PUBLISHING ARCHAEOLOGY IN *SCIENCE* AND *SCIENTIFIC AMERICAN*, 1940–2003

R. Lee Lyman, Michael J. O'Brien, and Michael Brian Schiffer

Many new, or processual, archaeologists of the 1960s argued that Americanist archaeology became scientific only in the 1960s. The hypothesis that the rate of publication of archaeological research in Science *and* Scientific American *increased after about 1965, as new archaeologists sought to demonstrate to their peers and other scientists that archaeology was indeed a science, is disconfirmed. The rate of archaeological publication in these journals increased after 1955 because the effort to be more scientific attributed to the processualists began earlier. Higher publication rates in both journals appear to have been influenced by an increased amount of archaeological research, a higher rate of archaeological publication generally, and increased funding. The hypothesis that editorial choice has strongly influenced what has been published in* Science *is confirmed; articles focusing on multidisciplinary topics rather than on narrow archaeological ones dominate the list of titles over the period from 1940 through 2003.*

Muchos de los arqueólogos nuevos o 'procesales' de los años sesenta argumentaron que la arqueología Americanista solamente llegó a ser científica en los años sesenta. La hipótesis de que el índice de publicaciones en investigación arqueológica de las revistas Science *y* Scientific American *aumentó después de 1965, año en el que muchos arqueólogos intentaron mostrar a sus colegas y a otros científicos que la arqueología era efectivamente una ciencia, se desaprueba. El índice de publicaciones en estas revistas científicas aumentó después de 1955 porque este esfuerzo de los 'procesalistas' de llegar a ser mas científicos ya había empezado antes. Los altos índices de publicación en ambas revistas parecen haber sido afectados por una gran cantidad de investigación arqueológica, por un alto índice de publicaciones arqueológicas en general, y por un crecido financiamiento. La hipótesis de que la selección editorial ha influenciado fuertemente los artículos publicados en* Science *se confirma; artículos que se concentran mas en temas multidisciplinarios que en temas arqueológicos limitados son los que dominan la lista de artículos escritos entre 1940 y 2003.*

Throughout the twentieth century, archaeologists in North America contended that their discipline is a science (Caldwell 1959; Kidder 1932; Meggers 1955; Plog 1982). This claim became especially strident in the 1960s and early 1970s (Binford 1972; Fritz and Plog 1970; Watson et al. 1971). We agree with many who over the past 100 years or so have argued that archaeology can be and often is scientific (O'Brien et al. 2005). Indeed, results of archaeological research have appeared in national scientific journals such as *Science* and *Scientific American*, two journals that since their inceptions have published many papers on diverse scientific topics. Articles on various aspects of human prehistory appeared in issues of both journals during the late nineteenth century and throughout the twentieth century. This observation, however, reveals little about the history of the discipline, something in which we are quite interested. It is well known that during the 1960s there was a shift in the conceptions held by some archaeologists as to how archaeological practice could become scientific (Binford 1968a, 1968b; Fritz and Plog 1970; Watson et al. 1971). Here we examine one variable that might indicate whether archaeological research was more, or less, "scientific" at different times. Although we find that this variable—the rate of archaeological publication in scientific journals—is not a very good indicator of the scientific emphasis in archaeology, it leads us

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into other interesting arenas of our discipline's history.

Beginning in the 1960s and continuing into the early 1970s, some members of a segment of American archaeologists, referred to variously as "new," or "processual," archaeologists (Binford 1968a, 1968b; Chang 1967; Flannery 1967; Kushner 1970), in effect claimed that only archaeology accomplished under the aegis of the new program would be scientific. "Birth" announcements of the new archaeology appeared in both *Science* (Hammond 1970) and *Scientific American* (Flannery 1967), and seminal case studies were also published in both journals (e.g., Binford and Binford 1969; Flannery 1965; Hole 1966; Leone 1968; Longacre 1964; Wilmsen 1968). These facts hinted that a closer examination might reveal previously undetected details about the history of the discipline. In particular, we wondered if publishing in such prominent science journals might serve as an indication—to archaeologists and nonarchaeologists alike—that the discipline was in fact scientific.

We recognized that the publication rate of archaeology would be influenced by variables such as rate of submission and, perhaps most importantly, editorial choice. Direct data on submission rates are unavailable, but it is not unreasonable to assume a correlation between editorial choice and the sample of manuscripts from which an editor has to choose. Frank Hole, editor of *American Antiquity* from 1974 to 1978, summed up the kind of influence that a journal editor has: "Although there are a number of ways in which an editor can influence the journal, he is limited by the kinds of articles which he receives. . . .[T]he bulk of material which crosses his desk arrives unannounced beforehand, and it reflects the varied interests of archaeologists who read and use the journal" (Hole 1974:405). Therefore, we used published articles as a reflection of disciplinary goals. We came to appreciate, however, that one cannot easily isolate disciplinary aspirations after the filter of editorial choice has been applied to submissions.

