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An Editorial

Kinsey and Kosnik IV.

THE MOST striking and telling failure of Kinsey's 1947 book on male sexual behavior—well-noted at the time of publication by reviewers—is that there is, to use Lionel Trilling's words, "scarcely any indication in the book that sex has any connection with propagation." (*Partisan Review,* April, 1948.) Kosnik's book on human sexuality, written 30 years later, is similarly defective.

Discussing sex behavior as if it had no relation to propagation suffers the same limitation as discussing spring as if the seasonal rains, the lengthening days, the increasing warmth of the sun, and the "spring fevers" that follow the vernal equinox had nothing to do with the greening of the land or the bringing forth of new animal life. Since this omission of Kinsey and Kosnik can hardly be called an oversight, it signifies either the authors' superficial and limited understanding of sex, or their need, deep-seated or otherwise, to avoid the procreative dimension, a dimension permeating all aspects of sex, and without which there would be no need for the existence of the sexes or, consequently, sex itself.

Dissociating the copulatory parts (the genitalia) from the generative parts (the gonads, the uterus and the hormonal interrelationships) and from the psyche and the biofundaments in general, which incline male and female in different ways and in different degrees to parenthood, dissociates the means from its governing and determinative end. But sex cannot be delimited by the subjective states of persons captured and enraptured by sensate pleasure as if genital expressions had a meaning independent of the order of nature. That millions of unwanted pregnancies occur annually in these modern times should make this evident. Even if modern technology is successful in physically separating genital parts and generative parts from each other through contraception or sterilization, it is naive to believe that such physical separation simultaneously and automatically results in the psychological separation of the love-giving and life-giving components inherent in lovemaking. Man and woman, as one writer[1] put it, "embrace their biological destinies when they embrace each other." When they resist em-

bracing their biological destiny, they become, according to psychiatrist, Marynia F. Farnham,[2] a lost sex with a thinning out of their interpersonal relationships and their sexual pleasures as such.

Rollo May[3] furthers Farnham's thought:

> . . . The modern man's rigid principle of full freedom (in sex) is not freedom at all but a new straightjacket, in some ways as compulsive as the old. He does all this because he is afraid of his body and his compassionate roots in nature, afraid of the soil and his procreative power.

Erik Erikson[4] expresses a similar concern:

> Modern man, forced to limit his fertility, is apt to consider the matter of procreative involvement resolved by the technical possibility of making a conscious choice in the matter of fertilization. For such choice, men must be readied. Yet an ever so 'safe' love life, if accompanied by a mere avoidance of offspring and a denial of generativity, could be, in some, as severe a source of inner tension as the denial of sexuality itself has been.

These psychiatrists make evident the manner in which Kinsey and Kosnik trivialize sex by ignoring the procreative element. But it is Aristotle,[5] the master philosopher and the father of biology, who expresses most profoundly the controlling dynamism of nature in this regard:

> . . . for any living thing that has reached its normal development . . . , the most natural act is the production of another like itself, an animal producing an animal, a plant a plant, in order that, as far as its nature allows, it may partake in the eternal and divine. That is the goal towards which all things strive, that for the sake of which they do whatsoever their nature renders possible. . . . Since then no living thing is able to partake in what is eternal and divine by uninterrupted continuance . . . , it tries to achieve that end in the only way possible to it, . . . so it . . . continues its existence in something *like* itself—not numerically but specifically one. HR

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Breast-Feeding

A Commentary in Celebration of the International Year of the Child, 1979

DESPITE increasing evidence for the apparent superiority of human milk, formula-feeding has progressively supplanted breastfeeding throughout much of the industrialized world, with the exception of the Soviet Union and Israel.[1] The decline of breastfeeding in industrialized society began about 50 years ago, then spread to developing countries. This change in feeding patterns has had implications for infant morbidity and mortality and for the economy of those nations which can least afford to waste their resources.[2]

The need to intensify the promotion of a return to breastfeeding has been stated in several documents.[3,4] A resolution adopted by the World Health Organization in May 1974 urged all member countries to undertake vigorous action,[5] and an International Pediatric Association seminar on nutrition in 1975 placed special emphasis on education programs.[6]

For much of the population in developing countries, both economic and health considerations speak conclusively for breastfeeding.[7,8] The physiologic role of breastfeeding has received less emphasis in the industrialized world because of the low morbidity and mortality of bottle-fed infants, which has resulted from nutritional and technological advances in the formulation and manufacture of infant formulas[9,10] as well as from the higher standards of housing, sanitation, and public health services in these countries.[11] However, newer information suggests that significant advantages still exist for the breastfed infant,[12,13] including one study in which a lower morbidity was reported during the first year of life.[14] Therefore, it seemed timely to examine and evaluate present-day information, to provide up-to-date guidance for physicians in counseling mothers with regard to feeding their infants, to discuss factors related to the decline of breastfeeding in the United States and Canada, and to propose ways and means to encourage breastfeeding if the advantages of breastfeeding prove compelling.

NUTRITIONAL AND PHYSIOLOGICAL PROPERTIES OF HUMAN MILK

On teleological grounds, it is reasonable to suppose that the milk of each species is well adapted to the particular needs of that species. On this basis, the various properties of human milk will be compared with those of infant formulas.

Nutrition

Differences in the composition of human milk and unmodified cow's milk have been known for many years.[15 16] Early attempts to substitute unmodified cow's milk for human milk were unsatisfactory for feeding infants. Heat treatment, homogenization, and the addition of carbohydrate to cow's milk improved to some extent its usefulness and tolerance by infants, but protein and ash levels were still unphysiologically high, and the fat was absorbed poorly.

Newer knowledge of nutritional and physiological needs of infants and advances in technology have led to the development of newer infant formulas which provide many of the nutritional and physiological characteristics of breast milk.[17 18] However, there are still differences between infant formulas and breast milk,[19] and we believe human milk is nutritionally superior to formulas for the following reasons.

Fat and Cholesterol. Lipids of human milk are better absorbed by infants than those of cow's milk,[20] mainly because of the fatty acid composition and the position of the fatty acids on the glycerol molecule. Human milk has a high oleic acid content,[21] and the palmitate residue is mainly in the 2-position of the glycerol molecule.[22] This improves its digestibility. The presence of significant lipolytic activity in human milk may also help fat absorption.[23] Human milk lipids are better absorbed than those of earlier marketed infant formulas.[24-26] Vegetable oils, which replace butterfat in newer infant formulas,[27 28] have significantly improved fat absorption[29]—even in the first month of life—to practically the level achieved with breast milk.[30]

In preterm newborn infants fed formulas, fat malabsorption may still be as high as 25% to 30%.[31] Medium-chain triglycerides (MCT) permit fat absorption similar to that from breast milk.[32 33] Poor fat absorption makes it difficult for preterm infants to meet energy requirements, and nitrogen retention may also be decreased. Breast milk or MCT-containing infant formulas help overcome this problem.

When the butterfat of milk is replaced by vegetable oils in infant formulas to provide better

INITIATED BY the Nutrition Committee of the Canadian Paediatric Society, this statement was prepared by both the Committee on Nutrition of the American Academy of Pediatrics and the Nutrition Committee of the Canadian Paediatric Society.

fat absorption, most of the cholesterol is removed. Thus, these formulas are practically devoid of cholesterol, but human milk contains cholesterol. Cholesterol may play a significant role in early feeding of the infant. Even though humans synthesize cholesterol efficiently, some authors have suggested that exogenous cholesterol for formation of nerve tissue or for synthesis of bile salts may be useful to the infant. It would be difficult to determine this experimentally. Another question is prompted by animal studies suggesting that the ingestion of cholesterol during infancy may induce enzymes that can subsequently better metabolize cholesterol and thereby result in lower serum cholesterol levels early in life.[34 35] This has not been confirmed in other animal studies or retrospective and cross-sectional studies carried out in infants. High cholesterol feeding did not protect the subjects against high serum cholesterol levels later in life.[36 37] An ongoing, prospective, longitudinal study in the Boston area[38] seems to show that 30-year-old adults who were exclusively breastfed for at least two months had significantly lower serum cholesterol levels than those who had been breastfed for less than two months. This finding is now being tested in a larger group of subjects from four other longitudinal studies. Because subjects in the Boston study had received evaporated cow's milk (which does contain cholesterol), it is difficult to attribute the findings to cholesterol *per se*. Active research is needed to determine the effects of dietary cholesterol or breastfeeding on serum cholesterol level and the incidence of arterial disease in later life.

A recent concern about the fat composition of infant formulas is the relatively high polyunsaturated fatty acid content of most of them. Vegetable oils, which are well absorbed by the infant, are usually higher in polyunsaturated fatty acid content than the fat in "average" breast milk. Linoleic acid or polyunsaturated fatty acid levels in human milk vary from 8% to 20% of the fat,[39 40] depending on the type of fat consumed by the mother, but the average level for human milk in recent years is considered to be about 14%.[41] The physiologic consequences of feeding the full-term infant a formula which has a linoleic acid content two or three times the average in human milk are not known. However, in preterm infants, formulas with high levels of polyunsaturated fatty acids may cause a relative or absolute deficiency of vitamin E[42] (characterized by hemolytic anemia) as a result of increased lipid peroxidation, particularly when iron supplements are also given. This is reviewed in a recent statement on feeding low-birth-weight infants.[43]

Protein. The neonatal and suckling periods are characterized by a level of anabolic activity almost

never equaled later in life. This is especially true in low-birth-weight infants. Clearly then, it is vital to provide an optimum source and level of nitrogen intake.[44,45] Most formulas used for full-term and preterm infants are based on cow's milk protein.[46] Recent studies[47,48] suggest that current estimates of protein requirements of preterm infants may be too high because they are based on cow's milk protein rather than on human milk protein. The total level of protein in formulas is higher than in human milk to provide a margin of safety for the infant.

The proteins in human milk differ qualitatively from those in cow's milk. In the latter, the casein/albumin-globulin whey ratio is approximately 76:24; in human milk it is approximately 40:60. The major fraction of albumin-type protein in cow's milk whey is composed of β-lactoglobulin, which is not present in human milk.[49] The major albumin of human milk whey is α-lactoglobulin. Some milk-based formulas have been made from demineralized whey and milk to provide a casein/whey ratio similar to that in human milk. The sulfur amino acids in cow's milk are provided mainly by methionine, with a small amount of cystine; relatively more cystine is present in human milk. Because of this lower protein content, human milk also contains less aromatic amino acids than cow's milk. Thus, the amino acid composition of human milk is particularly suited to the metabolic peculiarities of the newborn infant, especially those of the preterm infant, whose liver is inefficient in converting methionine to cystine and in metabolizing tyrosine.[50] There are notable differences between the plasma amino acid patterns of preterm infants fed human milk and those fed cow's milk-based infant formulas,[51] but the importance of this remains unclear.

Breast milk also contains a variety of nucleotides.[52] They provide a source of nonprotein nitrogen which has been postulated to play a role in anabolism and growth. In this context, it is interesting to note that recent analyses of human milk from well-nourished mothers who had been lactating for two to three months showed that the average protein concentration was only 0.88 gm/dl, representing about 75% of the total nitrogen; the remaining 25% was supplied as nonprotein nitrogen.[53] Previous estimates of breast milk protein were based on determination of total nitrogen by Kjeldahl N-analysis, which did not distinguish protein nitrogen from nonprotein nitrogen. In cow's milk, only 6% of the total nitrogen is supplied as nonprotein nitrogen[54]; the remainder is supplied as intact protein. Whether some of the factors in the nonprotein nitrogen in human milk are of nutritional significance to the infant remains to be studied.

Iron. The iron content of milk from all mammalian species is

low. In a recent study,[55] an average of 0.2 to 0.3 μg/ml was found in term human milk. Teleologically, the low iron concentration in human milk may be extremely useful because there are two bacteriostatic proteins in human milk[56]—lactoferrin and transferrin—which lose their bacteriostatic properties when saturated with iron. A review of the relation of the iron content of milk to the incidence of infection was recently published.[57] Lactoferrin is present in human milk in much higher quantities than in cow's milk.[58] The small amount in milk used to make infant formulas is denatured, and its bacteriostatic properties have been lost in processing the formula.

Data suggest that about 50% of the iron in human milk is absorbed; iron in pasteurized cow's milk is less well absorbed.[59-61] McMillan *et al.*[62] recently reported that the iron in human milk is sufficient to meet the iron requirements of the exclusively breastfed, full-term infant until he triples his birth weight. It has been postulated that the better availability of iron in human milk, as compared to cow's milk, may be the result of the lower content of protein and phosphorus and the higher levels of lactose and vitamin C.[63] Present-day infant formulas include most of these adtantages (*i.e.*, lower protein and phosphorus and a greater lactose and vitamin C content). Heat treatment in making the formula has also significantly improved iron absorption.[64] In 1970, Gross found that about 50% of the iron in infant formula containing 1.4 μg/ml was retained by infants.[65] The infant fed pasteurized cow's milk too early in life is prone to iron deficiency partly because the milk is a poor source of iron and partly because cow's milk which has not been properly heat-treated causes significant gastrointestinal blood loss in some infants.[66] This is not found with heat-treated formulas.

Overfeeding and the obesity question

The relationship between infant feeding and obesity in later life is still poorly understood, but it has been the subject of many conferences and papers.[67] Obesity is extremely prevalent in Canada[68]; 10% of the men and 30% of the women are obese. Obesity is also prevalent in the United States, where current estimates indicate that 25% to 33% of the population is overweight or obese.[69] The effects of obesity probably include decreased life expectancy, but evidence for increased mortality from hypertension and cardiovascular disease is still conflicting.[70]

Some studies have shown a higher prevalence of obesity in formula-fed infants than in breastfed infants[71]; other studies show no difference between formula-fed and breastfed infants.[72] Studies have suggested that obese infants may be at increased

risk of becoming obese children[73] and adults,[74 75] but the evidence is fragmentary and at times conflicting. Although animal studies suggest that early overfeeding increases the cellularity of the adipose tissue, there is also evidence that fat-cell multiplication in humans continues throughout childhood.[76] In any event, because the first few years of life may be a critical time for adipose tissue development, excessive weight gain should be avoided during this time and throughout childhood. Overfeeding in infants may affect food habits and regulation of energy intake later in childhood and adult life.[77 78] Although current infant feeding practices are associated with a high prevalence of obesity in infants, the extent to which this predisposes to obesity in childhood and adult life is still uncertain.

There are several reasons why breastfeeding may better control caloric intake than formula-feeding. Milk intake by the breastfed infant is determined primarily by the amount needed to satisfy the infant; the mother of the formula-fed infant may see some formula left in the bottle and induce the infant to consume more.[79] In addition, recent studies have shown that milk samples from nursing mothers at the end of feeding contain much higher levels of lipid and protein than at the beginning of the feeding; this change in composition may satiate the infant or in some way signal a cessation of feeding.[80]

However, a more significant fact may be that the early introduction of solid foods, which adds greatly to the caloric intake of the infant, has paralleled the use of infant formulas. In a study in England, twice as many bottle-fed infants as breastfed infants were receiving solid foods at age 2 months.[81]

Immunologic considerations

At birth the newborn infant is suddenly transferred from a regulated environment to one in which prompt adaptation is required for survival. He must receive adequate nourishment and quickly develop immunologic mechanisms to enable him to exist in a hostile environment. There is increasing evidence that newborn infants can acquire certain important elements of host resistance from breast milk while maturation of his own immune system is taking place.[82] The human breast secretes antibodies to some intestinal microorganisms, and this may help protect breastfed infants from enteric infections.[83-85] An important recent observation has established the presence of an enteromammary system by which enteric antigen-stimulated mucosal plasma cells in the mother migrate to breast tissue where they secrete antibodies or are secreted directly into breast milk where antibodies are produced.[86] Most of the factors contributing to immunologic protection *cannot* be supplied by heat-treated formula.

The critical role of breastfeeding in the prevention of gastroenteritis in infants in developing countries has been demonstrated. Although gastroenteritis is less common in infants in industrialized countries, breastfed infants have been shown to be less susceptible.[87] A recent study[88] further suggests that breastfeeding is protective against intestinal infections, but only when it is an ongoing process. Respiratory infections, meningitis, and Gram-negative sepsis are also reported to be less frequent among breastfed infants.[89-91] However, a small study in an affluent community has shown no difference in resistance to infection between breast- and formula-fed infants.[92] A study in a Canadian Eskimo population concluded that children who had been breastfed for at least one year had an incidence of chronic otitis media that was one-eighth that of children who had been bottle-fed as infants.[93]

The newborn infant does not receive a full complement of antibodies transplacentally. Immunoglobulin G (IgG) is provided in this manner; IgA and IgM are not. The serum levels of these three immunoglobulins are significantly higher in colostrum-fed infants. Some intestinal absorption of these macromolecules may take place,[94] although, unlike other animal species, human colostral antibodies are not absorbed from the intestine in significant quantities during the neonatal period. In colostrum and breast milk, secretory IgA is the dominant immunoglobulin.[95] It is resistant to proteolysis and confers passive mucosal protection of the gastrointestinal tract against the penetration of intestinal organisms and antigens.[96]

Breast milk is also a source of the iron-binding whey protein, lactoferrin. It is normally about one-third saturated with iron and has an inhibitory effect on *Escherichia coli* in the intestine. Its bacteriostatic effect is diminished as it becomes saturated with iron.[97 98] Heating also results in loss of its iron-binding capacity as well as of its inhibitory effect on *E. coli.* Arguments against the fortification of infant formula with iron, on the basis of saturating lactoferrin, have no validity because heat-treated infant formula has no inhibitory effect on the growth of *E. coli* when compared to fresh, unprocessed human or cow's milk. The addition of iron (12 mg/liter) does not change the rate of growth of *E. coli* in formula.[99] There is no evidence of an increased incidence of infection in infants fed iron-fortified formulas compared with those fed unfortified formulas.

