Breastfeeding and Changing American Child-Rearing Practices

Jeanne Reed
Western Michigan University

Follow this and additional works at: http://scholarworks.wmich.edu/masters_theses

Part of the Social and Cultural Anthropology Commons

Recommended Citation
http://scholarworks.wmich.edu/masters_theses/2028

This Masters Thesis-Open Access is brought to you for free and open access by the Graduate College at ScholarWorks at WMU. It has been accepted for inclusion in Master's Theses by an authorized administrator of ScholarWorks at WMU. For more information, please contact maira.bundza@wmich.edu.
BREASTFEEDING AND CHANGING 
AMERICAN CHILD-REARING PRACTICES

by

Jeanne Reed

A Thesis 
Submitted to the 
Faculty of The Graduate College 
in partial fulfillment 
of the 
Degree of Master of Arts

Western Michigan University 
Kalamazoo, Michigan 
April 1979
ACKNOWLEDGEMENTS

There are many people to whom I am indebted for assistance and encouragement in the writing of this thesis. In particular, I would like to express my appreciation to Doctors Norman Greenberg and William Garland for serving on my thesis committee, and a special thank you to Dr. Robert Jack Smith, my thesis advisor, for his constructive criticism and advice throughout the writing of this paper. I would also like to thank W. Bryan Staufer, M. D., for the loan of materials from his personal library.

Furthermore, I wish to express my gratitude to the Graduate College for the award of a Graduate Student Research Grant which helped to offset the expenses incurred in my field research.

Finally, I give my sincere thanks to all those women who participated in this study, making my field research a positive and enjoyable experience.

Jeanne Reed
INFORMATION TO USERS

This was produced from a copy of a document sent to us for microfilming. While the most advanced technological means to photograph and reproduce this document have been used, the quality is heavily dependent upon the quality of the material submitted.

The following explanation of techniques is provided to help you understand markings or notations which may appear on this reproduction.

1. The sign or “target” for pages apparently lacking from the document photographed is “Missing Page(s)”. If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting through an image and duplicating adjacent pages to assure you of complete continuity.

2. When an image on the film is obliterated with a round black mark it is an indication that the film inspector noticed either blurred copy because of movement during exposure, or duplicate copy. Unless we meant to delete copyrighted materials that should not have been filmed, you will find a good image of the page in the adjacent frame.

3. When a map, drawing or chart, etc., is part of the material being photographed the photographer has followed a definite method in “sectioning” the material. It is customary to begin filming at the upper left hand corner of a large sheet and to continue from left to right in equal sections with small overlaps. If necessary, sectioning is continued again—beginning below the first row and continuing on until complete.

4. For any illustrations that cannot be reproduced satisfactorily by xerography, photographic prints can be purchased at additional cost and tipped into your xerographic copy. Requests can be made to our Dissertations Customer Services Department.

5. Some pages in any document may have indistinct print. In all cases we have filmed the best available copy.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>BREASTFEEDING AND THE EVOLUTION OF MATERNAL-INFANT BONDS IN HUMANS</td>
<td>4</td>
</tr>
<tr>
<td>MOTHER-INFANT SEPARATION IN MAMMALS AND MAN</td>
<td>18</td>
</tr>
<tr>
<td>BREASTFEEDING, BOTTLEFEEDING AND CHANGING AMERICAN CHILD-REARING PRACTICES</td>
<td>33</td>
</tr>
<tr>
<td>BREASTFEEDING, BOTTLEFEEDING AND MATERNAL BEHAVIOR</td>
<td>45</td>
</tr>
<tr>
<td>Introduction</td>
<td>45</td>
</tr>
<tr>
<td>Materials and Methods</td>
<td>45</td>
</tr>
<tr>
<td>Results</td>
<td>49</td>
</tr>
<tr>
<td>Implications and Speculations</td>
<td>55</td>
</tr>
<tr>
<td>CONCLUSIONS</td>
<td>60</td>
</tr>
<tr>
<td>REFERENCES CITED</td>
<td>64</td>
</tr>
<tr>
<td>APPENDIX</td>
<td></td>
</tr>
<tr>
<td>A Questionnaire Form Used in Interviews with Bottlefeeding Women</td>
<td>69</td>
</tr>
<tr>
<td>B Questionnaire Form Used in Interviews with Breastfeeding Women</td>
<td>72</td>
</tr>
</tbody>
</table>

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
# LIST OF ILLUSTRATIONS

## TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Species-specific Mothering Behaviors in Various Animal Species</td>
<td>20</td>
</tr>
<tr>
<td>2. Effects of Separation on Maternal Behavior in Rats</td>
<td>24</td>
</tr>
<tr>
<td>3. Effects of Separation on Maternal Behavior in Goats</td>
<td>25</td>
</tr>
<tr>
<td>4. Maternal Motivation in Pigtail Macaque Mothers Separated From Their Young</td>
<td>26</td>
</tr>
<tr>
<td>5. Effects of Separation on Maternal Behavior in Primates</td>
<td>27</td>
</tr>
</tbody>
</table>

## FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Bar Graph Showing Educational Background of Breastfeeders, Bottlefeeders and Their Husbands</td>
<td>47</td>
</tr>
<tr>
<td>2. Bar Graph Showing the Childbirth Preparation of Breastfeeding and Bottlefeeding Mothers</td>
<td>48</td>
</tr>
<tr>
<td>3. Line Graph Showing Period of Time Night Feedings of Infants Continued</td>
<td>52</td>
</tr>
<tr>
<td>4. Line Graph Showing the Introduction of Solid Foods in Infants</td>
<td>53</td>
</tr>
<tr>
<td>5. Bar Graph Showing Rocking and Sleeping Behavior in Mothers</td>
<td>54</td>
</tr>
</tbody>
</table>
In recent years a growing number of American women have returned to breastfeeding and the child-rearing practices associated with it, thus rejecting more popular cultural attitudes concerning infant feeding and early child care. This change of behavior in American mothers is believed to be the result of an increased awareness of the long-range effects of modern technology on the health of the population at large. This awareness has triggered a concern for ecological considerations which have penetrated every facet of our lives.

We are living at a time when many people are very much concerned about getting "back to the basics," and what could be more basic to our existence than the nursing couple? Humans have evolved into the species they are today as a direct result of their mammalian heritage, and the ability to nurse the young at the breast has had a tremendous impact on human socio-cultural as well as physical evolution. It is felt that in contemporary America, where so many human needs are being met by new and complex technological inventions, this ability may continue to play a very important, though subtle, role in our socio-cultural survival, if it is not impeded.

Cross-cultural data and the latest research on birthing and early child-rearing practices suggest that the interference of technology into this very primary and personal realm may have some detrimental side effects on family solidarity. This information comes at a time when many people are predicting the inevitable decay of the American
family based on their concern over such social problems as the soaring divorce rate, increasing incidence of runaway mothers, staggering amount of juvenile delinquency and the increase in child abuse and spouse beating, to mention but a few (Bronfenbrenner 1976). Therefore, it would seem that any research which might lead to new insights into possible solutions or ways of better coping with family stress would be of general interest.

The research presented in this paper was designed to study changes in American child-rearing practices centered around infant feeding techniques and to evaluate the long and short-range effects that these changes in behavior might have on American society. Information from a wide variety of disciplines and sources was drawn upon in the undertaking of the research topic. The information presented in the first portion of this report is based primarily on library research and represents a synthesis of the latest medical literature, ethological studies and cross-cultural data relevant to the subject. The purpose of this section is to establish firmly the significance of the subject to the social scientist and to provide a sound theoretical foundation on which further research can build.

The second part of this paper is based principally on original field work conducted by the author over a period from March, 1976, to September, 1977. The research consisted of interviews and observations made by the researcher in an effort to ascertain if and how a mother's behavior toward her infant is affected by her choice of feeding method and how this might affect the lifestyle of the family. It is hoped that this research might add strength to the suggestion in
the preceding section that the unchecked intervention of technology into many of our basic reproductive and developmental processes may inhibit many innate human characteristics from fulfilling their potential, characteristics which have contributed to the evolutionary success and the quality of human life from its beginnings.
BREASTFEEDING AND THE EVOLUTION
OF MATERNAL-INFANT BONDS IN HUMANS

A woman's ability to feed her infant at the breast is as old as Mankind and is the result of millions of years of mammalian evolution. This point is of the utmost importance when studying the relatively recent changes in socio-cultural attitudes toward breastfeeding. By considering breastfeeding from an evolutionary perspective, we can achieve an adequate understanding of the impact that the introduction of artificial feeding on a large scale has had, and is having, on human societies.

As in any discussion of evolution, a key factor is time. The time it took for our ancestors to develop mammary glands is actually incomprehensible to most of us. We do know that some kinds of primitive mammalian forms began feeding their offspring some type of fluid from some simple breast-like apparatus more than 200 million years ago (Keast 1972, Sharman 1976:37). Several theories have been put forth in attempts to explain how these breast-like structures originated, but none has proven to be entirely satisfactory (Raynaud 1961:10).

One major stumbling block for scientists interested in studying this question is the vast diversity and variety of present-day mammals. There are thousands of thriving mammalian species today, each representing a different adaptation to its environment. However, there is agreement that the first mammals were egg-laying animals and not animals that give birth live to their offspring as are most mammals today. The particular characteristic of giving birth live appears
not to have evolved until a much later time. Therefore, scientists have reasonably focused their attention on the present-day animals that most closely resemble the description proposed for the earliest mammals, namely, the Monotremata (Raynaud 1961).

The Monotremata, the lowest order of mammals, is represented by only two survivors, the echidna and the duckbill platypus. These mammals have been found only in Australia and Tasmania, with the echidna known also from New Guinea. This general region is also the habitat of the greatest number of marsupials, another unique order of mammals. It is not surprising that this area of the world would harbor such a rare collection of mammals as its geographic isolation from the Asian mainland occurred after mammals appeared on the scene but before many of the species known today had time to evolve. Thus, this area with its unique inhabitants has been the focus of attention for scientists seeking insights into our mammalian beginnings.

A monotreme is an oviparous animal whose mammary glands are extremely simple when compared to other mammals. In the duckbill platypus, for example, the mammary glands consist of sacs which empty into a porelike depression. Milk is not secreted from a nipple but rather from glands on the ends of mammary hairs. The young feed by licking the secretion from the mother's abdominal hairs while she lies on her back (Raphael 1973:60). This adaptation has led many authorities to believe that these simple structures are modified sweat glands, resembling those from which the first primitive breasts evolved (Raynaud 1961, Mayer and Klein 1961:52).
Results from comparative studies can be confusing and misleading in that we do not know how representative these existing forms are of primitive mammals or how much specialization they have undergone over the millions of years since the first mammals appeared. It does seem that the majority of researchers agree that mammary glands evolved from elaborate sweat glands, and although studies of the embryology of monotremes seem to favor this theory, studies of placental mammals seem to indicate otherwise (Raynaud 1961).