Methods, Materials, Hypotheses

We chose two prominent and well-known scientific journals—*Science* and *Scientific American*—to guard against the possibility that the idiosyncrasies of a single data source would unduly influence our analysis. This decision invites others to compare our results with analyses based on publication patterns in other science journals (e.g., *American Scientist, Nature*). For guidance on analytical methods we examined journals specializing in the history of science. Perusal of *Isis* (described on its cover as "an international review devoted to the history of science and its cultural influences"), *History of Science*, and *Journal of the History of the Behavioral Sciences* failed to provide examples of the kind of analysis we envisioned. Thus, our data and methods are of our own design. Our data base includes the author(s), year of publication, title, volume number, issue number, and page numbers for each archaeological article. (For a copy of the data base, contact the senior author at lymanr@missouri.edu.)

We examined all issues of both journals published between 1940 and 2003 inclusively. The period is long enough to reveal temporal trends, and it spans the critical event—emergence of the "new" scientific archaeology—of interest here. We originally had no intention of monitoring potential influences of World War II, which would have required data from the 1930s. Significant changes in formatting and structure of both journals occurred in the 1940s and early 1950s, and we wished to control for these influences. We also sought to include the development of radiocarbon dating (Arnold and Libby 1949; Libby et al. 1949) in our data, so we chose 1940 as a starting date.

Given the publication dates of the new archaeology's birth announcements (e.g., Binford 1962; Flannery 1967), early case studies (e.g., Deetz 1965; Flannery 1965; Hole 1966; Longacre 1964), and seminal volumes (e.g., Binford and Binford 1968; Clarke 1968), as well as Sterud's (1978) finding that a marked increase in the frequency of *citation* of processual publications began in 1968, we chose 1965 as the approximate date for when changes in publication trends should appear. Thus, if the processualist claim is correct—that archaeological research became scientific only after about 1965—then perhaps the rate at which results of archaeological research were published in *Science* and *Scientific American* would show a dramatic increase after 1965, perhaps as late as 1970.

Scientific American has been in existence for more than 150 years. The journal's editorial policy is to publish articles about cutting-edge research in

a manner that scientists in any discipline (and lay people) can understand. Photographs have been prominent for more than a century, and they, together with charts, maps, and line drawings of artifacts and excavations, have set an impressive standard for archaeological illustration. Authors either submit a proposal for an article, which is reviewed and accepted or rejected, or contributions are solicited and reviewed by the editors. In the past several years, authorship of articles on archaeological topics in *Scientific American* has, for unclear reasons, begun to shift from professional archaeologists to science journalists (e.g., Nemecek 2000). Our hypothesis concerning *Scientific American* was that the per-year rate of publication of archaeological papers measured as the percentage of all articles published would increase beginning about 1965.

Science has been published weekly since 1880. In 1952, then-chairman of the editorial board, Howard Meyerhoff, reported that the journal was meant to serve as "a medium for brief but adequately documented reports of new discoveries and developments in every field of science" and as "an outlet for quick publication of significant research before definitive articles can be prepared for, and published in, the specialty journals" (Meyerhoff 1952:3a). At that time some articles, apparently a minority, were solicited by the editors, but most were submitted without solicitation. The acceptance rate was less than 50 percent. Manuscripts submitted today are typically subjected to a rigorous review process that results in a very low acceptance rate. The purported goal of *Science* is to reach a broad cross section of the scientific community representing multiple disciplines and (we suspect, hopefully) a sizable portion of the lay public, and most importantly, to publish new, cutting-edge results.

Similar to that for *Scientific American,* one hypothesis for *Science* is that the rate of publication of archaeological titles measured as the annual proportion of all published papers would increase beginning about 1965. We also propose a "content hypothesis" for *Science* based on our subjective impressions of the journal's contents. The hypothesis is that a majority of titles concern the most newsworthy archaeological phenomena. By "newsworthy" we mean news of the "oldest" or "first" but also multidisciplinary pieces that catch the attention of numerous readers, scientist or not, archaeologist or not, with interests in diverse fields of inquiry. These might include radiometric age determinations of, say, the earliest inhabitants of a geographic place, a synthesis of the prehistory of an area, or some aspect of ancient metallurgy. Testing this hypothesis requires classification of published papers by subject matter. If this hypothesis is supported, it could reflect the influence of editorial choice on what has been published rather than whether archaeology is perceived by archaeologists to be scientific or not, remembering that editors can choose only from what has been submitted.