Lysozymes are bacteriolytic enzymes which are more abundant in human milk than in cow's milk.[100] Bacterial lysis by IgA antibodies does not occur unless lysozymes are present.[101] The biologic importance of low concentrations of specific complement fractions C3 and C4 in human milk is unknown at present.

Living leukocytes are normally present in human colostrum.[102 103] Macrophages comprise about 90% of the cells and are found in a concentration of about 2,100/cu mm. These cells have the ability to synthesize complement, lysozyme, and lactoferrin. Lymphocytes comprise 10% of the cells; some are T cells which may have the ability to transfer delayed hypersensitivity from the mother to her infant; others are B cells which synthesize IgA. Although the biologic importance of the colostral cells to the infant has yet to be determined, pregnant women orally immunized with a nonpathogenic strain of *E. coli* during the last month of gestation produce colostrum with IgA-producing plasma cells that can synthesize antibodies to *E. coli* liposaccharide.[104]

Another component of the possible "nutritional immunity" conferred by breast milk is the maintenance of a microflora in which *Lactobacillus bifidus* is predominant.[105] The alimentary canal is sterile at birth; within a few hours bacterial colonization occurs. After three or four days, more than 99% of the flora consists of the anaerobic *L. bifidus*, with a paucity of putrefactive bacteria such as the Gram-negative anaerobes (*Bacteroides, Proteus, Clostridium,* and *E. coli*). The mechanisms by which a wholly breastfed infant is able to maintain an acid stool with *L. bifidus* as the predominant organism are poorly understood, but they probably involve several complex, interdependent factors, including the low buffering capacity of breast milk,[106] the high lactose content of milk,[107] specific *L. bifidus* growth-promoting factors,[108] and the destruction of ingested *E. coli* by lactoferrin in the alkaline pH of the small intestine.[109] Even though most infant formulas provide a lactose content similar to that of human milk and a buffering capacity almost as low as that of human milk, the predominantly *L. bifidus* flora is not maintained. With the introduction of supplementary milk feedings or solid foods in breastfed infants, the microflora changes to the usual adult type.

Breast milk also spares the gastrointestinal tract from exposure to foreign food antigens at a time when macromolecules may be readily absorbed[110] and may cause a local reaction. Evidence suggests that allergic manifestations later in childhood (such as eczema, rhinitis, and asthma) are more prevalent in bottle-fed infants than in breastfed infants, presumably because of the early exposure to cow's milk and other food antigens.[111-113] The incidence of cow's milk allergy is low, but, when it does occur, it may cause a wide spectrum of clinical symptoms and affect the jejunal mucosal histology and growth.[114 115] In a Boston study,[116] a slightly reduced occurrence of allergic manifestations during childhood and adult life was found in persons who were wholly breastfed up to 2

months of age. This reduction was more evident when breastfeeding was coupled with a negative history of allergy. A recent study has noted a reduction in allergic disease in breastfed infants with a strong family history of allergy, strict environmental control, and delayed immunization.[117]

Immunologic immaturity of the gut is considered to be a factor of possible importance in the pathogenesis of necrotizing enterocolitis.[118] This frequently fatal condition is rare in low-birth-weight, breastfed neonates. Its frequency is apparently increased in preterm infants fed hypertonic formulas.[119] A similar disorder can be produced experimentally in goats by feeding dialyzed milk of higher osmolality.[120] Fresh rat breast milk is protective in the newborn rat subjected daily to hypoxia.[121] However, the degree of protection offered by breast milk against necrotizing enterocolitis in the human infant is not yet known. At a recent workshop on human milk in premature infant feeding, the need for active research to determine if it is protective and to identify the properties most important for such protection was emphasized.[122]

Much remains to be learned about the role of the secretory immunoglobulin system and its relationship to viral, bacterial, and food antigens in the early months of life.

The sudden infant death syndrome (SIDS) is the most frequent cause of death in infants between 1 and 12 months of age.[123] It has been reported by some[124 125] to occur significantly less often in breastfed infants, although others[126 127] have found no association with the type of feeding. SIDS is probably a multifactorial condition of presently unknown etiology and pathogenesis.

Miscellaneous

The low renal solute load in breast milk provides a margin of safety for the young infant with physiologically immature renal function.[128] This was extremely important some years ago when high-protein, high-solute formulas were fed. It is of less consequence today because infant formulas now provide renal solute loads which are not greatly in excess of those of breast milk. In low-birth-weight infants weighing less than 1,500 gm, the low sodium[129] and calcium[130] content of formulas, and perhaps of pooled term human milk,[131] may lead to hyponatremia and impaired growth and provide insufficient calcium for skeletal mineralization. Based on these considerations, some increases in mineral levels might be made in formulas intended for use by premature infants to achieve a mineral retention equivalent to that *in utero*.[132]

At a global level, breastfeeding may play a role as a means of contraception,[133] but it is not reliable for the individual mother. There may be a significant delay in ovulation in many mothers when in-

fants are fully breastfed. Ovulation and menstruation are delayed for at least ten weeks in some women, and up to six months in others.[134-136] In some cultures, the contraceptive effect is attributed in part to the taboo of sexual intercourse while the mother is breastfeeding the infant.[137 138] Although earlier oral contraceptives – which contained large doses of both estrogens and progestins – tended to suppress lactation, the newer preparations – which contain progestins alone – do not interfere with milk secretion and may even increase it.[139]

Many drugs ingested by a lactating mother will be present in her milk and excreted in amounts depending on various factors, such as blood levels, dissociation constants, and fat solubility. This subject has been well reviewed.[140] Drugs such as antithyroid compounds, antimetabolites, anticoagulants, and most cathartics may be hazardous to the nursing infant, and a nursing mother should be advised not to take these drugs.[141] Recent findings of organochlorine insecticides such as DDT, polychlorinated biphenyls (PCBs), and other environmental pollutants in breast milk have raised questions which have not as yet been resolved in regard to the safety of breastfeeding by all mothers.[142] The restriction of the use of DDT resulted in a decrease in the concentrations found.[143 144] No such change has been seen for PCBs, but banning of the compound is more recent.[145]

Early and prolonged contact between a mother and her newborn infant can be an important factor in mother-infant "bonding" and in the development of a mother's subsequent behavior to her infant.[146 147] It has been reported that mothers who have had prolonged physical ("skin-to-skin") contact with their newborn infants exhibit greater soothing behavior, engage in more eye-to-eye contact with the infant later in infancy, and are more reluctant to leave their infants with someone else than mothers who have had the lesser amount of contact which prevails in most maternity wards.[148] Breastfeeding may promote maternal-infant bonding, particularly when this contact is desired by the mother.[149]

EPIDEMIOLOGY OF BREASTFEEDING

A steady decline in breastfeeding was documented in both developed and developing countries until recently. Before 1950, in the industrialized world, breastfeeding was more common among the lower social classes. However, in the past 10 to 15 years the decline in breastfeeding as a concomitant of socioeconomic development has changed. Data from the United States show that breastfeeding is even less commonly practiced among lower income groups than among higher income groups.[150] In the 1940s, approximately 65% of the infants in the United States were breastfed while in the hospi-

tal.[151] By 1972, only 28% and 15% were nursed by their mothers by the time they reached the age of 1 week and 2 months, respectively.[152] Statistics from the United Kingdom also reveal a significant decline, with figures of 60% in 1948 and a little more than 40% in 1968.[153] In a marketing survey completed in 1973 by Ross Laboratories in Canada, 35% of the infants were breastfed during the first week of life; by 3 and 6 months, only 17% and 6%, respectively, were still breastfed. *Consumer Reports* states that, in 1975 in the United States, 38% of the women leaving the hospital after childbirth reported they were breastfeeding. In 1976, surveys by Mead Johnson Company and Ross Laboratories found that 53% of infants in the United States and 48% of those in Canada were breastfed at the time of discharge from the hospital.

FACTORS RESPONSIBLE FOR THE DECLINE OF BREASTFEEDING

Historically, bottle feeding was intended to replace the wet nurse when breastfeeding by the mother was not possible, because many wet nurses were irresponsible and only the wealthy could afford a healthy wet nurse.[154] Pasteurization of milk helped initiate sanitation practices which permitted some substitution of cow's milk for breastfeeding. Late in the 19th century, heat treatment of evaporated milk reduced curd tension; the addition of carbohydrate early in the 20th century decreased excessive protein and electrolyte levels, which further improved bottle feeding. The technologic progress and nutritional discoveries of more recent decades made bottle feeding a viable alternative. Bottle feeding gradually replaced breastfeeding and resulted in the development of infant formulas which provide the best alternative for meeting nutritional needs during the first year when breastfeeding is unsuccessful, inappropriate, or stopped early.[155]

With the profound social transformations which have taken place in the Western world, breastfeeding is frequently considered incompatible with modern life-styles or with work outside the home. Furthermore, the advantages of breastfeeding in terms of nutrition, immunity, and psychophysiologic interaction between the mother and her offspring are frequently considered to be outweighed by possible inconvenience, by fear or failure of lactation, and by anxieties concerning infection and/or cosmetic effects on the breasts. In addition, the act of breastfeeding is frequently regarded as a source of embarrassment or shame, and it is usually carried out privately. It is a curious commentary on our society that we tolerate all degrees of explicitness in our literature and mass media as regards sex and violence, but the normal act of breastfeeding is taboo.

When breastfeeding was universal, as it still is in some societies, the "art" was handed down through the generations. This familiar personal heritage was comforting and reassuring to the young mother. In Western societies, the new mother frequently receives little encouragement to breastfeed from her husband, relatives, friends, and even physicians. Furthermore, because formula-feeding is safe, acceptable, and promoted as "nearly identical" in nutritional composition to breast milk, the new mother may have little inclination to breastfeed.

Nowadays, mothers in many maternity wards are expected to formula-feed their infants for the convenience of the hospital staff. To enable the new mother to breastfeed, she needs free access to her infant, knowledgeable help, encouragement, and instruction. Recent studies have shown a dramatic increase in breastfeeding with in-hospital instruction from staff and mothers.[156-158] Sedgwick[159] has found that 96% of the mothers were able to breastfeed successfully when circumstances were favorable.

Successful lactation is the result of reflex interactions between the mother and her offspring.[160] Stimulation of the breast, the areola, and the nipple leads to the secretion of prolactin in the mother's circulation and to milk secretion in the alveoli.[161] The suckling stimulus brings about the release of oxytocin, which contracts myoepithelial cells around the alveoli, thereby ejecting milk into lacteals.[162] Emotional tension and stress readily inhibit this reflex; therefore, the anxieties of the young mother during a short stay on an obstetric ward—where she often receives inadequate instruction and little emotional support—may explain why success is elusive, even when the mother wishes to breastfeed. The main cause of lactation failure is thought to be inhibition of the "milk ejection reflex."

Drugs such as chlorpromazine and oxytocin nasal spray[163] can be used for a short period to assist a mother who is having difficulty with "let down" in establishing successful lactation. The reasons for stopping breastfeeding after the mother goes home include cracked nipples and infection[164] or erroneous advice to adhere to a rigid three- to four-hour feeding schedule.[165 166] Many infants cry to be fed every two to three hours during the first two weeks of life. This can lead some mothers to feel that they have an inadequate supply of milk. If mothers resort to supplemental feeding, lactation may cease within a week or so because the development of full milk production is dependent on emptying the breasts.[167 168] This is also the problem with the advice to feed "ten minutes on each breast," which may deprive the infant of the nutritional benefits of milk of a somewhat different composition at the end of a feed.[169] Good

breastfeeding techniques are described in detail by Applebaum[170]; when they are practiced, breastfeeding can be a convenient and pleasant way for the majority of women to feed their infants.[171 172]

WAYS TO INCREASE BREASTFEEDING

Breastfeeding is strongly recommended for full-term infants, except in the few instances where specific contraindications exist. Ideally, breast milk should be practically the only source of nutrients for the first four to six months for most infants. When the nursing mother is healthy and well fed, fluoride and possibly vitamin D may be the only supplements which need to be provided to the infant. Iron may also be given after about four months.[173]

Because the decision to breastfeed or not is the result of many factors—including education, cultural background, and personality—information about breastfeeding should be included in nutrition and sex education in schools.[174 175] This information and education should also be provided for boys because the husband's attitudes are important in successful lactation.[176 177]

There is also a need for all physicians to become much more knowledgeable about infant nutrition and the physiology, value, and technique of breastfeeding. Education about breastfeeding should be directed to the undergraduate curriculum of physicians and nurses and to the residency training program of obstetricians and pediatricians.

The routine in many hospitals makes breastfeeding difficult; therefore, efforts should be made to change obstetrical ward and neonatal unit practices to increase the opportunity for successful lactation. Changes may include the following:

1. Decrease the amount of sedation and/or anesthesia given to the mother during labor and delivery because large amounts can impair suckling in the infant.[178]
2. Avoid separation of the mother from her infant during the first 24 hours.
3. Breastfeed infants on an "on demand" schedule rather than on a rigid three- to four-hour schedule, and discourage routine supplementary formula feedings.
4. Reappraise physical facilities to provide easy access of the mother to her infant. Rooming-in of mother and infant is important to successful lactation.

Many women require encouragement to foster the "milk ejection reflex"[179]; therefore, the personnel involved in the care of pregnant women and new mothers should be psychologically oriented toward breastfeeding and should be well informed about the preparation of the breasts, lactation, and the management of breastfeeding. Nursing personnel with personal experience in breastfeeding can be extremely helpful.[180] In addition, mothers should be taught the details of

breastfeeding during prenatal classes as well as during the postpartum period. Consultation between maternity services and members of La Leche League International (9616 Minneapolis Avenue, Franklin Park, IL 60131) or the Human Lactation Center Ltd. (666 Sturgis Highway, Westport, CT 06880) may be helpful in encouraging breastfeeding.

The availability of infant formulas and other infant foods has influenced infant feeding practices throughout the world. Apathy and lack of knowledge about infant nutrition by health professionals and the medical profession have been important problems. Effective and, at times, unfair publicity of formula-feeding, lack of financial support from governments in developing countries, and the need for many women to work outside the home have also been contributory factors. These factors have resulted in a decrease in breastfeeding in sections of society where formula use may not be suitable.[181-184] Breastfeeding along with provision of inexpensive "multi-mix" weaning foods have been suggested as two immediate priorities in developing countries. Also, supplies of infant formulas similar in nutritional quality to breast milk must be available for infants who cannot breastfeed; particular care must be paid to ensure safe water and sanitary conditions for mothers using these formulas.

Many women in both industrialized and developing countries now work outside the home, either for economic or personal reasons. Increasing numbers of married women have a full-time career that they are either reluctant or unable to give up. Therefore, it is recommended that countries adopt legislation to enable new mothers to obtain three to four months of leave after delivery to care for their infants. In addition, studies need to be carried out to determine whether it is feasible or practical for mothers to continue to breastfeed their infants – possibly in day nurseries adjacent to places of work – after returning to work.

SUMMARY

1. Full-term newborn infants should be breastfed, except if there are specific contraindications or when breastfeeding is unsuccessful.

2. Education about breastfeeding should be provided in schools for all children, and better education about breastfeeding and infant nutrition should be provided in the curriculum of physicians and nurses. Information about breastfeeding should also be presented in public communications media.

3. Prenatal instruction should include both theoretical and practical information about breastfeeding.

4. Attitudes and practices in prenatal clinics and in maternity wards should encourage a climate which favors breastfeeding. The

staff should include nurses and other personnel who are not only favorably disposed toward breastfeeding but also knowledgeable and skilled in the art.

5. Consultation between maternity services and agencies committed to breastfeeding should be strengthened.

6. Studies should be conducted on the feasibility of breastfeeding infants at day nurseries adjacent to places of work subsequent to an appropriate leave of absence following the birth of an infant.

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Editor's Comment:

The joint statement in support of breastfeeding, a long time in coming, marks a major advance for the pediatric establishment. For over half a century, pediatricians were fixed in their belief that man-made formulas were as good as nature's formula. Further, they viewed nursing unbefitting to the emancipated woman. When La Leche League, a mothers' organization formed in 1956, initiated a countercurrent to help mothers eager to breastfeed to succeed, pediatricians unhesitatingly branded LLL mothers fanatics.

Unfortunately, the physician's training and experience does not foster an understanding of nature's inherent wisdom, nor an appreciation of nature's authoritative voice, the result of time-tested evolutionary processes. The physician, therefore, disregards the obvious messages and norms of nature. He usurps nature's authority and brashly intervenes in natural mechanisms and processes. This opacity to nature—and its effect—is particularly apparent in obstetrics and pediatrics because these specialties deal primarily with the healthy. It results, to use an old indictment, in meddlesome obstetrics and meddlesome pediatrics.

The mass move to bottle feeding, spurred on by good home refrigeration, accelerated in the twenties when weight gain was singled out as the prime parameter of infant health and development, and the scale became the focus of the office visit. If physicians understood nature, they would know that nature uses multipurpose mechanisms. To restrict progress to weight gain, important though it is, is insufficient. The joint statement impressively covers the many pluses of breast milk and breastfeeding.