Marsupials are members of another lower order of mammals and represent some other curious adaptations to the environment. "The marsupial reproductive system is unique," yet there is considerable variation among the over 230 species (Sharman 1976:41). Marsupials develop no placental, and the female usually has a double uterus and a vagina. There is usually a pouch on the abdomen of the female which contains the teats and can also be used to carry the young. These mammals may have as many as 44 teeth or more, few or none of which are preceded by functional milk teeth. Wombats, opposums and bandicoots all belong to this group of mammals, but probably the best known and most popular marsupial is the kangaroo.

Kangaroos give birth live to their offspring, but the newborn kangaroo is born in a very underdeveloped state. The "joey," as the neonate is called, measures only about one inch in length at birth. Immediately following its birth the joey begins its climb along a tract of hair from the mother's vaginal opening to a teat inside the mother's pouch, where once inside, the neonate locks onto the teat and remains for several months to develop and mature within the safety of the mother's body.
Although generally speaking marsupials have more developed mammary glands than either the echidna or the platypus, the kangaroo has the unique capability of being able to produce two types of milk from two different teats. The milk produced by one teat differs in both quality and quantity from the milk produced by the other teat and allows the mother to satisfy simultaneously the nutritional needs of her newborn and those of an older offspring who stands outside the pouch (Raphael 1973:63).

Placental, or eutherian mammals, make up the vast majority of mammalian species today. The development of the placenta was a major evolutionary advancement which gave rise to many distinct reproductive advantages. Providing the necessary protection, food and oxygen to the fertilized egg while still within the mother was a great achievement which improved the reproductive economy of placental mammals. This made it no longer necessary to produce so many eggs at a time to insure the survival of a few. In the higher primates and humans, where we find a hemochorial placenta, the evolution of the placenta seems to have been carried a step further than in other placental mammals as, "only fetal tissue separates the fetal and maternal blood streams, with fetal vessels actually penetrating the endometrial vessels" (Kaufman 1970:4-5). Thus, the hemochorial placenta provides the optimum conditions for the developing embryo with an improved supply of food and oxygen, a better system for the elimination of waste materials and an improved system for the transmission of antibodies (Kaufman 1970: 4-5, Sharman 1976).
The evolutionary importance of certain reproductive changes in mammals is significant to human development as an animal and as a socio-cultural being, because these changes are interrelated with behavioral changes which occurred simultaneously. In a discussion of some of the major reproductive changes in mammals, Kaufman states the following:

Of at least equal significance, mammals also evolved a behavioral program of reproductive economy, namely, a higher order of parental care of the young after birth, without the consequence of which it is impossible to visualize the development of man. Care of the very young was already evolved in fish, reptiles, and especially birds, but what made possible the tremendous advance in mammals was the system of feeding the infant, through special glands, a substance, milk, which contains everything needed for growth and development. The improved feeding arrangement keeps the young physically close to the mother and safer from harm... Finally, and very importantly, the close physical relationship and the shared personal experience provided to the infant and mother by the feeding from her body constitute a degree of contact and intimacy which creates a new kind of bond, with durable characteristics, one major effect of which is to allow a slower rate of growth (1970:5).

There seems to be little doubt that special bonding processes centered around the birth and early care of infants, such as Kaufman mentions above, do exist for most, if not all, mammalian species, and this is particularly true for higher primates and humans. This phenomenon has been observed by humans for centuries, and the mother-infant bond has been a dominant theme in man's literature and the arts for as far back in time as our evidence reaches (Raphael 1973). Just how important and how durable this bond is we are only beginning to understand, especially in the case of humans where the neonate has the longest period of dependence of any species.
The need for bonding to occur between mother and infant is accentuated in the higher primates as it must have been for our early ancestors, due to the prolonged period of maturation in the infant. In most primates the infant has the ability to cling to its mother, thus taking an active role in the assurance of its survival. Such is not the case with the human infant who is born too immature to be able to grasp the mother's body and must depend on the mother to carry him. In this situation the mother must take a more active role in the caretaking of the infant if he is to survive. Washburn describes the evolutionary importance of the process as follows:

The emergence of man's large brain occasioned a profound change in the plan of human reproduction. The human mother-child relationship is unique among the primates... In man adaptation to bipedal locomotion decreased the size of the bony birth canal at the same time that the exigencies of tool use selected for larger brains. This obstetrical dilemma was solved by delivery of the fetus at a much earlier stage of development. But this was possible only because the mother, already bipedal and with hands free of locomotor necessities, could hold the helpless, immature infant... Bipedalism, tool use and selection for large brains thus slowed human development and invoked far greater maternal responsibility (1960:73-4).

The need for the development of greater maternal responsibility in humans is obvious when the condition of the human neonate is described from the perspective of the exterior-gestate concept. Based on comparisons with other animals the gestation period of the human infant appears incomplete at birth and may require as much as another nine months of intensive care to prepare it for the transition to life outside the womb. Accordingly, fetal life can be considered to have two distinct stages; one inside the womb beginning with conception and ending with birth, the second, outside the womb continuing from
birth to the commencement of quadrupedal locomotion (Bostock 1962:1032). Montagu has compared this concept with the developmental process of marsupials with the second stage, that in which the fetus is extero-gestate, resembling the marsupial embryo in its mother's pouch (Bostock 1962:1032). As in the kangaroo example, the extero-gestate human fetus is extremely dependent upon the mother's ability to provide protection, warmth, transportation, and above all, her ability to produce milk. As Bostock explains,

Foetal life demands the ultimate in security, the closest contact with a mother providing food from herself. Proteins, fats, carbohydrates, enzymes, and metabolites are compounded, measured, and distributed from her personal laboratory. Extrusion from the womb does not break the foetal cycle or alter essential metabolic needs. It is vital that the continuity of supply and environment be maintained. Thus baby, the free foetus, must have security, maternal contact, and maternal food (1962:1034).

Whether or not we agree with the specifics of the exterior-gestate concept, the fact remains that the infant is born in a very helpless state, and this fact certainly must have posed a great many hazards for early man throughout the course of evolution, as it still does today. At some point in time, these hazards began to be reflected in a specific pattern of social organization on the human species, one in which the movements of the mother were restricted by her caretaking responsibilities, thus placing the burden of the hunt primarily on the male. This fundamental social arrangement makes perfect sense and reflects the need for the development of diligent parental care, a need made necessary by the immaturity of the human infant at birth (Kaufman 1970). Thus, the responsibilities of child rearing fell primarily upon women who came well-equipped to fulfill the needs of the newborn infant.
We must not understate the importance of breastfeeding and the many advantages it held for human development and evolution. Breastfeeding made it unnecessary to carry the young infant to the food source or to seek out and carry special foods to the infant. The mother could totally sustain the infant from herself for an indefinite period of time, requiring comparatively little extra input into her own diet in return for her milk (Jelliffe and Jelliffe 1975). In fact, studies conducted among women in various tribal groups in New Guinea as well as among women in India, Pakistan and Guatemala suggest that the quality of breastmilk is detrimentally affected only when the mother has a grossly inadequate diet. In addition, it is noted that even a mother who is malnourished can produce the quality of breastmilk and almost the quantity of breastmilk of a well nourished mother for the first three to six months, after which time her body cannot keep pace with the demand for production (Wray 1977). There appears to be a tendency for protein and lactose levels to remain fairly constant throughout a wide range of maternal dietary intake levels with the greatest variance in the fat content of the milk. However, the quantity and duration of milk production does seem to be more sensitive to fluctuations in the mother's diet. Thus, "the human mammary gland seems to adapt to dietary deprivation by maintaining compositional quality at the expense of quantity and duration" (Wray 1977: 203). This adaptive ability has definite significance for the survival of an infant born during a season where food is scarce.

As with other mammalian milks, the composition of human breastmilk seems to reflect teleonomy. In other words, it appears that it
is adapted to the species-specific physiological needs required to in-
sure the optimal growth, development and survival of the neonate, at
least during the exterior-gestate period (Jelliffe and Jelliffe 1975:
557). For instance, specific patterns of polyenoic fatty acids, chol-
esterol, cystine and lactose are found in particularly high levels in
human milk. These and other nutrients in human breastmilk are found
to vary in levels significantly from other mammalian milks, including
cow's milk, and are the essential ingredients "most needed for the
rapid growth and development of the central nervous system, including
the brain" (Jelliffe and Jelliffe 1975:558). This factor was of extreme
importance in the evolution of a talking, tool making, bipedal animal
with a large brain and an expanding cranial capacity.

Recent evidence indicates that not only does human milk differ in
substance levels from other mammalian milks, but it may consist of
certain elements that are more or less peculiar to it. The discovery
of the "bifidus factor" in human breastmilk is one example. This sub-
stance, *Lactobacillus bifidus*, is thought to interfere with the activi-
ties of influenza virus and, therefore, illustrates another way in
which breastmilk protects the infant, especially during the critical
post-natal stage (Jelliffe 1968:14, Gyorgy 1971:973). The bifidus
factor is just one of many antibodies transferred to the infant via
the mother's milk. A multitude of evidence indicates breastfeeding
prolongs the period of immunity to many viral diseases such as polio,
measles, mumps and pneumonia.

Besides protection against viral infections, prolonged breast-
feeding seems to be the best guard against the development of food
allergies as well as other certain bacteria, respiratory and gastro-intestinal ailments (Mata and Wyatt 1971). Very importantly, breast-feeding is the best known prevention and prescription for diarrheal disease in infants as well as forms of malnutrition such as kwashiokor and marasmus which claim an increasing number of infants every year in non-Western developing countries where the practice of breastfeeding is waning (Jelliffe 1968, 1976; Raphael 1973; Wade 1974; Jelliffe and Jelliffe 1975; Macfarlane 1977). Evidence even suggests that there is a correlation between breastfeeding and a lower incidence of the "sudden death syndrome," commonly known as crib death, though no one has satisfactorily explained why this is so (Applebaum 1969:10; Macfarlane 1977:85).

The list of therapeutic advantages that human milk has for an infant could be much expanded. Suffice it to say that breastmilk has always been and still is a very important factor in the health and survival of the human infant. However, in our discussion we must not overlook the fact that breastfeeding bestows certain health advantages on the lactating mother as well as upon her infant.

Breastfeeding has an important role in the actual birth process itself. As soon as the baby is put to its mother's breast and begins to suck, it causes contractions of the mother's uterus which aids in the expulsion of the placenta. This is extremely important as these contractions help lessen the risk of hemorrhage by closing off the open wounds left after the detachment and delivery of the placenta (Newton 1955:50-51; LLLI 1963; Montagu 1971:51-52; Raphael 1973:83; Kippley 1974; Klaus and Kennell 1976a). Also, the bleeding that occurs
for weeks following the birth tends to be heavier and longer-lasting in mothers who do not breastfeed and thus tends to deplete the mother's energy reserves (Montagu 1971, Kippley 1974). Of course, today we have pills and injections made available through our medical technology which can start these contractions without the sucking stimulus and can be used when needed to avert the danger of hemorrhage following birth when the mother does not breastfeed. However, the natural process stimulated by breastfeeding was vital to the survival of our ancestors and remains so to women in parts of the world today where Western medical technology is not accessible.