To test the rate hypothesis for *Science,* we tallied the total number of articles and reports that directly or indirectly concerned archaeology. Letters, news items by reporters and science writers, book reviews, and technical comments written as responses to reports or articles on archaeological topics were not counted. Items that indirectly concern archaeology are those such as Susman's (1994) anatomical analyses of ancient hominid hand bones, indicating that the precision grip required of habitual tool makers and users was present two million years ago. Such information is critical to our understanding of the archaeological record and holds test implications for it. Another example of an indirectly related article is Haynes's (1982) use of archaeological data to address geochronological issues of archaeological import.

Titles in *Science* that concern only the biological evolution of hominids were not counted. Similar rules of inclusion and exclusion attended our tallying of titles published in *Scientific American.* The major difference is that we tallied *Scientific American* articles authored by science writers. Had we instead used the criterion that a professional archaeologist be an author, the list of titles recorded for either journal would not have varied in any significant way, except that there would have been fewer titles tallied for *Scientific American* during the last few years. *Scientific American* articles on ancient feats of engineering that used only historical documents or principles of mechanics to analyze phenomena such as Roman waterworks and seagoing vessels were not tallied. Only titles making direct reference to archaeological data were counted. To interpret annual trends in both journals, we fit polynomial regression lines to point scatters

Table 1. Descriptive Data on Annual Publication Rates of Archaeological Research in *Scientific American* and *Science*.

Statistic (per year)	*Scientific American*	*Science*
1940–2003		
Average (± SD) number all articles	95.39 ± 8.62	763.2 ± 246.2
Range of all articles	66–114	312–1230
Average number archaeology	4.09 ± 2.34	7.55 ± 5.85
Range of archaeology articles	0–10	0–23
Average (± SD) percentage archaeological	4.21 ± 2.41	0.90 ± 0.56
Range of percentage archaeological	0–10.2	0.00–2.21
95 percent CI on percentage archaeological	3.61–4.81	0.76–1.04
1951–2003		
Average (± SD) number all articles	97.94 ± 5.89	835.7 ± 202.0
Range of all articles	77–114	439–1230
Average number archaeology	4.62 ± 2.02	8.75 ± 5.71
Range of archaeology articles	0–10	0–23
Average (± SD) percentage archaeological	4.72 ± 2.07	1.00 ± 0.55
Range of percentage archaeological	0–10.2	0–2.21
95 percent CI on percentage archaeological	4.14–5.29	0.85–1.15
1965–2003		
Average (± SD) number all articles	98.08 ± 6.82	913.8 ± 127.6
Range of all articles	77–114	742–1230
Average number archaeology	4.46 ± 2.16	9.82 ± 5.71
Range of archaeology articles	0–10	1–23
Average (± SD) percentage archaeological	4.54 ± 2.20	1.05 ± 0.57
Range of percentage archaeological	0–10.2	0.13–2.21
95 percent CI on percentage archaeological	3.82–5.25	0.87–1.24

representing the percentage of all articles published per year that were archaeological. Choice of a second-, third-, or fourth-order polynomial was based on the magnitude of the coefficient of determination and our combined subjective impressions regarding which line best described the temporal trend evident in the point scatter. We also use three-year running averages of annual publication rates to smooth otherwise noisy data.

Results

The archaeology articles in *Scientific American* are fairly evenly distributed across the 64 years studied (Table 1). Of the 636 issues of the journal published between 1951 and 2003, 242 (38 percent) include an article on archaeology. Only one issue has more than one archaeology title, but that issue—issue 3 of volume 203, published in September 1960—has as its theme the biological and cultural evolution of humans. The average annual percentage of archaeological articles (among all articles) appearing in *Scientific American* between 1940 and 2003 was 4.2 percent (4/95), and the range was zero to 10.2 percent (Figure 1a). During the 64-year period, the annual rate of publication fluctuated markedly; a fourth-order best-fit regression line describes this fluctuation, but the low value of the coefficient of determination ($r^2 = .25$) suggests that the long-term trend is perhaps more apparent than real. Deletion of the extreme annual low in 1973 (0.99 percent) and the extreme high in 1980 (10.2 percent) from the *Scientific American* data does not change the coefficient of determination appreciably (from $r^2 = .25$ to .28).

No archaeological articles were published in *Scientific American* from 1943 to 1947 (Figure 1a); only 3 articles were published in 1942 (3.7 percent of all articles published that year) and one each in 1948, 1949, and 1950 (< 1.1 percent per year for all 3 years). The regression line for 1940–2003 indicates that World War II influenced the archaeology publication rate. Omitting the data from 1940 through 1950—we believe publication decisions were influenced by the myriad technological discoveries stemming from World War II—does not change the coefficient of determination or the overall shape of the regression line. Thus, even omit-

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ting the 1940–1950 data, our hypothesis that there would be an increased publication rate of archaeology in *Scientific American* beginning about 1965 is falsified. The rate increases after 1950, surpasses the 1940–2003 mean in 1958, peaks in the early 1970s, and then decreases until about 2000. We consider why this is so in the discussion section.

