TIME THROUGH TIME:
AN EVOLUTIONARY PERSPECTIVE

by

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Introduction

Analysis of the nature of time has engaged the attention of many historic philosophers and logicians including Aristotle, Augustine, and Kant. However, within the anthropological framework, Maxwell (1971:48) notes that the cross-cultural study of time has not yet even been given a name, nor have "schools" of thought emerged, and only occasionally have individuals considered the subject toward the goal of understanding why men perceive and order time as they do.

Time as a Reality

The reality of time was a perplexity to Augustine (Confessions xi.3) in his oft-quoted: "What, then, is time? If no one asks me, I know; if I wish to explain it to one that asks, I know not." Augustine insisted that time is grammatically a noun, a precept which is central to the later linguistic content of this paper. However, even he had difficulty in its definition, in that using his name-substance theory of meaning, there is no referent. Gale (1968:5) observes that "time is a name that does not name."

Time is a universal reality. It is perceived by each society within the context of cultural constructs which are created by the society in terms of its own history and ethos. Using a broad cross-cultural approach, this definition relieves the necessity

to consider time as an "abstract Thing," (Allen, 1947), or, alternately, as dimensional (spatial/temporal).

Time is a phenomenon of universal existence and may be described by various societies in differing ways. Something must go into each of these constructs, and if time is not considered as an abstract or a dimension, then to what do these constructs refer? Time is analogous to the universal cultural construct of an indigenous kinship system which develops and is meaningful to participants in role definition and expectations. Whether Spring is determined by an astronomical equinox, a "green season," or, as in Eskimo, "when rivers commence to flow" is inconsequential except that the onset of Spring may influence behavior and values of members of a specific society. To measure distance by the non-parallel spatial units of light-years, a "ten minute walk", or "two days by dog-team" merely suggest that space-time dimensions universally exist, but are important only in locally significant terms. Any or all of the Western philosophical definitions of time as static, dynamic, segmented, linear, cyclical, spatial, or temporal, as well as other concepts unique to indigenous groups, may occur in native cultures. Their importance and role can be assessed only internally based on ethos, values, and the local level of technology.

Time in Evolutionary Perspective

Time appears to have both biological and cultural components when viewed in terms of the ascent on an evolutionary scale. Orme (1969) succinctly summarized studies on a series of faunal types ranging from crabs and the mayfly to passerine birds and

rats, and he concludes that with increasing complexity an increased capacity to deal with time become apparent.

At the human level, the increase of brain size appears to be directly associated with the occurrence of greater conceptual ability, including the use of tools and speech. Pomphrey (1951) links the origin of language to the Upper Paleolithic and the emergence of Homo erectus who were, unlike those of an earlier phase, capable of making tools for future use. This suggests that tools made for future use indicate the presence of time concepts, and he associates the origin of language with this by asserting that language includes the past and future (it continues in both), whereas speech is restricted to the present. In possible agreement with Lenneberg (1967), there may be a biological imperative for man to conceptualize, in both time and space, since man alone through the vehicle of culture has the opportunity to direct his destiny--to exercise free will--through group and personal choice.

These distinctions may be somewhat subjective. It may be that Australopithecus conceptualized the "future", as Oldowan choppers were made for future use. Furthermore, having once made the tools, he must have remembered in order to repeat the process by which he made the tools, thereby conceptualizing not only the future, but also the past. So indeed, might Jane Goodall's chimps, who carried ad hoc tools from termite hill to termite hill, be said to have exercised foresight.

As hominid forms ventured into ecological zones alien to their assumed ancestral tropical homeland, we believe that they were required to think ahead, to plan for seasonality in the food

quest and a supporting material culture. Simultaneously, as populations grew, with needs to establish rules of reciprocal interaction (kinship) and even minimal jurisprudence, they were forced to think back to search for solutions (precedence) to immediate problems. Although evidence suggests that other animals may have limited time/space perceptions, language still appears to be the conceptual medium which confers upon man his unique time-binding capacity. To know the developmental sequence of conceptualization of time on the prehistoric level would contribute substantially to an understanding of the development of culture, but may always remain within the shaded area of inference.

The biological component of time is still operative in man even in the most technologically-advanced cultures. Self-evident is the "time to work, time to rest, time to live, time to die" syndrome of the individual circadian rhythm applicable at all stages of human existence. Modern rapid transportation, however, quickly disturbs it--namely, the effect of "jet lag."

