

ARTIFICIAL INFANT FEEDING: WOMEN'S LOSS, MEN'S GAIN

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Synopsis – Artificial infant feeding, the first reproductive technology, has eliminated the need for women's breasts and lactation function in successful reproduction. This paper argues that men have been the primary beneficiaries of this technology. Artificial infant feeding provides wealth, power, and status to the men who produce and control it. Women in nonindustrialized nations are especially vulnerable to the negative impact of artificial infant feeding because they are targets of the industry's marketing practices, population controllers who promote Westernized lifestyles, and social institutions which exploit them. In addition, breastfeeding is devalued because it is connected to biology which women have come to believe is oppressive, and because it fails to conform to the dominant model of sexuality. Men benefit from this devaluation because breastfeeding is something they can neither understand nor control and because it prevents their access to women's bodies.

The recent development of reproductive technologies which promise revolutionary changes in women's experience has drawn a prompt and probing feminist response. One critical question debated is "who benefits from replacing women's reproductive functions with artificial methods?" Earlier this century a silent revolution occurred with such low-key response its significance is seldom realized. The development of artificial infant feeding (AIF) which eliminated the need for women's breasts and lactation function was the first successful reproductive technology. An analysis of how this development has effected women is appropriate and overdue. In this paper I will argue that the real beneficiaries of AIF have been and are men.

Few statistics are available from the 19th century, but it is likely the breastfeeding decline began in its later decades. Twentieth century statistics indicate dramatic changes in American breastfeeding patterns. Government surveys (Moore, 1917) in various geographical areas found exclusive breastfeeding rates of approximately 90% at birth in 1917. Rates continued to decline, with a rapid reduction after World War II, until the late 1960s, when it was estimated that 18% of American mothers breastfed their newborns (Meyer, 1968), and in 1970 only 5% continued breastfeeding during the sixth month (Martinez & Krieger, 1985). At this time a growing interest in the value of breastfeeding caused a rapid increase until 1982, when 61.9% of new mothers breastfed

at birth and 28.8% were breastfeeding at six months. Since then figures indicate a slow but persistent decline which fell to 52.2% in 1989, a figure also including those supplementing with formula (Ross Laboratories).¹ Class and ethnic group gaps are large. In 1989, black women breastfed in the hospital at a rate of 23.0%, Hispanic women at 48.4%, and white women at 58.5%. Also in 1989, 28.8% of women with annual incomes of less than \$7,000 breastfed their newborns, while 66.3% of those with incomes of \$25,000 or more breastfed. Infant feeding technology affects the vast majority of women in industrialized nations, and is rapidly being incorporated into the lives of women in the remaining populations. Its significance is compounded when we recognize that breastfeeding traditionally continued for years, not weeks or months as currently practiced. This process of delactation has been aptly labelled "functional castration" by Weichert (1975).

THE NATURE OF BREASTFEEDING

To understand how the convergence of various historical factors affected changes in infant feeding it is necessary to understand the nature of breastfeeding (Lawrence, 1989; Riordan, 1983). Breastmilk production and ejection are responses to hormones and neurological events that are influenced by physiological and psychological conditions, and are stimulated by the infant's

sucking. An insufficient milk supply will increase as the frequency and length of nursing increase. Production is inhibited when the breasts are not emptied, and when the nipples receive inadequate stimulation. Ejection is inhibited when mothers are under stress. Intervals between and length of nursing episodes vary with babies and mothers, change with the infant's age, and vary within a 24-hour period, ranging from minutes to hours. Human breastmilk has low solute concentration,² and is quickly and efficiently digested, hence infants seldom go beyond three hours without desiring to nurse. Night feedings are important to the maintenance of milk and nursing at both breasts for most feedings allows for adequate stimulation. Artificial foods take longer to digest, will increase intervals between feedings, and can lead to inadequate breast stimulation. Also, sucking on artificial nipples is different than suckling the human breast and newborns often have difficulty nursing after being fed with artificial nipples. Exclusively breastfed infants need no additional food or water for about the first six months of life, and continued breastfeeding throughout at least the first year of life is a health advantage for infants (Jelliffe & Jelliffe, 1971). Separation of mothers and infants, delayed and scheduled feedings, and free samples of formula have been shown to decrease the success and duration of breastfeeding (Winnikoff et al., 1987).

Chemicals and rough treatment of nipples increase the likelihood of soreness, and hence breastfeeding discontinuation, because they remove protective outer cells and oils (Woolridge, 1986). No medications have been found to decrease the incidence or duration of soreness, and many increase it. Nipple shields and restricted schedules delay rather than enhance healing.