The shape of the best-fit regression line for the three-year running average rate of publication in *Scientific American* is similar to that for the annual rate (compare Figure 1a with Figure 2a). Given the smoothing effect of averages, it is not surprising that the coefficient of determination is greater for the former (r^2 = .42) than for the latter (r^2 = .25). This suggests that the trend hinted at by the annual rates is real but obscured by a random factor such as the rate of submission or perhaps the timing of when papers were accepted for publication. The three-year running average-rate values indicate a marked drop in rate in the 1970s (Figure 2a), just as do the annual-rate data (Figure 1a). The drop is well below the annual mean of 4.2 percent. We are unsure why this drop occurred, but wonder if it has a cause similar to that for the apparent decreases in the middle 1950s and the early 1960s (Figure 2a). The gradual but more or less consistent decline in rate after the late 1970s may obscure later, similar fluctuations in rate.

The average annual publication rate of archaeological research in *Science* between 1940 and 2003 was 0.9 percent of all titles published, and the range was zero to 2.2 percent (Table 1). On average, 763 titles were published per year, of which about 7.5 were on archaeology. During the 64-year period, the annual rate of publication fluctuated markedly (Figure 1b). The fourth-order polynomial regression line resembles that for *Scientific American,* but it is not identical. For one thing, the coefficient of determination is markedly stronger (r^2 = .83), suggesting the long-term trend is real. The long-term trend is particularly evident in the graph of three-year running average rates (compare Figure 1b with Figure 2b). The archaeology publication rate decreased after 1943 and was very low between 1944 and 1954, but the annual rate increased in the late 1950s. This is not just recovery from the influence of World War II; the values for 1955–1959 are the highest for that decade. The hypothesis that there would be an increase in the publication rate beginning about 1965 is falsified. The rate began to increase after 1954, exceeded the 1940–2003 mean in 1958, peaked between 1966 and 1978, decreased after that, and began to recover only after the early 1990s.

Comparison of the regression lines for *Science* and *Scientific American* is instructive. In both journals, the increase in publication rate begins in the middle 1950s, and in both journals that rate exceeds the mean for the entire 1940–2003 period in the same year (1958). The rate of publication in *Science* increases from 0.9 percent in 1958 to an approximate average peak of 1.8 percent centered in the early 1970s; the rate in *Scientific American* increases from 4.2 percent in 1958 to an approximate average peak of about 5.5 percent in the early 1970s. There is no indication in *Science* of the marked decrease in rate during the 1970s evident in *Scientific American* (Figure 2); given earlier rate dips in the latter, perhaps the 1970s dip should be expected. The publication rate decreases much more rapidly in *Science* than in *Scientific American* after the peak in the 1970s. The annual rate falls below the mean in 1989 in *Scientific American* and in 1985 in *Science*. But the publication rate in *Science* also seems to recover much sooner (in the early 1990s) than in *Scientific American* (perhaps in 2000), but data for the latter are too sparse to permit a definitive conclusion.

Discussion

A combination of factors likely contributed to the increasing rate of archaeology publication in both *Science* and *Scientific American* during the late 1950s. First, the post-WWII boom in land modification was accompanied by increases in federal funding directed toward protecting archaeological resources by salvage excavation (Jennings 1985). Some of the research results funded by this increase appeared in the pages of these journals; however, to sort out more than a few exemplary titles (e.g., Davis and Schultz 1952; Roberts 1948; Wedel 1967) would require intimate knowledge of which sites were sampled and which artifacts were collected under the sponsorship of salvage work. That additional funds were provided by the National Science Foundation, which began supporting archaeology in 1954 (Yellen and Greene 1985), adds to the complexity. The annual amount of money that NSF furnished for archaeological

