Mortality Profile of the Middle Mississippian Population of Dickson Mound, Fulton County, Illinois

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Abstract

The analysis of skeletal material excavated at Dickson Mound, Fulton County, Illinois, beginning in 1927 and continuing through 1967, reveals certain correlations between age, sex, and culture in the Middle Mississippian population represented. During the investigation of exclusively Middle Mississippian burials by the authors in the summer of 1967, a mortality profile was constructed which illustrates significant mortality frequencies. From this study, inferences concerning cultural activities, sex, and age relationships were indicated. It was found that various mother-child relationships were reflected in the death rate. The analysis also suggests certain male-oriented activities which affect the mortality profile.

Dickson Mound (F°34) is one of over fourteen hundred prehistoric American Indian sites in Fulton County, Illinois. The semilunar-shaped mound is located on a bluff overlooking the west floodplain of the Illinois River approximately thirty-five miles southwest of the present Peoria, Illinois. The artifact assemblage associated with the burials indicates that the site was utilized as a burial cemetery by a population possessing a predominantly Middle Mississippian culture (1). However, recent evidence suggests that a few of the burials represent a population with a Late Woodland artifact inventory (2). Radiocarbon dates for the Eveland site, a Middle Mississippian occupation site adjacent to Dickson Mound, range from 950 to 1350 A.D. (communication from E. J. Blasingham).

The majority of the burials are in an excellent state of preservation due to the alkalinity of the loess deposits of which the mound is constructed. The Middle Mississippian burials are predominantly supine and extended and indicate a moderate degree of prehistoric and historic disturbance. A discussion of the artifact inventory accompanying the burials is beyond the scope of this paper, however it should be noted that the grave goods conform to those of related Middle Mississippian burial cemetery sites and differ neither quantitatively or qualitatively (3 and 8).

During the summer of 1967 the authors were employed by the Illinois State Museum to analyze the burials excavated at Dickson Mound. The burials included those removed during the 1966 and 1967 summer excavations as well as those left exposed *in situ* in the enclosed museum for display purposes. The authors examined the burials to determine the age at the time of death, the sex, and the gross skeletal pathology. As the authors processed the skeletal material a number of interesting variations in the death rate were noted. The number of individuals which died at each age were graphed and the curve illustrating the relative frequencies of deaths was termed a mortality profile.

The purposes of this paper are two-fold: first, to indicate the

fluctuations in the frequencies of deaths, and second, to offer possible explanations for these variations.

All 479 burials utilized in the study were analyzed by the authors. The purpose in so doing was not to compound the writers' error, but rather to insure that all the criteria employed to determine the ages and the sex remained constant throughout the investigation. It should be noted that the ages reflect physiologic ages and not necessarily chronologic ages which are not, in many instances, equivalent. For this reason, the mortality profiles represent a close approximation to the death rate as determined chronologically in living populations. Generally speaking, age assessment becomes less accurate as the age of the subject increases because the maturation rate decreases as an individual ages. Consequently the criteria employed to determine age by the physical anthropologist become less specific, and concomitantly less accurate, the older the subject. Similarly, age criteria which reflect physiologic degeneration are less constant than those indicative of early maturation. For these reasons, the authors have arbitrarily designated three age categories: infants, children, and adults. The ages for infants were determined in months, while ages for children ranging from three years to 11.9 years were measured in half years and the age at death among adults was assessed in years.

It is not the objective of this paper to justify the aging criteria employed by the authors. However it should be mentioned that whenever possible multiple criteria were applied in conjunction with one another to obtain the maximum accuracy possible. Deciduous and permanent eruptions of dentition (communication from G. K. Neumann) as well as the degree of dental attrition determined specifically for the F°34 population (communication from A. D. Harn) were often used concomitantly with the linear length of long bones (communication from K. B. Hunter) to assess the ages of infants and children. Epiphyseal union (5), age changes in the pubic symphysis (6), endocranial suture closure (7), and general texture (communication from G. K. Neumann) were often utilized together to determine the physiologic ages of adolescents and mature adults, here regarded as a single age category.

F°34 adult males and females were differentiated on the basis of two assumptions. First, it was assumed that the sexual dimorphism of the population was great enough to allow consistent and accurate identification of sex. Secondly, it was observed that the mortality profile would reflect a sexual division of activity which would remain undetected had male and female curves not been graphed independently. Because there exists no proven criteria for distinguishing the sexes of subadults, and so to avoid spurious conclusions, no attempt was made to separate the sexes among children and infants.