Breastfeeding is an intimate experience involving extensive skin-to-skin contact during which each participant sees, touches, smells, hears, and senses the movements of the other. It involves the transfer of a bodily fluid from one person into another. A woman's response to breastfeeding depends on her interpretation of the situation as either threatening, disgusting, a tolerable responsibility, pleasurable, or exciting (undoubtedly there are combinations and other interpretations as well). Women comfortable with the relationship experience what might be described as the "female breastfeeding response"

during which the complex hormonal, neurological, and emotional interactions contribute to changes in local tissue blood flow and temperature, uterine contractions, nipple erection, and a sense of well being (Newton, 1972), plus other yet to be articulated responses. It has been suggested that the close, rather continuous contact of nursing couples is an adaptation to the low solute concentration of human milk, which allows for constant monitoring of the infant and stimulation to enhance cognitive development (Gussler & Briesemeister, 1980). More likely the social adaptation of frequent contact and the biological adaptation of low concentration are inseparable and interact in complex ways.

The amount of research concerning the biological value of breastfeeding for infants is substantial (Lawrence, 1989; Jelliffe & Jelliffe, 1978). Human milk is unique and includes nutritional elements in the proportions and forms most adapted to infants, and varies with the infant's stage of development. The quantity and quality of fats are especially important for optimal central nervous system development that occurs rapidly during early infancy and continues throughout at least the first year. Among its significant physiological benefits are its antiinfective and antiallergenic properties, which prevent some conditions or render them less severe.

In nonindustrialized countries, bottle-fed babies have significantly higher mortality rates, a situation also true in the United States until the middle of this century (U.S. Children's Bureau). Presently in the United States, where health care is higher quality and infant mortality lower, differences in mortality are difficult to detect. Therefore, research here has concentrated on morbidity, including cognitive development, and has substantiated the superior health of breastfed infants in industrialized nations (Cunningham, 1979). Current research is looking at effects on cholesterol (Hamosh, 1988), diabetes (Blom et al., 1989), and some cancers (Davis et al., 1988).

It is known that breastfeeding decreases women's risk of postpartum hemorrhage (Lawrence, 1989), and there is evidence it decreases the incidence of breast cancer (Yuan et al., 1988) and possibly osteoporosis (Aloia, 1985). But literature on benefits for women is startlingly sparse, and little is known about breastfeeding's

effect on women's mental or physical health, relationships with infants or behaviors.

Physiological and/or anatomical problems of the mother that prohibit breastfeeding are rare. The majority of women and babies have the capacity for breastfeeding. Numerous customs have been connected to breastfeeding, but most women throughout history have breastfed on the fundamental principle of nonrestriction: by keeping their infants close by and nursing as often and as long as the mother and infant desire (HRAF; Kay, 1982; Jelliffe & Jelliffe, 1978).

A HISTORY OF THE DEVELOPMENT OF ARTIFICIAL INFANT FEEDING

The concept of AIF is ancient, and we know it was attempted at least as long ago as 2500 B.C. (Riordan, 1983). However, death was the inevitable result and wet nursing was a more common approach. Wet nursing was received with different degrees of popularity during various historical eras and is an important topic in its own right. However, it was usually available only to some elite groups and most women nursed their own babies.

During the 1800s, there was an explosion of scientific knowledge that eventually pervaded all aspects of life. Several technical advances were necessary to the success of AIF, one of which was the development of suitable sterilization containers that could be fitted with a pliable rubber nipple to which infants could adapt their sucking reflex. Chemists of the 1800s discovered the basic components of foods (Rotch, 1907), paving the way for modifying animal milk to imitate human milk as much as possible. Early 19th century nutritional scientists acquired knowledge of some nutrient deficiencies, and the hazards of AIF were decreased with additives. The developing field of bacteriology was essential to safe AIF, and the science of providing clean milk eventually led to government standards for dairies, pasteurization, and distribution.

Chemists and other scientists capitalized on their knowledge, and marketed the products they developed. The young infant food companies used a variety of techniques to enhance sales, often implying their product was as good, if not superior, to breastmilk. Eskay's advertisements pictured chubby smiling babies with printed testimonials of

mothers (*LHJ*, 1900, p. 20). Promising to ease the responsibility of motherhood some advertisements said their food "makes baby grow while mother sleeps" (*LHJ*, 1899, p. 32). Manufacturers of feeding supplies also made claims to win mother's approval, sometimes saying they could "prevent colic" (*LHJ*, 1894, p. 25). These companies advertised in middle-class women's magazines, and offered free booklets on child care. Their products were not financially accessible to all women during the first half of this century, and poor women were instructed to use less expensive condensed or evaporated milk (Levenstein, 1983), although the adequacy and safety of these products was highly controversial (Holt, 1897a).

The new companies recognized the financial benefit from gaining physician support. Manufacturers provided them with pamphlets and free samples, advertised in medical journals, and presented their products at medical meetings (Apple, 1987). The infant food companies carefully used technical terminology to convince physicians their products were based on science.