The cultural component of time in an evolutionary schema involves a correlation of technology (includingthe methods of time reckoning) with the cultural perception of time as indicated by linguistic usage. Although others, such as Childe and White, or even archaeologists Willey and Phillips, have established more detailed divisions of human evolution, only three seem important here: Hunters (including fishermen and gatherers); Farmers and Herders; and Industrialists. Each of these three groups, representative of increasing technology, will be briefly analyzed.

Hunters probably once roamed entire continents, but are now small and isolated groups living in habitats that range from tropical rainforests to the Arctic coast. Essentially, their life style is predicated upon the use of local resources, often without much modification. To our knowledge, no single cross-cultural study has been undertaken to assess the number of human hours of labour required per individual in non-literate societies, or the time needed (daily, weekly) to meet minimal requirements for food and other material culture. Such a comparative study might prove highly illuminating and at variance with the long-standing notion that "primitive" people are continuously grubbing for sheer survival.

Sahlins (1972) alludes to this notion when he suggests that Arnhem Land (Australia) hunters and gatherers failed to develop a higher level of technology not because of a lack of time, but because of too much leisure time, which led to idleness. He also observes that the Hadza of Africa refuse to participate in the neolithic revolution because to do so would rob them of their spare time. Indeed, Sahlins (1972:35) submits that "the amount of work (per capita) increases with the evolution of culture, and the amount of leisure decreases."

Among isolated recent reports, Lee (1972) provides data for the !Kung Bushmen living in the very arid Kalahari Desert to the effect that subsistence requirements for food may be met in the modest output of labor of only two to three work days per adult per week; building a house for the rainy season camp is only a day's work; the all-important digging stick can be whittled in an hour; and even a complete set of bow arrows, and quiver can

be made in three to four day's time, with a life expectancy of several years. Among the !Kung, the food quest is a routine daily activity, with only minor variances due to differences in the abundance of food during wet and dry seasons.

Time reckoning among Hunters appears, in general, to be associated with observation of natural phenomena, and devices for measuring the passage of time are virtually non-existant. Nillson (1920) stresses that socially-used divisions of time reflect social life rather than the astronomical observations on which it is based. Given the lack of importance of time relative to survival among Hunters, it follows that linguistic development in reference to time would be lacking. Of the many other recent case studies available (cf. Kluckhohn and Strdbeck, 1961, et al), none reveal an elaborate time vocabulary. To paraphrase, time is measured in "sleeps," "moons," and/or "seasons of activity" that are locally important. Age is generational, based on kinship, rather than chronologically. Among our Eskimo informants, specific past events are recalled only by reference to a series of other, mutually-known circumstances.

Farmers and Herders are the product of the transition from food gathering to food production associated with the Neolithic. The definition by Leach (1958:120-1) merits quotation:

> If there is any single criterion which distinguishes primitive society from that which is more advanced, it is that in the former, all persons of one sex have the same interests and acquire the same skills, while in the latter, technical tasks and special duties come to be carried out by specialists. It seems that historical and magical time-

thinking develop out of primitive time-thinking along with specialization of labor and reflect the special interests of the priestly and official classes.

The shift from food gathering to food production was gradual but pervasive; as new tools for cultivation and harvesting appeared, words to name them were created, and expanded the language. Time increased in importance, and as it did so, words for its description--astronomical, astrological, ritualistic-- were added to the vocabularies. The historic development of measuring devices such as water clocks and sun dials, together with calenders and numbering systems to analyze and record the passage of time have all been fully reported by many, and need not be recounted here. The effect of specialization of labor, including settled life for farmers and nomadism for pastoralists, must have triggered an enormous information and linguistic explosion. Leach (1958) and others link language with magico-religious values, involving the naming of festivals, the development of ritual, and the rise of a priesthood and political systems. Human history has deep roots in the elaboration of culture in this era, and the richness of our language reflects it.

Time reckoning among Farmers and Herders is determined in a variety of ways. Titiev (1960) provides a good example of time reckoning among the Hopi, who follow a "natural calendar" of sunwatching. The solstices are observed and often indicate that it is "time" for important calendrical rites. Various natural landmarks serve as calendrical markers in such a system.

Among the Tiv of Nigeria, Bohannan (1953) reports that time is not measured. Time is indicated by associations of natural phenomena (wet or dry seasons, for example) or social phenomena (such as when a "market" is held). Linguistic development reflects this lack of time measurement. The Tiv relate an event to the number of markets or the number of wet seasons elapsed since the event, but this indicates lapse of time only, rather than a specific time. Hence, the Tiv have no words for days, months, or years as units of time. Rather, they count suns, moons, or dry seasons -- natural phenomena -- to reckon lapse of time.