The thinking and habits of pediatricians will not change overnight. It may take more than a generation before breastfeeding replaces bottle feeding. The reasons are many. The medical profession's experience with bottle feeding is long, its experience with successful breastfeeding very short. Given the slightest difficulty, pediatricians quickly switch to bottle feeding just as contemporary obstetricians, faced with even minor difficulties in parturition, switch to cesareans. Neither, thereby, learns to handle the common difficulties that arise in the transition from intrauterine to extrauterine life. The joint statement is a necessary step on the road to viewing nature as an ally. Those interested in the promotion of breastfeeding are thankful for it. HR

SAMUEL L. BLUMENFELD

Motherhood: A Proud Profession

FIRST, I WANT to say how delighted I am to be here. I was truly honored by your invitation to address you. After all, is there a more important audience than this one? I think not, for without mothers, can there possibly be any future at all for the human race, let alone this country? Second, I have a confession to make. I really don't like the title of my speech. After all, to think of motherhood simply as a profession or to compare it to a career is, I think, to shortchange it. Motherhood is much more: it is at the very heart of life; and the mother-child relationship is the inner sanctum of life's mysteries. Also, I am very wary of the word *proud.* Of course, I can understand a woman's pride in bearing and raising her children. But too much pride can lead to unrealistic expectations. It can sometimes become a barrier to love, which requires much more humility than pride.

Also, the phrase "proud profession" smacks of our having to justify motherhood, and only a lunatic society would have to do that. And I'm sure that all of you would agree that we don't live in a lunatic society—or do we? I don't know. Yet, it is a strange irony that this organization and this convention have had to come into existence in the first place. It's as if we had to create an organization to encourage people to remain human.

Apparently, there are a lot of people in this world who do not want to be as God created them. They want to be some product of technology, a mechanical being programmed to fit in with computers, jumbo jets, cars, frozen foods, and pills. The pills are supposed to liberate us from our emotional, instinctual, and spiritual needs so that we can conveniently mesh with all of the technological contrivances around us. It is a dehumanizing process which started in the last century when man discovered the uses, or I should say the *misuses,* of scientific technology. It is a dehumanizing process that has been accelerated greatly in the last thirty years, making it virtually impossible for our newer generations to know what being human is. It is a process which must be stopped and

reversed unless we wish to destroy ourselves.

During 1974, when I was writing *The Retreat from Motherhood*, I found myself becoming very pessimistic about the future. So much of what I found out about the women's liberation movement, the increase in premarital sex, the widespread practice of abortion, child abuse, the epidemic of divorce, the pornographic explosion, the anti-maternalism of our educational system, the increasing suicide rate among the young made me feel that the situation was quite hopeless. And then I found out about La Leche League, and I thought that perhaps here is the beginning of the way back to sanity. It was the only positive ray of light I found in that vast darkness, but it was a strong ray. Indeed, it was strong enough to lift me out of my pessimism. I was particularly encouraged by the fact that, despite all of the trends in the opposite direction, the League has grown remarkably since its founding in 1956, and that the idea of breastfeeding has become much more acceptable among young mothers. Part of this, I suppose, is due to the back-to-nature movement among the young, and part of it, I believe, is the result of a healthy rebellion against dehumanizing technology.

Let me say at the outset that I am not against technology per se. I have no objection to any technological advance that enhances life. But technology has always been a two-edged sword, capable of doing both good and harm. And unless we know or learn how to maximize its benefits and minimize its harms, we shall not know how to use technology. For example, amniocentesis was invented by a doctor in New Zealand as a means of tapping the fluid in the amnio sac during pregnancy to see if the prenatal infant required treatment *in utero* prior to its birth. Its purpose was to save the life of an endangered prenatal infant. But this same technique has been adapted by other doctors to perform saline abortions which kill perfectly healthy prenatal infants. Thus, the sword is indeed double-edged. Yet, some social scientists would say that the second use was just as humanitarian as the first. I'll let you be the judge of that.

Another example. Dr. Albert Einstein, the great humanitarian physicist, discovered the principles of nuclear energy. But the way man first made practical use of them was by destroying two Japanese cities. So we must always be on guard where technology is concerned, particularly where technology removes man from what is natural to him, and where technology is applied without sufficient knowledge. For example, there is the recently reported case of the maternity clinics that routinely subjected about four million newborn babes to a

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high dose of radiation in the 1940's and 1950's because it was believed that such treatment would eliminate the need for future tonsillectomies. But today it has been discovered that these grown up individuals are now susceptible to cancer of the thyroid because of that supposedly benign dose of radiation.

Man's intrusions

The fields of pediatrics and obstetrics, I'm afraid, are full of that same kind of mindless application of technology with surprisingly little concern about future ramifications. Entire hospital procedures have been developed that have made of childbirth a technological nightmare, transforming a natural process into a hospital sickness in which everything is done to place as much emotional distance between mother and newborn infant as possible. The fact is that modern obstetrics and pediatrics are the children of modern technology. They are man's intrusions into God's processes.

I know it is no longer fashionable to talk about God. It's all right to believe in astrology or the occult, but mention God in educated or so-called enlightened circles, and you get back very peculiar vibrations. They either think you're a religious fanatic, a primitive fundamentalist, or a political reactionary. They simply will not take the idea of God seriously, and they consider anyone who does as someone fit for psychiatric treatment or commitment to a mental institution. And it is these secular humanists, as they call themselves, who today totally dominate science and technology. They consider themselves the guardians of rationality and they consider religionists as basically irrational.

They see motherhood as a productive but limited and inferior role in society, to be managed by the scientific principles of behavioral psychology and subordinated to the policies of government planning. I see motherhood quite differently. I see it as a manifestation of God's will for both mother and child. I see motherhood as the result of God's technology, not man's. The miracle of birth exceeds anything man has ever done or will ever do. All you have to do is observe what happens from the moment of conception to the birth of a unique human being nine months later to realize how really puny man's achievements are in comparison.

But man's pride is insatiable and he must denigrate God's achievements in order to elevate his own. And he does this by denying the sacredness of God's creation and treating the unborn child like so much fetal tissue. Make no mistake about it, a true respect for life is impossible without a belief in its Creator. And that is the basic issue that separates religionists from secular humanists.

There were about a million abortions in America last year, all

in the name of rational family planning. These perfectly healthy prenatal infants were killed because they were unwanted. Unwanted by whom? By their parents. Think of it, such a terrible denial of all that is sacred to the human heart and conscience, all for the sake of personal convenience, sexual enjoyment, and social advantage. And both our legal and medical systems have been perverted to accommodate this silent carnage. Ms. Gloria Steinem was terribly upset some months ago when the Congress voted against the use of federal funds to pay for the abortions of poor women. She could not understand why a very large number of American taxpayers did not want to become accomplices in what can only be described as mass murder. And Ms. Steinem is a shining example of a secular humanist in action.

It is fortunate for us that the people who first settled this country and created the United States were anything but secular humanists. They were, for the most part, Calvinists, profoundly religious, fearful of God, and ever mindful of man's depraved, sinful nature. They were so wary and distrustful of human nature that they created a Constitution and a form of government that would minimize man's capability of inflicting tyranny on his fellowman.

Now if you wish to understand secular humanism—the philosophy currently predominant among America's intellectuals, educators, natural and social scientists—you have to understand that it not only rejected the Calvinist view of man but also the entire concept of a God-centered universe. The universe of the secular humanist is man-centered, and man, they tell us, is not by nature depraved. He is not the sinful descendant of Adam and Eve. On the contrary, he is basically benevolent, rational, and perfectible. He is, some of them say without modesty, even Godlike. But if man is so wonderful, one asks, why does he commit so much evil? Why have we seen in our own lifetime such devastating warfare, such atrocities, so much violent crime, so much mayhem? The secular humanists have been studying the problem for at least the last one hundred years under the heading of "psychology" and they've theorized that men do evil because of poverty, ignorance, social injustice, racial and religious prejudice, lack of adequate education, poor housing and other environmental factors, sexual frustration, abusive treatment in childhood and, of course, faulty upbringing by their mothers. So in the minds of some social scientists, mothers have fallen under suspicion as being a prime cause of evil.

Like psychology, modern pediatrics is a child of modern science, and it emerged in the 1880's as one of the new medical specialties. Its first practitioners were male doctors who thought they could apply scientific principles

to the rearing of infants. The man who is most credited with having founded modern pediatrics is Dr. Luther Emmett Holt, who received his doctor's degree in 1880, after which he worked at the New York Infant Asylum. In 1887, the Babies Hospital of New York was founded and a year later Holt was appointed its director. Under his leadership, the hospital grew and became quite well known; its procedures became the standard for the field. In 1894 Holt published his *Care and Feeding of Children.* The success of this book was unparalleled in medical publication. It ran through more than 75 printings, was translated into three languages, and made Holt's name a household word.

The book was written in the form of questions and answers, and here is a sample of some of Dr. Holt's advice:

How can a baby be taught to be regular in habits of eating and sleeping?

By always feeding at regular intervals and putting to sleep at exactly the same time every day and evening.

When should regular training be begun?

During the first week of life.

Should a baby be wakened to be nursed or fed if sleeping quietly?

Yes, for a few days. This will not be required long, for regular feeding soon teaches an infant to awaken regularly for his meal almost upon the minute.

Should children during the 3rd and 4th years be fed between meals?

Under no circumstances should anything but water be given between the regular meals.

Should a child sleep in the same bed with its mother or nurse?

Under no circumstances if this can possibly be avoided; nor should older children sleep together.

At what age may an infant go all night without feeding?

At five months a child should not be fed or nursed between 10 p.m. and 7 a.m. At one year a child will usually go from 7 p.m. to 7 a.m. without feeding or nursing.

Is rocking necessary?

By no means. It is a habit easily acquired, but hard to break, and a very useless and sometimes injurious one.

When is crying useful?

In the newly born infant the cry expands the lungs, and it is necessary that it should be repeated for a few minutes every day in order to keep them well expanded.

How much crying is normal for a very young baby?

From 15 to 30 minutes a day.

What is the nature of this cry?

It is loud and strong. Infants get red in the face with it; in fact, it is a scream. This is necessary for health. It is the baby's exercise.

What is the cry of indulgence or from habit?

This is often heard even in very young infants, who cry to be rocked, to be carried about, sometimes for a light in the room, for a bottle to suck, or for the continuance of any other bad habit which has been acquired.

How can we be sure that a child is crying to be indulged?

If it stops immediately when it gets what it wants, and cries when it is withdrawn or withheld.

How is an infant to be managed that cries from temper or to be indulged?

It should simply be allowed to cry it out. A second struggle is rarely necessary.

At what age may playing with babies be begun?

Never until four months, and better not until six months. The less of it at any time the better for the infant.

What harm is done by playing with very young babies?

They are made nervous and irritable, sleep badly, and suffer in other respects.

What are the most common bad habits of children?

Sucking, nail-biting, bed-wetting, and masturbation.

What should be done when one of these habits is discovered?

The fact should be brought immediately to the notice of the mother and physician, and every means taken to break up the habit while the child is young and before it becomes deeply seated.

In the case of sucking or nail-biting confining the hands to the sides during sleep or the wearing of mittens will often succeed if persisted in. On no account should the habit of sucking be allowed as a means of putting children to sleep or to quiet them while restless or suffering from indigestion.

Masturbation is the most injurious of all these habits, and should be broken up just as early as possible. Children should especially be watched at the time of going to sleep and on first waking. Punishments are of little avail and usually make matters worse. Medical advice should at once be sought.

I wonder what mothers did during the thousands of years before there were pediatricians? How did they know what to do before Dr. Holt came along? As you probably suspect, Dr. Holt, who dominated the field of pediatrics during his long career, was a pioneer in getting mothers to switch from breastfeeding to bottle feeding. Bottle feeding fitted in so much better with the scientific way of doing things. In a way, Holt wanted to turn mothers into pediatricians, for everything he did was calculated to create the same kind of distance between mother and child as existed between pediatrician and child. Holt also urged mothers to get rid of the cradle.

Infants enjoyed rocking too much and anything a child enjoyed that much had to be bad. And in just a few years time, the millions of cradles in American homes were discarded for the flat, stationary crib.

For thousands of years the cradle had been used because it was found that infants were soothed by a gentle rocking motion. After all, for the first nine months of life, an infant is in constant motion within its mother's body. And even when its mother is asleep, it is aware of the rhythmic heartbeat and the occasional movements that even a sleeping person makes. One pediatrician, Dr. John Zahorsky, who was critical of the wholesale abolition of the cradle, wrote an article about the cradle's benefits in 1934. He observed that the cradle's motion acted as a gentle fan. It was also soporific and soothed an excited nervous system. But an even greater benefit, he argued, was its aid to the infant's digestion. He wrote:

> The intestine always contains gas, and the swinging movements of its body causes the liquid chyle to gravitate backward and forward over the intestinal mucosa. Rocking, therefore, is a physical therapy which aids digestion and probably absorption.

According to the good doctor, the motion of the cradle was able to relieve the infant of certain annoying digestive symptoms, which the stillness of the crib could not do. Once the symptoms were relieved, the infant could fall asleep. But Dr. Zahorsky's views went against the general trend, and his words fell on deaf ears. Pediatricians preferred to follow Dr. Holt down the scientific trail.

Modern pediatrics revolutionized child care. Mother love, with its rocking and petting, billing and cooing, was identified and condemned as the indulger and spoiler of children, and therefore was to be studiously avoided. One noted pediatrician wrote in 1900, "An infant during the first year should neither be amusing nor amused." And Bessie Cutler, a pediatric nurse wrote in her textbook of 1927, "The child must never be rocked to sleep, given a pacifier or any soothing device." Is it any wonder that Americans turned to cigarette smoking by the millions to make up for the oral deprivation they suffered as children and to relieve the tensions never relieved by soothing care? And is it any wonder that many mothers began to feel guilty about their natural maternal impulses? I don't think it would be too rash to characterize Dr. Holt's pediatric philosophy as a subtle form of child abuse.

At the turn of the century, this antimaternal philosophy of child care was so prevalent in children's hospitals, that many infants who were given the best scientifically approved care died from sheer neglect. Without that important in-

gredient of mother love, the infants simply wasted away. What we learned from that very tragic experience was that infants have a very definite biological need for the stimulation that comes with mother love, and that unless this need is satisfied, normal growth is thwarted.

Really, it's quite evident that a mother and child are made to indulge each other to their heart's content. That is the nature of the relationship, and satisfaction is its sweet reward. In fact, that is the lesson that La Leche League has taught us all about breastfeeding: that the mother gets as much emotional value out of it as the infant. Another thing we've learned is that there is a lot more to breastfeeding than feeding alone. The tactile experience is as important as the nourishment, if not more so. When being nursed, the infant learns to associate the feel, the warmth, the touch, and the smell of the mother with the taste and satisfaction of nourishment. It is an experience that appeals to and activates all of the senses. It encompasses a whole range of pleasant feelings. The mother, in her turn, also experiences a similar range of physical, emotional, and psychological pleasures. In the course of a year, this marvelously harmonious relationship forms the basis for a lifelong attachment.

Today the favorite word is *bond* or *bonding*. I prefer to use the word *attachment* for a number of reasons. We talk of the bonds of friendship or the bonds of marriage almost in the sense of physical ties that can be broken. But the word *attachment* implies a more emotional and spiritual tie, something more permanent than a bond. Let's face it. Friendships and marriages break up, but the attachment between mother and child endures a lifetime. It may undergo changes over the years, but it can never end. For many, this attachment will remain a lifelong anchor of emotional stability.

Incidentally, the truth of this was dramatically demonstrated to me not so long ago when I saw a TV show in which adopted children, reunited with their real mothers, expressed the deep feelings that compelled them to seek out their real mothers. As much as they loved and were attached to their adoptive parents, they retained a special attachment to the mother who had given them up or abandoned them.

A painful period

The need for attachment is a lifelong need, and we first become acutely aware of this need in childhood. Every child between the age of eight and twenty-four months begins to experience a painful period of emotional growth and adjustment known as attachment behavior. From a psychic point of view, it is as emotionally painful as teething can be physically painful, but only more so. It is the most important ad-

justment all children must make, and so I think it would be worthwhile to dwell on it for a few moments.

The human infant is a completely dependent being for several years, and during the first year of life he is the totally passive receiver of love and nourishment. He and his mother seem to be one. Then as he grows and gains the ability to move about, he becomes aware that he and his mother are not one but two entities and that the loss of mother is a possibility. He begins to feel an acute psychic pain known as separation anxiety. How do we know he feels it? By his behavior. He clings to mother, follows her around, requires constant reassurance of being loved—all in order to quell this painful separation anxiety. In fact, he acts very much like a passionate but highly insecure lover. Eventually he discovers that the best way to eliminate separation anxiety is to create an emotional tie by maintaining a permanent state of love between him and his mother. So from being a passive receiver of mother love, he learns to become an active giver of filial love. This permits the growing youngster to tolerate greater physical separation from mother without experiencing severe separation anxiety.

But the threat of separation anxiety is always there. It can be caused not only by a fear of losing mother but also by the threat of being attracted away from mother. And so the youngster in turn develops filial loyalty. The very same problem exists among adults in marriage. Separation anxiety can be aroused by the fear of losing one's mate or of being attracted away from one's mate. So we behave lovingly to keep our mates happy and develop monogamous loyalty to dampen our sexual response to others. We do all of this because we need the attachment. That is why so many bad and indifferent marriages endure. Because the pain of separation can be far more intolerable than the pain of a bad attachment. But obviously, a good attachment not only quells the negative pains of separation anxiety, but also provides a wide range of positive pleasures as well.