Health experts suggest some ways in which breastfeeding remains advantageous to a modern woman's health. For example, a growing amount of data indicate that breastfeeding reduces the risk of breast cancer in women (N. Newton 1955:51; LLLI 1963; Applebaum 1969:12; M. Newton 1971:989; Miller and Fraumeni 1972; Raphael 1975). Other studies have "demonstrated an association between suppression of lactation with oestrogens and the incidence of thromboembolism" (Bernal and Richards 1970:248), a disorder affecting blood clots in the body (Olds and Eiger 1972:12).

One very important adaptive side effect of breastfeeding is postpartum, or lactational amenorrhea. This may occur in lactating women for an indefinite period of time, depending upon the amount of sucking stimulus needed to inhibit ovulation and a return to the menstrual cycle in the individual. This process helps the mother avoid losing precious iron and body reserves every month by preventing menstrual bleeding (Kippley 1974, LLLI 1963). It also bestows a natural period of infertility upon the mother (Jelliffe and Jelliffe 1975:557, Kippley.
1974; Raphael 1976:83; Van Ginneken 1977). D. B. Jelliffe comments, "That the human should have such a built-in biological method of child spacing is unsurprising, as other mammals space their offspring by hormonally mediated breeding or estrus cycles" (1976:1232).

Although medical researchers cannot precisely describe the body chemistry involved, there is general agreement that lactational amenorrhea is related to the amount of sucking the infant does at the breast (Kipfpley 1974). Therefore, reliability of breastfeeding as a contraceptive is highly variable at the individual level even though it is highly effective as a birth control technique on the population level (Van Ginneken 1977). This discrepancy explains why most Western professionals have tended to dismiss the value of breastfeeding as a natural contraceptive as an "old wife's tale." What we have learned only recently is that it is not breastfeeding alone that assures a woman of infertility, but rather, the manner in which the woman breastfeeds. Token breastfeeding, breastfeeding that is highly supplemented by formula or other foods; occurs among a large percentage of nursing women in many Western countries and especially in the United States (Gonzalez 1964). This pattern of breastfeeding tends to nullify the contraceptive effect of breastfeeding in many lactating women by keeping the sucking stimulus below the level necessary to inhibit ovulation. This certainly limits the impact breastfeeding has on the population levels in countries where token breastfeeding is popular. However, recent evidence from rural areas of some developing countries where prolonged breastfeeding is practiced routinely, "found that lactation amenorrhea increased birth intervals by more than 15 months... which
accounts for about forty percent of the average birth interval, implying a considerable impact on fertility" (Van Ginneken 1977:191).

That breastfeeding can be a means of natural child spacing is a fact and one that has been of great significance throughout the evolution of Mankind. Prolonged periods of infertility due to intensive breastfeeding patterns was as important to the survival of early humans as the lifegiving qualities with which breastfeeding supplied. Increased birth intervals kept the birth rate in check and the growth of the group in balance with the environment. The extended birth interval also allowed the mother an opportunity to physically recuperate from the birth of one child before the birth of the next one. This was also of great importance to the mobility of the group. Most importantly, breastfeeding and extended birth intervals enhanced the intensity and durability of the mother-infant bond by providing an undisrupted period of intimacy between the mother and each of her offspring. This was extremely essential in improving the chances of survival for the offspring. Carpenter describes the process as follows:

A universal characteristic is that all social relations are, in varying degrees, reciprocal. The aroused motivation of one organism finds its satisfaction, or incentive, in an interacting organism or organisms. The nursing infant satisfies its hunger while at the same time it stimulates the nipple and breast of the mother positively and relieves the tension caused by accumulated milk. The infant is the incentive for a complex of the maternal drive (1942:180).

Prolonged breastfeeding and the period of infertility that accompanies it was very important to the evolutionary success of the human species, because it increased the chances of a neonate's survival by heightening the willingness of the mother to nourish and care for her extremely helpless infant. Therefore, breastfeeding must not
be viewed as an isolated act, but as the focal point of an entire complex of maternal behavior, a complex that encouraged the development of long-lasting bonds of attachment and so enhanced the quality of human life.
MOTHER-INFANT SEPARATION
IN MAMMALS AND MAN

Recent years have witnessed an increasing amount of interest and research in the interaction between a mother and her infant. The information provided by this new research has changed our manner of thinking about the mother-infant relationship. Where we used to talk about a mother having maternal instincts which help guide her in the caretaking of her young, we now find it more satisfactory to speak in terms of the processes which account for and stimulate maternal behavior.

It seems clear that natural selection has favored the emergence of processes which act to keep the young with one or both parents for an extended period of time so that mutual stimulation may occur and lead to the development of bonds (Kaufman 1970:25).

Although we have long been aware of the evolutionary necessity for the establishment of such bonds, we are only now beginning to understand the processes at work in their development and the consequences that can arise when this development is prevented from reaching its full potential.

Until recently, studies directed at increasing our knowledge about the nature of the mother-infant relationship have been somewhat one-sided, as researchers have tended to focus their attention on the infant and his ability to develop bonds of attachment with others. It has only been within the last decade or so that a shift in concern has occurred which place a new emphasis on the other side of the relationship, the mother's ability and need to bond with her infant.
This change in emphasis began to surface about fifteen years ago when the staffs of intensive care nurseries noticed a relationship between infants that had spent time in their charge and infants who were taken to hospitals under suspicious conditions for emergency treatment.

Studies began to show a dramatic increase in the incidence of abuse and the failure-to-thrive syndrome among premature infants as well as infants who had been hospitalized for other reasons during the newborn period (Klaus and Kennell 1976a:2). This relationship led doctors and researchers to reevaluate data from a number of studies concerning early separation of mother and infant so as to help reveal the connection between early separation and the development of child abuse and neglect (Klaus and Kennell 1976a, 1976b). These data have yielded results that are shocking and at the same time perfectly logical when considering the problem from an evolutionary perspective.

Detailed observations of parturition for a significant number of species have shed new light on the evolution of species-specific patterns of behavior surrounding this period and the relevance of this behavior to the type and quality of maternal care that follows (Trause et al. 1976:18). Table 1 presents a summary of observations of maternal behavior for a variety of animal species. This table "shows that different species have evolved comparable caretaking behavior to meet similar needs" (Trause et al. 1976:22). For instance, all mammals make preparations for the birth of their offspring, establish a birth place, and lick their bodies during parturition. After the birth, they are concerned with the warmth and protection of their young and the control of visitors and intruders into or near their nesting area.
Table 1. Species-specific Mothering Behaviors in Various Animal Species

<table>
<thead>
<tr>
<th>Animal</th>
<th>Preparation for birth</th>
<th>Birth site</th>
<th>Birth</th>
<th>Protection of young</th>
<th>Nursing</th>
<th>Stimulation of young</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic cat</td>
<td>Genital licking</td>
<td>Warm, dark place</td>
<td>Licks self, young, and floor of birth site; eats placenta</td>
<td>Retrieves vocalizing young</td>
<td>Initiates by presenting; begins ( \frac{1}{2} ) to 12 hours postpartum</td>
<td>Licking</td>
</tr>
<tr>
<td>Laboratory rat</td>
<td>Builds nest; anogenital licking</td>
<td>Birth nest</td>
<td>Eats placenta</td>
<td>Nest; retrieves</td>
<td>Mother drapes herself over her litter</td>
<td>Licking</td>
</tr>
<tr>
<td>Goats</td>
<td>Separate from herd</td>
<td>Secluded</td>
<td>Self-licking; licks newborn all over</td>
<td>Butts away all intruders; moves toward vocalizing kids</td>
<td>Adjusts position</td>
<td>Licking</td>
</tr>
<tr>
<td>Sheep</td>
<td>Separate from herd</td>
<td>Domestic: indoor shelter</td>
<td>Licks anal area; licks newborn all over</td>
<td>Moves toward bleating lamb</td>
<td>Adjusts position</td>
<td>Licking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Big Horn: inaccessible mountain area</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animal</td>
<td>Preparation for birth</td>
<td>Birth site</td>
<td>Birth protection of young</td>
<td>Nursing stimulation of young</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td>-----------------------</td>
<td>------------</td>
<td>---------------------------</td>
<td>----------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primates</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Indian langur</td>
<td></td>
<td></td>
<td>Keeps to herself for first hours</td>
<td>Licking, grooming, manipulating, stroking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rhesus monkey</td>
<td>Explores genitals; removes mucus manually</td>
<td>Floor of cage or metal bar</td>
<td>Squats; pulls fetus forward; eats placenta; licks young</td>
<td>Holds young close, cradles, avoids others for a long time; retrieves and restrains</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chimpanzee</td>
<td>Moves away from herd</td>
<td>Carries placenta by umbilical cord</td>
<td>Stays away from group for several days; 5 months before allows others to touch</td>
<td>Grooming</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(After Trause et al, 1976:20-21)
Another characteristic shared by most mammalian mothers is the licking and grooming of the young which serves not only to clean the infant but to arouse and stimulate the neonate as well (Trause et al. 1976).

Although there are some characteristics which are shared by most species of mammals, there are many differences among the species as well. In some mammals the specificity of the mother-infant relationship is not as strong as it is in other species. For instance, in many rodents adoption is a common practice, and in the bat it is the rule (Rheingold 1963:3). However, in many species adoption occurs infrequently.

In some monkeys and apes there has been recorded evidence of maternal-infant bonding which is very intense and enduring. For example, adult chimpanzees have been known to return to their mothers periodically for up to twelve years (Goodall 1965) and a clan relationship of sorts is known to exist in several macaque species where all the offspring of a female have been observed to maintain a special relationship to her and their siblings, even after they are fully grown themselves (Sade 1965, Kaufman 1970:11).

Differences in specific behavior toward the young have been noted in several cases where the species are very closely related to each other taxonomically. The North Indian langur and the rhesus monkey form one example of the phenomenon. Although behavior surrounding parturition in the two species is similar in many aspects, the langur mother "will allow as many as eight other females to handle her infant after the first few hours, whereas the rhesus mother jealously holds
her newborn close and avoids the approach of other animals" (Trause et al. 1976:19).

Once specific patterns of maternal behavior for a selection of mammals had been determined it was then possible to learn the effects that periods of separation between a mother and her offspring might have on the mother's attitude and behavior toward her infant. The results of some experiments on early separation are shown in Tables 2-5. Results from these and similar experiments strongly imply that in many species early separation of mothers from their infants can detrimentally affect the mother's ability and desire to care for her offspring and can even result in the mother's total rejection of her offspring if the separation has been a lengthy one.