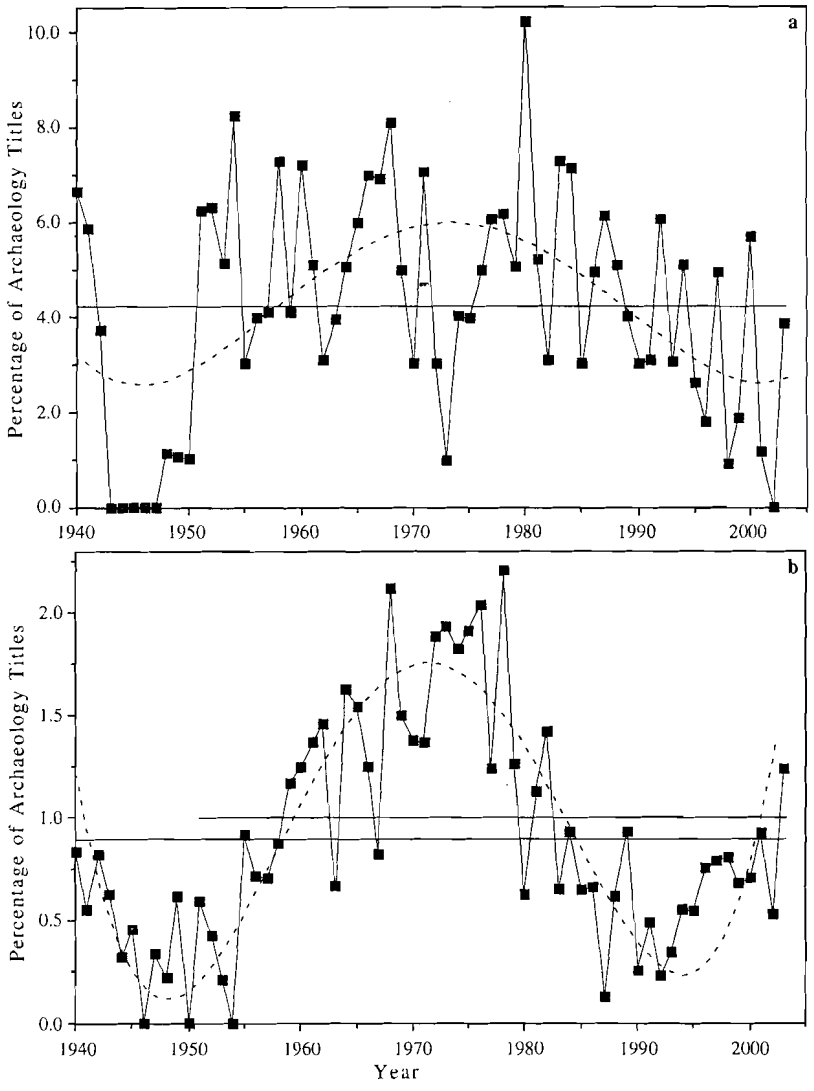
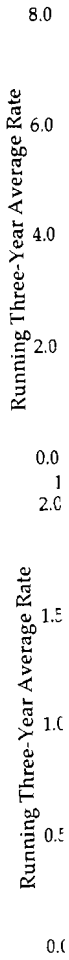


Figure 1. Percentage of all titles published per year that are archaeological. (a) *Scientific American*, solid line is the mean percentage for 1940 through 2003, dashed line is fourth-order polynomial best-fit regression line; (b) *Science*, lower horizontal solid line is the mean percentage for 1940 through 2003, upper horizontal solid line is the mean percentage for 1951 through 2003, dashed line is fourth-order polynomial best-fit regression line.

research between 1954 and 1983, and the annual rate of archaeology publication in *Science*, are correlated ($r = .514, p = .004$). The shape of a second-order polynomial best-fit regression line describing the relationship between NSF funds and year (Figure 3a; $r^2 = .90$) is similar to the curve describing the relationship between publication rate and year (Figure 1b) for the years 1954 through 1984. In both funding amount and publication rate, there is a progressive increase after the middle 1950s that peaks in the 1970s and subsequently decreases, or at least appears to, with respect to NSF funding (Figure 3a).

A second factor that might have contributed to the increased publication rate of archaeological titles in both journals during the 1955–1975 period was the dramatic increase in the number of professional archaeologists, who obviously would have needed additional publication outlets for their findings (Schiffer 1979). The annual number of pages in the top Americanist archaeology journal, *American Antiquity*, defines a curve similar to those of the archaeology publication rates in *Science* and *Scientific American* (compare Figure 1 with Figure 3b). The 64-year average number of pages pub-