Concurrently physicians were growing in status and developing a strong professional organization that protected its members. The new sciences allowed them to impact on the lives of patients, and because the amount and technical level of their knowledge was far beyond the grasp of laity, their advice was seldom questioned. Some physicians, prompted by the high infant mortality rate, paid particular attention to infants and children. The clear relationship between infant feeding and survival was recognized and became an important cornerstone for the developing specialty of pediatrics. These early pediatricians had not yet accepted proprietary foods (formulas sold by the infant food companies), and are best known for their own developments. Most influential in the United States was Rotch's percentage feeding (Rotch, 1897). Complicated formulas requiring difficult and time-consuming mathematical computations took up numerous pages in medical texts (Holt, 1897b), for which physicians themselves were responsible.

Rotch's laborious method was eventually rejected in favor of simply prescribing proprietary formulas, but it had far-reaching effects on physician's relationships with mothers. It firmly placed the feeding of infants on scientific ground, it made infant feeding a complicated process

requiring expertise thus legitimizing pediatrics as a specialty, and it instilled in the minds of physicians (and eventually mothers) that women were incapable of understanding infant feeding. “The mothers and nurses dominate the physicians” Rotch said, (1907, p. 532) and “the endeavor (should) be made to rescue this important branch of pediatrics from the pretensions of proprietary foods and the hands of ignorant nurses” (1892, p. 56).

Physicians recognized that proprietary companies which provided feeding instructions directly to mothers were a threat to their authority. In 1929, the American Medical Association (AMA) Committee on Foods was created to determine which products were suitable for advertising in their journal (AMA, 1929). The committee accepted Borden’s Evaporated Milk because they advertised only to medical professionals (AMA, 1930a), and Klim Powdered Whole Milk which instructed the laity to use according to a physician’s directions (AMA, 1930b). However, acceptance was withdrawn for Horlick’s Malted Milk when this company refused to remove feeding instructions from the packaging (AMA, 1933). Since other medical journals often followed the decisions of the AMA in their own advertising policies, companies often suffered when refusing to meet AMA requirements.

Late 19th- and early 20th-century physicians introduced virtually all of their articles devoted to infant feeding by stating the superiority of breastfeeding. Their interest in an alternative began as concern for the relatively few infants who could not be nursed, and physicians did acquire a substantial amount of knowledge about AIF This they could create, observe, and manipulate. Breastfeeding, however, was too intimate to study and could not be understood in the same way. But when claiming authority in infant feeding, they included breastfeeding, and their advice was disastrous to its success.

During the late 1800s physicians taught women that daytime nursing intervals should be two or three hours, probably based on mothers’ reports. But contrary to women’s usual experience physicians taught that night feedings should be spaced by five or six hours (Sansom, 1898), and vigorously stressed strict schedules, which meant waking the baby when asleep and permitting the baby to cry when it wasn’t time to feed. During the

early 1900s babies were not nursed during the first 12 hours after birth, day intervals were lengthened to four hours (Tow, 1934), and night feedings were to be eliminated after the first or second month (Morse, 1901). It was one physician’s “common experience that mothers nurse their babies too often” (Furrer, 1909, p. 522). Doctors strongly recommended women not interrupt their hours of sleep by nursing (Tow, 1934), and insisted that babies sleep in a separate room (Holt & Howland, 1940). Alternating breasts with each feeding was considered sufficient. Breasts needed to be washed before and after feedings, and tender breasts could be treated with nipple shields or silver nitrate (Holt, 1897b). Physicians often suggested daily supplementary bottles to make weaning easier, adding sugar or saccharin if necessary (Brenneman, 1923). During the 1930s, psychological theory had significant effects on child-care instructions. Possible problems caused by forced feeding were recognized and doctors suggested babies could be fed when hungry, although it was still common to suggest they be awakened at the proper times for convenience (Spock & Lowenburg, 1955).

As the 20th century progressed doubts about the adequacy of breastfeeding emerged and the use of supplements increased. Doctors questioned breastmilk quality as well as quantity, arguing that formulas were at least as adequate as or could enhance the value of breastmilk (Reisenfeld & Lechtenberg, 1938). One physician stated “psychic satisfaction will not be achieved for the infant unless the milk supply is adequate. Artificial feedings offer the easier means to ascertain their adequacy” (Stevenson, 1947, p. 617). He continued to explain that sucking on a rubber nipple offers “him pleasure as great as would be obtained from sucking at the breast.” Other professionals also doubted the value of breastfeeding. A nutritionist in 1931 told mothers “new studies have proved that breastmilk may fall short of being an adequate food” (Macy, 1931, p. 24).

Instructions from nurses mirrored that of physicians, and reinforced the notion of physician directed infant feeding. They too stressed the superiority of breastfeeding until after the 1930s, and repeated physician instructions on regularity and frequency. Nurses taught that only the baby’s mouth be permitted to touch the nipple, and described elaborate, time-consuming procedures

for unwrapping, cleansing, and rewrapping the breasts at each nursing episode (DeWitt, 1913).

