RECENT TRENDS IN THE PRE- AND PROTOHISTORIC ARCHAEOLOGY OF SOUTH ASIA

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I. THE CHANGING EMPHASES OF ARCHAEOLOGICAL RESEARCH

PRIOR to the Second World War the old Archaeological Survey of India was, in the words of a leading Indian archaeologist, "almost absolutely obsessed" with art, religious monuments, epigraphy, and numismatics. There was little or no overall long-range planning or coordinating of archaeological efforts. Amateur archaeology was rampant. The revelation in the 1920's and 1930's of South Asia's oldest civilization—named Indus or Harappan—attracted world-wide interest and shook the traditional belief that there was nothing but a timeless prehistoric void in South Asia prior to the reign of King Asoka in the third century B.C. But, partly because of the times, scholars seemed content to accept this vast Harappan civilization as a full-grown mature adult. It was over twenty years before serious queries were raised concerning its credentials, its conception, and its disappearance.

Now a fresh era of research has opened. The conservation and restoration of religious and historical monuments still receive the most immediate attention of the government archaeological services, as they rightfully should, but there is an ever-increasing attention being focused on the prehistoric foundations and on the rise of civilization in South Asia. Recent publications in and about Pakistan and India reflect the current introduction of modern archaeological methodology and the desire to synthesize the scattered bits of information into the beginnings of a meaningful picture of the early development of South Asia.

II. LOCAL FACILITIES AND RESOURCES

The spirit and fortunes of the old Archaeological Survey of India had reached such a low ebb by 1938 that outside advice was sought. Sir Leonard Woolley, the British archaeologist of Near Eastern fame, was summoned to assess the problems and make recommendations for revitalizing the Survey. His report has been described as "a monument of quick and penetrating vision and of trenchant but judicious and constructive criticism" (Wheeler, 1958). But the times and political circumstances were not receptive to the spirit of the report and it was immediately withdrawn. It was five years before the wisdom of the report was appreciated, but, when it was, an action was taken which was to reshape the entire archaeological research structure of South Asia. The years 1944–1947 represent, perhaps, the most decisive single period in the century-old history of archaeology in South Asia. Sir Mortimer Wheeler, one of the most eminent British archaeologists, was appointed Director-General of Archaeology in undivided India. His brilliant insights into the problems and needs of the tottering Archaeological Survey confirmed and enlarged upon the earlier report by Woolley. Wheeler's masterful tutoring of a cadre of young archaeologists in modern excavation techniques plus his own carefully planned and executed excavations have left a legacy which will endure perhaps as long as some of the monuments themselves.

Thus, with Partition in 1947, the Archaeological Survey of India and various Indian colleges and universities were well set up to carry on where Wheeler left off. A significant recent development has been the establishing of a School of Archaeology under the direction of the Archaeological Survey. Archaeology has indeed been de-amateurized in India and is receiving its fair share of university and government support. The publication of the results of the increasing archaeological activity still leaves much to be desired in terms of quantity and quality but economic factors are an understandable element here. The most important and useful periodicals—although unfortunately now three to four years behind schedule—are *Ancient India* and *Indian Archaeology: A Review,* both published by the Archaeological Survey.

The archaeological situation in Pakistan—pri-

marily West Pakistan for the purpose of this paper—has not been quite so favorable. This is partly because of the initial lack of trained archaeologists and scholars after Partition and partly because of the practical exigencies facing a new nation. Fortunately, Sir Mortimer Wheeler was prevailed upon to function for a time as archaeological adviser to the new government of Pakistan. Without his sound guidance in those difficult and frustrating formative years it is questionable whether a bona-fide Department of Archaeology could have been developed so quickly. But the Department still faces some grave problems and inadequacies. A formal program for recruiting and training young men for the archaeology service is a necessity. Increased freedom and facilities for publication are seriously needed. The Department has started publication of an official journal, *Pakistan Archaeology,* of which the first volume appeared in 1964. Descriptive monographs on individual sites and collections are being published but comprehensive final reports on archaeological excavations are still awaited. Economic conditions, as in India, naturally inject an uncontrollable factor into the publication problem. The archaeological program of the University of Peshawar, under the direction of Professor A. H. Dani, does appear to be making significant advances. Student training, extensive field work—both surveys and excavations—and publication are part of the Peshawar program. The first volume (1964) of a Peshawar Department of Archaeology bulletin, *Ancient Pakistan,* has appeared.