Of course, we must be careful in any application of data of the kind presented in Tables 2-5 to the human situation, as there are obvious differences between humans and other mammals which must be taken into consideration before any comparative statements can be made. Klaus and Kennell describe some of these considerations as follows:

It is difficult to understand the factors that determine the interactional and mothering behavior of an adult human who has lived for twenty to thirty years. A mother and father's behavior toward their infant is derived from a complex combination of their own genetic endowments, the infant's responses to them, a long history of interpersonal relations with their own families and with each other, past experiences with this or previous pregnancies, the absorption of the practices and values of their cultures, and probably most importantly, the way in which each was raised by his or her own parents. The mothering or fathering behavior of each woman and man, the ability of each to tolerate stresses, and the needs each has for special attention differ greatly and depend on a mixture of these factors (1976a:12).
Table 2. Effects of Separation on Maternal Behavior in Rats

<table>
<thead>
<tr>
<th>Beginning of separation</th>
<th>Length of separation</th>
<th>Tested (with a 5- to 10-day old pup that was not her own)</th>
<th>Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>At birth</td>
<td>Permanent</td>
<td>Weekly for 4 weeks after birth</td>
<td>Rare nursing; retrieving (retrieving slightly more than in virgin females); nest building drastically decreased</td>
</tr>
<tr>
<td>After female cleaned pup and ate placenta</td>
<td>Experimental: permanent; Control: no separation</td>
<td>Beginning of third day</td>
<td>Nursing; retrieving; nest building decreased (nest building decreased less)</td>
</tr>
<tr>
<td>At birth</td>
<td>2 days, then foster pups left with mothers for 9 days; 4 days, then foster pups left with mothers for 1 day</td>
<td>First day after introduction of foster pups then irregular intervals until tenth day after birth</td>
<td>Behavior increased after introduction of foster pups, then decreased to level of mothers with no pups; behavior decreased after separation, more for mothers with 4-day separation</td>
</tr>
<tr>
<td>At birth</td>
<td>4 days</td>
<td>After separation</td>
<td>No maternal behavior</td>
</tr>
<tr>
<td>3 days after birth</td>
<td>4 days</td>
<td>After separation</td>
<td>Maternal behavior returned; 60% to 75% of mothers nursed</td>
</tr>
<tr>
<td>9 days after birth</td>
<td></td>
<td>Every other day after separation</td>
<td>Maternal behavior declined earlier and to lower levels than controls</td>
</tr>
<tr>
<td>14 days after birth</td>
<td>Permanent</td>
<td>Every other day after separation</td>
<td>Decline in maternal behavior did not decrease—had already begun naturally</td>
</tr>
<tr>
<td>Ninth day after birth</td>
<td>Permanent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fourteenth day after birth</td>
<td>Permanent</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Table taken from Trause et al. 1976:24).
Table 3. Effects of Separation on Maternal Behavior in Goats

<table>
<thead>
<tr>
<th>Source</th>
<th>Beginning of separation</th>
<th>Length of separation</th>
<th>Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collias, 1956</td>
<td>Shortly after birth</td>
<td>2 to 4½ hours</td>
<td>5 of 6 young rejected for at least 1 hour on return</td>
</tr>
<tr>
<td></td>
<td>Shortly after birth</td>
<td>15 to 45 minutes</td>
<td>6 of 6 young accepted</td>
</tr>
<tr>
<td></td>
<td>No separation</td>
<td></td>
<td>8 of 8 young accepted</td>
</tr>
<tr>
<td>Klopfer, 1971</td>
<td>Immediately after birth</td>
<td>1, 2, or 3 hours</td>
<td>2 of 15 dams allowed kids to nurse; 15 of 15 dams vigorously rejected alien young</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>14 of 15 dams immediately reaccepted kids; 15 of 15 dams vigorously rejected alien kids</td>
</tr>
<tr>
<td>Hersher, Richmond,</td>
<td>Experimental: 5 to 10</td>
<td>½ to 1 hour</td>
<td>Observation of dam, her own kid, and two other kids 2 to 3 months later</td>
</tr>
<tr>
<td>and Moore, 1963a</td>
<td>minutes after birth</td>
<td></td>
<td>One half of kids did not nurse at all; one half but frequent-nursed indiscriminately butted alien young</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>No dam butted own young</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>No kid nursed indiscriminately</td>
</tr>
</tbody>
</table>

(Table taken from Trause et al. 1976:25).
Table 4. Maternal Motivation in Pigtail Macaque Mothers Separated From Their Young

<table>
<thead>
<tr>
<th>Separation began</th>
<th>Length of Separation</th>
<th>Preference (neonate or adult female macaque)</th>
</tr>
</thead>
<tbody>
<tr>
<td>At birth</td>
<td>1 hour</td>
<td>Neonate</td>
</tr>
<tr>
<td>2 weeks after birth</td>
<td>1 hour</td>
<td>Neonate</td>
</tr>
<tr>
<td>1 month</td>
<td>1 hour</td>
<td>Neonate</td>
</tr>
<tr>
<td>2 months</td>
<td>1 hour</td>
<td>Equal preference</td>
</tr>
<tr>
<td>6 months</td>
<td>1 hour</td>
<td>Adult</td>
</tr>
<tr>
<td>Controls (had not been pregnant or lived with infants)</td>
<td></td>
<td>Adult</td>
</tr>
<tr>
<td>At birth</td>
<td>24 hours</td>
<td>Adult</td>
</tr>
<tr>
<td>2 weeks</td>
<td>24 hours</td>
<td>Neonate</td>
</tr>
<tr>
<td>1 month</td>
<td>24 hours</td>
<td>Neonate</td>
</tr>
<tr>
<td>2 months</td>
<td>24 hours</td>
<td>Equal preference</td>
</tr>
<tr>
<td>6 months</td>
<td>24 hours</td>
<td>Adult</td>
</tr>
<tr>
<td>Controls</td>
<td></td>
<td>Adult</td>
</tr>
<tr>
<td>At birth</td>
<td>7 days</td>
<td>Adult</td>
</tr>
<tr>
<td>2 weeks</td>
<td>7 days</td>
<td>Neonate</td>
</tr>
<tr>
<td>1 month</td>
<td>7 days</td>
<td>Adult</td>
</tr>
<tr>
<td>2 months</td>
<td>7 days</td>
<td>Adult</td>
</tr>
<tr>
<td>6 months</td>
<td>7 days</td>
<td>Adult</td>
</tr>
<tr>
<td>Controls</td>
<td></td>
<td>Adult</td>
</tr>
</tbody>
</table>

(Table taken from Trause et al. 1976:27).

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
Table 5. Effects of Separation on Maternal Behavior in Primates

<table>
<thead>
<tr>
<th>Species and Source</th>
<th>Beginning of separation</th>
<th>Length of separation</th>
<th>Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhesus macaque monkey (Meier 1965)</td>
<td>Experimental: cesarean section with local anesthetic</td>
<td>Not specified—approximatively 2 hours</td>
<td>Laboratory animals reared in isolation did not accept infants (did not approach, pick up, or hold to ventral surfaces). Feral animals: 3 accepted infants on day of birth, the other 4 accepted infants by next day.</td>
</tr>
<tr>
<td>Pigtail macaque monkey (Rosenblum and Kaufman 1967)</td>
<td>4.8 to 6.1 months after birth</td>
<td>4 weeks</td>
<td>Laboratory and feral animals: normal maternal behavior.</td>
</tr>
<tr>
<td>Rhesus macaque monkey (Harlow et al. 1963)</td>
<td>7 months after birth</td>
<td>3 weeks</td>
<td>3 of 4 mothers immediately accepted infants; enclosure by mothers greater in month after than in month before separation; maternal behavior normally discouraging dyadic cohesiveness (i.e., punitive deference and nipple withdrawing) at this age appeared rarely. 3 of 4 mothers immediately accepted infants; 1 of 4 seemed totally indifferent for over 24 hours, despite infant efforts.</td>
</tr>
</tbody>
</table>

(Table taken from Trause et al. 1976:28).
The study of maternal behavior is so much more complicated in humans than in other animals. Doctors have no way of knowing when maternal feelings begin to develop in an individual woman or how she will react to them (Jessner et al. 1970). Events such as planning, confirming, and accepting the pregnancy are related to the development of a woman's feelings for her infant and these may occur months prior to the infant's birth (Jessner et al. 1970; Klaus and Kennell 1976a:38).

Similar to what has been observed in many other species, evidence does suggest that there is a "sensitive" period in humans which surrounds the birth of an infant and lasts for several hours afterwards, during which conditions for the formation of maternal-infant bonds are maximal (Klaus and Kennell 1970, 1976a, 1976b). Eight of nine studies of both premature and full term babies from the United States, Brazil, Sweden, and Guatemala provide evidence for this sensitive period in humans (Klaus and Kennell 1976a, 1976b). It appears that just as with the animal species mentioned earlier, separation can be a negative factor in the relationship between a mother and her infant. What we know of human evolution adds support to the probability that such would be the case. It is unnatural to separate a mother from her baby immediately after birth since the mother is the one best equipped to provide the warmth, security and nourishment needed to assure that the infant will survive. Though cultural customs may vary from group to group (Raphael 1975), lengthy separation of mother and infant is a fairly recent Western practice, one that comes as a consequence of moving childbirth out of the home and into the hospital.
Obviously, there are advantages in giving birth in a hospital as opposed to birthing at home. Birthing in hospitals has dramatically reduced infant and maternal mortality rates. On the other hand, it has permitted the survival of sick, fragile infants who place a tremendous financial and emotional burden of their families (M. Newton 1976:91).

Another consequence of moving childbirth to hospitals is the effects it has on the entire family unit. It is significant to mention that the father can be greatly affected by the events surrounding the birth of his child, just as the mother is affected by this special event (Biller 1976; Klaus and Kennell 1976a, 1976b). In fact, evidence coming from observations of home deliveries indicates that everyone present at the birth of a child is likely to be emotionally affected by the event. This characteristic has tremendous survival value for the infant, particularly in places where childbirth is still practiced in the home. Generally, in such situations the birth is attended by relatives or close friends, those most likely to care for the infant should the mother die or become too ill to do so herself. This early involvement provides added incentive for others to care for the infant should the situation arise (Klaus and Kennell 1976a).

Unfortunately, most hospitals in the United States deny family members the opportunity to participate in the child's birth and in many cases, except for fathers, family members are not allowed to view the baby until the mother and baby have been released to go home. Furthermore, there is some evidence that suggests that isolation of the mother from her own family may have some connection with the
post-partum depression that is so common in new mothers in this country. One study done by the Gordons found that "the incidence of post-partum breakdown increased with the actual distance in miles of the new mother from her own mother, sister, or close friends" (Raphael 1973:32). Therefore, we can be in agreement with Michael Newton when he states that hospitals have "developed an emotional bias that has militated against family closeness, closeness between father and mother, closeness between mother and baby and closeness of the family as a whole" (1976:91).

We are only now becoming aware of the full impact of standard hospital routine on the family-infant relationship. Analysis of data from long-term observations reveals that early events surrounding human parturition have long lasting effects. Mothers, chosen at random and without their knowledge, and given extra time with their infants during their hospital stay, were found to behave differently toward their infants hours, months, and even years after the child's birth than mothers who were allowed only routine contact with their infants during the same period (Klaus and Kennell 1976a).

In the months following birth, mothers who had been given extended time with their newborns fondled and looked directly at their babies significantly more during feedings than did mothers from the control group. During physical examinations of their infants at one year, mothers from the extended contact group were found, more often than mothers from the other group, to stand closer to their infants, assist the doctor with the examination and try to soothe the baby if he cried.
At two years a random selection of mothers from both groups was chosen and observed for linguistic behaviors. "The extended-contact mothers asked twice as many questions and used more words per proposition, fewer contact words, more adjectives, and fewer commands than the control mothers" (Klaus and Kennell 1976a:58). At five years the children of the extended-contact group scored better on two language tests and had significantly higher IQs than children from the other group (Klaus and Kennell 1976a:59).