The U.S. government also played an important role in undermining women's ability to breastfeed through the early Children's Bureau and the Public Health Service. Officials of these agencies determined government policy on maternal and child health, and their members had extensive contact with poor women (Ladd-Taylor, 1986). Because legislation did not provide funds for direct services the Children's Bureau's primary strategy was education. By 1929, approximately 50% of American mothers had contact with their pamphlet "Infant Care" (West, 1914), which provided women with copious amounts of practical information. However, it reinforced the need for medical advice on infant feeding, and echoed physician directions for strict regularity, scrupulous cleansing of nipples, and separate sleeping areas.

The Public Health Service contributed to the downfall of breastfeeding by failing to place their emphasis on sanitation within the context of women's, infant's, and children's experiences, as seen by the example of milk depots. These milk depots were a major project early this century (Summer Milk Stations, 1911) which involved distributing clean fresh milk and providing education on proper storage and handling in order to decrease infant mortality and morbidity associated with contaminated milk, particularly during hot summer months. Infants fed milk supplied by depots had higher survival rates than bottle-fed babies who received milk from other sources, but surveys often failed to compare them to breastfed babies. The depots provided free milk to women who bottle-fed, which was perceived as valuable, while no comparable item was provided to those who breastfed, and they often measured their success by the amount of milk dispensed rather than the successful support of breastfeeding (Cremerieux, 1889). Depots that did offer breastfeeding information espoused the inaccuracies existing at that time. This Public Health Service activity, along with others which supported scientific developments, regulation of sanitary practices, and professional and public education, significantly improved overall national health, but achieved this at the expense of women, infants, and children whose life experiences were degraded as the amount of energy given to

improving scientific methods, such as artificial infant feeding, far surpassed the energy given to understanding and supporting "unscientific" experiences, such as breastfeeding.

Women earlier this century accepted scientific medicine which promised to alleviate the real fear of death and disability in child-bearing. Although technology of the early 1900s allowed women some control over their reproductive capacity, women wove these into a reformed rather than radically restructured value system. They never questioned why instructions for AIF were addressed only to women because they accepted that infant feeding, bottle or breast, was women's work. The roles women fought for and obtained were added to their domestic work, which was romanticized rather than rejected (Cott, 1987). Their roles did expand in such areas as nursing, social work, and teaching, but women did not become the scientists. However, they did seek advice of experts in order to be better, scientific mothers, and they pleaded with other women to do the same. An anonymous letter from a mother begins "Maternal instinct, left alone, succeeds in killing a large proportion of the babies born into this world" (Maternal Instinct, 1911, p. 245). She later states "I have always looked at the clock to see if my baby was hungry," (p. 246) trusting "science" more than herself or her infant.

Women of this time were unaware of scientific medicine's oppressive nature, and did not relate their changing reproductive experience to the economic and political environment. As their ability to breastfeed decreased, the need for safe AIF increased. Improved safety, along with better sanitation, pasteurization, immunizations, and antibiotics, led to lower infant mortality and an indifference to breastfeeding. Infant feeding, once the province of women who shared experiences, became a carefully orchestrated activity conducted by physicians, providing status, wealth, and power to the men who produced and controlled it.

INFANT FEEDING IN INDUSTRIALIZING NATIONS

Public health authorities are currently concerned with decreased breastfeeding in non-industrialized countries, and are aware of its contribution to extremely high infant mortality rates. Introduction of AIF to these nations occurred early this century

during colonization when plantations replaced traditional economic systems and life styles (Palmer, 1988), and extensive expansion of the formula industry occurred shortly after World War II. At this time the United States and other Western governments had accumulated stores of dried skim milk for support of military personnel. Also at this time Western nations became involved with the problem of starvation. Nutritionists, who assumed healthy diets should include large amounts of milk and meat, described the widespread hunger as the "world protein gap" (McLaren, 1974). This created a use for the excess dried milk which, with the help of the World Health Organization (WHO) and United Nations International Children's Emergency Fund (UNICEF), was distributed to these populations. While handing the milk to nursing mothers for their children's use, professionals provided them with the same misinformation on breastfeeding as was offered in industrialized countries and urged mothers to wean early to protect their health and their babies' (Palmer, 1988). The milk was often used to lure women to the clinics. Since then the "World Protein Gap" has been reevaluated, and it is now realized that the quality of most traditional diets is excellent in spite of their relatively low proportion of protein, and that hungry people of the world require more of all nutrients, not just concentrated protein. The UNICEF and WHO now actively support the strategy of feeding mothers and encouraging breastfeeding, an economical and effective method of promoting health.

However this laid the path for the proprietary food companies who could claim their products were superior to skim cow's milk. These companies, Nestle's being the most notorious, use pictures of chubby healthy babies on billboards and flyers to promote a radical change in human experience in addition to a product. They hire "milk nurses," many not educated in nursing, to sell their products on a commission basis (Palmer, 1988).