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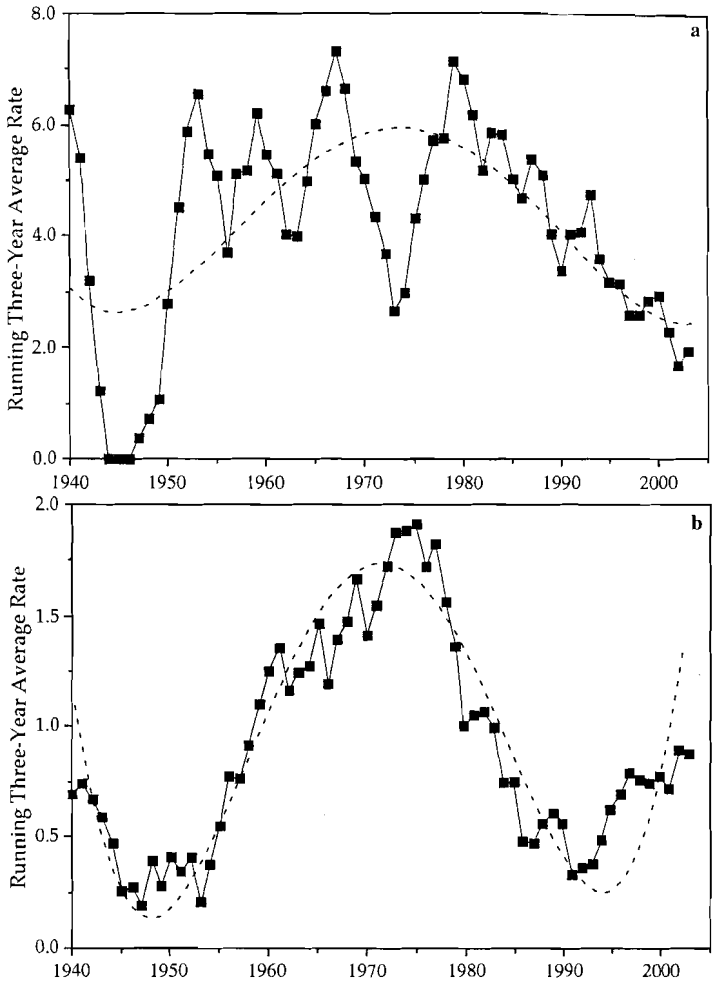


Figure 2. Three-year running average rates (percentage of all titles published) of archaeology publication. (a) *Scientific American*, dashed line is fourth-order polynomial best-fit regression line; (b) *Science*, dashed line is fourth-order polynomial best-fit regression line. Compare with Figure 1.

lished annually (= 640) in *American Antiquity* is consistently exceeded beginning in 1976. A third-order polynomial ($r^2 = .86$) regression line indicates a slight decrease in the number of pages published in the mid 1950s, followed by an increase that peaks in 1981 and then decreases. The peak in pages of *American Antiquity* is a bit later than the peak in publication rate in *Science* and *Scientific American*; the correlation between the annual number of pages in *American Antiquity* and the rate of publication in *Science* between 1960 and 2003 is negative and significant ($r = -.555$, $p < .0001$), suggesting more publication of archaeology generally, with *American Antiquity* or other, particularly new, journals publishing what *Science* did not. A number of specialty journals focusing on particular aspects of archaeology were founded in the 1970s and 1980s. These include *Journal of Archaeological Science* (first published in 1974); *Journal of Field Archaeology* (1974); *Advances in Archaeological Method and Theory* (1978, now *Journal of Archaeological Method and Theory*); *North American Archaeologist* (1980); *Journal of Ethnobiology* (1981); *Advances in World Archaeology* (1982, now *Journal of World Prehistory*); *Journal of Anthropological Archaeology* (1982); and *Geoarchaeology* (1986). Similarly, several new general-science publication outlets were initiated at the same time (e.g., *Smithsonian* in 1970, and *Discover* in 1980).

The third factor contributing to shifts in the rate of publication of archaeological titles in *Science* after 1950 appears to be editorial choice—the con-