Evans-Pritchard (1940) describes time reckoning among the Nuer, noting that their "concept of seasons is derived from social activities rather than from the climatic changes which determine them," (1940:95). Their words for time, then, refer to social activities which occur at certain times, rather than to particular units of time.

The mechanized American farmer and rancher is of interest here in that even though calendrical time sets approximates for planting and harvesting, or the transfer of animals to other ranges or "round-up", the precise onset of each activity is still dictated by local weather and other immediate conditions such as soil wetness, and ripeness of a crop as determined by amount and intensity of sunlight. To perceive the language of time in this technological stage, one needs only to listen to the members of the contemporary farming community. The generalized perception, "it's calving time," means only that it is the season of several weeks duration when cows may drop their claves.

Tangentially, however, this same group may share Industrialist concepts in other situations.

By contrast, however, this technological stage also includes peasant societies that have inherited calendars and clocks. Yet generalized time also appears to play an important role and may reflect a basic time perception. Among Urdu-Hindi speakers, cul means "yesterday, today, tomorrow, sometime," with the connotation that "it will get done, maybe, and even if it doesn't, perhaps it's not important." The stereotype of the Spanish mañana or "tomorrow" (that may never come) is widespread throughout Latin America.

Generalized perceptions of time can be reflected not only in this manner, but may also be indicated by verb tenses within a language. Among the Hopi, Whorf (1938) notes that the past and present tenses in the reportive are not distinct. To distinguish between whether an event is or was occuring is meaningless in Hopi, which assumes that the listener can or did observe the action himself. Therefore, in the reportive tense, "then" and "now" are the same, implying that when something is happening or happened is not of as much concern as is the fact that activity occurs.

As world economy moves increasingly toward multi-national business, and as mass tourism expands, one of the most widely-reported frustrations arises from this Farmer and Herder generalized perception of time. Transportation is not infrequently described as operating on "local time," implying that busses, trains, and even planes go when they get a full load, get ready, or perhaps just when "the spirit moves them."

The Industrialists have emerged within this century and include only infra-group segments of some highly industrialized nations, including some countries of Northwestern Europe, Japan, the USA, and offshoots of these. They are defined in terms of their concept of time, which is keyed almost entirely to the clock -- to the exclusion of all other values.

Increased specialization of labor associated with metallurgy and all its attendant by-products led to another explosion of language to name new machines and their many parts. Metallurgy also made possible a refinement of time-keeping, giving rise within the past two decades to the nearly-accurate electronic watch and the atomic clock. The traditional, allegorical moon-face of the round clock is being replaced by the digital clock styled after the computer. That the wrist watch misses perfection by only one second per year is mute testimony to the commoditization of time. Mumford (1963:16) phrases it well in that "as Franklin put it, 'time is money.' To become as 'regular as clockwork' was the bourgeois ideal, and to own a watch was a definite symbol success. The increasing tempo of civilization led to a demand for greater power and in turn power quickened the tempo."

To cite specifically the Industrialists' preoccupation with time, human life may literally depend upon its reckoning. Japanese trains are noted for their speed and precision; a two-minute station stop means that the train will be stopped at the platform for exactly 120 seconds. An airline pilot flying instrument conditions and in a holding pattern for landing over one of the major airports executes a precise circular maneuver

that return him to the navigation station in exactly four minutes. Rotating beacons and sirens on emergency vehicles signal that literally "every second counts."

In perspective, however, every American has at his disposal an identical number of seconds, minutes, and hours within a day. Not all Americans are Industrialists, and the latter may not function in that capacity at all times.

Contrasts exist between the excessive commoditization of time of the hourly-wage employee (and his employer), and the college professor who often pays little attention to time. The former strikes for pay increases spelled out at "so much per hour," is keenly aware of differences in wages paid for various skills, and demands and is paid for, "over-time." The professor receives an annual contractual salary to meet a specified number of minimally-prescribed office hours. Only his individual conscience dictates how much additional time is alloted to research, grading papers, or academic dialog.

The American perception of time is a function of employment, lifestyle and values, and, despite philosophical rejection by some of the excessive commoditization, Industrialist language usage dominates all our speech.

Linguists have repeatedly identified that in English the content of meaning is borne by nouns in contrast to other languages, such as Navajo, where verbs are more important. In English, the noun is often the only utterance necessary to be understood -- "Help," "Stop," "Fire," "Thief," "Rape" -- all are nouns that cue action. "Time," however, enunciated soley as such, has no meaning.

Dependent upon inflection, this utterance might mean "time's up," as in a game or an examination, but this noun must be perceived within some cultural construct. The Industrialist assigns to time simply the status of a commodity, and the meaning of the word must be expressed by modifiers, and especially by verbs.