Physicians now, unlike earlier this century, are on good terms with the industry. AIF companies offer free formulas to hospitals and gifts to physicians. Because they support research physicians are interested in, as well as conferences and grants, physicians and their professional organizations are reluctant to support federal legislation or international recommendations which

restrict industry practices (Palmer, 1988).

Media, such as the film *Bottle Babies* (Krieg, 1975) has stimulated public sympathy and action. Two years after production of this film the Infant Formula Action Coalition organized and then coordinated a Nestle Boycott that received widespread public support in Europe and the United States among people with varied political philosophies. Its message reached American politicians through numerous mailings, prompting many members of congress to support international cooperation (Chetley, 1986).

In 1979, the WHO and UNICEF held a meeting to consider the role of AIF sales in infant malnutrition. Participants agreed to develop a code for marketing breastmilk substitutes. The meeting included representatives from the AIF companies who were invited to participate as equals, but their activities illustrate obvious industry interests. One of the assembly's five working groups addressed the health and social status of women in relation to infant and young child feeding (Chetley, 1986). No formula company representatives attended this group's meetings.

When the 1981 World Health Assembly voted on the completed code, the United States cast the single no vote on the grounds of constitutional incompatibility (Chetley, 1986). This is in spite of the fact that the code, as finally accepted, is only a recommendation which governments can implement in any manner desired, and does not restrict the industry from selling their products or from sponsoring medical research. The WHO has no enforcement authority, but its code does ask AIF companies not to advertise their products or idealize AIF, not to provide gifts to mothers or health workers, and to consider the climate, storage ability, and water supply in the areas they sell their products (Armstrong, 1988). The WHO Code and activists who support breastfeeding have succeeded in increasing awareness of some nations such as Brazil and Papua, New Guinea, which have taken steps to control industry advertising (Monteiro et al., 1987). Others have neither the money nor power to take action. Reports from various nations indicate AIF companies still provide free samples, sometimes marketing this as follow-up milk to the breastfeeding period (Palmer, 1988). This marketing of follow-up milk is a relatively recent and successful strategic maneuver of the infant formula industry. By the

early 1970s, the inadequacy of condensed and evaporated milk for infant feedings was universally accepted by American pediatricians, and most newborns not being breastfed were given proprietary formulas. However, it was not unusual to switch them to regular whole or skim cow's milk at three to six months of age. Since breastfed babies were seldom nursed beyond a few months, it was also common to place them on regular cow's milk at an early age. During the late 1970s pediatricians had learned that cow's milk feedings at this early age could have negative physiological effects possibly through the age of twelve months and began recommending formula or breastmilk for the entire first year of life, with the gradual addition of other foods beginning at four to six months of age. This practice expanded the population consuming formula considerably. It not only extended the time bottle-fed infants required formula, but meant that most breastfed babies would also require formula for a substantial number of months. Mothers who breastfeed for three months now will purchase formula for nine months, and are a more profitable marketing target than non-breastfeeding mothers of several decades ago who only purchased formula for several months. The infant formula companies can easily afford to pay lipservice to the benefits of breastfeeding when the nursing period is short, in order to capture the follow-up market.

BREASTFEEDING, FERTILITY AND ECONOMICS

The contraceptive effect of breastfeeding has been known since ancient times, and, sometimes in conjunction with abstinence, has been a common way of limiting births in traditional societies. Those in power in other societies have utilized this effect to regulate women's fertility. Seventeenth-century noble women in England were discouraged from breastfeeding to produce more heirs (Hardyment, 1983). In the United States, slaves were encouraged or prevented from breastfeeding depending on whether raising children or purchasing adult slaves was more financially advantageous, or whether a wet-nurse for the owner's infant was desired (Palmer, 1988). A study of son preference in Korea found women less likely to breastfeed newborn daughters when they have no living sons, suggesting they are acting

under pressure to bear males and hence avoiding lactational infertility (Nemeth & Bowling, 1985).

Conception prevention through breastfeeding is not thoroughly understood, but it is likely that nipple stimulation initiates a neurogenic-hormonal process that prevents maturation of ova and induces amenorrhea. Eventually women will menstruate even while lactating, but ovulation is often irregular. Other physiological processes, such as poor development of the endometrium and corpus luteum,³ also inhibit conception when ovulation does occur. The contraceptive effect of lactation is most effective with unsupplemented frequent nursing which includes night episodes. Other variables include nutritional status, age, and parity (Simpson-Hebert & Huffman, 1981). Reports of pregnancy occurrence during lactational amenorrhea vary from 1% to 11% (WHO, 1981), a variation attributed to differences in breastfeeding practices and the failure to consider the exclusiveness and duration of breastfeeding.

In spite of its decline breastfeeding accounts for more delay or avoidance of births than all reversible contraceptives supplied through family planning programs (Kennedy et al., 1989). In 1989 an international group of numerous health experts and social scientists analyzed data from industrialized and industrializing countries and reached the conclusion that nonmenstruating women who breastfeed exclusively or nearly so during the first six postpartum months have less than a 2% chance of pregnancy, and that this conception prevention is at least as effective as reversible contraceptive methods (Kennedy et al., 1989).