The Pakistan government Department of Archaeology has conducted several important excavations: for example, the prehistoric site of Kotdiji (Khan, 1958, ?1959, and *Pakistan Archaeology* 1), the early Islamic seaport at Bambhore—both in West Pakistan—plus several large-scale excavations at historical period sites in East Pakistan. In addition it has conducted extensive surveys in the Indus Valley and Baluchistan (*Pakistan Archaeology* 1). This is a major step toward a program of overall planning for future archaeological excavations. Because of the limited capabilities of the government Department of Archaeology up to the present time there has been a greater reliance on foreign-sponsored expeditions in Pakistan than in India. Italian expeditions, under the general direction of Professor G. Tucci, have been working in northernmost West Pakistan for several years. Their interests have ranged from historical back to Stone Age sites. Preliminary reports on their excavations appear in the journal *East and West.* Japanese archaeologists have also been working for several years in the north, mainly at Buddhist period sites. J.-M. Casal, Director of the French Archaeological Mission, has completed excavations at the important pre-Harappan and Harappan period site of Amri in the Indus Valley (Casal, 1964). He is currently excavating at a very promising Kulli period (late pre-Harappan) site in the Ornach Valley of southeastern Baluchistan. Archaeological reconnaissances have been conducted by Miss Beatrice deCardi of England (deCardi, 1950, 1959, and in *Pakistan Archaeology* 1), and by Dr. Henry Field of the Peabody Museum, Boston (Field, 1959). Dr. Walter A. Fairservis, now Director of the Washington State Museum in Seattle, has done most of the basic surveying and pottery analysis for the prehistoric periods of the Quetta, Zhob, and Loralai areas of West Pakistan (Fairservis, 1956, 1959). The field work of the University Museum, Philadelphia, will be described under the heading of the Harappan Civilization.

III. ARCHAEOLOGY AND THE NATURAL SCIENCES

The desirability and need for closer cooperation between archaeologists and natural and physical scientists are generally expressed in recent publications in and about Pakistan and India. The scientific approach and knowledge of the geologists, palaeobotanists, palaeoethnologists, physicists, and oftentimes the practical approach of the engineers are essential if many of the crucial archaeological problems are to be understood. Cooperative efforts along these lines are still in the formative stage. In two spheres of inquiry, however, significant results have begun to appear—namely, studies of the ancient climate and physical environment, and the absolute dating of remains by the use of radiocarbon (C-14) analysis.

Convincing evidence, collected from both archaeological and natural science investigations, refutes the popular theories of appreciable climatic change in the South Asian area during the past four to five thousand years (Raikes, 1965*a*; Raikes and Dyson, 1961). Climate has thus been practically eliminated as a major factor in the environmental fortunes of the Harappan civilization. On the other hand, geological and geomorphological factors are emerging as significant contributors to

the decline of the Harappans (discussed below under Harappan Civilization).

The utilization of radiocarbon-dating procedures has already helped in defining the chronological framework of South Asian pre- and protohistory (Ralph, 1959; Stuckenrath, 1963; Kusumgar, *et al.*, 1963; Agrawal, *et al.*, 1964 and 1965). India is significantly ahead in this field with its fine Tata Institute of Fundamental Research (Bombay) which all but eliminates the necessity of using foreign laboratories for this type of dating analysis. Summaries and interpretations of the available dates have been published by Agrawal (1964) and Lal (1963).

IV. THE STONE AGE SEQUENCE

Until very recently the Stone Age prehistory of South Asia had been described and interpreted from the point of view of terminology and developmental patterns originally worked out for earliest Europe and Africa. There has been growing concern about the validity of this practice. Finally, at the International Conference on Asian Archaeology in Delhi (1961) a new terminology was agreed upon by a majority of the Indian prehistorians and visiting scholars. This terminology expresses a long overdue need to describe the prehistory of South Asia on the basis of its own internal evidence. The next step has yet to be taken—from a purely technological description of prehistoric man to a socio-economic description of his accomplishments. This will certainly come in due course now that the basic question of terminology has been seriously confronted. The new terminology for prehistoric India is thus:

Early Stone Age: hand-axe industries
Middle Stone Age: flake stone industries
Late Stone Age: microlithic stone industries

