America. Gove is an avid supporter of the technique, predicting that AMS will replace decay-based techniques in the near future.

A number of the other presentations deal with the improvements made in dating, the use of radiocarbon variations as a proxy to estimate climatic variables, and the like, but the wealth of information in these contributions cannot be dealt with in this review. The reader is referred to the volume to follow up on these issues.

Two other sections deal explicitly with the history of the development of archaeology in various areas of the Old and New World. Donald O. Henry makes impressive use of new radiocarbon determinations to fine-tune his model for the origins of early agriculture in the Levant. Peter Robertshaw decries the absence of active dating labs in subSaharan Africa, seeing it responsible for the decline in the use of radiocarbon dating as a research technique by African archaeologists in the last two decades on the one hand, but also arguing on the other hand, that the overreliance of radiocarbon dating has reduced the ability of archaeologists to do ceramic analysis, with uncritical acceptance of dates, rather than being informed by stratigraphy, context, comparative studies, and seeing radiocarbon dates as being much more precise than they actually are.

In a fashion, Taylor makes the same comment for the New World, arguing that radiocarbon resulted in the shift in archaeology from chronology building to theory building. In this view, then, "New" or processual archaeology develops because archaeologists no longer need to be concerned with developing time-space systematics (the cultural historical paradigm), being freed from this business by radiocarbon dating, but could then begin to focus on cultural process, and the associated theory building that highlighted the decade or so of "New" archaeology.

In other papers on the impact of radiocarbon on New World archaeology, Scott Fedlick and Karl Taube detail how radiocarbon dating allowed the correlation to be made between the modern calendrical system and the Mayan calendrical system, and Rainer Berger summarizes the Tule Springs expeditions of 1962, and work at other California sites, in a discussion of the contributions of radiocarbon to the dating of early humans in the New World.

The volume is interdisciplinary in perspective, with a wide range of issues covered to direct interest to archaeologists. With respect to the themes of this journal, I would argue that several papers will be absolutely essential for any scholar assessing the impact of radiocarbon dating of the development, as well as shifts in paradigm in Americanist archaeology in the last half century.

60 Years of Southwestern Archaeology, A History of the Pecos Conference, by Richard B. Woodbury, University of New Mexico Press, Albuquerque. 1993. $29.95 xxvii + 497pp., bibliography, index (Cloth).

by
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Among the least commendable characteristics of the New Archaeology is a marked anti-historical perspective. The history of archaeology and much, if not most, of earlier theory, method, and the results of fieldwork are considered not worth knowing or irrelevant, especially for graduate education: "graduate courses in anthropology should cease being histories of thought" (Schiffer 1976:193).

Regrettably, New Archaeologists generally adopted this perspective and attitude, and partly because they did not pay attention to the history of archaeology, they tended to confirm Santayana's "hypothesis" about the consequences of forgetting the past: many of the arguments and accompanying rancor in the current debate between New Archaeologists and Post-Processualists resound the confrontation of a quarter century ago between New Archaeologists - "the louts" as Florence Hawley Ellis called them (p. 307, this volume) and their predecessors. Furthermore, because the anti-historical bias became so widely adopted, it was difficult to publish on the history of archaeology, at least in the United States.