The human being first encounters the problem of separation anxiety as a small child. But it is a problem that remains with us throughout life. I am inclined to believe that separation anxiety is one of our emotional reflexes, an intrinsic part of our biological makeup, a survival instinct. For the separation from mother in primitive circumstances meant sure death. Without separation anxiety the highly dependent small child might wander too far from mother and be killed. Human beings have a weak sense of smell. We don't run fast. Our muscles are comparatively weak. Our survival depends on strong, intense emotions that link us with other protecting human beings.

So there is far more to the mother-child relationship than

Dr. Holt ever dreamed of. There is the need to be loved and the need to love. There is the need for the stability and security of attachment and the need for the freedom and encouragement to grow. A wise mother must learn in some way how to satisfy all of these needs, and in the process she no doubt finds herself relying more and more on her intuition and instincts than on her pediatrician.

Now mothers must get over the idea that their job is to produce perfect children. There is no such thing as a perfect child, for human beings are not perfectible. Besides, no two parents would agree on what a perfect child is. But apparently many of you are quite aware of this, for there was an interesting session this morning about the myth of the Super Mom entitled, "Now I'm a Leader: Why Aren't My Children Perfect?" The wise mother learns quite early that her child is a separate human being whose ultimate destiny is in God's hands, not hers, and no amount of pediatric experimentation will ever change this. The most that any mother can do is simply instill in her child a sense of trust, constancy, and harmony, and hope for the best.

So intuitive an art

It is because motherhood is so intuitive an art that I consider it a calling rather than a profession. It is a calling which God has limited to women alone, and to whom He gave instincts suitable to cope with it. We have been told by modern scientists that there is no such thing as a maternal instinct, that mothering is a learned pattern of behavior. I don't think it is. I think that if a young mother and a small infant were left alone on a deserted island, she would know instinctively how to care for the child. I think that modern society has simply made it impossible for many women to feel their own maternal instincts. I think that modern pediatrics has made many young mothers afraid that they may be doing the wrong thing. It is part of the whole dehumanizing process.

We have been told a great deal about man's brain – his rationality – as being his primary tool of survival. I differ with this view. Man's brain is merely *a* tool of survival, a tool that applies more to his adult situation than his childhood one. His instincts and emotions are far more important to him, particularly during his early years, and only a mother can suitably respond to them. That's her special insight. That's what makes the qualitative difference between a man and a woman. She is made to respond to instinctual and emotional need. And that is why male pediatricians like Dr. Holt, with all their scientific know-how, were so far off base.

The tendency in these egalitarian days is to minimize the differences between men and women. In fact, we are in danger of mini-

mizing them out of existence. But the truth is that these differences are far more important than the women's libbers would permit us to believe. Moreover, it is quite significant that these differences, for the most part, involve children. First, only a woman can actually bear a new human being in her body. A man cannot do so, no matter how much he may wish to. Second, only a woman can nurse a child with her own body. True, a man can feed an infant with a bottle, but you and I know that that is not the same as breastfeeding. Third, only a woman can experience the symbiotic mother-child attachment with its great intensity in the early years and its satisfying emotional and spiritual aspects in the later years. In short, only a woman has that special capacity—both physical and emotional—to relate to her children in a way that is biologically denied men.

And don't for a moment think that men to some degree have not envied women their special capabilities. Yet, the psychologists have cleverly reversed the situation, giving the impression that it is the women who envy the men, and not vice versa. I suppose God was kind enough to permit men some compensatory pleasures and interests which made up for his limited biological function and complemented, in a paternal and husbandly way, what women were able to do in a maternal way. It is a marvelous division of labor based on biological realities. It doesn't mean that a woman cannot become a truck driver or an architect if she wants to. But it does mean that a man cannot become a mother no matter how many Equal Rights Amendments are added to the Constitution. God is not an egalitarian, and that is why the secular humanists resent Him so, and that is why they want to remake the human race to accord with their own peculiar notions of social justice. That's what dehumanization is all about. To be human is simply to be as God made us.

Which brings me to a most important issue. There is a danger in America that with all of our emphasis on family planning, parents are losing sight of what parenting means. Because technology has now given us the power to determine whether an unborn child is to live or die, some parents have decided to usurp God's role. For example, there are some pregnant women who will ask their doctors for an amniocentesis on the pretext that they want to determine if their unborn child is afflicted with some dreaded abnormality. Actually, what they really want to know is the sex of the child so that they can decide whether or not to abort it. I'd hate to be the child of parents who made such a life-and-death decision on such a cruel and arbitrary basis. A child born to such parents under such conditions would be expected to be what his parents wanted him to be, and not what he himself might want to be.

In denying God's will, the parents also deny the child's own personal destiny. Such parents are incapable of the unselfish and unconditional love that all children need. To such parents children are wanted for what they can give the parents, and not vice versa. The child is indeed a "wanted" child, but he is wanted for all the wrong reasons.

If motherhood is a sacred calling, as I believe it to be, it is because a mother must also be prepared to accept the heartbreak of a sick child, a deformed child, a child who may one day go astray. Everyone has to have a mother, the good and the bad, the saved and the damned, the ugly and the beautiful, the idiot and the genius, the success and the failure. That is why it helps a mother to believe in God, so that she can accept with serenity God's plan and thereby, through the power of her own love and faith, transform misfortune into blessing.

The happy mother is not the woman who fights God's will but who submits to it and enjoys its pleasures and satisfactions. She responds to the calling of motherhood, aware of its inherent sanctity. She knows that she is more than a breeder. She knows that in passing life on to the next generation, she is passing the torch of humankind forward. She also knows that motherhood is an art, not a science, because human beings are not produced on an assembly line like mechanical dolls. Each child is unique, an individual, a work of divine creation. And each mother-child relationship has its own special qualities, created by the interrelationship of two unique human beings, one helpless and dependent, the other loving and caring. So motherhood is both a calling and an art and it demands of a woman everything that is good in her: affection, gentleness, understanding, patience, playfulness, as well as firmness, restraint, endurance, courage, constancy, and sacrifice. A child who drinks at the fountain of such goodness cannot help but grow up loving and revering his mother, and experiencing a great zest for life.

Life's wonderful potential

To sum it up, let me say that motherhood is a marvelous opportunity for a woman to convey to her child the idea of life's wonderful potential. Some months ago, when Bette Davis, one of Hollywood's greatest stars, was honored by a television special that reviewed her remarkable career, she stood before that great, glamorous, and sophisticated audience at the end of the show and paid tribute to the one great influence in her life, without which her entire career would have been impossible: her mother, Ruthie. There was a mother-daughter relationship that transcended all difficulties and survived all of life's uncertainties, and it was a moving experience to hear that famous woman recalling the impor-

tance of mother love in the midst of all that plastic and celluloid technology. Without mother love, none of it would have ever happened.

In this century, where we focus so much of our attention and hopes on romantic and sexual love, we tend to forget that mother love is a far greater sustainer of life in the long run. And when we do achieve happiness in adulthood with our mates and our children, we know how much we owe to our mothers for what they did for us, for what they taught us, for what they were to us. This is a theme that runs throughout our lives. And when it is time for a human being to leave this earth, how often do we hear in that final whisper, the very first word we ever learned to speak: Mama?

My own mother died in 1960, and every day I think of her in some way. She was a simple immigrant woman who mothered five children without ever having read Dr. Holt. She accepted God's calling whenever it came. The idea of killing an unborn child was anathema to her. I derived more pure love and joy from her than from any other human being. And I didn't have to do very much to get it—just be born. How blessed I was. And that, in a nutshell, is what a mother can do for a child that nobody else can do: permit him or her to experience the full sense of God's benevolent power and blessing.

And so, I will very appropriately end by saying God bless you all, and God bless La Leche League, and—oh yes, one last thing—please bring back the cradle! □

Presented at the Sixth Biennial Convention of La Leche League International, Toronto, July 14-16, 1977.

Editor's Comment:

Our admiration for B. continues unbounded. He says so many right things: motherhood is a "calling" not a "profession," "an art, not a science"; "instincts and emotions are far more important" to "survival" than "rationality"; we must not "minimize the differences between men and women." And he says so many right things so well: "The happy mother . . . knows that she is more than a breeder. She knows that in passing life on to the next generation, she is passing the torch of humankind forward"; we must be on guard against the "mindless application of technology with surprisingly little concern about future ramifications"; "I don't think it would be too rash to characterize Dr. Holt's pediatric philosophy (*e.g.*, banning play with infants) as a subtle form of child abuse." Here we are reminded of a La Leche mother's definition of a fanatic: "She is a mother who is right 20 years before a male researcher finds the scientific justification for what she has been doing all along." Incidentally, B. is a great prolifer, and a great banquet speaker. Prolifers please take note. HR

OLIVER WENDELL HOLMES

The Contagiousness of Puerperal Fever*†

THE POINT AT ISSUE

The Affirmative

The disease known as Puerperal Fever is so far contagious as to be frequently carried from patient to patient by physicians and nurses.—*O. W. Holmes,* 1843.

The Negative

The result of the whole discussion will, I trust, serve, not only to exalt your views of the value and dignity of our profession, but to divest your minds of the overpowering dread that you can ever become, especially to woman, under the extremely interesting circumstances of gestation and parturition, the minister of evil; that you can ever convey, in any possible manner, a horrible virus, so destructive in its effects, and so mysterious in its operations as that attributed to puerperal fever.—*Professor Hodge,* 1852.

I prefer to attribute them to accident, or Providence, of which I can form a conception, rather than to a contagion of which I cannot form any clear idea, at least as to this particular malady.—*Professor Meigs,* 1852.

. . . in the propagation of which they have no more to do, than with the propagation of cholera from Jessore to San Francisco, and from Mauritius to St. Petersburg.—*Professor Meigs,* 1854.

I arrived at that certainty in the matter, that I could venture to foretell what women would be affected with the disease, upon hearing by what midwife they were to be delivered, or by what nurse they were to be attended, during their lying-in; and, almost in every instance, my prediction was verified.—*Gordon,* 1795.

*Printed in 1843; reprinted with additions, 1855.

†To be published in two parts.

A certain number of deaths is caused every year by the contagion of puerperal fever, communicated by the nurses and medical attendants.—*Farr, in Fifth Annual Report of Registrar-General of England,* 1843.

. . . boards of health, if such exist, or, without them, the medical institutions of a country, should have the power of coercing, or of inflicting some kind of punishment on those who recklessly go from cases of puerperal fevers to parturient or puerperal females, without using due precaution; and who, having been shown the risk, criminally encounter it, and convey pestilence and death to the persons they are employed to aid in the most interesting and suffering period of female existence.—*Copland's Medical Dictionary, Art. Puerperal States and Diseases,* 1852.

We conceive it unnecessary to go into detail to prove the contagious nature of this disease, as there are few, if any, American practitioners who do not believe in this doctrine.—*Dr. Lee, in Additions to Article last cited.*

[INTRODUCTORY NOTE.] It happened, some years ago, that a discussion arose in a Medical Society of which I was a member, involving the subject of a certain supposed cause of disease, about which something was known, a good deal suspected, and not a little feared. The discussion was suggested by a case, reported at the preceding meeting, of a physician who made an examination of the body of a patient who had died with puerperal fever, and who himself died in less than a week, apparently in consequence of a wound received at the examination, having attended several women in confinement in the meantime, all of whom, as it was alleged, were attacked with puerperal fever.

Whatever apprehensions and beliefs were entertained, it was plain that a fuller knowledge of the facts relating to the subject would be acceptable to all present. I therefore felt that it would be doing a good service to look into the best records I could find, and inquire of the most trustworthy practitioners I knew, to learn what experience had to teach in the matter, and arrived at the results contained in the following pages.

The Essay was read before the Boston Society for Medical Improvement, and, at the request of the Society, printed in the *New England Quarterly Journal of Medicine and Surgery* for April, 1843. As this Journal never obtained a large circulation, and ceased to be published after a year's existence, and as the few copies I had struck off separately

OLIVER WENDELL HOLMES, Harvard University School of Medicine Professor, was an influential 19th century medical essayist, and the father of Chief Justice Oliver Wendell Holmes.

were soon lost sight of among the friends to whom they were sent, the Essay can hardly be said to have been fully brought before the Profession.

The subject of this Paper has the same profound interest for me at the present moment as it had when I was first collecting the terrible evidence out of which, as it seems to me, the commonest exercise of reason could not help shaping the truth it involved. It is not merely on account of the bearing of the question,—if there is a question,—on all that is most sacred in human life and happiness, that the subject cannot lose its interest. It is because it seems evident that a fair statement of the facts must produce its proper influence on a very large proportion of well-constituted and unprejudiced minds. Individuals may, here and there, resist the practical bearing of the evidence on their own feelings or interests; some may fail to see its meaning, as some persons may be found who cannot tell red from green; but I cannot doubt that most readers will be satisfied and convinced, to loathing, long before they have finished the dark obituary calendar laid before them.

I do not know that I shall ever again have so good an opportunity of being useful as was granted me by the raising of the question which produced this Essay. For I have abundant evidence that it has made many practitioners more cautious in their relations with puerperal females, and I have no doubt it will do so still, if it has a chance of being read, though it should call out a hundred counterblasts, proving to the satisfaction of their authors that it proved nothing. And for my part, I had rather rescue one mother from being poisoned by her attendant, than claim to have saved forty out of fifty patients to whom I had carried the disease. Thus, I am willing to avail myself of any hint coming from without to offer this paper once more to the press. The occasion has presented itself, as will be seen, in a convenient if not in a flattering form.

I send this Essay again to the MEDICAL PROFESSION, without the change of a word or syllable. I find, on reviewing it, that it anticipates and eliminates those secondary questions which cannot be entertained for a moment until the one great point of fact is peremptorily settled. In its very statement of the doctrine maintained it avoids all discussion of the nature of the disease *"known as puerperal fever,"* and all the somewhat stale philology of the word *contagion.* It mentions, fairly enough, the names of sceptics, or unbelievers as to the reality of personal transmission; of Dewees, of Tonnellé, of Dugès, of Baudelocque, and others; of course, not including those whose works were then unwritten or unpublished; nor enumerating all the Continental writers who, in ignorance of the great mass of evidence accu-

mulated by British practitioners, could hardly be called well informed on this subject. It meets all the array of negative cases,—those in which disease did not follow exposure,—by the striking example of smallpox, which, although one of the most contagious of diseases, is subject to the most remarkable irregularities and seeming caprices in its transmission. It makes full allowance for other causes besides personal transmission, especially for epidemic influences. It allows for the possibility of different modes of conveyance of the destructive principle. It recognizes and supports the belief that a series of cases may originate from a single primitive source which affects each new patient in turn; and especially from cases of Erysipelas. It does not undertake to discuss the theoretical aspect of the subject; that is a secondary matter of consideration. Where facts are numerous, and unquestionable, and unequivocal in their significance, theory must follow them as it best may, keeping time with their step, and not go before them, marching to the sound of its own drum and trumpet. Having thus narrowed its area to a limited practical platform of discussion, a matter of life and death, and not of phrases or theories, it covers every inch of it with a mass of evidence which I conceive a Committee of Husbands, who can count coincidences and draw conclusions as well as a Synod of Accoucheurs, would justly consider as affording ample reasons for an *unceremonious dismissal* of a practitioner (if it is conceivable that such a step could be waited for), after five or six funerals had marked the path of his daily visits, while other practitioners were not thus escorted. To the Profession, therefore, I submit the paper in its original form, and leave it to take care of itself.

To the MEDICAL STUDENTS, into whose hands this Essay may fall, some words of introduction may be appropriate, and perhaps, to a small number of them, necessary. There are some among them who, from youth, or want of training, are easily bewildered and confused in any conflict of opinions into which their studies lead them. They are liable to lose sight of the main question in collateral issues, and to be run away with by suggestive speculations. They confound belief with evidence, often trusting the first because it is expressed with energy, and slighting the latter because it is calm and unimpassioned. They are not satisfied with proof; they cannot believe a point is settled so long as everybody is not silenced. They have not learned that error is got out of the minds that cherish it, as the taenia is removed from the body, one joint, or a few joints at a time, for the most part, rarely the whole evil at once. They naturally have faith in their instructors, turning to them for truth, and taking what they may choose to give them; babes in

knowledge, not yet able to tell the breast from the bottle, pumping away for the milk of truth at all that offers, were it nothing better than a Professor's shrivelled forefinger.

In the earliest and embryonic stage of professional development, any violent impression on the instructor's mind is apt to be followed by some lasting effect on that of the pupil. No mother's mark is more permanent than the mental nevi and moles, and excrescences, and mutilations, that students carry with them out of the lecture room, if once the teeming intellect which nourishes theirs has been scared from its propriety by any misshapen fantasy. Even an impatient or petulant expression, which to a philosopher would be a mere index of the low state of amiability of the speaker at the moment of its utterance, may pass into the young mind as an element of its future constitution, to injure its temper or corrupt its judgment. It is a duty, therefore, which we owe to this younger class of students, to clear any important truth which may have been rendered questionable in their minds by such language, or any truth-teller against whom they may have been prejudiced by hasty epithets, from the impressions such words have left. Until this is done, they are not ready for the question, where there is a question, for them to decide. Even if we ourselves are the subjects of the prejudice, there seems to be no impropriety in showing that this prejudice is local or personal, and not an acknowledged conviction with the public at large. It may be necessary to break through our usual habits of reserve to do this, but this is the fault of the position in which others have placed us.