The hand-axe industries are equivalent, in general terms, to the Lower Palaeolithic of Europe and western Asia. The microlithic industries are perhaps the least well defined of these three phases because of the wide distribution in time of such artifacts. It remains to be seen whether the early examples of the microlithic tradition in India actually represents a "mesolithic" stage of socio-economic development. It should be noted that the earliest human skeletal remains so far discovered in India belong to this Late Stone Age, which is dated geologically to about 4000 B.C. Seven skeletons, buried in highly flexed positions and wearing beads of dentalium shells, were found in the well-stratified site of Langhnaj in Gujarat. Surveys of the Stone Age periods and new discoveries are found in Allchin, B. (1963); Dales (1964*c*); Dani (1964); Ghosh (1964); Khatri (1964); Lal (1964*a*, *b*, and *c*); Misra (1965); Oakley (1964); Sankalia (1962 and 1963); Soundara Rajan (1961); Wheeler (1959); *Indian Prehistory: 1964; Ancient Pakistan* 1; *Indian Archaeology: East and West.*

V. THE NEOLITHIC PERIOD

At an important seminar on Indian pre- and protohistory held in Poona in 1964 (Misra, 1965; Thapar, 1965), efforts were made to define "neolithic" in terms of the Indian evidence and to clarify the problems of its origins. Unfortunately, there still remains the tendency to define "neolithic" in technological terms (e.g., the presence of polished stone tools). A more meaningful socio-economic basis for its identification has yet to be framed. The fallacy inherent in using only the presence or absence of polished stone tools to identify a site as "neolithic" is obvious in India where copper-bronze objects have been found at almost all the sites having such stone tools. Thapar (1965, including comments by other Indian scholars at the end of the article) summarizes the current thinking of the Indian archaeologists. There are at least three distinct regional variants designated "neolithic." The northern complex centers around Burzahom in Kashmir. Radiocarbon dates from the site suggest a period around the first quarter of the second millennium B.C. for the beginning of this northern pre-metallic culture.

An eastern "neolithic" area extends through Orissa, Bihar, West Bengal, and Assam (Dani, 1960, already outdated in parts). On the basis of similarities between certain distinctive stone tool types it is suggested that this complex has a Chinese, or at least Far Eastern or Southeast Asian origin. Recent excavations at several sites have at last provided a stratigraphic context for this period, but as has been mentioned above the excavated evidence is still mainly of a technological nature. A radiocarbon date from the site of Pandurajar-dhibi in West Bengal supports other indications that this eastern "neolithic" is not older than 1000 B.C.

A southern neolithic complex, centered in the Deccan, has received the most scientifically oriented attention. Eight sites have been more or or less carefully excavated during the past fifteen years (Brahmagiri, Sanganakallu, Piklihal, Maski,

Nagarjunakonda, Utnur, T. Narsipur, and Tekkalkota). Radiocarbon dates suggest a range from about 2000 B.C. down to perhaps 650 B.C. The terminal date is the least certain, partly because of ambiguities in the definition of what the southern neolithic comprises and partly because a neolithic tradition has actually persisted in certain areas even to the present day. The most comprehensive study of the southern neolithic has been done by F. R. Allchin (1960, 1961, and 1963, plus a review of it by Dales, 1964*a*). The picture is still not clear but present evidence—or lack of evidence—suggests that southern India jumped directly from a neolithic state to the Iron Age and Early Historical period without the intervening chalcolithic-bronze age so familiar in other areas. The question of the origin of the southern neolithic is a matter of debate. Allchin prefers to see a northern Iran homeland whereas other scholars prefer an indigenous development theory.