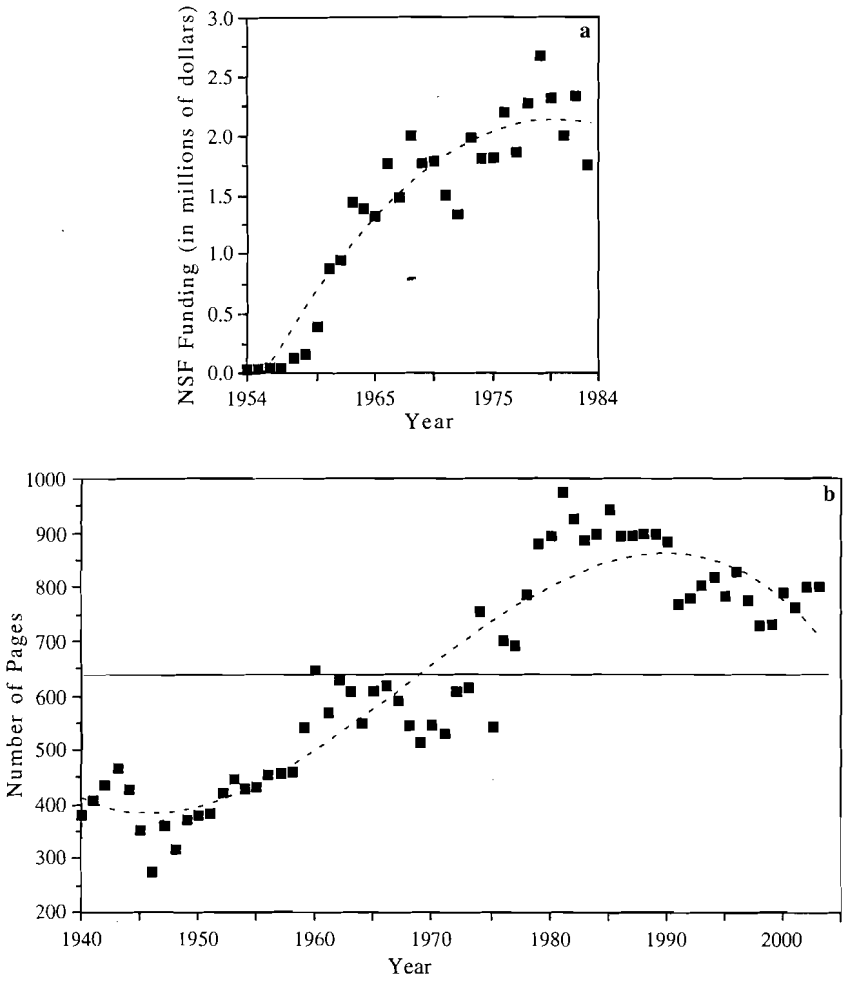
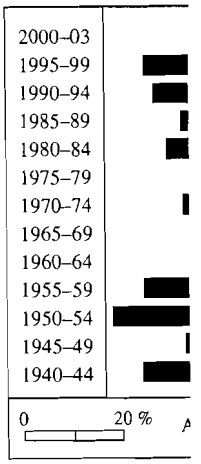


Figure 3. Amount of funding and pages published per year. (a) Rate of National Science Foundation funding (in millions of dollars) for archaeology from 1954 through 1983 [data from Yellen and Greene (1985)], dashed line is second-order polynomial best-fit regression line; (b) number of pages published in *American Antiquity* per year from 1940 through 2003, solid line is annual mean (640), dashed line is third-order polynomial best-fit regression line.

tent hypothesis. Tatum (1947:98) observed that "the new horizons of archaeology lie in the development of methods and practices fully applicable to all sciences." This sort of thinking is evidenced by multidisciplinary articles that we categorize generally as "archaeometry-type articles." These include reports on new chronometric techniques such as radiocarbon dating (e.g., Arnold and Libby 1949, 1951; Johnson 1967; Libby et al. 1949), thermoluminescence (e.g., Matess and Zimmerman 1966), and obsidian hydration (e.g., Johnson 1969; Meighan et al. 1968; Michels 1967); reports on ancient metallurgy (e.g., Bayard 1972; Friedman et al. 1966); and source analysis of various materials (e.g., Gordus et al. 1968; Hammond 1972; Patton and Miller 1970). The proportion of archaeology articles that constitute archaeometry pieces is greater than one third in all but two of the 13 five-year periods beginning with 1940–1944 (Figure 4); the publication rate of archaeometry tends to be relatively stable over the 64-year period sampled. The second most abundant category of article is what we term "overviews," which can be areal (e.g., Bordes 1961; Laughlin 1963; Rouse 1964; Willey 1960) or topical (e.g., Ascher and Ascher 1965; Caldwell 1959; Heizer 1966; Howell 1959).

Overviews synthesize and summarize major data sets or issues for general scientific consumption and tend to be relatively common until about 1980, after which they decrease. Overviews are



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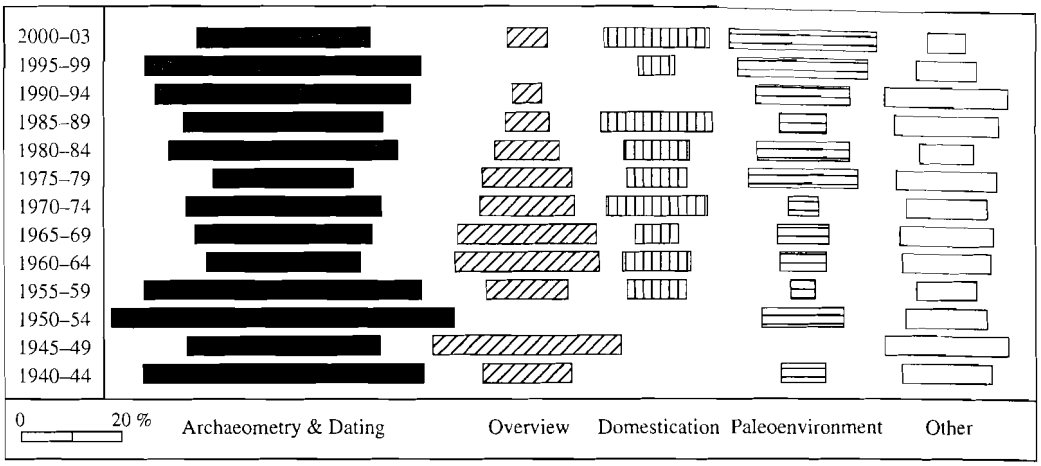
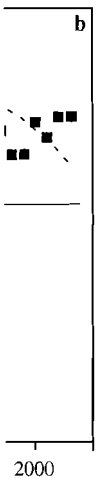