Two widely-known and highly-esteemed practitioners, Professors in two of the largest Medical Schools of the Union, teaching the branch of art which includes the Diseases of Women, and therefore speaking with authority; addressing in their lectures and printed publications large numbers of young men, many of them in the tenderest immaturity of knowledge, have recently taken ground in a formal way against the doctrine maintained in this paper.[1] The first of the two publications, Dr. Hodge's Lecture, while its theoretical considerations and negative experiences do not seem to me to require any further notice than such as lay ready for them in my Essay written long before, is, I am pleased to say, unobjectionable in tone and language, and may be read without offense.

This can hardly be said of the chapter of Dr. Meigs's volume which treats of Contagion in Childbed Fever. There are expressions used in it which might well put a stop to all scientific discussions, were they to form the current coin in our exchange of opinions. I leave the "very young gentlemen," whose careful expositions of the results of practice in

more than six thousand cases are characterized as "the jejune and fizenless dreamings of sophomore writers," to the sympathies of those "dear young friends," and "dear young gentlemen," who will judge how much to value their instructor's counsel to think for themselves, knowing what they are to expect if they happen not to think as he does.

One unpalatable expression I suppose the laws of construction oblige me to appropriate to myself, as my reward for a certain amount of labor bestowed on the investigation of a very important question of evidence, and a statement of my own practical conclusions. I take no offense, and attempt no retort. No man makes a quarrel with me over the counterpane that covers a mother, with her newborn infant at her breast. There is no epithet in the vocabulary of slight and sarcasm that can reach my personal sensibilities in such a controversy. Only just so far as a disrespectful phrase may turn the student aside from the examination of the evidence, by discrediting or dishonoring the witness, does it call for any word of notice.

I appeal from the disparaging language by which the Professor in the Jefferson School of Philadelphia would dispose of my claims to be listened to. I appeal, not to the vote of the Society for Medical Improvement, although this was an unusual evidence of interest in the paper in question, for it was a vote passed among my own townsmen; nor to the opinion of any American, for none know better than the Professors in the great Schools of Philadelphia how cheaply the praise of native contemporary criticism is obtained. I appeal to the recorded opinions of those whom I do not know, and who do not know me, nor care for me, except for the truth that I may have uttered; to Copland, in his *Medical Dictionary,* who has spoken of my Essay in phrases to which the pamphlets of American "scribblers" are seldom used from European authorities; to Ramsbotham, whose compendious eulogy is all that self-love could ask; to the *Fifth Annual Report* of the Registrar-General of England, in which the second-hand abstract of my Essay figures largely, and not without favorable comment, in an important appended paper. These testimonies, half forgotten until this circumstance recalled them, are dragged into the light, not in a paroxysm of vanity, but to show that there may be food for thought in the small pamphlet which the Philadelphia Teacher treats so lightly. They were at least unsought for, and would never have been proclaimed but for the sake of securing the privilege of a decent and unprejudiced hearing.

I will take it for granted that they have so far counterpoised the depreciating language of my fellow-countryman and fellow-teacher as to gain me a reader here and there among the youth-

ful class of students I am now addressing. It is only for their sake that I think it necessary to analyze, or explain, or illustrate, or corroborate any portion of the following Essay. But I know that nothing can be made too plain for beginners; and as I do not expect the practitioner, or even the more mature student, to take the trouble to follow me through an Introduction which I consider wholly unnecessary and superfluous for them, I shall not hesitate to stoop to the most elementary simplicity for the benefit of the younger student. I do this more willingly because it affords a good opportunity, as it seems to me, of exercising the untrained mind in that medical logic which does not seem to have been either taught or practiced in our schools of late, to the extent that might be desired.

I will now exhibit, in a series of propositions reduced to their simplest expression, the same essential statements and conclusions as are contained in the Essay, with such commentaries and explanations as may be profitable to the inexperienced class of readers addressed.

I. It has been long believed, by many competent observers, that Puerperal Fever (so called) is sometimes carried from patient to patient by medical assistants.

II. The express object of this Essay is to prove that it is so carried.

III. In order to prove this point, it is not necessary to consult any medical theorist as to whether or not it is consistent with his preconceived notions that such a mode of transfer should exist.

IV. If the medical theorist insists on being consulted, and we see fit to indulge him, he cannot be allowed to assume that the alleged laws of contagion, *deduced from observation* in other diseases, shall be cited to disprove the alleged laws *deduced from observation* in this. Science would never make progress under such conditions. Neither the long incubation of hydrophobia, nor the protecting power of vaccination, would ever have been admitted, if the results of observation in these affections had been rejected as contradictory to the previously ascertained laws of contagion.

V. The disease in question is not a common one; producing, on the average, about three deaths in a thousand births, according to the English Registration returns which I have examined.

VI. When an unusually large number of cases of this disease occur about the same time, it is inferred, therefore, that there exists some special cause for this increased frequency. If the disease prevails extensively over a wide region of country, it is attributed without dispute to an *epidemic* influence. If it prevails in a single locality, as in a hospital, and not elsewhere, this is considered proof that some *local* cause is there active in its production.

VII. When a large number of

cases of this disease occur in rapid succession, in one individual's ordinary practice, and few or none elsewhere, these cases appearing in scattered localities, in patients of the same average condition as those who escape under the care of others, there is the same reason for connecting the cause of the disease with the *person* in this instance, as with the *place* in that last mentioned.

VIII. Many series of cases, answering to these conditions, are given in this Essay, and many others will be referred to which have occurred since it was written.

IX. The alleged results of observation may be *set aside;* first, because the so-called facts are in their own nature equivocal; secondly, because they stand on insufficient authority; thirdly, because they are not sufficiently numerous. But, in this case, the disease is one of striking and well-marked character; the witnesses are experts, interested in denying and disbelieving the facts; the number of consecutive cases in many instances frightful, and the number of series of cases such that I have no room for many of them except by mere reference.

X. These results of observation, being admitted, may, we will suppose, be *interpreted* in different methods. Thus the coincidences may be considered the effect of *chance.* I have had the chances calculated by a competent person, that a given practitioner, A., shall have sixteen fatal cases in a month, on the following data: A. to average attendance upon two hundred and fifty births in a year; three deaths in one thousand births to be assumed as the average from puerperal fever; no epidemic to be at the time prevailing. It follows, from the answer given me, that if we suppose every one of the five hundred thousand annual births of England to have been recorded during the last half-century, there would not be one chance in a million million million millions that one such series should be noted. No possible fractional error in this calculation can render the chance a working probability. Applied to dozens of series of various lengths, it is obviously an absurdity. Chance, therefore, is out of the question as an explanation of the admitted coincidences.

XI. There is, therefore, *some* relation of cause and effect between the physician's presence and the patient's disease.

XII. Until it is proved to what *removable condition* attaching to the attendant the disease is owing, he is bound to stay away from his patients so soon as he finds himself singled out to be tracked by the disease. How long, and with what other precautions, I have suggested, without dictating, at the close of my Essay. If the physician does not at once act on any reasonable suspicion of his being the medium of transfer, the families where he is engaged, if they are allowed to know the facts, should decline his services

for the time. His feelings on the occasion, however interesting to himself, should not be even named in this connection. A physician who talks about *ceremony* and *gratitude,* and *services rendered,* and the *treatment he got,* surely forgets himself; it is impossible that he should seriously think of these small matters where there is even a question whether he may not carry disease, and death, and bereavement into any one of "his families," as they are sometimes called.

I will now point out to the young student the mode in which he may relieve his mind of any confusion, or possibly, if *very* young, any doubt, which the perusal of Dr. Meigs's Sixth Letter may have raised in his mind.

The most prominent ideas of the Letter are, first, that the transmissible nature of puerperal fever appears improbable, and, secondly, that it would be very inconvenient to the writer. Dr. Woodville, Physician to the Small-Pox and Inoculation Hospital in London, found it improbable, and exceedingly inconvenient to himself, that cow-pox should prevent smallpox; but Dr. Jenner took the liberty to prove the fact, notwithstanding.

I will first call the young student's attention to the show of negative facts (exposure without subsequent disease), of which much seems to be thought. And I may at the same time refer him to Dr. Hodge's Lecture, where he will find the same kind of facts and reasoning. Let him now take up Watson's Lectures, the good sense and spirit of which have made his book a universal favorite, and open to the chapter on Continued Fever. He will find a paragraph containing the following sentence:

> A man might say,
>
> > I was in the battle of Waterloo, and saw many men around me fall down and die, and it was said that they were struck down by musket-balls; but I know better than that, for I was there all the time, and so were many of my friends, and we were never hit by any musket-balls. Musket-balls, therefore, could not have been the cause of the deaths we witnessed.
>
> And if, like contagion, they were not palpable to the senses, such a person might go on to affirm that no proof existed of there being any such thing as musket-balls.

Now let the student turn back to the chapter on Hydrophobia in the same volume. He will find that John Hunter knew a case in which, of twenty-one persons bitten, only one died of the disease. He will find that one dog at Charenton was bitten at different times by thirty different mad dogs, and outlived it all. Is there

no such thing, then, as hydrophobia? Would one take no especial precautions if his wife, about to become a mother, had been bitten by a rabid animal, because so many escape? Or let him look at *Underwood on Diseases of Children*,[2] and he will find the case of a young woman who was inoculated eight times in thirty days, at the same time attending several children with smallpox, and yet was not infected. But seven weeks afterwards she took the disease and died.

It would seem as if the force of this argument could hardly fail to be seen, if it were granted that every one of these series of cases were so reported as to prove that there could have been no transfer of disease. *There is not one of them* so reported, in the Lecture or the Letter, as to prove that the disease may not have been carried by the practitioner. I strongly suspect that it was so carried in some of these cases, but from the character of the very imperfect evidence the question can never be settled without further disclosures.

Although the Letter is, as I have implied, principally taken up with secondary and collateral questions, and might therefore be set aside as in the main irrelevant, I am willing, for the student's sake, to touch some of these questions briefly, as an illustration of its logical character.

The first thing to be done, as I thought when I wrote my Essay, was to throw out all discussions of the word *contagion*, and this I did effectually by the careful wording of my statement of the subject to be discussed. My object was not to settle the etymology or definition of a word, but to show that women had often died in childbed, poisoned in some way by their medical attendants. On the other point, I, at least, have no controversy with anybody, and I think the student will do well to avoid it in this connection. If I must define my position, however, as well as the term in question, I am contented with Worcester's definition; provided always this avowal do not open another side-controversy on the merits of his Dictionary, which Dr. Meigs has not cited, as compared with Webster's, which he has.

I cannot see the propriety of insisting that all the laws of the eruptive fevers must necessarily hold true of this peculiar disease of puerperal women. If there were any such propriety, the laws of the eruptive fevers must at least be stated correctly. It is not true, for instance, as Dr. Meigs states, that contagion is "no respecter of persons"; that "it attacks all individuals alike." To give one example: Dr. Gregory, of the Small-Pox Hospital, who ought to know, says that persons pass through life apparently insensible to or unsusceptible of the smallpox virus, and that the same persons do not take the vaccine disease.

As to the short time of incubation, of which so much is made, we have no right to decide before-

hand whether it shall be long or short, in the cases we are considering. A dissection wound may produce symptoms of poisoning in six hours; the bite of a rabid animal may take as many months.

After the student has read the case in Dr. Meigs's 136th paragraph, and the following one, in which he exclaims against the idea of contagion, because the patient, delivered on the 26th of December, was attacked in twenty-four hours, and died on the third day, let him read what happened at the "Black Assizes" of 1577 and 1750. In the first case, six hundred persons sickened the same night of the exposure, and three hundred more in three days.[3] Of those attacked in the latter year, the exposure being on the 11th of May, Alderman Lambert died on the 13th, Under-Sheriff Cox on the 14th, and many of note before the 20th.[4] But these are old stories. Let the student listen then to Dr. Gerhard, whose reputation as a cautious observer he may be supposed to know.

> The nurse was shaving a man, who died in a few hours after his entrance; he inhaled his breath, which had a nauseous taste, and in an hour afterwards was taken with nausea, cephalalgia, and singing of the ears. From that *moment* the attack began, and assumed a severe character. The assistant was supporting another patient, who died soon afterwards; he felt the pungent heat upon his skin, and was taken immediately with the symptoms of typhus.[5]

It is by notes of cases, rather than notes of admiration, that we must be guided, when we study the Revised Statutes of Nature, as laid down from the curule chairs of Medicine.

Let the student read Dr. Meigs's 140th paragraph soberly, and then remember, that not only does he *infer, suspect,* and *surmise,* but he actually *asserts* (page 154), "there was poison in the house," because three out of five patients admitted into a ward had puerperal fever and died. Have I not as much right to draw a positive inference from "Dr. A.'s" seventy exclusive cases as he from the three cases in the ward of the Dublin Hospital? All practical medicine, and all action in common affairs, is founded on inferences. How does Dr. Meigs know that the patients he bled in puerperal fever would not have all got well if he had not bled them?

> You see a man discharge a gun at another; you see the flash, you hear the report, you see the person fall a lifeless corpse; and you *infer,* from all these circumstances, that there was a ball discharged from the gun, which entered his body and caused his death, because such is the usual and natural cause of such an effect. But you did not see the ball leave

the gun, pass through the air, and enter the body of the slain; and your testimony to the fact of killing is, therefore, only inferential,—in other words, circumstantial. It is *possible* that no ball was in the gun; and we *infer* that there was, only because we cannot account for death on any other supposition.[6]

The question always comes to this: Is the circumstance of intercourse with the sick followed by the appearance of the disease in a proportion of cases so much greater than any other circumstance common to any portion of the inhabitants of the place under observation, as to make it inconceivable that the succession of cases occurring in persons having that intercourse should have been the result of chance? If so, the inference is unavoidable, that that intercourse must have acted as a cause of the disease. *All observations which do not bear strictly on that point are irrelevant,* and, in the case of an epidemic first appearing in a town or district, a succession of *two cases* is sometimes sufficient to furnish evidence which, on the principle I have stated, is nearly irresistible.[7]

Possibly an inexperienced youth may be awestruck by the quotation from Cuvier. These words, or their equivalent, are certainly to be found in his Introduction. So are the words "top not come down"! to be found in the Bible, and they were as much meant for the ladies' headdresses as the words of Cuvier were meant to make clinical observation wait for a permit from anybody to look with its eyes and count on its fingers. Let the inquiring youth read the whole Introduction, and he will see what they mean.

I intend no breach of courtesy, but this is a proper place to warn the student against skimming the prefaces and introductions of works for mottoes and embellishments to his thesis. He cannot learn anatomy by thrusting an exploring needle into the body. He will be very liable to misquote his author's meaning while he is picking off his outside sentences. He may make as great a blunder as that simple prince who praised the conductor of his orchestra for the piece just before the overture; the musician was too good a courtier to tell him that it was only the tuning of the instruments.

To the six propositions in the 142d paragraph, and the remarks about "specific" diseases, the answer, if any is necessary, seems very simple. An inflammation of a serous membrane may give rise to secretions which act as a poison, whether that be a "specific" poison or not, as Dr. Horner has told his young readers, and as dissectors know too well; and that poison may produce its symptoms in a few hours after the system has received it, as any may see in Druitt's *Surgery,* if they care to look. Puerperal peritonitis

may produce such a poison, and puerperal women may be very sensible to its influences, conveyed by contact or exhalation. Whether this is so or not, facts alone can determine, and to facts we have had recourse to settle it.

The following statement is made by Dr. Meigs in his 142d paragraph, and developed more at length, with rhetorical amplifications, in the 134th. "No human being, save a pregnant or parturient woman, is susceptible to the poison." This statement is wholly incorrect, as I am sorry to have to point out to a Teacher in Dr. Meigs's position. I do not object to the erudition which quotes Willis and Fernelius, the last of whom was pleasantly said to have "preserved the dregs of the Arabs in the honey of his Latinity." But I could wish that more modern authorities had not been overlooked. On this point, for instance, among the numerous facts disproving the statement, the *American Journal of Medical Sciences,* published not far from his lecture room, would have presented him with a respectable catalogue of such cases. Thus he might refer to Mr. Storrs's paper "On the Contagious Effects of Puerperal Fever on the Male Subject; or on Persons not Childbearing" (Jan. 1846), or to Dr. Reid's case (April 1846), or to Dr. Barron's statement of the children's dying of peritonitis in an epidemic of puerperal fever at the Philadelphia Hospital (Oct. 1842), or to various instances cited in Dr. Kneeland's article (April 1846). Or, if he would have referred to the *New York Journal,* he might have seen Prof. Austin Flint's cases. Or, if he had honored my Essay so far, he might have found striking instances of the same kind in the first of the new series of cases there reported and elsewhere. I do not see the bearing of his proposition, if it were true. But it is one of those assertions that fall in a moment before a slight examination of the facts; and I confess my surprise, that a professor who lectures on the Diseases of Women should have ventured to make it.

Nearly seven pages are devoted to showing that I was wrong in saying I would not be

> . . . understood to imply that there exists a doubt in the mind of any well-informed member of the medical profession as to the fact that puerperal fever is sometimes communicated from one person to another, both directly and indirectly.

I will devote seven lines to these seven pages, which seven lines, if I may say it without offense, are, as it seems to me, six more than are strictly necessary.