VI. PRE-HARAPPAN CULTURES OF BALUCHISTAN AND THE INDUS BASIN

The first systematic description and appraisal of the earliest metal-using cultures of West Pakistan were made by Stuart Piggott (1950). Whereas his basic descriptions of sites and archaeological complexes remain valid and very useful, his relative chronology of the various cultural groups is largely obsolete. Considerable attention has been focused on the relationships—chronological and cultural—during the fifteen years since Piggott's book appeared. This is not to suggest that the pre-Harappan chronology is settled. It is possible, however, to make more intelligent guesses than were possible a decade ago. The most recent synthesis of relative and absolute chronology (Dales, 1965*d*) attempts to group all the known aspects of the various cultures into developmental "phases." This is a direct reaction against the previous chronologies based primarily on ceramic comparisons. Such a synthesis, with all of its tentativeness, has been possible only because of the new information gathered through the field work of Fairservis (1956 and 1959), deCardi (1950 and 1959), Casal (1961*a* and 1964), Wheeler (1947), Khan (1958, 1959?, and in *Pakistan Archaeology* **1**, and the Pakistan Department of Archaeology. Until very recently there was only the most scattered and scanty evidence for pre-Harappan occupation in the Indus basin itself. Casal's work at Amri, Khan's excavations at Kot-diji, Wheeler's trenching at Harappa, and the current Indian excavations at Kalibangan in northern Rajasthan have provided glimpses of widespread occupation, on a village level, prior to the establishment of the Harappan civilization (Ghosh, 1965). The Indian archaeologists seem to favor the name "Sothi" for this complex but the relation between the northern sites and those in the lower Indus valley, such as Kot-diji, remains to be elucidated before any single name is applied to the pre-Harappan occupation of the entire Indus basin. A fuller exposure of this occupation is an essential factor in any understanding of the beginnings of Harappan civilization—a problem which will be discussed below.

One of the most exciting discoveries relevant to the pre-Harappan period concerns the geographical distribution of the so-called Kulli culture. Kulli sites are centered mainly in the valleys of southern Baluchistan. Certain painted motifs on Kulli pottery suggest stylistic connections with southern Iran and southern Mesopotamia. This has been important because of its possible implications for the relations between Mesopotamia and the Indus region in pre- and early Harappan times. The chronological and cultural relationships between Kulli and Harappan are anything but clear but it has always seemed that some significant connections existed. The current French excavations at the important Kulli site of Nindowari (or Nindo Damb) in the Ornach valley of southeastern Baluchistan should help to clarify this issue. It is the recent discovery of Kulli-like materials in the Persian Gulf which has provided the first material link between these areas at such an early date. Burial cairns containing painted pottery similar to that of Kulli and southern Baluchistan were excavated by Danish archaeologists on the island of Umm an-Nar (Abu Dhabi) off the Trucial Coast (Bibby, 1964; Thorvildsen, 1962). Current plans by Beatrice deCardi (British) to excavate in southeastern Iran hold out great promise of providing yet further material links along the southern routes of Pakistan and Iran.

VII. THE HARAPPAN OR INDUS CIVILIZATION

The existence of a vast early civilization in South Asia, contemporary with those in Mesopotamia and Egypt, was not even seriously suspected until the excavations at huge ancient mounds in the Indus Valley were begun in the 1920's. Mohenjo-daro in the southern valley (Marshall, 1931; Mackay, 1938), Harappa in the

Panjab (Vats, 1940), and later Chanhu-daro in the southern valley (Mackay, 1943) yielded abundant material evidence of a sophisticated, advanced civilization centered in the Indus basin. Detailed descriptions of the material remains of this civilization—based on the excavation reports—have been published by Mackay (1948), Piggott (1950), and Wheeler (1959, 1960, 1961). Exploration, both in Pakistan and India, has greatly extended the geographical range of the Harappans. Their domain is now known to have covered a triangular area, centered along the Indus basin, having sides nearly one thousand miles in length. The discovery of a Harappan site, Alamgirpur, in the headlands of the Ganges basin; the identification of over eighty Harappan sites in the Gujarat area of western India, north of Bombay (Rao, 1963); the confirmation of the mature Harappan character of Sutkagen-dor in the Dasht Valley between southern West Pakistan and Iran (Dales, 1962*a* and *B*), plus extensive explorations demonstrate that well over half of the some one hundred and fifty reported Harappan sites are actually outside the geographical limits of the Indus valley. This does not invalidate the use of the name Indus or Harappan for the civilization as a whole because the two largest urban centers (Mohenjo-daro and Harappa) are in the Indus basin and the core-area of the civilization still appears to have been in the southern valley.

Much of the recent and current research on the Harappan civilization has been focused on clarifying, correcting, or refuting impressions derived from the original excavation reports. The principal new investigations have concentrated on such questions as Harappan origins, the life span and dates of the civilization, the nature of the civilization itself, and the causes of its decline and disappearance.