However, most family planners are reluctant to accept the fertility reduction property of breastfeeding. They insist it is not as effective as scientific hormonal methods, and consider it unreliable (Howie & McNielly, 1982). At the same time there is concern about the decline in breastfeeding when family planning programs are instituted in industrializing nations (Mosely et al., 1985). Reasons for this include attraction to scientific methods and lack of breastfeeding support from modern health care. But another portion of the decline is due to ethnocentric attitudes and the promotion of hormonal contraceptives.

Hormonal combinations, the most widely available oral contraceptives, interfere with

breastmilk production (Gruloff et al., 1974). Progestin-only contraceptives have not been shown to significantly alter milk production, but have not been extensively studied and have high discontinuation rates related to side effects (Canto et al., 1989). The effect of small amounts of hormones found in breast-milk on infants is unknown. Although the effects of combined hormones on lactation are known, they continue to be provided to lactating women (Pebley et al., 1985) who are encouraged to bottle-feed so they can use these without risking their babies' health (DeLeon & Potter, 1989).

Fertility control, the predominant approach to poverty in industrializing countries, assumes the poverty is due to the dramatic population increase earlier this century. Women's fertility rates, not their lives, are the focus. Women are encouraged to use contraceptives, to abandon traditional lifestyles, and to seek employment in order to improve their economic situation. Breastfeeding rates decline, and women are shuffled into work with insufficient pay to cover contraceptives, feeding supplies, child care, and increased health expenses. Although women's employment continues to increase, Mitter (1986) provides compelling arguments that the changing global division of labor, which on the surface seems to favor women, in reality takes advantage of women and minorities in both industrialized and industrializing nations because they are flexible, docile workers and dispensable when the need arises. And not all women who accept modern contraception and bottle feeding become employed. Winnekoff and Laukaran (1989) studied breastfeeding trends in four populations undergoing industrialization and found that most mothers of bottle-fed infants were not employed.

A different approach to rapid population growth and poverty is based on the assumption that these are caused by the sudden replacement of traditional lifestyles with unjust social and economic institutions that distribute material resources unequally, causing an imbalance between fertility and economic resources. This approach supports development of social and economic institutions which benefit women (Hernandez, 1985). Evidence to support the success of this approach is the voluntary decrease in fertility of women in Western nations as industrialization occurred. This may be the superior approach, yet caution is

necessary because "social and economic institutions which benefit women" may be interpreted in various ways. At present, most women who compete in the economic system and interact with public social institutions on equal terms with men must accept, at least within public vision, the dominant value system of these male constructions which invariably devalues women's biology and assumes a hierarchal social order which invariably devalues certain groups of people.

That hormonal contraceptives are often the contraceptives of choice in family planning programs is not by chance. The oral contraceptive industry is part of the powerful multinational drug industry with enormous amounts of money to spend on promotion and on research that attracts physicians. They are also scientific, a characteristic that is seen as highly desirable. Hormonal contraceptives provide wealth to drug corporations, increased profits for employers who pay women low wages, and status and wealth to scientists and physicians who create and promote them.

Artificial infant feeding and hormonal contraception are economically valuable to physicians, scientists, and industry, but human milk produced through unpaid labor is economically valuable to women, their babies, and families. In 1982 (Rhode), an analysis of breastmilk production in Indonesia revealed mothers produced one billion liters annually. It would cost over \$400 billion to replace this with AIF. In addition it was estimated that \$120 million less was spent on healthcare than if AIF replaced this breastfeeding. The monetary value of this "great resource" is more than most of Indonesia's leading industries. While these figures illustrate the real economic impact of breastfeeding, they fail to describe its experiential value.

SHARED INFANT FEEDING

Shared childcare among men and women has been offered by feminists as one solution to women's inferior status (Chodorow, 1978; Dinnerstein, 1977), and is appealing because it prevents the psychological and social damage to both sexes caused by women-only childcare. However, the theoretical basis of this solution does not adequately address the relationship between childcare and women's biological reproductive

experience. That women are not biologically more suited to childcare than men is an important feminist concept, yet is problematic when reproduction is considered because it is related to both biology and childcare. Because it has been urgent to impress upon people that inequality is a social construction and not biological, there has been a tendency to ignore this relationship.