All those burials having Late Woodland affiliations were omitted from the study. The twenty-three Late Woodland burials excavated at Dickson Mound as of 6 September, 1967, were eliminated because the authors felt that to include such individuals in the study might invalidate the findings. Because burials with Late Woodland grave goods may represent a population subjected to different sociocultural

and physical factors than those of the Middle Mississippian population, it was regarded advisable to omit that variable from the current study. The criteria employed to define the Late Woodland burials were the grave position of the burials (flexed or semiflexed) and the associated grave goods (communication from J. R. Caldwell and H. D. Winters).
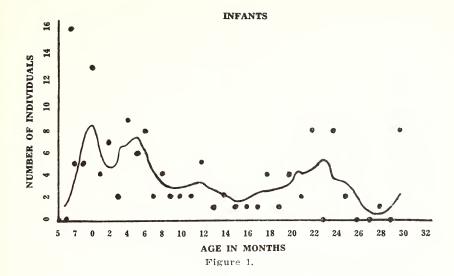
A total of 479 burials were analyzed by the authors during the summer of 1967. Of these 304 represent adults, here defined as those individuals of twelve years of age and older. The remaining 175 sub-adults included fifty-five children, or individuals ranging from three to 11.9 years of age, and 120 infants. Ten infants were determined to be fetuses from five to eight fetal months. Thirteen burials represent neonates, or those infants which died at childbirth or during the subsequent two-week period. The remaining infants, or ninety-seven burials, were between one and thirty-five post-natal months.

Of the 304 adult burials 166 were determined to be males, with the remaining 138 being adult females. Thus 54.6 percent of the adult population is male and 45.4 percent is female. The observed deviation from a one-to-one ratio which one might expect to find in any population easily falls within the normal range of variability seen in many American Indian populations, both prehistorically and historically (4). Parenthetically, it is very seldom that a one-to-one sexual ratio is realized in any naturally breeding population.

The composite average age of death for the entire F°34 population is 23.39 years. This figure may seem exceedingly low because of the inclusion of the 175 subadults in the average. The average age of death for the entire male population was derived by adding fifty percent of the subadult average age of death to that derived for the adult males. A similar procedure was followed to estimate the average age of death for females. The resulting averages are 25.05 years for males and 21.39 years for females. It should be pointed out that in the absence of absolute statistics concerning the sex of the infants and children that the averages for each sex represent a hypothetical approximation. Perhaps more revealing for comparative purposes are the average ages of death derived for the adult population only. The average age at death for adult males (those twelve years and older) was calculated to be 37.23 years as contrasted to the average age at death for adult females of 33.27 years. The difference in the average age at death for adult males and females is 3.96 years with the males living longer. The average age at death for the total adult population is 35.43 years.
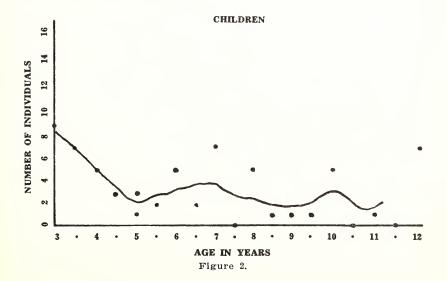
It might be of interest to note that 33.4 percent (represented by 160 burials), or over one-third, of the population died prior to age nine years illustrating the relatively high frequency of deaths among infants and young children (Figures 1 and 2). By age fifty years approximately ninety-two percent of the population had died.
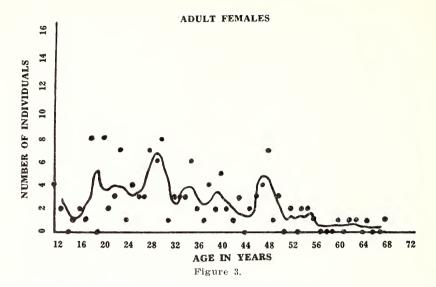
The mortality profiles illustrate the fluctuations in the number of deaths occurring at different ages. The curves show clusters of deaths at certain ages and a virtual lack of deaths at other ages and it is possible that these variation reflect, to a greater or lesser extent,

INFANTS

Figure 1.