Since studies of early contact and separation in humans began, pediatricians in this country and abroad have made observations that substantiate the conclusion that the amount of time a mother spends with her newborn can affect her behavior toward her infant for some time afterwards (Staufer 1976, Margolis 1979). While the real significance of these observations is still being debated, the data presently available do indicate that children of mothers who spend extended periods of time with their newborns can be affected by the quality of the relationship which grows out of the extended contact situation (Klaus and Kennell 1976a).

Unlike what we have observed in some other species, separation of a human mother and infant, even lengthy separation, does not mean the mother will necessarily reject her infant. However, as Brazelton explains,

It is not that mothers cannot attach after such separations, it is that it may be more expensive—and unnecessarily so. And in stressed situations, where there is little or no reason to want a baby or to want to attach to him, the difference may be critical (Quoted in Klaus and Kennell 1976a:52).
Although certainly not every woman who experiences early separation from her infant will later abuse or neglect him, it has been observed that a mother's ability to care for and cope with her infant's needs is greater if little or no separation has occurred during the post-partum period. This phenomenon was observed and recorded as early as 1907 by Budin who wrote *The Nursling*, the first text on neonatology. In his book Budin says, "Unfortunately . . . a certain number of mothers abandon the babies whose needs they have not had to meet, and in whom they have lost all interest" (Quoted in Klaus and Kennell 1976a:3). On the basis of his observations Budin believed all mothers, even mothers of premature infants, should try to breastfeed their babies so that they could become actively involved in the caretaking and survival of their child (Klaus and Kennell 1976a:3).

Budin certainly was not the first to realize the link between breastfeeding and maternal-infant bonding. For centuries, breastfeeding had been depicted in literature and the arts as a powerful factor in maternal love and devotion. However, by the time Budin wrote *The Nursling* in 1907, breastfeeding had already begun a sharp decline, a decline that began in the early nineteenth century (Sunley 1955).
Attitudes toward children and child-rearing changed dramatically in the United States between 1820 and 1860. This change came about mainly in response to the establishment of new patterns of family living which grew out of the Industrial Revolution (Sunley 1955). The new emphasis on technology during this period opened the way for the rapid acceptance of the practice of artificially feeding a baby from a bottle, a practice that is probably the most drastic change in infant nurture that has ever occurred (M. Newton 1976:91).

The use of pap-like foods as a supplement to breastfeeding has been documented in many parts of the world. A wide variety of utensils designed specifically for the purpose of feeding infants and young children has been found with pre-Christian remains of Romans, Greeks, Assyrians, Egyptians, and others, but these utensils were used for supplementary foods and were seldom relied upon as the total means of feeding an infant (Gesell and Ilg 1937:36-37).

In many parts of the world breast stimulation was the accepted method of inducing lactation in a substitute mother in cases where the child's biological mother died in childbirth. This phenomenon is called "non-puerperal induced lactation" and is still used in some areas of the world as an emergency method of infant feeding (Jelliffe and Jelliffe 1972). Prior to the nineteenth century in Europe and the United States, the use of wet nurses who could supply an infant with human milk and physical closeness was preferred over
other alternatives in cases where the mother did not lactate (N. New-
ton 1976). Thus, the early nineteenth century witnessed for the first
time the popularity of strictly artificial feeding of an infant on a
large scale.

Many factors contributed to the increasing popularity of bottle-
feeding, also known as "dry nursing" and "raising a baby by hand"
(Sunley 1955:154). Such technological advances as the invention of
the rubber nipple and improvement of bottles to contain the milk not
only made bottlefeeding easier, but also the modern, fashionable thing
to do (Sunley 1955; Sesell and Ilg 1937).

As was the case with so many of our traditional childbirth and
infant care practices, the movement of childbirth into hospitals and
clinics had a tremendous impact on breastfeeding. Although separation
from the infant may in itself decrease a mother's desire to breast-
feed her infant, many other hospital procedures may also hamper the
efforts of the most determined mother. One doctor describes the role
of the hospital in the decline of breastfeeding as follows:

This is a consequence of mother/baby separation, but is also
a part of the emotional factors surrounding the hospital
confinement. Even if she tries to breastfeed, she often is
disturbed and the amount of milk she gives is sharply re-
duced because of failure of her ejection reflex. Such dis-
turbance can affect milk secretion and therefore may be a
further important factor in decreasing the incidence of

Practices such as medicating or sedating the mother during and
after delivery, the insistence by hospital personnel that mothers
perform certain lactation rituals, hospital staffs offering supple-
mental feedings to infants and rigid feeding schedules which are
unnatural and unbiological can also impede a mother's ability to
breastfeed (N. Newton 1955, 1976; Raphael 1973; Findlay 1974; Kippley
1974; Jelliffe 1976). Studies show that where rooming-in situations
have been instituted and the mother and baby are kept together with
less interference from hospital personnel, there is likely to be a
significant increase in breastfeeding and a decrease in feelings of
anxiety in the mothers (Klaus and Kennell 1976a:53).

Even in cases where the mother survives her hospital stay as a
breastfeeder, she has tremendous pressures to face when she arrives
home with her newborn. Particularly in the United States where many
young women are often separated by miles from their own families, or
their close female relatives and friends are employed, there is often
no one to fill the role of the doula, that of providing assistance,
instruction, and encouragement for the mother concerning her child care
responsibilities (Raphael 1973). This is especially true when it comes
to breastfeeding the baby.

Few people in a modern mother's circle know what breast
milk looks like. No one is there to tell the new mother how
to hold the infant, how long to keep him suckling, or how to
care for uncomfortably full breasts or irritated nipples
(Raphael 1973:16).

In many cases the only information a new mother receives comes
from either her doctor who is generally male and has little or no
knowledge of the art of breastfeeding, or from books, magazines,
television, etc., where advertisements promote bottlefeeding and
commercially prepared infant foods. Very often information from these
sources persuades a mother to give up breastfeeding entirely.
The absence of a close friend or relative who will assume the role of the *doula* has forced many mothers to search elsewhere for support. This search has culminated in the formation of spontaneous voluntary groups whose existence exemplifies the inability of today's family to provide the necessary positive reinforcement for a woman during her childbearing and child-rearing years (Newman 1975:9).

The Le Leche League is one such group which has gained international recognition as a supportive organization whose purpose is to promote good mothering through breastfeeding. The Le Leche League and its sister organizations throughout the world serve as surrogate *doulas* for thousands of mothers by offering encouragement and support, information and instruction in the art of breastfeeding, and a social outlet as well. This organization, which began in 1956 and now has hundreds of local chapters here and abroad, has been instrumental in the recent resurgence of breastfeeding in America (LLLI 1963).

The last two decades or so have witnessed a significant increase in the incidence of breastfeeding in this country. Just as the pre-occupation with technology over a century ago led to a decline in breastfeeding, a critical evaluation of the socio-cultural impact of technology in the 1960's brought to the fore a new awareness of technological dangers such as pollution and waste.4

This more cautious attitude toward technology and a desire on the part of many to *return to nature* generated a great deal of interest in the infant and child-rearing practices of the past. Research stimulated by this interest has led to some startling discoveries about ourselves. Frequently, however, the research has
created as many new questions as it has answered them. This is true of the research that has been directed at increasing our knowledge of breastfeeding.

The possibility that feeding method *per se* has reliable or consistent effects on the behavioral development of infants has long been a topic of debate. There are areas of an infant's growth and development where it has been proven that feeding method does have pronounced effects, those being primarily in health and nutrition. Therefore, it is reasonable to suspect that psychological differences might also arise as a result of the feeding method. Although the general consensus among researchers has been that the evidence has not demonstrated a connection between psychological development and feeding method, the possibility of such cannot be ruled out (Bernal and Richards 1970:247). Recent research is influencing our thinking on this matter and as we learn more about the capabilities of the newborn, we will be able to understand better the psychology of mothering and the effects of mothering on infant development.

Very recently, data have been collected by Heinz Prechtl on the brain wave patterns of infants, which shows babies under the age of two weeks are never fully awake if left lying flat in their cribs. Although the practice observed in many non-Western countries, where a baby is carried upright in a sling-lick sack around his mother, is becoming more popular in the United States, the majority of mothers here let their babies spend long periods of time lying alone in their beds, with feedings representing the majority of time the infant is held. When an infant is being breastfed, the head is held
higher than the legs. This is not always the case with a bottlefed baby. Thus, the breastfed infant is more likely to be alert and better able to interact with the mother during feedings than a baby who is not breastfed (Macfarlane 1977:75).

This interaction may partially account for the fact that breastfed infants have been observed to be more active than bottlefed babies (Bernal and Richards 1970:249). Of course, this phenomenon could be the result of other factors, such as a difference in the post-natal environment due to feeding method, the fact that breastfed babies must suck harder on the breast than bottlefed babies have to suck on a rubber nipple to keep the flow of milk coming, or a variety of other reasons. However, it is very likely that the activity seen in breastfed infants is a consequence of the freedom of movement that breastfeeding allows and bottlefeeding does not (Brody 1956:319-320).

Another facet of this activity may be a result of the sucking pattern of the human infant. Although different species of mammals are known to use different sucking patterns, only the human infant shows two categories of sucking behavior. One category of sucking is called the "nutritive mode" and is described as a fairly continuous sucking action with few, if any, hesitations. The other is known as the "non-nutritive mode" which consists of alternating periods of bursts and rests (Findlay 1974:458). It has been observed that "mothers interact with their infants in precise synchrony with the burst-pause pattern of sucking" (Schaffer 1977:66). During bursts mothers tend to be quiet and passive, while during pauses they may touch, play and talk to the infant. Obviously, the breastfeeding
mother is better able to respond to these cues from her infant as "she fits in with his natural sucking pattern, responds to his signals such as ceasing to suck, accepts the opportunity to intervene offered by his pauses, and by this means sets up a dialogue between them" (Schaffer 1977:66).

Furthermore, another aspect of behavior related to infant sucking has been found to differ between breastfeeding and bottlefeeding mothers and their newborns. It seems bottlefeeding mothers usually initiate the end of the feeding period by pulling the nipple from the baby's mouth, whereas among nursing couples, it was found that the infant terminates the feeding as often as the mother, by releasing the nipple (Macfarlane 1977:122). Thus, the infant seems to be given greater freedom of movement and the mother seems more receptive to his needs and desires in the breastfeeding situation.

The position in which an infant is held has been found to be significant in the establishment of eye-to-eye contact, which is a very important factor in mother-infant bonding (Klaus and Kennell 1976a, 1976b). For years, it was thought that infants were unable to see at birth. It has since been discovered that infants do see but that they focus best at a distance of about nine inches. When a mother breastfeeds her infant, her face is approximately nine inches from her baby's. The is not always the case with bottlefeeding mothers, who often tend to hold their babies at a greater distance from their faces. Therefore, the chances for visual interaction appear to be greater if the mother breastfeeds her infant than if she does not (Macfarlane 1977:77). The ability of the infant to see his mother's
face may have a direct influence on his sucking behavior, as it has been observed among six week olds that suckling occurs more frequently when a picture is brought into focus (Findlay 1974:459). Increasing the frequency of suckling increases the amount of interaction between the mother and baby.