Figure 4. Percentage of each of five categories of archaeology titles published in *Science* in 13 multiyear periods between 1940 and 2003.



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replaced by articles concerning early plant and animal domestication (e.g., Adams 1962; Evenari et al. 1961; Helbaek 1959; Isaac 1962; Reed 1959) and paleoenvironmental topics (e.g., Churcher and Smith 1972; Jelinek 1966; Klein 1975; Pearson 1977; Simenstad et al. 1978). The latter become particularly noticeable in the 1970s. We believe such shifts in content reflect changing editorial perceptions of what is newsworthy, particularly multidisciplinary studies such as domestication and paleoenvironmental studies that are likely thought by editors to be of interest to many kinds of nonarchaeological scientists (geneticists, botanists, zoologists, agriculturalists, and economists for domestication; palynologists, botanists, zoologists, climatologists, geologists, restoration ecologists, and conservation biologists for paleoenvironments). If so, our content hypothesis is not falsified.

Conclusion

Ignoring the apparent influence of World War II, the rate of archaeological publication did not increase after 1965 in *Scientific American* or in *Science* but rather after 1955. This was not just a recovery from what seem to have been influences of World War II. The claim of the processual archaeologists—that only with their assistance after about 1965 was the discipline scientific—is not reflected in the rate of publication in two major general-science journals. Of course, it need not be so reflected as there is no necessary causal relation between the claim and the publication rate. But why did the rate not change after 1965, as we expected, and instead changed earlier? It was suggested in 1970 that "despite a decade of intensive activity, relatively few research results have been reported yet by practitioners of the new archeology" (Hammond 1970:1119), but our research contradicts this assertion (O'Brien et al. 2005). There were research results that could have been and indeed were published in *Scientific American* and in *Science* (e.g., Binford and Binford 1969; Flannery 1965; Hole 1966; Leone 1968; Longacre 1964; Wilmsen 1968).

We believe that the publication rate changed earlier because the effort to be more scientific and more anthropological attributed to the processualists (e.g., Willey and Sabloff 1993) actually began before 1960. That beginning involved in part the adoption of the cultural evolutionism of Leslie White, along with a healthy dose of Julian Steward's cultural ecology (O'Brien et al. 2005). For example, an overview of Americanist archaeology published in *Science* in 1959 listed three foci of what was then termed "the new American archeology"—identification of culture processes, human ecology and adaptation, and cultural evolution (Caldwell 1959). Exactly those same three foci were said to characterize Americanist archaeology of the 1960s a decade later and several years after the birth of processual archaeology; the difference supposedly was that pre-1960s archaeological research had been largely inductive whereas processual archaeology involved deduction and the explicit testing of hypotheses (Adams 1968). However, deduction and hypothesis testing were

employed by archaeologists in the 1940s (Bennett 1946) and 1950s (Meggers 1955). In our view, what happened was less an adoption of new scientific procedures for doing research and more the creation of a cohort of archaeologists with a similar vision of the products of archaeological research; many in this cohort landed jobs in prestigious centers of research and training (particular universities) where they could influence the next generation (O'Brien et al. 2005). The products were supposed to involve "cultural processes," hence the name "processual archaeology."

The increasing publication rate evident in both journals in the 1950s appears to have been influenced by several factors, including a greater amount of archaeological research, a higher rate of archaeological publication generally, and increased funding. Why the publication rate decreased in both journals after the late 1970s is unclear, but we suspect that editorial choice played a significant role both directly and indirectly—directly because editors accepted manuscripts that corresponded to their nonspecialist ideas of what was important in archaeology and reflected their goal to publish articles of interest to many disciplines, and indirectly because a low acceptance rate caused archaeologists to submit their manuscripts to archaeological journals, including new ones, that were more author friendly. In our view, the historical development of publishing archaeological research in journals of general science from 1940 through 2003 reflects previously unacknowledged patterns in the discipline's history.

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