The following authors are cited as sceptics by Dr. Meigs: –

Dewees. – I cited the same passage. Did not know half the facts.
Robert Lee. – Believes the disease is sometimes communicable by

contagion. *Tonnellé Baudelocque.* – Both cited by me. *Jacquemier.* – Published three years after my Essay. *Kiwisch.* – Behindhand in knowledge of Puerperal Fever.[8] *Paul Dubois.* – *Scanzoni.*

Continental writers not well informed on this point.[9]

The story of Von Busch is of interest and value, but there is nothing in it which need perplex the student. It is not pretended that the disease is always, or even, it may be, in the majority of cases, carried about by attendants; only that it is so carried in certain cases. That it may have local and epidemic causes, as well as that depending on personal transmission, is not disputed. Remember how smallpox often disappears from a community in spite of its contagious character, and the necessary exposure of many persons to those suffering from it; in both diseases contagion is only one of the coefficients of the disease.

I have already spoken of the possibility that Dr. Meigs may have been the medium of transfer of puerperal fever in some of the cases he has briefly catalogued. Of Dr. Rutter's cases I do not know how to speak. I only ask the student to read the facts stated by Dr. Condie, as given in my Essay, and say whether or not a man should allow his wife to be attended by a practitioner in whose hands "scarcely a female that has been delivered for weeks past has escaped an attack," "while no instance of the disease has occurred in the patients of any other accoucheur practicing in the same district." If I understand Dr. Meigs and Dr. Hodge, they would not warn the physician or spare the patient under such circumstances. They would "go on," if I understand them, not to seven, or seventy, only, but to seventy times seven, if they could find patients. If this is not what they mean, may we respectfully ask them to state what they do mean, to their next classes, in the name of humanity, if not of science!

I might repeat the question asked concerning Dr. Rutter's cases, with reference to those reported by Dr. Roberton. Perhaps, however, the student would like to know the opinion of a person in the habit of working at matters of this kind in a practical point of view. To satisfy him on this ground, I addressed the following question to the President of one of our principal Insurance Companies, leaving Dr. Meigs's book and my Essay in his hands at the same time.

> *Question.* If such facts as Roberton's cases were before you, and the attendant had had ten, or even five fatal cases, or three, or *two* even, would you, or would you not, if insuring the life of the next patient to be taken care of by that attendant, expect an extra premium over that of an average case of childbirth?

Answer. Of course I should require a very large extra premium, if I would take the risk at all.

But I do not choose to add the expressions of indignation which the examination of the facts before him called out. I was satisfied from the effect they produced on him, that if all the hideous catalogues of cases now accumulated were fully brought to the knowledge of the public, nothing, since the days of Burke and Hare, has raised such a cry of horror as would be shrieked in the ears of the Profession.

Dr. Meigs has elsewhere invoked "Providence" as the alternative of accident, to account for the "coincidences." (*Obstetrics*, Phil. 1852, p. 631.) If so, Providence either acts through the agency of secondary causes, as in other diseases, or not. If through such causes, let us find out what they are, as we try to do in other cases. It may be true that offenses, or diseases, will come, but "woe unto him through whom they come," if we catch him in the voluntary or careless act of bringing them! But if Providence does not act through secondary causes in this particular sphere of etiology, then why does Dr. Meigs take such pains to reason so extensively about the laws of contagion, which, on that supposition, have no more to do with this case than with the plague which destroyed the people after David had numbered them? Above all, what becomes of the theological aspect of the question, when he asserts that a practitioner was "only *unlucky* in meeting with the epidemic cases?" (*Op. cit.* p. 633.) We do not deny that the God of battles decides the fate of nations; but we like to have the biggest squadrons on our side, and we are particular that our soldiers should not only say their prayers, but also keep their powder dry. We do not deny the agency of Providence in the disaster at Norwalk, but we turn off the engineer, and charge the Company five thousand dollars apiece for every life that is sacrificed. Why a grand jury should not bring in a bill against a physician who switches off a score of women one after the other along his private track, when he knows that there is a black gulf at the end of it, down which they are to plunge, while the great highway is clear, is more than I can answer. It is not by laying the open draw to Providence that he is to escape the charge of manslaughter.

To finish with all these lesser matters of question, I am unable to see why a female must necessarily be unattended in her confinement, because she declines the services of a particular practitioner. In all the series of cases mentioned, the death-carrying attendant was surrounded by others not tracked by disease and its consequences. Which, I would ask, is worse,—to call in another, even a rival practitioner, or to submit an unsuspecting female to

a risk which an Insurance Company would have nothing to do with?

I do not expect ever to return to this subject. There is a point of mental saturation, beyond which argument cannot be forced without breeding impatient, if not harsh, feelings towards those who refuse to be convinced. If I have so far manifested neither, it is well to stop here, and leave the rest to those younger friends who may have more stomach for the dregs of a stale argument.

The extent of my prefatory remarks may lead some to think that I attach too much importance to my own Essay. Others may wonder that I should expend so many words upon the two productions referred to, the Letter and the Lecture. I do consider my Essay of much importance so long as the doctrine it maintains is treated as a *question*, and so long as any important part of the defense of that doctrine is thought to rest on its evidence or arguments. I cannot treat as insignificant any opinions bearing on life, and interests dearer than life, proclaimed yearly to hundreds of young men, who will carry them to their legitimate results in practice.

The teachings of the two Professors in the great schools of Philadelphia are sure to be listened to, not only by their immediate pupils, but by the Profession at large. I am too much in earnest for either humility or vanity, but I do entreat those who hold the keys of life and death to listen to me also for this once. I ask no personal favor; but I beg to be heard in behalf of the women whose lives are at stake, until some stronger voice shall plead for them.

I trust that I have made the issue perfectly distinct and intelligible. And let it be remembered that this is no subject to be smoothed over by nicely adjusted phrases of half-assent and half-censure divided between the parties. The balance must be struck boldly and the result declared plainly. If I have been hasty, presumptuous, ill-informed, illogical; if my array of facts means nothing; if there is no reason for any caution in the view of these facts; let me be told so on such authority that I must believe it, and I will be silent henceforth, recognizing that my mind is in a state of disorganization. If the doctrine I have maintained is a mournful truth; if to disbelieve it, and to practice on this disbelief, and to teach others so to disbelieve and practice, is to carry desolation, and to charter others to carry it, into confiding families, let it be proclaimed as plainly what is to be thought of the teachings of those who sneer at the alleged dangers, and scout the very idea of precaution. Let it be remembered that *persons* are nothing in this matter; better that twenty pamphleteers should be silenced, or as many professors unseated, than that one mother's life should

be taken. There is no quarrel here between men, but there is deadly incompatibility and exterminating warfare between doctrines. *Coincidences*, meaning nothing, though a man have a monopoly of the disease for weeks or months; or *cause and effect*, the cause being in some way connected with the person; this is the question. If I am wrong, let me be put down by such a rebuke as no rash declaimer has received since there has been a public opinion in the medical profession of America; if I am right, let doctrines which lead to professional homicide be no longer taught from the chairs of those two great Institutions. Indifference will not do here; our Journalists and Committees have no right to take up their pages with minute anatomy and tediously detailed cases, while it is a question whether or not the "black-death" of childbed is to be scattered broadcast by the agency of the mother's friend and adviser. Let the men who mold opinions look to it; if there is any voluntary blindness, any interested oversight, any culpable negligence, even, in such a matter, and the facts shall reach the public ear; the pestilence-carrier of the lying-in chamber must look to God for pardon, for man will never forgive him.

THE CONTAGIOUSNESS OF PUERPERAL FEVER

IN COLLECTING, enforcing, and adding to the evidence accumulated upon this most serious subject, I would not be understood to imply that there exists a doubt in the mind of any well-informed member of the medical profession as to the fact that puerperal fever is sometimes communicated from one person to another, both directly and indirectly. In the present state of our knowledge upon this point I should consider such doubts merely as a proof that the sceptic had either not examined the evidence, or, having examined it, refused to accept its plain and unavoidable consequences. I should be sorry to think, with Dr. Rigby, that it was a case of "oblique vision"; I should be unwilling to force home the *argumentum ad hominem* of Dr. Blundell, but I would not consent to make a *question* of a momentous fact which is no longer to be considered as a subject for trivial discussions, but to be acted upon with silent promptitude. It signifies nothing that wise and experienced practitioners have sometimes doubted the reality of the danger in question; no man has the right to doubt it any longer. No negative facts, no opposing opinions, be they what they may, or whose they may, can form any answer to the series of cases now within the reach of all who choose to explore the records of medical science.

If there are some who conceive that any important end would be answered by recording such opinions, or by collecting the history of all the cases they could find in

which no evidence of the influence of contagion existed, I believe they are in error. Suppose a few writers of authority can be found to profess a disbelief in contagion, – and they are very few compared with those who think differently, – is it quite clear that they formed their opinions on a view of all the facts, or is it not apparent that they relied mostly on their own solitary experience? Still further, of those whose names are quoted, is it not true that scarcely a single one could by any possibility have known the half or the tenth of the facts bearing on the subject which have reached such a frightful amount within the last few years? Again, as to the utility of negative facts, as we may briefly call them, – instances, namely, in which exposure has not been followed by disease, – although, like other truths, they may be worth knowing, I do not see that they are like to shed any important light upon the subject before us. Every such instance requires a good deal of circumstantial explanation before it can be accepted. It is not enough that a practitioner should have had a single case of puerperal fever not followed by others. It must be known whether he attended others while this case was in progress, whether he went directly from one chamber to others, whether he took any, and what precautions. It is important to know that several women were exposed to infection derived from the patient, so that allowance may be made for want of predisposition. Now if of negative facts so sifted there could be accumulated a hundred for every one plain instance of communication here recorded, I trust it need not be said that we are bound to guard and watch over the hundredth tenant of our fold, though the ninety and nine may be sure of escaping the wolf at its entrance. If any one is disposed, then, to take a hundred instances of lives endangered or sacrificed out of those I have mentioned, and make it reasonably clear that within a similar time and compass *ten thousand* escaped the same exposure, I shall thank him for his industry, but I must be permitted to hold to my own practical conclusions, and beg him to adopt or at least to examine them also. Children that walk in calico before open fires are not always burned to death; the instances to the contrary may be worth recording; but by no means if they are to be used as arguments against woolen frocks and high fenders.

I am not sure that this paper will escape another remark which it might be wished were founded in justice. It may be said that the facts are too generally known and acknowledged to require any formal argument or exposition, that there is nothing new in the positions advanced, and no need of laying additional statements before the Profession. But on turning to two works, one almost universally, and the other extensively appealed to as authority in this

country, I see ample reason to overlook this objection. In the last edition of Dewees's Treatise on the *Diseases of Females,* it is expressly said,

> In this country, under no circumstance that puerperal fever has appeared hitherto, does it afford the slightest ground for the belief that it is contagious.

In the *Philadelphia Practice of Midwifery* not one word can be found in the chapter devoted to this disease which would lead the reader to suspect that the idea of contagion had ever been entertained. It seems proper, therefore, to remind those who are in the habit of referring to these works for guidance, that there may possibly be some sources of danger they have slighted or omitted, quite as important as a trifling irregularity of diet, or a confined state of the bowels, and that whatever confidence a physician may have in his own mode of treatment, his services are of questionable value whenever he carries the bane as well as the antidote about his person.

The practical point to be illustrated is the following: *The disease known as Puerperal Fever is so far contagious as to be frequently carried from patient to patient by physicians and nurses.*

Let me begin by throwing out certain incidental questions, which, without being absolutely essential, would render the subject more complicated, and by making such concessions and assumptions as may be fairly supposed to be without the pale of discussion.

1. It is granted that all the forms of what is called puerperal fever may not be, and probably are not, equally contagious or infectious. I do not enter into the distinctions which have been drawn by authors, because the facts do not appear to me sufficient to establish any absolute line of demarcation between such forms as may be propagated by contagion and those which are never so propagated. This general result I shall only support by the authority of Dr. Ramsbotham, who gives, as the result of his experience, that the same symptoms belong to what he calls the infectious and the sporadic forms of the disease, and the opinion of Armstrong in his original Essay. If others can show any such distinction, I leave it to them to do it. But there are cases enough that show the prevalence of the disease among the patients of a single practitioner when it was in no degree epidemic, in the proper sense of the term. I may refer to those of Mr. Roberton and of Dr. Peirson, hereafter to be cited, as examples.

2. I shall not enter into any dispute about the particular *mode* of infection, whether it be by the atmosphere the physician carries about him into the sick-chamber, or by the direct application of the virus to the absorbing surfaces

with which his hand comes in contact. Many facts and opinions are in favor of each of these modes of transmission. But it is obvious that in the majority of cases it must be impossible to decide by which of these channels the disease is conveyed, from the nature of the intercourse between the physician and the patient.

3. It is not pretended that the contagion of puerperal fever must always be followed by the disease. It is true of all contagious diseases, that they frequently spare those who appear to be fully submitted to their influence. Even the vaccine virus, fresh from the subject, fails every day to produce its legitimate effect, though every precaution is taken to insure its action. This is still more remarkably the case with scarlet fever and some other diseases.

4. It is granted that the disease may be produced and variously modified by many causes besides contagion, and more especially by epidemic and endemic influences. But this is not peculiar to the disease in question. There is no doubt that smallpox is propagated to a great extent by contagion, yet it goes through the same periods of periodical increase and diminution which have been remarked in puerperal fever. If the question is asked how we are to reconcile the great variations in the mortality of puerperal fever in different seasons and places with the supposition of contagion, I will answer it by another question from Mr. Farr's letter to the Registrar-General. He makes the statement that "*five* die weekly of smallpox in the metropolis when the disease is not epidemic," – and adds,

> The problem for solution is, – Why do the five deaths become 10, 15, 20, 31, 58, 88, weekly, and then progressively fall through the same measured steps?

5. I take it for granted, that if it can be shown that great numbers of lives have been and are sacrificed to ignorance or blindness on this point, no other error of which physicians or nurses may be occasionally suspected will be alleged in palliation of this; but that whenever and wherever they can be shown to carry disease and death instead of health and safety, the common instincts of humanity will silence every attempt to explain away their responsibility.

The treatise of Dr. Gordon of Aberdeen was published in the year 1795, being among the earlier special works upon the disease. A part of his testimony has been occasionally copied into other works, but his expressions are so clear, his experience is given with such manly distinctness and disinterested honesty, that it may be quoted as a model which might have been often followed with advantage.

This disease seized such

women only as were visited, or delivered by a practitioner, or taken care of by a nurse, who had previously attended patients affected with the disease.

I had evident proofs of its infectious nature, and that the infection was as readily communicated as that of the smallpox or measles, and operated more speedily than any other infection with which I am acquainted.

I had evident proofs that every person who had been with a patient in the puerperal fever became charged with an atmosphere of infection, which was communicated to every pregnant woman who happened to come within its sphere. This is not an assertion, but a fact, admitting of demonstration, as may be seen by a perusal of the foregoing table, [—referring to a table of seventy-seven cases, in many of which the channel of propagation was evident].

He adds,

> It is a disagreeable declaration for me to mention, that I myself was the means of carrying the infection to a great number of women.

He then enumerates a number of instances in which the disease was conveyed by midwives and others to the neighboring villages, and declares that

> . . . these facts fully prove that the cause of the puerperal fever, of which I treat, was a specific contagion, or infection, altogether unconnected with a noxious constitution of the atmosphere.

But his most terrible evidence is given in these words:

> I ARRIVED AT THAT CERTAINTY IN THE MATTER, THAT I COULD VENTURE TO FORETELL WHAT WOMEN WOULD BE AFFECTED WITH THE DISEASE, UPON HEARING BY WHAT MIDWIFE THEY WERE TO BE DELIVERED, OR BY WHAT NURSE THEY WERE TO BE ATTENDED, DURING THEIR LYING-IN: AND ALMOST IN EVERY INSTANCE, MY PREDICTION WAS VERIFIED.

Even previously to Gordon, Mr. White of Manchester had said,

> I am acquainted with two gentlemen in another town, where the whole business of midwifery is divided betwixt them, and it is very remarkable that one of them loses several patients every year of the puerperal fever, and the other never so much as meets with the disorder, [—a difference which he seems to attribute to their various modes of treatment].[10]

Dr. Armstrong has given a number of instances in his Essay on Puerperal Fever, of the prevalence of the disease among the pa-

tients of a single practitioner. At Sunderland,

> . . . in all, forty-three cases occurred from the 1st of January to the 1st of October, when the disease ceased; and of this number forty were witnessed by Mr. Gregson and his assistant, Mr. Gregory, the remainder having been separately seen by three accoucheurs.

There is appended to the London edition of this Essay, a letter from Mr. Gregson, in which that gentleman says, in reference to the great number of cases occurring in his practice,

> The cause of this I cannot pretend fully to explain, but I should be wanting in common liberality if I were to make any hesitation in asserting, that the disease which appeared in my practice was highly contagious, and communicable from one puerperal woman to another. . . . It is customary among the lower and middle ranks of people to make frequent personal visits to puerperal women resident in the same neighborhood, and I have ample evidence for affirming that the infection of the disease was often carried about in that manner; and, however painful to my feelings, I must in candor declare, that it is very probable the contagion was conveyed, in some instances, by myself, though I took every possible care to prevent such a thing from happening, the moment that I ascertained that the distemper was infectious.

Dr. Armstrong goes on to mention six other instances within his knowledge, in which the disease had at different times and places been limited, in the same singular manner, to the practice of individuals, while it existed scarcely if at all among the patients of others around them. Two of the gentlemen became so convinced of their conveying the contagion, that they withdrew for a time from practice.

I find a brief notice, in an American Journal, of another series of cases, first mentioned by Mr. Davies, in the *Medical Repository*. This gentleman stated his conviction that the disease is contagious.