It has also been discovered that infants rapidly develop their sense of smell and by six days of age can distinguish their mother's breast pad from the breast pad of another woman (Macfarlane 1977:77). It makes sense that a breastfed baby would have a better opportunity to distinguish his mother's odor sooner than a bottlefed infant as the breastfed infant would have closer, more intimate and more frequent bodily contact with his mother. This is especially true in the United States where it is the practice to hide or disguise any personal odor with clothing, deodorant, or perfume.

For years it was believed that affection in infants developed from the satisfaction of being fed. Harry Harlow disputed this idea on the basis of results from one of his early experiments on rhesus monkeys (1959). Later experiments verified the finding that of all mother-infant interaction, sheer bodily contact is the dominant variable in providing security, at least in rhesus monkeys (Harlow and Harlow 1966). Since Harlow's experiments, mounds of data have been compiled which indicate the same holds true for humans, i.e., that body contact is the single most significant interaction between a mother and infant, or for that matter, between any two individuals (Montagu 1971, Klaus and Kennell 1976a, 1976b).
Evidence further suggests that tactile stimulation is not only important to the newborn's physical and emotional development, but to the mother's acceptance of the newborn as well (Klaus and Kennell 1976a, 1976b). Montagu compares the importance of handstroking or caressing in humans to that of licking in other mammals. "It would seem evident that one of the elements in the genesis of the ability to love is 'licking' or its equivalent in other forms of pleasurable tactile stimulation." (1971:37).

Certainly the act of breastfeeding must fall into the category of "pleasurable tactile stimulation," for it offers an experience which can be enjoyed mutually by mother and infant. Newton and Newton have observed that this pleasure is very obvious in the behavior of older babies.

The total body shows signs of eagerness—rhythmic motions of the hands, feet, finger, and toes may occur along with the rhythm of sucking. Erection of the penis is common in male babies. After feeding there is often a relaxation that is characteristic of the conclusion of satisfactory sexual response (Quoted in Kaufman 1970:35).

Recordings of babies during feedings support the observation that breastfeeding is a pleasurable experience for the infant. These recordings reveal that breastfed infants make "cooing" noises, interpreted as a sign of satisfaction and contentment, that bottlefed babies do not make (Applebaum 1969:71).

As for the infant, breastfeeding can be a physically stimulating experience for the mother. Stimulation of the breasts alone can induce orgasm in many women and, "the sucking stimulus may induce sexual excitement and active enjoyment in some, but not all, women"
Masters and Johnson found that many nursing mothers reported having even more erotic feelings after experiencing childbirth than they had prior to becoming pregnant, and in general, nursing mothers were more interested in resuming sexual relations after childbirth than mothers who bottlefed their infants (Olds and Eiger 1972:136-137). While some women may experience orgasm during the suckling of their infant, most experience a sense of satisfaction and contentment, a "combination of physical and emotional fulfillment" (Olds and Eiger 1972:134-135). Just knowing that she is continuing to nourish and support her infant from her own body is a reinforcing psychological factor for many nursing mothers (Macfarlane 1977:85).

Perhaps the physical gratification received from nursing may explain why in a study of post-parturient women and mice, Newton, Peeler and Rawlings observed that in both species those who nursed their young exhibited a significantly heightened desire to be in close contact with them (Kaufman 1970:32). On the other hand, this increased drive in nursing women and mice to have close contact with their young could also be related to other factors such as hormonal mechanisms.

We know that hormones can be an important factor in behavior. For some time we have been aware of the hormonal differences between men and women and have attributed much of the strong maternal behavior of women to female hormonal levels (Ehrhardt 1975). Findings from experiments on laboratory animals support the assumption that hormones can induce maternal behavior, particularly in the period following childbirth (Trause et al. 1976:33). When we look at the balance of hormones...
in breastfeeding and non-breastfeeding women, we find they differ significantly from one another, with a major dissimilarity in the level of prolactin in breastfeeders. Furthermore,

... recent studies have shown the polyvalent hormonal role of prolactin—in the mammary-alveoli with milk secretion, in the kidneys with a water-conserving antidiuretic effect, in the ovaries with anovulatory lactation amenorrhea, and possibly in the brain with increased maternal behavior ('motherliness') (Jelliffe 1976:1228).

We cannot be sure to what extent hormonal or psychological factors influence maternal behavior in individual women. Some recent research efforts suggest that maternal behavior may also be linked to inherent characteristics in the central nervous system of the female (Harlow 1971:5). Whatever the reasons, the research on mother-infant bonding discussed in the preceding chapter showed that in many women deep, long lasting maternal feelings appear to remain latent or never to fully develop unless properly activated by the care-eliciting features and responses of the human infant (Klaus and Kennell 1976a, 1976b).

The data presented above on breastfeeding indicate that there are many mutually reinforcing factors involved in the act of breastfeeding that might tend to produce maternal feelings in women, thus enhancing the mother-infant relationship. This evidence is strengthened by the fact that a growing number of American women are returning to breastfeeding and enjoying it. Even some mothers of adopted children in the United States, Western Europe and Australia have gone to great lengths to be able to nurse their adopted babies at the breast. These mothers have reported that their efforts were reinforced and rewarded by the strong feelings of attachment and affection.
they experienced while breastfeeding (Raphael 1973, Klaus and Kennell 1976). Much of the success in breastfeeding that these mothers experienced stemmed from their sheer desire and determination to do so.

Attitudes have been known to affect directly the success of a woman to breastfeed her infant (Newton 1955, Raphael 1973, Jelliffe 1976). Thanks to the efforts by some individuals and organizations, namely the Le Leche League, attitudes in this country have become more favorable and relaxed toward breastfeeding, making it an easier and more acceptable means of child-rearing.

However, breastfeeding should not be considered as an isolated act, but rather as the center of a complex of maternal behavior. As the incidence of breastfeeding increases, so does the incidence of other related types of behavior, behavior that tends to encourage mother–infant contact and interaction,

The concept that has developed in some Western countries that bottle-feeding by an affectionate mother is the equivalent of breast feeding is plainly not so. The degree of somato-sensory contact and the direct hormonal effects in the mother are obviously dissimilar. Also bottle-feeding cultures are also more likely to include other practices limiting mother–baby contact (Jelliffe 1972:1233).

The evidence cited throughout this and preceding chapters should help us to understand why and how it is possible that different caretaking behavior may develop in breastfeeding and non-breastfeeding women. The extent of this difference is the subject of the research presented in the following chapter.
Introduction

Breastfeeding is gaining in popularity in the United States. This change in behavior in American women signifies a change in attitude toward children and child-rearing which comes at a time when the mother-infant relationship is the center of much attention.

The purpose of the field research aspect of this study was to try to determine if and in what manner a breastfeeding mother's behavior toward her infant differs from that of a bottlefeeding mother and how this difference might affect the mother-infant relationship.

Materials and Methods

Data were collected from a carefully selected sample of white, middle-class mothers in the Kalamazoo area chosen by means of a random sampling technique. The universe under study was selected because of its accessibility and because this segment of the population is thought to reflect popular American attitudes toward child-birth and child-rearing (Olds and Eiger 1972, Jelliffe and Jelliffe 1975, Jelliffe 1976:1231).

The sample consisted of 34 mothers of infants and toddlers ranging in age from 23 to 35 at the time of the study. Although many of the mothers lived in small outlying communities, all but one delivered in a Kalamazoo hospital.
Of the 34 mothers studied, 20 had intensively breastfed their infants for at least three months, while the other 14 mothers had bottlefed. In both groups the average age of the mothers at the birth of the first child was 24 years. The socio-economic status and religious backgrounds of the mothers in the two groups were similar. There was, however, a significant difference in the educational background of the mothers and their husbands, with breastfeeders and their husbands having attained a significantly higher level of education. This difference is depicted in Figure 1. There was also a difference in the amount and type of childbirth preparation between the breastfeeders and bottlefeeders. This relationship is shown in Figure 2.

Fifteen percent of the breastfeeding mothers belonged to an organization concerned with childbirth education and preparation, as compared to 7% of the bottlefeeding mothers. Fifty-five percent of breastfeeders had attended meetings of the Le Leche League, although only 30% were members. None of the bottlefeeders had ever attended a Le Leche League meeting.

The study was conducted through personal interviews with each mother in the home environment. Since many women are extremely sensitive about their choice of feeding method, a separate set of basic questions was devised for each group so as not to intimidate a mother or influence her answers. A pre-test questionnaire was devised to assure the adequacy of the instrument for acquiring appropriate data. This was followed by more extensive questionnaire forms which served as the basis for the interviews which ranged from 1½ hours to 3 hours in length. Conclusions are based on statistical analysis of the data.
Figure 1. Bar Graph Showing Educational Background of Breastfeeders, Bottlefeeders and Their Husbands.
Figure 2. Bar Graph Showing the Childbirth Preparation of Breastfeeding and Bottlefeeding Mothers.
collected concerning socio-cultural background, reasons for breastfeeding or bottlefeeding, and behavior of the informants during the interview sessions.

Results

Many factors contribute to a woman's decision as to how she will nurture and care for her infant. The women under study in this investigation gave varying responses as to why and how their choices of feeding methods affected their relationships with their children.

The breastfeeding women reported 65% of their mothers had breastfed at least one child as opposed to 29% of bottlefeeders. Husbands were reported as the most positive influence on breastfeeding by 25% of the nursing women, while family members other than husbands were positive influences in only 15% and negative influences in 35%. In only 29% did a family member suggest that a bottlefeeding mother should breastfeed.

Friends were reported as the most positive influence toward breastfeeding by 20% of the nursing mothers and the most discouraging influence by 15%. Sixty-four percent of the bottlefeeders said that most of their friends breastfed, and 43% said a friend had suggested they breastfeed also.

Doctors were not considered by nursing mothers to be an important factor in decisions about breastfeeding, although 80% felt their doctors were supportive of breastfeeding. Doctors suggested breastfeeding as an alternative method to 21% of the bottlefeeding mothers,
and in one case (7%) a doctor recommended that the mother not breastfeed because of a health problem.

Of the 12 multiparous breastfeeders, four had bottlefed an older child. In each of the four cases, the mother had attempted to breastfeed but had been unsuccessful. All of the multiparous bottlefeeders had bottlefed their older children. Fifty-seven percent of the bottlefeeders had at one time attempted to breastfeed, but only one (7%) had been successful and she quit breastfeeding after two months because of a busy schedule.

Husbands of breastfeeders were present for 75% of births. In addition, 10% of the husbands had planned to be there but missed the delivery, and were united with mother and infant immediately following the births. Husbands of bottlefeeders were present for 50% of the births. It should be noted that at the time of this study, fathers were not permitted to attend Cesarean births which accounted for 36% of deliveries in bottlefeeders and 5% in breastfeeders.

