THE ESTROGEN MYSTIQUE

OR

MENSTRUATION IN CULTURAL CONTEXT

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The biological basis of human behavior has recently been the subject of intensive investigation, especially within the framework of physiological psychology. On the other hand, psychosomatic medicine and the developing research on biofeedback mechanisms are more concerned with behavioral effects on biological mechanisms. Much of the insight gained in these studies has been considered by anthropologists in their analysis of cultural norms. One particular interaction of biology and culture will be discussed in this report, that of the menstrual cycle and the complexes of social behaviors related to it in various societies.

The existence of particular customs related to menstruation has been well documented in the literature of anthropology with perhaps the most extensive records summarized by Sir James Frazer in The Golden Bough (Gaster, 1959). For example, Australian aborigine women are forbidden during menstruation to touch anything that men use or to walk on a path used by men. In Uganda the pots handled by a menstruating woman must be destroyed, and Eskimos require the ritual purification of utensils used by a menstruating woman (Gaster: p.212). The Arapesh of New Guinea and some groups of North American Indians banned a menstruating woman to an isolated hut, while women in ancient Persia were restricted to a room at least 15 paces from the fire and water supply (Graham 1951:30). These restrictive prescriptions most often include avoidance of contact with a menstruating woman, varying from forbidding sexual intercourse with her to completely banning her from the community. Many of these taboos have been continued in one form or another

down to recent times and their residual effects appear to be widespread in the most modern societies.

Students of anthropology frequently encounter descriptions of menstrual taboos in the ethnographies of primitive groups. Several studies have been reported using the data from the Human Relations Area Files to determine the occurrence and correlates of menstrual taboos. One such study was that of William N. Stephens (1961) who analyzed 71 societies for the degree of manifestation of castration anxiety in relation to the intensity of menstrual restrictions. Using Freud's proposals for evidence of fear of castration (severity of sex training, punishment for masturbation, and the postpartum sex taboo), he found a strong relationship to the severity of taboos on menstruating women. By his reasoning, menstrual blood symbolized the blood of castration, leading men to fear menstruating women. Stephens tested several alternate explanations for menstrual taboos, as follows:

a. a disgust reaction, connected with disgust for feces (but no correlation was found with severity of toilet training)
b. abhorrence of menstrual blood per se (cultural "depressors" such as menstrual pads would eliminate the need for taboo, but some societies without pads have few, if any, taboos)
c. taboo is a function of the status of women (but there is no correlation between extensiveness of taboos and rules of residence or descent or importance of women in subsistence)
d. a historical accident, the extensiveness of taboos depending mainly upon borrowing or inheriting (true, but antecedent variables in the cultures studied are also similar)

In a later analysis of Stephens' data, Young and Bacdayan (1965) proposed a sociogenic rather than a psychogenic correlation. They concluded that social rigidity is a sufficient explanation for the occurrence of menstrual taboos. Social

rigidity is defined as the relative lack of communication among the parts of a social system and is a measure of the degree of cleavage among subsystems. They found a high frequency of occurrence of menstrual taboos in association with a condition of social rigidity. In 1967 Philip Bock criticized Young and Bacdayan on several points. He pointed out the high correlation of geographic area with the occurrence of menstrual taboos (Africa, the Americas, Melanesia) and proposed diffusion and culture history as key factors. He outlined the dangers of extracting social facts from their contexts before comparison and suggested the possibility of biased sampling techniques, e.g., what circumstances would lead Western ethnographers to report menstrual customs for a society?

The concept of the menstruating woman as unclean and dangerous to men is as old as historical records in Western cultures. Among the earliest written records on menstrual taboos are the biblical laws in Leviticus (Bullough 1973a:45). Stringent laws were given for the purification of women after childbirth and for ritual hygiene at the time of menstruation. These laws still influence the customs of Orthodox Jews and have undoubtedly played a role in the formation of Judeo-Christian traditions of Europe and America.

Thus, the biological fact of menstruation appears to have a significant correlation with several social facts or cultural norms in many different societies. So many cultures have prescribed restrictive behavior in relation to menstruation that groups lacking it may be considered unusual.

As with other bodily functions, understanding of the

menstrual cycle did not begin until the modern development of the sciences of physiology and biochemistry. In the 1890s the ovaries were first transplanted in animals, and in 1923 estrogen was first isolated. It was soon demonstrated that menstrual flow followed a drop in the estrogen level of the blood, but little more was understood of the entire cycle (Graham: 635).