An extreme approach to this feminist dilemma is the replacement of women's reproductive function with technology (Firestone, 1970). However, it is not clear that eliminating fundamental differences in reproductive activity will eliminate bias against women. The height of the American breastfeeding decline was also the height of the "feminine mystique" era (Friedan, 1963) during which woman's domestic role was not affected by eliminating breastfeeding. And although employment undoubtedly affects women's initiation and success with breastfeeding, infant feeding method has not been a predictor of women's equal participation in the work place. Earlier this century breastfeeding rates did decline as women's employment increased. But breastfeeding decreased significantly among employed and nonemployed women (U.S. Children's Bureau) suggesting that there is something besides women's reproductive functions which inhibit them from participating equally in the public sphere. Reskin (1985) theorizes that class and gender differences are due to the desire of the ruling class to maintain their advantage. To support her theory she notes that income differences between the black and white populations persist in spite of the decreasing gap in education. She believes white males maintain their superiority by altering the commercial world to reflect class and gender status. For example, she notes that as women began having fewer children, became more educated and independent, and competed with men in certain jobs, these jobs (such as real estate) became unattractive to men and their status decreased. Also women remain segregated in the lowest strata of professions they have entered in significant numbers. Likewise, reproductive activities may not be the variable causing women's inferior status, but rather men's desire to maintain power.

The creation of AIF and shared infant feeding may also be related to another phenomenon: men's desire (related to fear or jealousy?) to be connected

to reproduction. O'Brien (1981) hypothesized that women's consciousness of pumanity differs from men's because the nature of their reproductive experience is continuous, flowing from pregnancy through birth and then breastfeeding. She suggests that because men's experience with reproduction is discontinuous, they seek an artificial continuity. Shared feeding and AIF are methods of creating an artificial continuity in reproductive experience.

In spite of these possibilities, it is a mistake to project women as totally controlled pawns in their reproductive activity. Many women who value female biology decide to experience breastfeeding part-time combined with AIF by fathers and/or others to allow them to share in feeding and/or to permit themselves time for other fulfilling activities. Some women may decide on bottle feeding because it ensures more assistance with child-care. These situations may be related, consciously or not, to the notion of "control of one's body and life" which has been a central theme of the women's movement. The close continuous contact, spontaneous physical sensations, unpredictable infant's needs, and time demand which inhibits participation in the public sphere fail to fit into the image of control. Fleischer's (1990) comments on body politics are particularly meaningful here. "The body is therefore a means with which women structure their social relations, with which however, they also build themselves into the socioeconomic circumstances of capitalist-patriarchal domination in which they live," (p. 4) she says, and then concludes that "women's desire not to live alienated lives is achieved at the price of their alienation from their own body" (p. 5). These situations might be seen as a compromise of the available possibilities allowed in a society which does not offer women any alternative truly supportive of female biology. I agree with Fleischer that reproductive technologies are a chance to "control" our bodies, but that this may be a "substitute for the lack of control over structuring the female life-context" (p. 7). I believe we have too easily grasped onto this slogan of control without considering its complex nature and more clearly defining it. Our present perception of "control" causes us to name our bodies as the oppressor, to depend on technology to release us, and then to thank those who create and control the

technology for saving us. Will we fall for this delusive trap and thank the technocrats when they, in fact, are the oppressors?

BREASTFEEDING, SEXUALITY AND OWNERSHIP

The common media image of large female breasts aimed squarely at men to sell automobiles and beer attest to the perception that the female body is an object for male use. The number of raped and battered women illustrate how deeply ingrained male ownership of women's bodies is. This explains why some women choose bottle feeding because it is demanded or preferred by their male partner, and is more subtly exhibited in breastfeeding women's relationships with male partners. The two functions of female breasts commonly noted in contemporary human sexuality texts are sexual pleasure and nurturing, usually in that order. Such categorization implies that only one of these is sexual. Therefore, literature on breastfeeding and sexuality focuses on how breastfeeding affects intercourse between the mother and a male partner (Poorman, 1988), and workshops address "couples' sexuality" (Harp, Odum, & Panke, 1984). Even the feminist lay health text, *The New Our Bodies, Ourselves* (Boston Women's Health Book Collective, 1984) discusses breastfeeding and sexuality by addressing sexual activity between a woman and her male partner, not the sexual nature of breastfeeding. The bias of this focus is underscored by the conclusion drawn from research on the relationship between breastfeeding and sexuality: "Breastfeeders showed greater impairment of sexuality" (Alder & Bancroft, 1988, p. 389). This statement is absurd when breastfeeding is considered as part of female sexuality. But female sexual behavior is defined by patriarchal thought as that behavior relating to intercourse, and considered normal only when it coincides with male desire. The omission of the topic of breastfeeding as sexual in its own right is significant. Refusing to consider women's menstrual cycle and other reproductive activities as sexual ensures survival of the "perpetually receptive female" myth. Female sexuality has been fragmented, with some portions being obliterated and the remaining portion patterned after the male model.

Of course there is a connection between sexuality and breastfeeding. It has been touched upon by some authors, although its acceptance as a valid topic is illustrated by their rarity. Newton (1972) noted several similarities between female orgasm, childbirth, and lactation, including hormonal secretions, physiological responses, and behaviors. Riordan (1980) describes breastfeeding as a sensually pleasurable process, recognizing both similarities and differences between nursing and coitus.