Seventy percent of the breastfeeders spent extended time with their infants immediately following birth, as opposed to 29% of bottlefeeders. With the exception of one mother whose infant was in intensive care for one and one-half weeks, all breastfeeding mothers were united with their babies within 12 hours of birth and all bottlefeeding mothers within 48 hours.

During the hospital stay, 90% of the breastfeeders and 79% of bottlefeeders had an extended rooming-in situation where they spent 12 to 16 hours each day with their infants. Five percent of breastfeeders spent about 6 hours a day with their infant, as did 14% of
the bottlefeeders. In one case in each group a mother did not spend time with her infant because of complications surrounding the birth.

There were some distinct differences in the attitudes of breast-feeding and bottlefeeding mothers which were reflected in their behavior concerning feedings. Breastfeeders fed 90% of their infants on demand, as compared to only 14% of the bottlefeeders. All mothers gave night feedings for some length of time, but the average time among breastfeeders was seven months and among bottlefeeders, it was 2.7 months. Figure 3 illustrates the length of time that night feedings continued.

Bottlefeeders were also more likely to begin their infants on solid foods at an earlier age than breastfeeders. Figure 4 shows the ages at which the mothers introduced their infants to solids, the average age being four months among breastfeeders and 1.6 months in bottlefeeders. The most common reason given for beginning solids at an early age was to help make the baby sleep through the night.

Ninety-three percent of bottlefeeders said they always held their infants when feeding. However, 50% stated they often put the baby to bed with a bottle once the infant was old enough to hold the bottle.

Seventy-five percent of breastfeeders said they allowed their infants to pacify themselves at the breast at times not related to feedings or sleep, while only 36% of bottlefeeders said they let their infants pacify themselves with their bottles in similar situations.

Behavior differed significantly between the mothers of the two groups. Breastfeeders spent more time rocking their babies and more frequently slept with their infants than bottlefeeders. Figure 5
Figure 3. Line Graph Showing Period of Time Night Feedings of Infants Continued.
Breastfed Infants

Bottlefed Infants

Figure 4. Line Graph Showing the Introduction of Solid Foods in Infants.
Figure 5. Bar Graph Showing Rocking and Sleeping Behavior in Mothers.
compares rocking and sleeping behavior in bottlefeeding and breastfeeding mothers. It was also found that breastfeeders less frequently allowed their babies to cry themselves to sleep, with 95% saying they usually nurse their babies to sleep, while 58% of the bottlefeeders sometimes or often let their babies cry themselves to sleep.

Mothers who breastfed also spent less time away from their infants than mothers who bottlefed. Only 5% of breastfeeders felt breastfeeding was definitely confining, while the remainder said the baby's schedule was not too difficult to work around. All bottlefeeders felt it was easy to leave the baby, and most reported doing so often because other people could take the mother's place during feedings.

All mothers agreed that a breastfeeding mother should be relaxed and calm and must desire to breastfeed if she is to be successful. None of the breastfeeders reported feeling nervous or anxious about rearing their infants, while 21% of the bottlefeeders described their early relationship with their infants in these terms. All breastfeeders felt they benefited from nursing their infants, and all said they would want to breastfeed again with another child. Only 50% of the bottlefeeders said they would like to try to breastfeed a child.

Implications and Speculations

Behavior was definitely found to differ between breastfeeding and bottlefeeding mothers and their infants in this study. The most obvious difference was in the tactile relationship between the mothers and their infants. Breastfeeders reported having more frequent body
contact with their infants than bottlefeeders through such behaviors as rocking, night feedings and sleeping with their infants. Observations made by the researcher during the interview sessions support the statements of the mothers, as a great deal more contact was observed between breastfeeders and their infants than between bottle-feeding mothers and their babies.

The results of this study corroborate findings of other researchers in this area. For instance, Newton and co-workers found in a similar study of breastfeeders and bottlefeeders that 63% of the breastfeeders reported they often rocked their babies as compared to only 29% of the bottlefeeders and that 56% of the breastfeeders said they sometimes or often slept with their infants as opposed to 25% of bottlefeeders (N. Newton 1976:103). In another study, Rawlins, Peeler and Newton found in matched pairs of mothers one to two months post-partum that 71% of the breastfeeders sometimes or often slept with their infants as opposed to only 20% of the bottlefeeders (N. Newton 1976:103). Furthermore, Bernal and Richards have also found kissing and rocking to be more common among breastfeeders, while bottlefeeders tended more toward rubbing, patting, jiggling and a concern for bringing up gas (Macfarlane 1977:122).

That night feedings continued for prolonged periods among breastfeeding mothers and their infants should not surprise us, as night feeding are as important to the mother's comfort and milk supply as to the infant's need for nourishment. Many breastfeeding mothers said they particularly enjoyed the intimacy and privacy the night feedings afforded them. Therefore, it is very possible that the night feedings

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
promote and reinforce body contact between the mother and infant by providing incentive for mothers to take their babies to bed with them. The convenience of the nursing situation further lends itself to prolonged night feedings.

On the other hand, bottlefeeders reported night feedings to be the most inconvenient part of early child care. The feeling may result from the fact that there is little positive tactile stimulation to reinforce the bottlefeeding mother to continue to get up with her infant during the night. Efforts to eliminate night feedings and make the baby sleep through the night seem to motivate the early introduction of solid foods among many mothers and bottlefeeders in particular. Furthermore, efforts by parents to eliminate night feedings is an attempt to regulate the infant to meet the demands of the parents' schedule instead of the parents meeting the demands of the infant's schedule. Further evidence that the parents of bottlefed infants try to make the baby conform to their schedule is the fact that the large majority of bottlefeeders fed their infants on a rigid schedule, instead of feeding on demand as most of the breastfeeding mothers did.

Other evidence also suggests that breastfeeders were more baby-oriented in their child care than bottlefeeders, meaning that the breastfeeding mother was more attuned to the wants and needs of the infant and did not rely on others to help in caring for those needs. Breastfeeders were not as likely as bottlefeeders to leave their babies for extended periods of time. Also, breastfeeders did not leave their babies to go out as early as many bottlefeeding mothers.
reported they did as many bottlefeeders said they left their babies immediately to go out, while most breastfeeders did not leave their infants for the first several months.

Many factors influence the behavior of a woman toward her infant, but probably the most important is the way in which she was raised and her relationship to her own parents (Klaus and Kennell 1976a:12). Although most mothers said that family members did not really influence their decision to either breastfeed or bottlefeed, there was a strong correlation between the manner in which a woman chose to feed her infant and the way in which she herself had been fed. If, indeed, breastfeeding or bottlefeeding gives way to the development of certain types of behavior, and the research suggests that it does, then the way in which a woman is nurtured is quite likely to affect how she will choose to feed her own infant and her success in doing so.

Today, with the new emphasis on childbirth education and preparation, it is hoped that a mother will be better prepared psychologically and emotionally as well as physically to accept the responsibility of child-rearing. This is especially important for American mothers, as they spend proportionately more time responsible for their infants than women in other countries who often have the help of other adult family members (Minturn and Lambert 1964:102; Stephens 1964:366). The importance of a positive childbirth experience on the quality of care the infant will receive has been discussed in an earlier chapter. The high correlation between mothers who attended childbirth preparation classes to enhance their birthing experience and mothers who breastfed indicates that these mothers were more receptive
to involvement with their infant, the involvement breastfeeding demands and encourages.

Of course, even though the evidence shows breastfeeding mothers behave differently from bottlefeeding mothers, we cannot be sure to what extent breastfeeding plays a role in the differentiation of this behavior, as many mothers may breastfeed because they are more maternal and baby-oriented in the first place. Also, there are many extremely maternal and loving bottlefeeding mothers who interact with their infants in ways somewhat similar to breastfeeders. However, based on what we have learned about the process of breastfeeding, it must be said that the relationship between a mother and her breastfed infant is definitely different from that of a bottlefeeding mother and her baby (N. Newton 1955:51).

Unfortunately, we may never be able to learn the full impact of breastfeeding on the mother-infant relationship; there is no way experimentally to test for this in women, since women cannot be assigned at random to breastfeed or to bottlefeed (N. Newton 1976:102).
CONCLUSIONS

Today in the United States, where there exists a multitude of affordable alternative substances for mother's milk, more mothers are choosing to nurse their babies at the breast. In the process, they are beginning to realize that in addition to its nutritional benefits, breastfeeding offers many advantages for each family member and for the family as a unit. These advantages and their effect on the family will ultimately have an effect on our society.

A great deal of concern has been expressed over the future of the American family and some fear that the disorganization and disorientation found in many families today may lead to the total collapse of American society as we now know it. However, a closer look at the most recent literature suggests something quite different. Contrary to the pessimism expressed by some, new data seem to indicate that there is a renewed interest in families and family life in this country. Although many young couples are choosing not to have families, those who are having children seem to be enjoying it more. Family size is increasing and today's parents are beginning to participate more with their families by becoming more actively involved in the birth and rearing of their children than has been the case for decades. Today's parents are better educated and more independent than parents of a generation ago. The recent emphasis on ecology and ecological considerations has made this generation more aware of the intervention of technology in their everyday lives and of the pressures that confront the family today. Based on this awareness, young parents are
capable of making many family-based decisions on their own and are doing so, thus relying less on the authority of professionals to determine what is best for their particular family situation. Nowhere is this more evident than in our birthing and child-rearing practices.

Recent research on the effects of modern American childbearing and child-rearing practices which promote mother-infant separation has encouraged many Americans to return to more traditional methods of birthing and child-rearing. The new emphasis on "natural" and "educated" childbirth has done much to further an interest in breastfeeding. Breastfeeding is no longer looked upon as a separate process but one that is the natural antecedent to childbirth. This philosophy is the basis for the formation of organizations such as the Le Leche League whose primary purpose is to encourage and support breastfeeding here and abroad. The Le Leche League and its sister organizations around the world do more than spread the word about the nutritional advantages of breastfeeding. In many cases they have taken on the role traditionally filled by the family in passing along information about mothering, a kind of folk knowledge, much of which is beginning to be substantiated by research from a variety of disciplines.

Results from this and other studies on infant feeding practices show a distinct difference in mother-infant interaction between breastfeeding mothers and bottlefeeding mothers and their infants, with breastfeeding mothers showing a tendency toward more intimate and personal contact with their infants through maternal behavior that
encourages tactile stimulation such as holding, rocking, and sleeping with the baby.

Of course, such research does not mean to imply that all breastfeeding mothers are good mothers or that all mothers who bottlefeed are not. However, it does suggest that in most cases breastfeeding can enhance the mother-infant relationship and, therefore, strengthen family ties.

. . . perhaps a higher degree of closeness within the family, commencing with the primary mother-child tactile tie, would help Americans to feel somewhat more anchored in the family, while an acceptance of the importance of emotional tactile needs beyond childhood might help them to withstand the impersonal pressures of our times and the inevitable vicissitudes of life (Montagu 1971:287).