The very important problem of the origin of the Harappan civilization has been the subject of some interesting and provocative studies by Casal (1961*b*), Fairservis (1961), Ghosh (1965), and Wheeler (1959, 1960, 1961). The present author's work on the chronology of South Asia (Dales, 1965*d*) also deals with some of the problems. The archaeological evidence pertinent to the rise of the Harappan civilization can be viewed from two geographical vantage points. Baluchistan should logically be the first place to look for any type of proto-Harappan development. This can be said because during the entire pre-Harappan era many of the material traits we find in Baluchistan can be traced back to Near Eastern prototypes. The various Baluchistan cultural groups, individually distinctive as they are, apparently derived a great deal of their impetus from Afghanistan and Iran. Pakistani Baluchistan is, after all, situated at the eastern edge of the Iranian plateau which provided a geographical, cultural pool extending from the eastern edge of Mesopotamia to the western edge of the Indus basin. But other factors, as yet unclear, entered during the third millennium B.C. when we see the beginning of civilization in the Indus valley. The Baluchistan prototypes we might expect are not there. There is a definite, and disturbing, hiatus in the cultural development sequence which remains to be filled. If the answers are not to be found in Baluchistan, we should expect them to be found in the Indus valley itself. But the hiatus—cultural, not chronological—confronts us there too. The extensive excavations at Kot-diji (Khan, 1958, ?1959, and in *Pakistan Archaeology* 1) and Amri (Casal, 1964) in the southern valley and more recently at Kalibangen in the north have provided even more puzzling evidence than we possessed prior to these excavations. At Amri there is the earliest phase of occupation which is undoubtedly pre-Harappan, characterized by bichrome painted pottery which has possible earlier connections with the Quetta area and southeastern Afghanistan. Then there is an intermediate phase in which this basic Amrian culture is mixed with the Quetta area and southeastern Afghanistan. Then there is an intermediate phase in which this basic Amrian culture is mixed with what is recognized as mature Harappan. Finally there is a pure Harappan phase. Casal stresses the point that the Harappan material appears at Amri already fully developed, thus precluding any direct growth of Harappan from the Amrian complex. At Kot-diji a similar situation is noted. There are certain types of objects and some design motifs characteristic of mature Harappan which are seen in the pre-Harappan Kot-dijian levels but still not enough to prove that Harappan developed out of the Kot-dijian culture alone. The pattern is repeated at Kalibangan where the preliminary reports stress that mature Harappan material mixes with an indigenous cultural group (called Sothi), co-exists with it for a time, apparently peacefully, and finally supplants it. This new evidence could logically suggest that the Harappans arrived from somewhere outside the Indus area and imposed an already developed civilization on the indigenous inhabitants

of the valley. This begs the question, however. Generations of explorers in the areas surrounding the Indus regions have not discovered a trace of cultural remains suggesting any homeland for the Harappans.

We have sufficient evidence from various sites to allow a description of the material aspects of the mature, and to a lesser extent, a late Harappan phase. What still eludes the archaeologist's spade is a recognizable early Harappan phase. The various publications cited above offer some very intelligent guesses but it must still be admitted that the question of Harappan origins lies more in the realm of philosophical speculation than in the more factual realm of archaeological evidence. The next stage of investigation should be more extensive archaeological exposure of the so-called Sothi (or Kot-dijian) settlements which are known to precede the appearance of mature Harappan. Perhaps a better understanding of their cultural, economic, and technological level would provide a more solid base for the pursuit of the presently enigmatic—and possibly hypothetical—early Harappan phase.

The dating of the Harappan civilization and the length of its mature phase have attracted considerable scientific attention and happily some positive results are coming forth. Radiocarbon (C-14) dating has provided the most dramatic confirmations and modifications of the conjectured dates of the Harappan civilization (Agrawal, 1964; Lal, 1963). Earlier estimates based on archaeological evidence alone stated that the Harappans endured, unchanging, for a thousand years. The presence of distinct Harappan-type stamp seals in Mesopotamian contexts, primarily in Akkadian period levels of approximately 2300 B.C., provided at least one fixed chronological point for the Harappans. The radiocarbon dates, admittedly still too few, bracket the mature Harappan phase is approximately the period of 2400 to 1800 B.C. We can safely extend this bracket back to perhaps 2500 B.C. on the basis of certain Near Eastern parallels, but there is no evidence to suggest lowering the terminal date for the mature phase. The dating of the earliest phase of the civilization must await further elucidation of the broader question of Harappan origins.