A review of the attitudes of 19th century American physicians towards menstruation suggests the characteristic beliefs of even a relatively modern society (Bullough 1973b). At a time when women in Euro-American cultures were beginning to challenge the stereotypes about their status in society, several physicians published books and articles on the dangers of mental exertion for pubertal females. Citing cases of weakness, collapse, and insanity among girls attending boarding school, these physicians suggested that exertion of the brain interfered with development of the reproductive apparatus and they specifically asserted the need for long periods of rest during menstruation. The American physician of the late 19th century was generally aware of the theory that ovulation and menstruation were connected but still had little understanding of hormones. A large measure of folklore was still included in most speculations on sexual and reproductive processes. An influential theorist on the topic was Edward H. Clarke whose popular book, Sex in Education: or a Fair Chance for Girls , went through 17 editions in 13 years. Clarke's work was thoroughly attacked by his fellow physicians as unscientific, but it continued to have a wide influence for many years. His

principal thesis was that women could not be educated in the same manner as men and retain good health. Many other physicians jumped into the controversy, citing the evidence of weakness and disability confusing their political and social biases with objective findings. As Bullough points out (1973b:81), many of the physical symptoms reported could as well be ascribed to poor nutrition, tight-waisted corsets, and multiple heavy skirts as to any presumed disability related to menstruation. He continues "...obviously women are anatomically different from men, and they do have monthly periods, but to generalize from this and a few isolated patients a whole theory of female inferiority seems to be an example of poor medical theorizing. The difficulty with past medical theory, whether good or bad, is that it often remains a part of the popular ideology of a later generation".

In modern Euro-American societies there are apparently several interacting biological-behavioral factors at work in relation to the menstrual cycle: 1) a woman's attitude toward herself as a person, e.g., her body-image, her role in close interpersonal relationships, and her potential performance in the larger society; 2) a woman's concept of illness and health, e. g., her expectations of menstrual pain and distress, her reaction to menopause, and her judgments of factors in tension and depression; 3) the attitude of individuals in contact with a menstruating woman, especially her family and physician; 4) the attitude of society in general terms to the ramifications of menstrual cycle phase in relation to the behavior of women, e.g., employers and co-workers, educators, voters, and 5) objective data on the physiological correlates of biology

and behavior, e.g., scientifically designed studies of motor or intellectual performance in relation to phase of the menstrual cycle, or controlled studies of psycho-social factors affecting the cycle itself.

Self-image for a woman develops within the context of her culture and, with respect to menstruation, includes concepts derived from the tradition and folklore of her particular society. Although some members of Western societies consider science as only the newest form of folklore, it is apparent that accurate knowledge of human physiology has been a boon to the physical and mental health of many women. The physical emancipation of American women from the restrictions of the menstrual flow was given a major boost by the development of the sanitary napkin. It first appeared on the market after World War I as a result of the development of cellucotton surgical dressings. When the Kimberley Clark Company planned to market their new product, Kotex, the subject of menstruation had to be brought out into the open. Many imitators also entered the market and new products such as tampons and cups were introduced. One of the first effects was the shedding of heavy skirts and petticoats by women who no longer needed to mask the bulges and odors of the diaper-like pads of earlier years. This new physical freedom and improved hygiene undoubtedly had psychological effects and perhaps allowed some women to begin questioning their roles and potential performance in society in a new way (Bullough 1973a: 340.)

A woman's concept of illness and health as well as her actual physical feelings of well-being may be strongly connected to the menstrual cycle in her own mind as well as in the view of

those around her, whether they be her own family, her employer, her physician, or her track coach. For many girls the menarche or onset of menstruation is accompanied by feelings of fear and disgust reinforced by the use by her family or friends of such terms as "the curse" and by implicit or explicit anticipations of pain, discomfort, and moodiness on a monthly schedule. This type of conditioning has apparently produced in some women neurotic anxieties which enhance any physiologically based tension or discomfort. A brief review of the literature of psychology and psychiatry of women in the last 50 years can produce a wealth of material relating the menstrual cycle, menopause, and fluctuations in hormone levels to the occurrence of neuroses and psychoses, the incidence of suicide and accidents, and the level of female criminal activity (e.g. Balasz 1936; Birtchnell 1974; Chadwick 1932; Coppen 1963; Dickmeiss 1946; Eagleson 1927; Freed and Kroger 1950; Goldschmidt 1934; Healy 1928; Middleton 1934; Sowton, Myers, and Bedale 1928; Stern 1946).