In a male-dominated society it is not surprising that female sexuality is defined only to the extent that it fulfills male desires or needs, a fact born out of academic literature. Sexologist Havelock Ellis is credited for enlightening the world with the knowledge that women were sexual and had the right to sexual pleasure (Ellis, 1897-1910), but he concentrated on the superiority of heterosexual relationships and maintained the concept of gender power differences. Sexuality research by Kinsey (1948, 1953), and Masters and Johnson (1966) assumes that heterosexual intercourse is the most natural and satisfying sexual activity, although other forms such as masturbation were tolerated to various degrees or "useful" in therapy. It was Masters and Johnson's goal to produce sexual adequacy, which meant each partner of a heterosexual couple having an orgasm at the proper time (not too soon for men, but sooner for women) *during intercourse* (Masters & Johnson, 1970).

The social construction of male sexuality includes power over females. Women who fail to feel arousal at their advances, experience sexual satisfaction without penile thrusting and do not express total fulfillment in a heterosexual relationship threaten that power. Therefore, breastfeeding women who enjoy a satisfying sexual experience without interacting with a male adult threaten that power. The threat is magnified as the infant grows older and the relationship is increasingly seen as sexually perverse (incestuous and/or lesbian?) with each passing month.

CONCLUSION

AIF was developed by men to provide suitable nourishment for infants who were unable to breastfeed, and was originally assumed to be women's responsibility. I have argued that AIF

provided scientists, industrialists, and physicians with wealth, status, and power, and still benefits the men dominating these fields today. I have also argued that women in industrializing nations are particularly vulnerable to the negative effects of AIF, which is supported by the AIF industry and medical professionals, and by population controllers who implement fertility reduction methods without promoting successful social measures to improve women's lives. Furthermore, men benefit from AIF because it eliminates a threatening female experience, and ensures their access to women's bodies. These provide ample reason to suspect male-created technologies which replace female functions, and to critically analyze motivations for their development as well as the personal and social consequences for women.

ENDNOTES

1. It is unfortunate and remarkable that the only current and accurate data source on breastfeeding that considers the entire population and a variety of variables comes from Ross Laboratories, a major formula producer.

2. The dilution (referring primarily to solute and protein concentration) of milk is species specific and is related to environmental interactions and adaptations, including the usual frequency of nursing episodes. Species with dilute milk tend to nurse frequently, while those with more concentrated milk tend to nurse less often. Human milk is more dilute than almost all other mammals. (See Jelliffe & Jelliffe, 1978, chapters 1, 8, & 9).

3. The endometrium is the lining of the uterus that proliferates during the menstrual cycle, a necessary requirement for implantation. The corpus luteum is the pocket in the ovary from which an ovum was released. It also proliferates and secretes hormones which are necessary for implantation.

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Supplemented breastfed infants had similar weight loss patterns to the exclusively breastfed newborns. "Degree of weight loss is critical in the decision to supplement breastfed infants with formula," write the study's authors, Patricia J. Martens, IBCLC, PhD, and Linda Romphf, IBCLC. "Breastfeeding-supportive environments are necessary to support and enable women to breastfeed." The article, "Factors Associated With Newborn In-Hospital Weight Loss: Comparisons by Feeding Method, Demographics, and Birthing Procedures," was published in the Journal of Human Lactation. make a difference: sponsored opportunity. Story Source SAGE Publications. "Infant Feeding Method Predicts In-hospital Weight Loss." ScienceDaily. Men's Health. Mental Health. Migraine. Infant Formulas. Which is better, breastfeeding or formula-feeding? What is in an infant formula, and how do I choose the right one? So, what types of formula should parents give to their babies? Human milk is the preferred feeding for all infants. With rare exceptions, this includes premature and sick newborns, as well. Pediatricians generally advise that full-term, healthy infants exclusively breastfeed when possible for the first 12 months of life and, thereafter, for as long as mutually desired. Artificial Infant Feeding. By J. N. SMELLIDEE, Department of Paediatrics and Child Health, University of Birmingham. It can be accepted as axiomatic at the present time that the basic food substance for the artificial feeding of healthy infants is cow's milk. In the first place, therefore, attention must be directed towards a comparison between human breast milk and cow's milk. Ideally, the substitute food should approximate to nature's food as closely and as exactly as possible. Towards the end of the last century this seemed to be a simple and relatively easy procedure and was the basis of what Feeding of LBW infants: How is it different? Term infants with normal birth weight require minimal assistance for feeding in the immediate postnatal period - they are able to feed directly from mother's breast. In contrast, feeding of LBW infants is relatively difficult because of the following limitations: 1. Many LBW infants are born premature and have inadequate. Further requirements are calculated by daily estimation of weight loss/gain, serum sodium, urine output and specific gravity. The usual daily increment would be about 15-20 mL/kg/day so that by the end of first week, 150 mL/kg/day is reached in both the categories. We usually reach a maximum of 180 mL/kg/day by day 14.12.