Many aspects of the problem of the life span of the civilization can, and must be investigated from the purely archaeological standpoint. Only the laborious excavation, according to accepted modern methods, of Harappan sites is going to tell us anything about the internal development and decline of Harappan fortunes. Progress along these lines will be slow, to judge from the recent pace of activities. During the past decade, horizontal excavations have been conducted at only three Harappan sites—Lothal, an important seaport at the head of the Gulf of Cambay, Kalibangan in northern Rajasthan, and to a lesser extent at Mohenjo-daro. Excavation is still in progress at Kalibangan and the final report on Lothal is expected soon. Both sites promise to provide valuable new information on the evolution and devolution of Harappan architecture, artifacts, and artistic preferences—information which will be as important for the purposes of chronology and dating as for a deeper understanding of the nature of the civilization. The excavations at Amri (Casal, 1964) and at Rangpur in Gujarat (Rao, 1963) have since provided valuable, but limited, new evidence which helps toward an identification of the material changes which took place between the mature and the late Harappan phases.

Excavations were resumed at Mohenjo-daro, the largest and best-preserved Harappan site, during the winter of 1964–1965, by a joint expedition of the University Museum (Philadelphia) and the Pakistan Department of Archaeology (Dales, 1965*a*, *b*, and *c*).[1] One of the aims of the new excavations is to obtain a complete stratified sequence of architecture and artifacts from the latest level down to the earliest. Such excavations, if completed, would provide the only such sequence from a major site in the core-area of the civilization. It will be most interesting to compare the sequence from the largest urban center with those from the outlying towns of Lothal and Kalibangan. The first season's work at Mohenjo-daro has already yielded stratified materials which show a decided decline in prosperity in the uppermost and latest levels. The problem of excavating down to the lowest and earliest levels is essentially one of engineering. The present ground-water table is abnormally high in the Mohenjo-daro area, only about fifteen feet below plain level. Test borings made during the 1964–1965 season showed that the lowest level of occupation—at least in the area of the borings at the southern part of the site—is thirty-nine feet below plain level. Thus the earliest twenty-four feet of occupation levels are sub-

[1] This work was sponsored in part by grants from The JDR 3RD Fund, the National Science Foundation, the American Philosophical Society, W. E. Seeley Trust Fund, and private donors.

merged in ground water. Several systems are under consideration for the lowering of the water table or for at least dewatering a limited area to allow deep excavations. Expensive and complicated as such an operation will probably be it should definitely be worth the effort. The relative dating information obtained from this type of excavation would be supplemented by a sequence of absolute dates if the necessary carbonized remains could be collected for radiocarbon dating. Eight samples were collected during the 1964–1965 season from the late levels of the city and are undergoing testing at the University of Pennsylvania.

As for the nature of the Harappan civilization itself, little positive advance has been made in our knowledge since the original discoveries in the 1920's. Various theories appear in print from time to time concerning the possible social, religious, economic bases of the Harappan culture, but at present, at least, they must be treated more as working hypotheses than as fact (Fairservis, 1961).[2] The Kalibangan excavations hold out the greatest promise at this time. They have, for example, produced the first certain material evidence for religious practices. But excavations alone, even if the major sites such as Mohenjo-daro and Harappa were to be completely excavated, will never provide the golden key to a true understanding of the culture. We are still faced with the unfortunate circumstance of having an undeciphered script. Even sadder is the fact that even if, for example, a bilingual inscription were found which would identify the Harappan language, no lengthy texts or inscriptions have yet been discovered. Legal, administrative, economic, religious, and literary documents which we should expect to find in such a vast and highly organized civilization have completely eluded the archaeologist's spade. If they were written on perishable materials, their loss presents an unsurmountable obstacle to ever understanding the Harappans' motives, methods, and accomplishments.

The decline of the Harappan civilization and its apparent disappearance from the South Asian scene has been a major point of concern and has received the most concentrated attention as of late. Recent and current research is gradually reducing the necessity for speculative reconstructions which have dominated the literature for so many years. Many of the new insights are being provided by the natural scientists, working alone or in conjunction with archaeologists. They are providing the kinds of information which the pure archaeologist could never obtain through the most careful and extensive excavations. An example of the rewards to be reaped from the cooperative efforts of different disciplines is seen in the advance in our knowledge of the ancient climate and physical environment of the Indus valley and Baluchistan. The earlier theory that drastic climate change in these areas was responsible for the demise of the civilization has been shown to be incorrect (Raikes, 1965*a*; Raikes and Dyson, 1961). Similarly, the theory popularized mainly by Piggott (1950) and Wheeler (1959, 1960) that the invasion of South Asia by the Indo-Aryans was the immediate cause of the destruction of the Harappan civilization is under scientific attack. Recent work is demonstrating more and more that no single cause was responsible for the Harappan demise. What little archaeological evidence we have so far suggests that we must at least consider the fates of the northern and southern parts of the Harappan domain as separate but closely interrelated phenomena (Ghosh, 1965).