Enough studies have been done to confirm the changing circulating hormone levels during the menstrual cycle, with estrogen at a peak near mid-cycle or the time of ovulation, and progesterone and estrogen both lowest just before or during menstruation. A great many women do report changes in mood and actions during the course of the cycle, but there is disagreement among researchers as to the number of women who report these changes, ranging from 15% in some studies to 95% in others (Paige 1973:41). Karen Paige conducted a study of menstrual distress among 52 women using birth-control pills. Even though the pill tends to minimize hormone fluctuations there were still variations in volume and duration of menstrual bleeding. Paige proposed that

menstrual distress may be a social response to menstruation itself rather than a physiological response to changing hormone levels. She reasoned that if premenstrual anxiety and depression are linked to the bleeding volume, then pill users with reduced flow should report fewer complaints than those with no change in flow pattern. Her study supported her sociogenic hypothesis that reduced anxiety was correlated with reduced flow.

An additional study was done by Paige (1973:45) to determine the relationship of religious background to menstrual complaints. Data were gathered through a questionnaire survey of 352 unmarried college women of known religious affiliation: Jewish, Catholic, or Protestant. Paige attempted to identify social and psychological factors related to menstrual distress, first by exploring the possibility that women use menstruation to "explain" discomfort or stress which in fact has other origins, and second, to investigate the relationship between menstrual distress among different religious groups and three dimensions of femininity. The femininity dimensions were given as follows: family and motherhood orientation; virginity or sexual experience; and menstrual social behavior; i. e., behavioral change and adherence to rituals. The results showed that women with physical complaints and psychological stress during menstruation tend to report similar symptoms when they are not menstruating. Each religious group was equally likely to report distress, but the origins and meanings of the symptoms differed. For the Jewish women the amount of distress was related most strongly to adherence to rituals and menstrual taboos, for Catholics the amount of distress correlated highest with an

index for family and motherhood orientation, and distress among Protestants was not strongly correlated with any particular social factor. Paige concludes that the traditionally feminine woman is most apt to suffer physical discomfort and psychological stress. She found no evidence to support theories that a woman's reaction to menstruation is a result of her early experience or of information she had received, and no evidence that variations in symptoms are related to physiological differences such as cycle length, regularity, or age at menarche. As she points out, all women exhibit hormone fluctuations during the cycle but not all have menstrual symptoms. She suggests that the problem should be studied more thoroughly in relation to cultural ideologies which narrowly define behaviors and emotions which are appropriately feminine. Her most recent research on a sample of 114 societies from around the world leads her to propose that menstrual taboos and rituals reflect a society's emphasis on sexual stratification, including specifically the control of women and their fertility (1973: 46).

Several recent reports and reviews have been published on the correlation of phases of the menstrual cycle with certain aspects of behavior: alcoholism, psychiatric symptomology, suicide, psychological states, motor performance, response to heat stress, and intellectual performance. The quality of these papers varies widely and summaries are presented here only as examples of the range of recent research.

In 1971 Belfer recorded the menstrual status and cycle phase along with other data from interviews of 34 alcoholic and 10 non-alcoholic women at a clinic. Sixty-seven percent of those still menstruating and 46% of those not menstruating related

their drinking to their menstrual cycle, all of these associating drinking or increased drinking with the premenstrual phase of the cycle. The alcoholics indicated a significant increase in anxiety and depression at the time of the interview, but their femininity scores were normal. Belfer suggests that acceptance or non-acceptance of feminine role behavior and perception of premenstrual physiological changes may be significant stress factors for alcoholic women.

Jacobs and Clark reported in 1970 on a study of 200 patients seeking psychiatric help at either a hospital emergency room or an out-patient clinic. They found a significant correlation between the request for psychiatric help and the phase of the menstrual cycle as follows: 24.5% sought help when menstruating, 22.5% sought help during the premenstrual phase, and 18% asked for help at mid-cycle. The menstrual phase was higher for the emergency room patients and the premenstrual phase higher among the clinic patients. The authors discuss possible causes for this variation related to the time and place of contact with the patient, but the thrust of their article was to alert the physician to record a patient's menstrual history carefully. They believe such a history can be useful for the physician in understanding patterns of disturbance or alterations of affect related to cycle phase.

A review of the literature on suicide in relation to the menstrual cycle was published by Wetzel and McClure in 1972. They summarized 23 studies into four categories: completed suicides, attempted suicides, and suicide threateners. They were critical of most of the reports either on the basis of biased selection of cases or of inadequate methods for determin-

ing the menstrual phase of the patient. The studies which they reviewed suggested a higher frequency of completed suicides during the menstrual phase and a higher frequency of suicide attempts in the late luteal and menstrual phases. They conclude that no adequate studies have yet been done, and predict that well-designed research will show that, for some suicidal groups, the phase of the menstrual cycle will be one effective predictor of the timing of a suicide attempt.