> In the autumn of 1822 he met with twelve cases, while his medical friends in the neighborhood did not meet with any, 'or at least very few.' He could attribute this circumstance to no other cause than his having been present at the examination, after death, of two cases, some time previous, and of his having imparted the disease to his patients, notwithstanding every precaution.[11]

Dr. Gooch says,

> It is not uncommon for the

greater number of cases to occur in the practice of one man, whilst the other practitioners of the neighborhood, who are not more skillful or more busy, meet with few or none. A practitioner opened the body of a woman who had died of puerperal fever, and continued to wear the same clothes. A lady whom he delivered a few days afterwards was attacked with and died of a similar disease; two more of his lying-in patients, in rapid succession, met with the same fate; struck by the thought, that he might have carried contagion in his clothes, he instantly changed them, and met with no more cases of the kind.[12] A woman in the country, who was employed as washerwoman and nurse, washed the linen of one who had died of puerperal fever; the next lying-in patient she nursed died of the same disease; a third nursed by her met with the same fate, till the neighborhood, getting afraid of her, ceased to employ her.[13]

In the winter of the year 1824,

Several instances occurred of its prevalence among the patients of particular practitioners, whilst others who were equally busy met with few or none. One instance of this kind was very remarkable. A general practitioner, in large midwifery practice, lost so many patients from puerperal fever, that he determined to deliver no more for some time, but that his partner should attend in his place. This plan was pursued for one month, during which not a case of the disease occurred in their practice. The elder practitioner, being then sufficiently recovered, returned to his practice, but the first patient he attended was attacked by the disease and died. A physician, who met him in consultation soon afterwards, about a case of a different kind, and who knew nothing of this misfortune, asked him whether puerperal fever was at all prevalent in his neighborhood, on which he burst into tears, and related the above circumstances.

Among the cases which I saw this season in consultation, four occurred in one month in the practice of one medical man, and all of them terminated fatally.[14]

Dr. Ramsbotham asserted, in a Lecture at the London Hospital, that he had known the disease spread through a particular district, or be confined to the practice of a particular person, almost every patient being attacked with it, while others had not a single case. It seemed capable, he thought, of conveyance, not only by common modes, but through the dress of the attendants upon the patient.[15]

In a letter to be found in the *London Medical Gazette* for January, 1840, Mr. Roberton of Manchester makes the statement which I here give in a somewhat condensed form.

A midwife delivered a woman on the 4th of December, 1830, who died soon after with the symptoms of puerperal fever. In one month from this date the same midwife delivered thirty women, residing in different parts of an extensive suburb, of which number sixteen caught the disease and all died. These were the only cases which had occurred for a considerable time in Manchester. The other midwives connected with the same charitable institution as the woman already mentioned are twenty-five in number, and deliver, on an average, ninety women a week, or about three hundred and eighty a month. None of these women had a case of puerperal fever.

> Yet all this time this woman was crossing the other midwives in every direction, scores of the patients of the charity being delivered by them in the very same quarters where her cases of fever were happening.

Mr. Roberton remarks, that little more than half the women she delivered during this month took the fever; that on some days all escaped, on others only one or more out of three or four; a circumstance similar to what is seen in other infectious maladies.

Dr. Blundell says,

> Those who have never made the experiment can have but a faint conception how difficult it is to obtain the exact truth respecting any occurrence in which feelings and interests are concerned. Omitting particulars, then, I content myself with remarking, generally, that from more than one district I have received accounts of the prevalence of puerperal fever in the practice of some individuals, while its occurrence in that of others, in the same neighborhood, was not observed. Some, as I have been told, have lost ten, twelve, or a greater number of patients, in scarcely broken succession; like their evil genius, the puerperal fever has seemed to stalk behind them wherever they went. Some have deemed it prudent to retire for a time from practice. In fine, that this fever may occur spontaneously, I admit; that its infectious nature may be plausibly disputed, I do not deny; but I add, considerately, that in my own family I had rather that those I esteemed the most should be delivered, unaided, in a stable, by the manger-side, than that they should receive the best help, in the fairest apartment, but exposed to the vapors of this pitiless disease. Gossiping friends, wetnurses, monthly nurses, the practitioner himself, these are the channels by

which, as I suspect, the infection is principally conveyed.[16]

At a meeting of the Royal Medical and Chirurgical Society, Dr. King mentioned that some years since a practitioner at Woolwich lost sixteen patients from puerperal fever in the same year. He was compelled to give up practice for one or two years, his business being divided among the neighboring practitioners. No case of puerperal fever occurred afterwards, neither had any of the neighboring surgeons any cases of this disease.

At the same meeting Mr. Hutchinson mentioned the occurrence of three consecutive cases of puerperal fever, followed subsequently by two others, all in the practice of one accoucheur.[17]

Dr. Lee makes the following statement:

> In the last two weeks of September, 1827, five fatal cases of uterine inflammation came under our observation. All the individuals so attacked had been attended in labor by the same midwife, and no example of a febrile or inflammatory disease of a serious nature occurred during that period among the other patients of the Westminster General Dispensary, who had been attended by the other midwives belonging to that institution.[18] □

(To be Continued.)

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Editor's Comment:

The denial of the physician's contribution to maternal deaths from puerperal fever is the classic historic example of the obduracy of obstetricians to accept or admit culpability. It is as if medical practice were enshrined and could never be harmful. H's landmark essay – to be concluded in the next issue – helps to unfold the story. HR

ROBERT HEBERT QUICK

Essays on Educational Reformers*

XI

THE GENTLEMEN OF PORT-ROYAL

§ 1. IN THE sixteen-hundreds by far the most successful schoolmasters were the Jesuits. In spite of their exclusion from the University, they had in the Province of Paris some 14,000 pupils, and in Paris itself at the Collège de Clermont, 1,800. Might they not have neglected "the Little Schools," which were organized by the friends and disciples of the Abbé de Saint-Cyran, schools in which the numbers were always small, about twenty or twenty-five, and only once increasing to fifty? And yet the Jesuits left no stone unturned, no weapon unemployed, in their attack on "the Little Schools." The conflict seems to us like an engagement between a man-of-war and a fishing boat. That the poor fishing boat would soon be beneath the waves, was clear enough from the beginning, and she did indeed speedily disappear; but the victors have never recovered from their victory and never will. Whenever we think of Jesuitism we are not more forcibly reminded of Loyola than of Pascal. All educated Frenchmen, most educated people everywhere, get their best remembered impressions of the Society of Loyola from the Provincial Letters. (Pascal)

§ 2. The Society had a long standing rivalry with the University of Paris, and the University not only refused to admit the Jesuits, but several times petitioned the Parliament to chase them out of France. On one of these occasions the advocate who was retained by the University was Antoine Arnauld, a man of renowned eloquence; and he threw himself into the attack with all his heart. From that time the Jesuits had a standing feud with the house of Arnauld.

§ 3. But it was no mere personal dislike that separated the Port-Royalists and the Jesuits. Port-Royal with which the Arnauld family was so closely united, became the stronghold of a

*The seventh of several parts.

theology which was unlike that of the Jesuits, and was denounced by them as heresy. The daughter of Antoine Arnauld was made, at the age of eleven years, Abbess of Port-Royal, a Cistercian convent not far from Versailles. This position was obtained for her by a fraud of Marion, Henry IV's advocate-general, who thought only of providing comfortably for one of the twenty children to whom his daughter, Made. Arnauld, had made him grandfather. Never was a nomination more scandalously obtained or used to better purpose. The Mère Angélique is one of the saints of the universal church, and she soon became the restorer of the religious life first in her own and then by her influence and example in other convents of her Order.

§ 4. In these reforms she had nothing to fear from her hereditary foes the Jesuits; but she soon came under the influence of a man whose theory of life was as much opposed to the Jesuits' theory as to that of the world which found in the Jesuits the most accommodating father confessors.

Duvergier de Hauranne (1581-1643) better known by the name of his "abbaye," Saint-Cyran, was one of those commanding spirits who seem born to direct others and form a distinct society. In vain Richelieu offered him the posts most likely to tempt him. The prize that Saint-Cyran had set his heart upon was not of this world, and Richelieu could assist him in one way only – by persecution. This assistance the Cardinal readily granted, and by his orders Saint-Cyran was imprisoned at Vincennes, and not set at liberty till Richelieu was himself summoned before a higher tribunal.

§ 5. Driven by prevailing sickness from Port-Royal des Champs, the Mère Angélique transported her community (in 1626) to a house purchased for them in Paris by her mother who in her widowhood became one of the Sisters. In Paris Angélique sought for herself and her convent the spiritual direction of Saint-Cyran (not yet a prisoner), and from that time Saint-Cyran added the Abbess and Sisters of Port-Royal to the number of those who looked up to him as their pattern and guide in all things.

Port-Royal des Champs was in course of time occupied by a band of solitaries who at the bidding of Saint-Cyran renounced the world and devoted themselves to prayer and study. To them we owe the works of "the Gentlemen of Port-Royal."

§ 6. It is then to Saint-Cyran we must look for the ideas which became the distinctive mark of the Port-Royalists.

Saint-Cyran was before all things a theologian. In his early days at Bayonne his studies had been shared by a friend who afterwards was professor of theology

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at Louvain, and then Bishop of Ypres. This friend was Jansenius. Their searches after truth had brought them to opinions which in the England of the nineteenth century are known as "Evangelical." According to "Catholic" teaching all those who receive the creed and the sacraments of the Church and do not commit "mortal" sin are in a "state of salvation," that is to say the great majority of Christians are saved. This teaching is rejected by those of another school of thought who hold that only a few "elect" are saved and that the great body even of Christians are doomed to perdition.

§ 7. Such a belief as this would seem to be associated of necessity with harshness and gloom; but from whatever cause, there has been found in many, even in most, cases no such connection. Those who have held that the great mass of their fellow-creatures had no hope in a future world, have thrown themselves lovingly into all attempts to improve their condition in this world. Still, their main effort has always been to increase the number of the converted and to preserve them from the wiles of the enemy. This Saint-Cyran sought to do by selecting a few children and bringing them up in their tender years like hothouse plants, in the hope that they would be prepared when older and stronger, to resist the evil influences of the world.

§ 8. His first plan was to choose out of all Paris six children and to confide them to the care of a priest appointed to direct their consciences, and a tutor of not more than twenty-five years old, to teach them Latin.

> I should think [says he] it was doing a good deal if I did not advance them far in Latin before the age of twelve, and made them pass their first years confined to one house or a monastery in the country where they might be allowed all the pastimes suited to their age and where they might see only the example of a good life set by those about them. (Letter quoted by Carré, p. 20.)

§ 9. His imprisonment put a stop to this plan, "but," says Saint-Cyran, "I do not lightly break off what I undertake for God"; so when intrusted with the disposal of 2,000 francs by M. Bignon, he started the first "Little School," in which two small sons of M. Bignon's were taken as pupils. The name of "Little Schools," was given partly perhaps because according to their design the numbers in any school could never be large, partly no doubt to deprecate any suspicion of rivalry with the schools of the University. The children were to be taken at an early age, nine or ten, before they could have any guilty knowledge of evil, and Saint-Cyran made in all cases a stipulation that at any time a child might be returned to his friends; but in cases where the

master's care seemed successful, the pupils were to be kept under it till they were grown up.

§ 10. The Little Schools had a short and troubled career of hardly more than fifteen years. They were not fully organized till 1646; they were proscribed a few years later and in 1661 were finally broken up by Louis XIV, who was under the influence of their enemies the Jesuits. But in that time the Gentlemen of Port-Royal had introduced new ideas which have been a force in French education and indeed in all literary education ever since.

To Saint-Cyran then we trace the attempt at a particular kind of school, and to his followers some new departures in the training of the intellect.

§ 11. Basing his system on the Fall of Man, Saint-Cyran came to a conclusion which was also reached by Locke though by a different road. To both of them it seemed that children require much more individual care and watching than they can possibly get in a public school. Saint-Cyran would have said what Locke said:

> The difference is great between two or three pupils in the same house and three or four score boys lodged up and down: for let the master's industry and skill be never so great, it is impossible he should have fifty or one hundred scholars under his eye any longer than they are in school together: Nor can it be expected that he should instruct them successfully in anything but their books; the forming of their minds and manners [preserving them from the danger of the enemy, Saint-Cyran would have said] requiring a constant attention and particular application to every single boy, which is impossible in a numerous flock, and would be wholly in vain (could he have time to study and correct everyone's peculiar defects and wrong inclinations) when the lad was to be left to himself or the prevailing infection of his fellows the greater part of the four-and-twenty hours. (*Thoughts c. Ed.* § 70.)

§ 12. An English public schoolmaster told the Commission on Public Schools, that he stood *in loco parentis* to fifty boys. "Rather a large family," observed one of the Commissioners dryly. The truth is that in the bringing-up of the young there is the place of the schoolmaster and of the schoolfellows, as well as that of the parents; and of these several forces one cannot fulfill the functions of the others.

§ 13. According to the theory or at least the practice of English public schools, boys are left in their leisure hours to organize their life for themselves, and they form a community from which the masters are, partly by their own overwork, partly by the traditions of the school, utterly exclud-

ed. From this the intellectual education of the boys no doubt suffers. "Engage them in conversation with men of parts and breeding," says Locke; and this was the old notion of training when boys of good family grew up as pages in the household of some nobleman. But, except in the holidays, the young aristocrats of the present day talk only with other boys, and servants, and tradesmen. Hence the amount of thought and conversation given to school topics, especially the games, is out of all proportion to the importance of such things; and this does much to increase what Matthew Arnold calls "the barbarians' " inaptitude for ideas.

§ 14. What are we to say about the effects of the system on the morals of the boys? If we were to start like Saint-Cyran from the doctrine of human depravity, we should entirely condemn the system and predict from it the most disastrous results (1); but from experience we come to a very different conclusion. Bishop Dupanloup, indeed, spoke of the public schools of France as *"ces gouffres."* This is not what is said or thought of the English schools, and they are filled with boys whose fathers and grandfathers were brought up in them, and desire above all things to maintain the old traditions.

§ 15. The Little Schools of Port-Royal aimed at training a few boys very differently; each master had the charge of five or six only, and these were never to be out of his presence day or night.

Separate functions

§ 16. It may reasonably be objected that such schools would be possible only for a few children of well-to-do parents, and that men who would thus devote themselves could be found only at seasons of great enthusiasm. Under ordinary circumstances small schools have most of the drawbacks and few of the advantages which are to be found in large schools. As I have already said, parents, schoolmasters, and school-fellows have separate functions in education; and even in the smallest school the master can never take the place of the parent, or the school become the home. Children at home enter into the world of their father and mother; the family friends are *their* friends, the family events affect them as a matter of course. But in the school, however small, the children's interests are unconnected with the master and the master's family. The boys may be on the most intimate, even affectionate terms with the grown people who have charge of them; but the mental horizon of the two parties is very different, and their common area of vision but small. In such cases the young do not rise into the world of the adults, and it is almost impossible for the adults to descend into theirs. They are "no company" the one for the other, and to be constantly

in each other's presence would subject both to very irksome restraint. When left to themselves, boys in small numbers are far more likely to get into harm than boys in large numbers. In large communities even of boys, "the common sense of most" is a check on the badly disposed. So as it seems to me if from any cause the young cannot live at home and attend a day-school, they will be far better off in a large boarding school than in one that would better fulfill the requirements of Erasmus, Saint-Cyran, and Locke.

§ 17. As Saint-Cyran attributed immense importance to the part of the master in education, he was not easily satisfied with his qualifications.

> There is no occupation in the Church that is more worthy of a Christian; next to giving up one's life there is no greater charity. . . . The charge of the soul of one of these little ones is a higher employment than the government of all the world. (Cadet, 2.)

So thought Saint-Cyran, and he was ready to go to the ends of the earth to find the sort of teacher he wanted.

§ 18. He was so anxious that the children should see only that which was good that the servants were chosen with peculiar care.

§ 19. For the masters his favorite rule was: "Speak little; put up with much; pray still more." Piety was not to be instilled so much by precepts as by the atmosphere in which the children grew up. "Do not spend so much time in speaking to them about God as to God about them:" so formal instruction was never to be made wearisome. But there was to be an incessant watch against evil influences and for good. "In guarding the citadel," says Lancelot, "we fail if we leave open a single gateway by which the enemy might enter."

§ 20. Though anxious, like the Jesuits, to make their boys' studies "not only endurable, but even delightful," the Gentlemen of Port-Royal banished every form of rivalry. Each pupil was to think of one whom he should try to catch up, but this was not a school-fellow, but his own higher self, his ideal. Here Pascal admits that the exclusion of competition had its drawbacks and that the boys sometimes became indifferent.

§ 21. As for the instruction it was founded on this principle: the object of schools being piety rather than knowledge there was to be no pressure in studying, but the children were to be taught what was sound and enduring.

§ 22. In all occupations there is of necessity a tradition. In the higher callings the tradition may be of several kinds. First there may be a tradition of noble thoughts and high ideals, which will be conveyed in the words of the greatest men who have been engaged in that calling, or have

thought out the theory of it. Next there will be the tradition of the very best workers in it. And lastly there is the tradition of the common man who learns and passes on just the ordinary views of his class and the ordinary expedients for getting through ordinary work. Of these different kinds of tradition, the schoolroom has always shown a tendency to keep to this last, and the common man is supreme. Young teachers are mostly required to fulfill their daily tasks without the smallest preparation for them; so they have to get through as best they can, and have no time to think of any high ideal, or of any way of doing their work except that which gives them least trouble. "Practice makes perfect," says the proverb, but it would be truer to say that practice in doing work badly soon makes perfect in contentment with bad workmanship. Thus it is that the tradition of the schoolroom settles down for the most part into a deadly routine, and teachers who have long been engaged in carrying it on seem to lose their powers of vision like horses who turn mills in the dark.