Excavations at the northern sites have not revealed evidence for any appreciable decline in Harappan prosperity prior to what seems to have been a hasty abandonment of the areas. These sites show a complete break in the occupation during a mature Harappan phase followed by lengthy abandonment which lasted possibly for centuries. It is logical to assume that the Harappans were forced to flee in the face of foreign incursions. Just who the invaders or raiders were, if they in fact existed, is unknown. There is, however, no evidence of any kind, literary or archaeological, which allows a positive identification of them as Aryans. What is more crucial, at this stage of our knowledge, is not what or who, but rather why. What internal circumstances could have resulted in such a weakening of the vast Harappan cultural and administrative complex as to allow a successful incursion in the north? An explanation may be found when we look at the misfortunes suffered by the Harappans in the core-area of the civilization—the southern Indus valley with its huge urban center Mohenjo-daro. Excavators of southern sites have almost always stressed the evidence for massive destructive floods at their sites. Suggestions have even been made by archaeologists that unusual flooding was responsible for the destruction of the Harappan activities in

[2] A general article on the nature of Harappan civilization by the present author will appear in *Scientific American* early in 1966.

the lower Indus valley (Mackay, 1943). But this evidence was generally considered as of secondary importance until physical scientists began noticing possible relationships between geological and geographical anomalies in the lower Indus valley and the fate of the early civilization (Sahni, 1952 and 1956). The University Museum's Mohenjo-daro project in 1964–1965 included investigation of the history of flooding in the lower valley and its importance in the life and death of Mohenjo-daro and the core-area of the Harappan civilization. Robert L. Raikes, a professional hydrologist and expert in ancient environment, has been the principal investigator from the physical science side. Several reports on the tentative results of these preliminary investigations have been published and need not be repeated here (Raikes, 1964 and 1965*b*; Dales, 1965*a*, *b*, and *c*). Suffice it to say that geological disturbances south of Mohenjo-daro created a series of massive floodings which over a period of perhaps three or four centuries completely disrupted the life and economy of Mohenjo-daro and the villages in the lower valley. Presumably, this unsurmountable environmental situation would have so weakened the power structure of the civilization (whatever it consisted of!) that the more remote areas to the north became vulnerable to outside pressures. This flooding theory is in need of further elaboration and confirmation as Raikes so correctly stresses. Additional archaeological work at Mohenjo-daro, studies of the flood-silt levels at other sites, and further geomorphological studies are required. At the very least we can say that the popular notion of invasion and massacre having been the final act in Mohenjo-daro is no longer tenable (Dales, 1964*b* and the review by Wheeler, 1964).

Leaving the causes of the Harappan decline open for further investigation, we should at least close this paper with some remarks concerning the aftermath of the Harappan experiment. As has been noted, the mature Harappan period came to an abrupt end in the northern regions. We read the available evidence to mean that this rapid abandonment in the north was a result rather than a cause of the demise of the Harappan civilization as a whole. Where the northern Harappan population moved to is still an unknown factor. In the south, the evidence for abandonment because of natural—or rather unnatural—disasters is becoming overwhelmingly apparent. The discovery in recent years of over eighty sites in the Saurashtra peninsula of western India—sites which are identified as belonging to the latest phase of Harappan civilization—points to the conclusion that the populations of Mohenjo-daro and the Harappan villages in the lower Indus valley were forced to migrate to the southeast. Preliminary reports on excavations at these sites with late Harappan levels (e.g., Rangpur: Rao, 1963) tell a sorry story. The Harappan zest was dissipated and gradually the characteristic Harappan material traits became dissolved in the sea of the local indigenous west and central Indian agrarian cultures. Figurines, sculpture, seal engraving, writing, urban living, and all the other features which so epitomized Harappan culture disappeared completely from the South Asian scene. There are some admittedly striking artistic and stylistic parallels to be drawn between Harappan and historical Indian materials but the centuries, and more likely the millennia, which separate them without any cognizable linking threads make one speculate concerning the existence of many enduring values within the Harappan cultural milieu.

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