The return of many Americans to more traditional methods of childbearing and child-rearing may benefit our society as a whole and, hopefully, will serve as a new model for non-Western nations where breastfeeding and related child care practices are on the decline.

With the advent of such technological wonders as pills which can increase the chances of fertility and, conversely, those which can inhibit the chances of conception, improvements in the technique of artificial insemination and the recent achievement of producing test tube babies, we have entered a new phase of human reproduction, one that is limitless and disquieting. It is clear that now is the time to start a careful reevaluation of our goals and practices concerning the birth and rearing of our young. Technology must be controlled so as not to interrupt those processes in which we have inborn responses that can enhance the quality of both our physical and sociocultural survival.
When speaking of animals one usually refers to udders or teats and to their related structures on human beings as breasts and nipples (Raphael 1973:61).

An attachment has been defined by Klaus and Kennell, "as a unique relationship between two people that is specific and endures through time" (1976a:2).

"The word comes from the Greek, and in Aristotle's time meant 'slave.' Later it came to describe a woman who goes into the home and assists a newly delivered mother by cooking for her, helping with the other children, holding the baby, and so forth. She might be a neighbor, a relative, or a friend, and she performs her task voluntarily and on a temporary basis" (Raphael 1973:24).

References Cited

Applebaum, E. M.

Bernal, Judith, and M. P. M. Richards

Biller, Henry

Bostock, John

Brody, Sylvia

Bronfenbrenner, Urie

Carpenter, C. R.
1942 Societies of Monkeys and Apes. Biological Symposia 8:177-204.

Ehrhardt, Anke A.

Findlay, A. L. R.

Gesell, Arnold, and Frances I. Ilg

Gonzalez, Nancie L. Solien
Goodall, Jane Van Lawick

Gyorgy, Paul

Harlow, Harry F.

Harlow, Harry F., and Margaret Harlow

Jelliffe, Derrick B.

Jelliffe, Derrick B., and E. F. Patrice Jelliffe

Jessner, L., E. Weigert, and J. Foy

Kaufman, Charles

Keast, Allen

Kippley, Sheila
Klaus, Marshall, and John Kennell


Klaus, M. H., J. Kennell, N. Plumb, and S. Zuehlke

La Leche League

Macfarlane, Aidan

Margolis, Frederick J.

Mata, Leonardo J., and Richard G. Wyatt

Mayer G., and Marc Klein

Miller, R. W., and J. F. Fraumeni, Jr.

Minturn, Leigh, and William Lambert
1964 Mothers of Six Cultures. New York: John Wiley and Sons, Inc.

Montagu, Ashley

Newman, Lucile

Newton, Michael

Newton, Niles


Olds, Sally W., and Marvin S. Eiger, M. D.

Raphael, Dana


Raynaud, Albert

Rheingold, Harriet, ed.

Sade, D. S.

Schaffer, Rudolph

Sharman, G. B.

Staufer, W. Bryan
Stephens, William N.

Sunley, Robert

Thoman, E., H. Leiderman, and J. Olson

Trause, M. A., M. Klaus and J. Kennell

Van Ginneken, Jeroen

Wade, Nicholas

Washburn, Sherwood L.

Wray, Joe
APPENDIX A

Questionnaire Form Used in Interviews
with Bottlefeeding Women

1. Mother's name_______________________________.
2. Address_____________________________________.
3. Phone_______________________________________.
4. Religious affiliation___________________________.
5. Education: Mother_________________ Father___________.
6. Occupation: Mother_________________ Father___________.
7. Annual Income_______________________________.
8. Mother's age at time of birth of child covered in this study_____.
9. Total number of children_______________________.
10. If you have older children, were they bottlefed also?_____.
    If yes, for how many months in each case were they on the bottle?___________________________.
11. Did you ever attempt to breastfeed any of your children?_____.
12. Did your mother bottlefeed you and the rest of her children?_____.
13. Has everyone in your family or your husband's family bottlefed
    their infants?_______________________________.
    If no, who did not?___________________________.
14. Did most of your close friends bottlefeed their babies?_____.
15. Did anyone in your family or your husband's family suggest
    breastfeeding to you?___________________________.
    If so, who_______________________________.
16. Did anyone outside your family suggest breastfeeding to you?_____.
    Physician_______ Friend_______ Other_______.
17. Did you ever attend any classes in childbirth preparation?_____.
    If so, what kind of classes did you attend?___________________________.

69
18. Have you ever heard of the Kalamazoo Association for Prepared Childbirth?

19. Have you ever heard of the La Leche League?

20. Have you ever attended any La Leche League meetings?

21. Do you think some women make better breastfeeding mothers than others?

22. Briefly state what you know about breastfeeding

23. Do you think you would ever consider breastfeeding as an alternative to bottlefeeding?

24. If you are a member of any organization(s) which concerns itself with childbirth, early child care of family planning practices, please give names of organizations

25. When a question arises on the subject of infant care and feeding who do you call for advice?

26. Name of infant covered in this study

27. Sex of infant: M_______ F____________

28. Date of infant's birth

29. Place of birth

30. Who attended mother at delivery?

31. Was the father present during delivery?

32. How soon after delivery were you reunited with your baby?

33. How many hours a day did your baby spend with you in the first five days after birth?

34. How many months was your baby on formula?

35. How many months all together was your baby taking a bottle?

36. What kind of feeding schedule did the baby have?

37. Did you give the baby night feedings?

38. How many months did the night feedings continue?
39. Did you always hold the baby when he was taking his bottle?  

40. Did you ever put the baby to bed with a bottle? 

41. Did you ever allow the baby to cry himself to sleep? 

42. Were there times other than those relating to sleep when you let the baby pacify himself with the bottle? 

43. Did you have a pacifier in the house? 

44. Did your baby ever use a pacifier?  
   If yes, how old was the baby when he first used it? 

45. How old was the baby when you first introduced solid foods? 

46. Does your baby have any known allergies? 

47. Does your baby ever sleep with you? 

48. Does the baby usually sleep in a separate room?  
   If yes, are there other children in this room? 

49. Do you have a rocking chair in your home? 

50. Do you ever rock the baby?  
   If yes, when and how often does this usually occur? 

51. At what age did you take the baby with you on trips, shopping, for visits, etc.? 

52. At what age did you leave the baby at home? 

53. For what reasons did you leave the baby at home? 

54. With whom did the baby stay while you were away? 

55. In what ways have you found bottlefeeding convenient? 

56. In what ways did you find bottlefeeding inconvenient or confining? 

57. Briefly describe how you felt about your childbirth experience: 

58. Briefly describe your infant care experience in terms of your relationship to your child: 

---

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
APPENDIX B

Questionnaire Form Used in Interviews with Breastfeeding Women

1. Mother's name ___________________________.
2. Address _____________________________.
3. Phone _____________________________.
4. Religious affiliation ________________________.
5. Education: Mother _____________ Father _____________.
6. Occupation: Mother _____________ Father _____________.
7. Annual Income _____________________________.
8. Mother's age at time of birth of child covered in this study ____________.
9. Total number of children _____________________________.
10. If you have older children did you breastfeed them also? _______.
    If yes, for how many months in each case? ________________________.
    If no, why not? ________________________.
11. Have you ever breastfed anyone else's child? ________________________.
    If yes, explain ________________________.
12. Did your mother breastfeed you or any of her other children? _______.
13. Did your mother approve of your decision to breastfeed? _______.
14. Did your husband approve of your decision to breastfeed? _______.
15. Has anyone else in your family or your husband's family breastfed an infant? ____________.
    In yes, did they influence your decision to do so? ____________.
16. Did your physician approve of your decision to breastfeed? _______.
17. Did the baby's pediatrician approve of breastfeeding? _______.
18. Did you ever attend any classes in childbirth preparation? _______.
    If yes, what kind of classes? _____________________________.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
19. Have you ever heard of the Kalamazoo Association for Prepared Childbirth?______________________________.

20. Have you ever heard of the La Leche League?______________________________.

21. Have you ever attended a La Leche League meeting?______________________________.

22. If you are a member of any organization(s) which concerns itself with childbirth, early child rearing or family planning practices, please give names of organization______________________________.

23. What person(s) would you say had the most positive influence on your decision to breastfeed?______________________________.

24. What person(s) would you say had the least positive influence on your decision to breastfeed?______________________________.

25. What was your main source of information on breastfeeding?______________________________.

26. When a question arises on the subject of infant care and feeding, who do you call for advice?______________________________.

27. Name of infant covered in this study______________________________.

28. Infant's sex: M______________ F______________.

29. Date of infant's birth______________________________.

30. Place of birth______________________________.

31. Who attended mother at delivery?______________________________.

32. Was the father present during delivery?______________________________.

33. How soon after delivery did you nurse your baby?______________________________.

34. How many hours a day did your baby spend with you in the first five days?______________________________.

35. Did your baby have anything besides breastmilk in the first five days after birth?______________________________.
   If so, what did the baby have and why?______________________________.

36. How many months did you totally breastfeed this infant?______________________________.

37. How often did you nurse your baby?______________________________.

38. Did you give the baby night feedings?______________________________.

39. How many months did the night feedings continue?______________________________.
40. Did you keep a bottle in the house?

41. Did your baby have a bottle?

42. How old was the baby when you introduced water or other liquids?

43. How old was the baby when you introduced solid foods?

44. Does your baby have any known allergies?

45. Did you keep a pacifier in the house?

46. Did your baby use a pacifier? If yes, how old was the baby when he first used it?

47. Did you ever nurse the baby lying down?

48. Did your baby like to be nursed to sleep?

49. Did you ever allow your baby to cry himself to sleep?

50. Were there times other than those related to sleep when you let your baby pacify himself at the breast?

51. Do you ever sleep with your baby?

52. Does the baby usually sleep in a separate room? If yes, are there other children in this room?

53. Do you have a rocking chair in your home?

54. Do you ever rock the baby? If yes, when and how often does this usually occur?

55. In what room(s) of your home did you usually nurse the baby?

56. When at home did you nurse the baby in the presence of your: husband, other children, relatives, guests.

57. Did you make any special preparations prior to each nursing? If so, what were they?

58. At what age did you take your baby with you on trips, shopping, for visits, etc.?

59. When away from home where did you nurse the baby?

60. At what age did you leave the baby at home?

61. For what reasons did you leave the baby?
62. With whom did the baby stay while you were away? __________________ .

63. Did you find breastfeeding to be convenient? __________________ .
    Explain ____________________________________________________________ .

64. Did you find breastfeeding to be confining or inconvenient? .
    Explain ____________________________________________________________ .

65. Do you believe that breastfeeding can be used as a natural contraceptive? .
    If so, have you used it as such? __________________ .

66. Do you think breastfeeding is better for the baby's health than bottle feeding? .
    If yes, in what ways? ____________________________________________ .

67. Do you think breastfeeding is beneficial to the mother's health? .

68. Do you think that some women make better nursing mothers than others? .

69. If you have more children do you plan to breastfeed them also? .

70. Briefly state how you felt about your childbirth experience .
    ________________________________________________________________ .

71. Briefly describe your nursing experience in terms of your relationship with your child .
    ________________________________________________________________ .

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.