The Gentlemen of Port-Royal worked free from schoolroom tradition. "If the want of emulation was a drawback," says Sainte-Beuve, "it was a clear gain to escape from all routine, from all pedantry." Piety as we have seen was their main object. Next to it they wished to "carry the intellects of their pupils to the highest point they could attain to."

§ 23. In doing this they profited by their freedom from routine to try experiments. They used their own judgments and sought to train the judgment of their pupils. Themselves knowing the delights of literature, they resolved that their pupils should know them also. They would banish all useless difficulties and do what they could to "help the young and make study even more pleasant to them than play and pastime." (Preface to Cic.'s *Billets,* quoted by Sainte-Beuve, vol. iij, p. 423.)

§ 24. One of their innovations, though startling to their contemporaries, does not seem to us very surprising. It was the custom to begin reading with a three or four years' course of reading Latin, because in that language all the letters were pronounced. The connection between sound and sense is in our days not always thought of, but even among teachers no advocates would now be found for the old method which kept young people for the first three or four years uttering sounds they could by no possibility understand. The French language might have some disadvantage from its silent letters, but this was small compared with the disadvantage felt in Latin from its silent sense. So the Port-Royalists began reading with French.

§ 25. Further than this, they objected to reading through spelling, and pointed out that as consonants cannot be pronounced by themselves they should be taken only in connection with the adja-

cent vowel. Pascal applied himself to the subject and invented the method described in the 6th chap. of the General Grammar (Carré, p. xxiij) and introduced by his sister Jacqueline at Port-Royal des Champs.

§ 26. When the child could read French, the Gentlemen of Port-Royal sought for him books within the range of his intelligence. There was nothing suitable in French, so they set to work to produce translations in good French of the most readable Latin books, "altering them just a little," as said the chief translator De Saci, for the sake of purity. In this way they gallicized the Fables of Phaedrus, three Comedies of Terence, and the Familiar Letters of Cicero.

§ 27. In this we see an important innovation. As I have tried to explain the effect of the Renascence was to banish both the mother-tongue and literature proper from the schoolroom; for no language was tolerated but Latin, and no literature was thought possible except in Latin or Greek. Before any literature could be known, or indeed, instruction in any subject could be given, the pupils had to learn Latin. This neglect of the mother-tongue was one of the traditional mistakes pointed out and abandoned by the Port-Royalists.

> People of quality complain [says De Saci] and complain with reason, that in giving their children Latin we take away French, and to turn them into citizens of ancient Rome we make them strangers in their native land. After learning Latin and Greek for 10 or 12 years, we are often obliged at the age of 30 to learn French. (Cadet.)

So Port-Royal proposed breaking through this bondage to Latin, and laid down the principle, new in France, though not in the country of Mulcaster or of Ratke, that everything should be taught through the mother-tongue.

Next, the Port-Royalists sought to give their pupils an early and a pleasing introduction to literature. The best literature in those days was the classical; and suitable works from that literature might be made intelligible *by means of translations.* In this way the Port-Royalists led their pupils to look upon some of the classical authors not as inventors of examples in syntax, but as writers of books that *meant* something. And thus both the mother-tongue and literature were brought into the schoolroom.

§ 28. When the boys had by this means got some feeling for literature and some acquaintance with the world of the ancients, they began the study of Latin. Here again all needless difficulties were taken out of their way. No attempt indeed was made to teach language without grammar, the rationale of language, but the science of grammar was reduced to first principles, and the special

grammar of the Latin language was no longer taught by means of the work established in the University, but by a "New Method" written in French which gave essentials only and had for its motto: "To me it will be among the grammarian's good points not to know everything." (Quintil.)

§ 29. With this minimum of the essentials of the grammar and with a previous acquaintance with the sense of the book the pupils were introduced to the Latin language and were taught to translate a Latin author into French. This was a departure from the ordinary route, which after a course of learning grammar rules in Latin went to the "theme," *i.e.,* to composition in Latin.

The art of translating into the mother-tongue was made much of. School "construes," which consist in substituting a word for a word, were entirely forbidden, and the pupils had to produce the old writer's thoughts *in French.*

§ 30. From this we see that the training was literary. But in the study of form the Port-Royalists did not neglect the inward for the outward. Their great work, which still stands the attacks of time, is the Port-Royal *Logic, or the Art of Thinking* (*see* Trans. by T. Spencer Baynes, 1850). This was substantially the work of Arnauld; and it was Arnauld who led the Port-Royalists in their rupture with the philosophy of the Middle Age, and who openly followed Descartes. In the *Logic* we find the claims of reason asserted as if in defiance of the Jesuits.

> It is a heavy bondage to think oneself forced to agree in everything with Aristotle and to take him as the standard of truth in philosophy. . . . The world cannot long continue in this restraint, and is recovering by degrees its natural and reasonable liberty, which consists in accepting that which we judge to be true and rejecting that which we judge to be false. (Quoted by Cadet.)

§ 31. To mark the change, the Port-Royalists called their book not "the Art of Reasoning," but "the Art of Thinking," and it was in this art of thinking that they endeavored to train their scholars. They paid great attention to geometry, and Arnauld wrote a book *(New Elements of Geometry)* which so well satisfied Pascal that after reading the MS. he burnt a similar work of his own.

Sweet reasonableness

§ 32. The Port-Royalists then sought to introduce into the schoolroom a "sweet reasonableness." They were not touched, as Comenius was, by the spirit of Bacon, and knew nothing of a key for opening the secrets of Nature. They loved literature and resolved that their pupils should love it also; and with this end they would give the first notions of it in the mother-tongue; but the

love of literature still bound them to the past, and they aimed simply at making the best of the Old Education without any thought of a New.

§ 33. In one respect they seem less wise than Rabelais and Mulcaster, less wise perhaps than their foes the Jesuits. They gave little heed to training the body, and thought of the soul and the mind only; or if they thought of the body they were concerned merely that it should do no harm.

> Not only must we form the minds of our pupils to virtue, [says Nicole] we must also bend their bodies to it, that is, we must endeavor that the body do not prove a hindrance to their leading a well-regulated life or draw them by its weight to any disorder. For we should know that as men are made up of mind and body, a wrong turn given to the body in youth is often in after life a great hindrance to piety.

§ 34. But let us not underrate the good effect produced by this united effort of Christian toil and Christian thought. "Nothing should be more highly esteemed than good sense," (Preface to the *Logique*), and Port-Royal did a great work in bringing good sense and reason to bear on the practice of the schoolroom. When the Little Schools were dispersed the Gentlemen still continued to teach, but the lessons they gave were now in the "art of thinking" and in the art of teaching; and all the world might learn of them, for they taught in the only way left open to them; they published books.

§ 35. Of these writers on pedagogy the most distinguished was "the great Arnauld," *i.e.,* Antoine Arnauld, (1612-1694) brother of the Mère Angélique. His *Règlement des Études* shows us how literary instruction was given at Port-Royal. In these directions we have not so much the rules observed in the Little Schools as the experience of the Little Schools rendered available for the schools of the University. On this account Sainte-Beuve speaks of the *Règlement* of Arnauld as forming a preface to the *Treatise on Studies* of Rollin. In the *Règlement* we see Arnauld yielding to what seems a practical necessity and admitting competition and prizes. Some excellent advice is given, especially on practice in the use of the mother-tongue. The young people are to question and answer each other about the substance of what they have read, about the more remarkable thoughts in their author or the more beautiful expressions. Each day two of the boys are to narrate a story which they themselves have selected from a classical author.

§ 36. With the notable exception of Pascal, Arnauld was the most distinguished writer among the Gentlemen of Port-Royal. A writer less devoted to controversy than Arnauld, less attached to the thought of Saint-Cyran and

of Descartes, but of wider popularity, was Nicole, who had Made. de Sévigné for an admirer, and Locke for one of his translators.

Nicole has given us a valuable contribution to pedagogy in his essay on the right bringing-up of a prince. In this essay he shows us with what thought and care he had applied himself to the art of instruction, and he gives us hints that all teachers may profit by. Take the following:–

> § 37. Properly speaking it is not the masters, it is no instruction from without, that makes things understood; at the best the masters do nothing but expose the things to the interior light of the mind, by which alone they can be understood. It follows that where this light is wanting instruction is as useless as trying to shew pictures in the dark. The very greatest minds are nothing but lights in confinement, and they have always sombre and shady spots; but in children the mind is nearly full of shade and emits but little rays of light. So everything depends on making the most of these rays, on increasing them and exposing to them what one wishes to have understood. For this reason it is hard to give general rules for instructing anyone, because the instruction must be adapted to the mixture of light and darkness, which differs widely in different minds, especially with children. We must look where the day is breaking and bring to it what we wish them to understand; and to do this we must try a variety of ways for getting at their minds and must persevere with such as we find have most success.
>
> But generally speaking we may say that, as in children the light depends greatly on their senses, we should as far as possible attach to the senses the instruction we give them, and make it enter not only by the ear but also by the sight, as there is no sense which makes so lively an impression on the mind and forms such sharp and clear ideas.

This is excellent. There is a wise proverb that warns us that "however soon we get up in the morning the sunrise comes never the earlier." A vast amount of instruction is thrown away because the instructors will not wait for the daybreak.

Goodness and intelligence

§ 38. For the moral training of the young there is one qualification in the teacher which is absolutely indispensable–goodness. Similarly for the intellectual training, there is an indispensable qualification–intelligence. This is the qualification required by the system of Port-Royal, but not required in working the ordinary machinery of the schoolroom either in those days or in ours.

When Nicole has described how instruction should be given so as to train the judgment and cultivate the taste, he continues:

> As this kind of instruction comes without observation, so is the profit derived from it likely to escape observation also; that is, it will not announce itself by anything on the surface and palpable to the common man. And on this account persons of small intelligence are mistaken about it and think that a boy thus instructed is no better than another, because he cannot make a better translation from Latin into French, or beat him in saying his Virgil. Thus judging of the instruction by these trifles only, they often make less account of a really able teacher than of one of little science and of a mind without light. (Nicole in Cadet.)

In these days of marks and percentages we seem agreed that it must be all right if the children can stand the tests of the examiner or the inspector. Something may no doubt be got at by these tests; but we cannot hope for any genuine care for education while everything is estimated.

§ 39. Whatever was required to adapt the thought of Port-Royal to the needs of classical schools, especially the schools of the University of Paris was supplied by Rollin (1661-1741) whose "Way of teaching and studying Literature," united the lessons of Port-Royal with much material drawn from his own experience and from his acquaintance with the writings of other authors, especially Quintilian and Seneca. Having been twice Rector of the University (in 1694 and 1695) Rollin had managed to bring into the schools much that was due to Port-Royal; and in his *Traité* he has the tact to give the improved methods as the ordinary practice of his colleagues.

§ 40. Much that Rollin has said applies only to classical or at most to literary instruction; but some of his advice will be good for all teachers as long as the human mind needs instruction. I have met with nothing that seems to me to go more truly to the very foundation of the art of teaching than the following:

> We should never lose sight of this grand principle that STUDY DEPENDS ON THE WILL, and the will does not endure constraint. (Quintil. j, I, cap. 3.) (2) We can, to be sure, put constraint on the body and make a pupil, however unwilling, stick to his desk, can double his toil by punishment, compel him to finish a task imposed upon him, and with this object we can deprive him of play and recreation. But is this work of the galley-slave studying? And what remains to the pupil from this kind of study but a hatred of books, of learning, and of masters, often till the end of

his days? It is then the will that we must draw on our side, and this we must do by gentleness, by friendliness, by persuasion, and above all by the allurement of pleasure.

§ 41. The passage I have quoted is from the *Article* "on giving a taste for study"; and if some masters do not agree that this is "one of the most important points concerning education," they will not deny that "it is at the same time one of the most difficult." As Rollin truly says,

> . . . among a very great number of masters who in other respects are highly meritorious there will be found very few who manage to get their pupils to like their work.

§ 42. One of the great causes of the disinclination for schoolwork is to be found according to Rollin and Quintilian, in the repulsive form in which children first become acquainted with the elements of learning.

> In this matter success depends very much on first impressions; and the main effort of the masters who teach the first rudiments should be so to do this, that the child who cannot as yet love study should at least not get an aversion for it from that time forward, for fear lest the bitter taste once acquired should still be in his mouth when he grows older.

§ 43. In this matter Rollin was more truly the disciple of the Port-Royalists than of Quintilian. They it was who protested against the dismal "grind" of learning to read first in an unknown tongue, and of studying the rules of Latin in Latin with no knowledge of Latin, a course which professed to lead, as Sainte-Beuve puts it, "to the unknown through the unintelligible." They directed their highly-trained intellects to the teaching of the elements, and succeeded in proving that the ordinary difficulties were due not to the dullness of the learners, but to the stupidity of the masters. They showed how much might be done to remove these difficulties by following not routine but the dictates of thought, and study and love of the little ones. □

FOOTNOTES

(1) A master in a great public school once stated in a school address what masters and boys felt to be true. "It would hardly be too much to say that the whole problem of education is how to surround the young with good influences. I believe we must go on to add that if the wisest man had set himself to work out this problem without the teaching of experience, he would have been little likely to hit upon the system of which we are so proud, and which we call "the Public School System." If the real secret of education is to surround the young with good influences, is it not a strange paradox to take them at the very age when influences act most despotically and mass them together in large numbers, where much that is coarsest is sure to be tolerated, and much that is gentlest and most refining—the presence of mothers and sisters for example—is for a large part of the year a memory or an echo rather than a living voice? I confess I have never seen any answers to this objection which *apart from the test of experience* I should have been prepared to pronounce satisfactory. It is a simple truth that the moral dangers of our Public School System are enormous. It is the simple truth that do what you will in the way of precau-

tion, you do give to boys of low, animal natures, the very boys who ought to be exceptionally subject to almost despotic restraint, exceptional opportunities of exercising a debasing influence over natures far more refined and spiritual than their own. And it is further the simple but the sad truth, that these exceptional opportunities are too often turned to account, and that the young boy's character for a time – sometimes for a long time – is spoiled or vulgarized by the influence of unworthy companions." This is what public schoolmasters, if their eyes are not blinded by routine, are painfully conscious of. But they find that in the end good prevails; the average boy gains a manly character and contributes towards the keeping up a healthy public opinion which is of great effect in restraining the evil-doer.

(2) Rollin somewhat extends Quintilian's statement: "The desire of learning rests in the will which you cannot force." About attempts to coerce the will in the absence of interest, I may quote a passage from a lecture of mine at Birmingham in 1884, when I did not know that I had behind me such high authorities as Quintilian and Rollin: "I should divide the powers of the mind that may be cultivated in the school-room into two classes: in the first I should put all the higher powers – grasp of meaning, perception of analogy, observation, reflection, imagination, intellectual memory; in the other class is one power only, and that is a kind of memory that depends on the association of sounds. How is it then that in most school-rooms far more time is spent in cultivating this last and least-valuable power than all the rest put together? The explanation is easy. All the higher powers can be exercised only when the pupils are interested, or, as Mr. Thring puts it, 'care for what they are about.' The memory that depends on associating sounds is independent of interest and can be secured by simple repetition. Now it is very hard to awaken interest, and still harder to maintain it. That magician's wand, the cane, with which the schoolmasters of olden time worked such wonders, is powerless here or powerful only in the negative direction; and so is every form of punishment. You may tell a boy – 'If you can't say your lesson you shall stay in and write it out half-a-dozen times!' and the threat may have effect; but no *'instans tyrannus'* from Orbilius downwards has ever thought of saying, 'If you don't take an interest in your work, I'll keep you in till you do!' So teachers very naturally prefer the kind of teaching in which they can make sure of success."

Reprinted from Essays on Educational Reformers *by Robert Hebert Quick as Rewritten in 1890. Volume XVII, International Education Series, William T. Harris (Ed.). D. Appleton and Company, New York, 1902. Chapter XI, pp. 172-196.*

Editor's Comment:

The surprising realization that emerges from the history of intellectual thought is that great minds and innovators build on the great minds that precede them. To exemplify from philosophy and theology, we have Aristotle following Socrates and Plato, Aquinas following Aristotle, Augustine and Albertus Magnus, and Maritain and Gilson following Aquinas and other medievalists. Twelfth century Bernard of Chartres expresses this thought with great humility: "Like dwarfs standing on the shoulders of giants, we see farther than they." Those of us who admire Maria Montessori and who have followed the series on educational reformers can't help but be impressed by the predecessors who paved the way for her great contribution. "Montessorian insights" from the gentlemen of Port-Royal are illustrative: Choose teachers who "speak little, put up with much, pray still more," and place a premium on their goodness as well as their intelligence; foster the use of the mother tongue; cultivate a love of literature; adapt the elements of learning with a "sweet reasonableness" to the mind of the learner; attach instruction to the senses; avoid wearisome instruction and pressure and routine in learning; "make study more pleasant than play and pastime"; ban reading through spelling; "expose things to be understood to the interior light of the mind," for "no instruction from without ... makes things understood"; "study and love ... the little ones." But for the discrepancy of time, it would be easy to believe that the gentlemen were quoting Maria. HR

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