Since time is a commodity with equal duration for all members, how can verbs tell us it is possible to "make" or "lose" time; to "save" it as if its fleeting qualities could somehow be stored in a safe-deposit box; to "find" time, ignoring that we already have it at our disposal; to "waste" time without implying value judgement that some activities are more important than others? Above all, how can one "kill" time, an inorganic, unseen substance?

Aside from verbs, some other modifiers might define the meaning, such as a "good times," "bad times," the "time of my life," "bed time," "meal time," or, the most loved phrase of the salaried employee, "quittin' time." And then we move to tempo -- to be "late" as a deviation to being "on time" is a sin; to be "early" may be embarrassing; to be "out of time" suggests lack of synchronization; and even one's "timing" in telling a joke is the key to its effectiveness.

Even in the analysis of the human life cycle, the anthropological status markers which define changing behavioral roles are age (time) markers. For youths, time seems endless, but for the aged, frequently "time is running out." In illness it is often said that one lives "on borrowed time." The plea of many very busy people seems to be for "more time," accompanied by allusions to "burning the midnight oil," "trying to squeeze it

all in," "time flies," and "it's later than you think." Medically-defined "speed sickness" (hypertension, ulcers, etc.) is an ailment of increasing frequency among Industrialists.

Further elaboration of the validity of this constructural framework lies best with the reader to listen and observe the frequency with which time, per se, or time-related topics, recur in daily speech and actions.

In summary, the Industrialists have made time central to their cultural construct and endowed it with philosophical and social meaning far in excess of its economic and substantive importance.

Conclusions

Aside from the desire to learn about the origins and development of human culture, the analysis of the language usage of any given groups may prove to be a reliable index of its technology or relative acculturation. At a symposium on culture change, Vera Rubin noted that individuals in emergent societies want (in ranked order) a ballpoint pen, a watch, and a bicycle. Their felt need implies the willingness to accept the value systems inherent in the use of these objects.

The analysis of time as a cultural construct appears to offer insight into the evolution of human culture, particularly in terms of its conceptualization as expressed by language. Time and language are integrally related, as Gale (1968:242) observes: "What time makes it possible for us to say is exactly what cannot be said about time."

References Cited

ALLEN, C.C. 1947 — The Tyranny of time. New York: Philosophical Library

BOHANNAN, P. 1967 — Concepts of time among the Tiv of Nigeria, IN Middleton, Myth and cosmos. New York: The Natural History Press.

EVANS-PRITCHARD 1940 — The Nuer. O ford: The Clarendon Press.

GALE, R. M. 1968 — The language of time. New York: Humanities Press.

KLUCKHOHN, F. R. and STRDTBECK, F. L. 1961 — Variations in value orientations. New York: Harper and Row.

LEACH, E. R. 1958 — Primitive time-reckoning, IN Singer, C., Holmyard, E. J., and Hall, A. R., Eds., A history of technology, volume I Oxford: The Clarendon Press.

1966 — Two essays concerning the symbolic representation of time, IN Rethinking Anthropology. London: Athone Press.

LEE, B. R. 1972 — The !Kung Bushmen, IN M. G. Bicchieri, (Ed). Hunters and gatherers today. New York: Holt, Rinehart, and Winston, Inc.

LENNEBERG, E. H. 1967 — Biological foundations of language. New Yourk: John Wiley and Sons, Inc.

MAXWELL, R. J. 1971 — Anthropological perspectives, IN Yaker, H., Osmond, H., and Cheek, F., Eds., The Future of time. New York: Doubleday.

MUMFORD, L. 1963 — Technics and civilization. New York: Harcourt, Brace, and World, Inc.

NILLISON, M.P. 1920 — Primitive time reckoning. Oxford: Oxford University Press.

ORME, J. E. 1969 — Time, experience, and behavior. New York: American Elsevier Publishing Company, Inc.

POCOCK, D. F. 1967 — The anthropology of time-reckoning, IN Middleton, Myth and Cosmos. New York: The Natural History Press.

PUMPHREY, R. J. 1951 — The origin of language. Liverpool: Liverpool University Press.

SAHLINS, M. 1972 — Stone age economics. Chicago: Aldine-Atherton, Inc.

SMITH, M. W. 1952 — Differential cultural concepts of past, present, and future: a study of ego extension. Psychiatry 15:395.

TITIEV, M. 1960 — A fresh approach to the problem of magic and religion. University of New Mexico, Albuquerque: Southwestern Journal of Anthropology.

WHORF, B. L. 1938 — Some verbal categories of Hopi, IN Language, thought, and reality. Cambridge. The M. I. T. Press.