factors external to the individual. It is not the objective of this paper, nor is it possible at this time, to determine precisely the causal factors for the variations in the number of deaths at different ages. It is possible, however, to make some tentative speculations concerning socio-cultural or physical factors which may have influenced the increases and decreases in the rate of death illustrated by the mortality profiles.
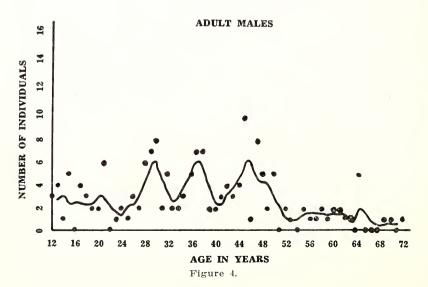
The highest frequency of deaths among all ages represented in this study occurs precisely at birth, represented by thirteen neonates, or newborn infants (Figure 1). Subsequent to the time of birth a somewhat erratic decline in the number of deaths is observed. The curve at

CHILDREN

Figure 2.

Figure 3.

birth is not particularly atypical when compared to data for contemporaneous American Indian populations (4). It is probable that this high mortality frequency reflects a failure on the part of the infant to adjust to an immediate post-natal environment coupled with a relative lack of technical knowledge concerning childbirth. The decrease in the number of deaths from birth to approximately nine months may indicate the infant's increasing ability to adjust to a post-natal environment.

Following a period during which few deaths occurred (between

Figure 4.

ages thirteen and nineteen months) is a relatively rapid increase in the frequency of mortalities represented by eight individuals at ages twenty-two, twenty-four, and thirty months (Figure 1) and nine individuals at age three years (Figure 2). Although it is conceivable that the specific peak at age twenty-four months may reflect investigative techniques, the curve itself may represent deaths resulting from a failure on the part of the infant to successfully make the transition from a weaning to a post-weaning diet. Findings from the diagnosis of F° 34 skeletal pathology were not sufficiently consistent to indicate whether conditions of malnutrition are more prevalent among individuals of this age. A similar hypothesis has been advanced for other American Indian populations for which mortality curves have been constructed (communication from K. B. Hunter).

Seven deaths were recorded for age seven years and five deaths at both age six and age eight years (Figure 2). It is possible that this increase in the frequency of deaths among children may be attributable to fatalities resulting from aboriginal childhood diseases. At present there is no evidence, pathological or otherwise, to substantiate such a hypothesis other than that of the mortality profile.

It may be noted by comparing the mortality profiles of F° 34 adult males and adult females that there are certain similarities in the curves illustrating the relative frequencies of mortality (Figures 3 and 4). To demonstrate a possible sexual division of activity on the basis of mortality profiles requires that there be observable differences in the frequency curves for adult female and male mortality. Therefore, it is necessary to determine the degree of difference which is sufficiently significant to posit a sexual division of labor.

There is a substantial increase in the number of adult female deaths beginning at eighteen years (Figure 3). The frequency remains relatively high for the next twelve years, through age thirty years. During this period 43.5 percent of the adult female population died. During the equivalent period, only 25.9 percent of the adult male population died (Figure 4). However, at age thirty years an equal number of male and female deaths are observed. It is impossible from the evidence available to state whether the former discrepancies and the latter similarity are attributable to factors related to the sexual division of activity. It is conceivable that the female curve may represent deaths as a result of difficulties encountered during childbirth. If this hypothesis is correct, then a different answer must be sought to explain the increase in the number of male deaths during the same period, and specifically at age thirty years. It is possible that his curve may reflect activities partially or exclusively relegated to males.

Both the male and female mortality profiles illustrate a relatively symmetrical curve during the fourth decade. Among females, this curve reaches an apex at age forty-eight years, (seven burials) and among adult males at age forty-five years (ten burials). Although the evidence is as yet inconclusive, it seems probable that these parallel curves represent fatalities due to diseases commonly referred to as "old age factors." It is difficult to substantiate this hypothesis because diseases

or the combinations of diseases which may ultimately result in death are rarely evidenced by the skeletal material. In Figure 4 the curve beginning at age thirty-five years with an apex at ages thirty-seven and thirty-eight years may represent the initial (left hand) shoulder of the curve just discussed.

It is not possible at this time to attempt to formulate any generalized conclusions concerning the lives of the Middle Mississippian population represented in this study. That has not been the primary objective of this paper; it has been, rather, to provide data which, pending further archeological and physical anthropological analyses of the data from Dickson Mound and other sites, may contribute to a greater understanding of prehistoric man in the Illinois Valley and elsewhere.

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