The concept of a premenstrual syndrome and psychological studies in relation to it were reviewed by Parlee in 1973. She divided these studies into four categories on the basis of method: 1) those collecting data on positive correlations between specific behaviors and the phase of the menstrual cycle; 2) those using retrospective questionnaires on symptoms and mood changes; 3) those employing daily self-ratings of moods, symptoms, and actions; and 4) those using thematic analysis of verbal material collected throughout the menstrual cycle. Parlee is critical of all of these studies for the lack of control group analysis and the choice of base lines for reporting behavioral changes. She points out the difficulty of relating psychological phenomena to specific physiological changes, and deplores the publication practices which limit the presentation of negative results in the literature. She cites the report of R. H. Moos that 150 different symptoms have been reported as associated with the menstrual cycle, and notes the conclusion of K. Dalton that the premenstrual syndrome has been taken to include recurrence of any symptom always at the same time in each menstrual cycle. Parlee says that, in spite of a lack of agreement on the precise nature or timing of the syndrome, a wide variety

of physiological factors have been proposed to account for it. She concludes that psychological studies have not established a class of behaviors and moods measurable in more than one way which can be shown to correlate with any particular menstrual phase for groups of women. In another study Parlee (1974) compared 34 male and 25 female undergraduates using the Menstrual Distress Questionnaire devised by Moos. The correlation of responses suggested to her an interpretation in terms of stereotypic beliefs about the psychological concomitants of menstruation.

As more has been learned of the cyclic nature of levels of circulating hormones, many studies have been carried out in different fields which attempt to correlate various physiological functions with cycle phases. Again the quality of such investigations varies widely and conflicting results are often reported. For example, in 1972 Wearing et al. studied the performance of a group of female intercollegiate athletes on a series of tests of physical fitness correlated with a record of their menstrual cycle history. They concluded that performance on the tests was best during the intermenstrual phases and poorest during the menstrual period. This study can be seriously criticized on several grounds: 1) the subjects knew the purpose of the tests in advance, 2) there was an opportunity for a practice effect to show up in the last repetitions of the same tests, and 3) no objective test of the menstrual phase or circulating hormone level was obtained. Also in 1972, an investigation was reported by Doolittle and Engebretsen on the performance of exercise tests by a group of non-athlete college women. They found no significant correlation between test performance and

cycle phase. Hormonal analyses were done on this group and they revealed a problem of correlation of day of cycle with phase of cycle. The degree of fluctuation in hormone levels between different individuals for the same cycle day casts doubt on the validity of any investigation based solely on the correlation of any behavior with the day of the cycle.

Two papers by Wells and Horvath exemplify the more sophisticated work being done in some physiological studies. In 1973 they reported research on response to heat stress in relation to the menstrual cycle. They found unusually high heart rates in women subjected to environmental heat stress as compared to men. It was found that menstrual phase has little influence on the ability to regulate body temperature. Total plasma proteins and hematocrit decreased and serum electrolytes increased, suggesting a net water influx into the vascular compartment in response to heat dehydration. They proposed that females adjust body temperature primarily through cardiovascular mechanisms involving compartmental fluid shifts, a situation which leads to the impression that women are more subject to circulatory collapse in heat. In a subsequent study reported in 1974 Wells and Horvath subjected a group of female subjects to exercise in a hot environment and attempted to correlate their degree of distress with menstrual cycle phase. No correlation was found. In this situation, apparently, the marked hemodilution observed during resting heat-distress was offset by a tendency to hemoconcentration which occurs following exercise dehydration under normal ambient conditions. These women showed considerable thermal strain which Wells and Horvath believe was caused by insufficient circulating blood to carry

out the transport of oxygen to working muscles and of heat to body surfaces.

The possible relationships of menstruation to cognitive and perceptual-motor behavior have been reviewed by Barbara Sommer (1973). She analyzed four classes of studies reported in the literature: 1) self-reports, in which between 8% and 16% of the subjects had reported they were aware of an impairment of cognitive ability during menstruation; 2) performance measures of physical fitness and coordination, in which little or no cycle effect has been demonstrated; 3) social behavior correlations such as crime statistics, factory absenteeism, or school disciplinary problems, which showed an increase during premenstrual and menstrual phases; and 4) central nervous system correlates which showed a direct effect of gonadal hormones on certain EEG changes (although these changes are not yet clearly related to any cerebral function). Sommer concludes that the responses in these investigations which are mediated by social and psychological factors are more likely to show changes related to the menstrual cycle. She recommends a further search for evidence of hormonal relationships to decreased performance, using a more intensive research design with smaller groups, and emphasizing women in the professions and in decision-making positions. In addition, she proposes further analysis of women's expectations about menstrual disability and how they are acquired, as well as studies of the psychosomatic aspects of cycle fluctuation.

One example of the effect of psychosocial factors on the menstrual cycle was reported recently by McClintock (1971). Citing the effects of pheromones on estrous cycles in mice,

together with anecdotal reports of menstrual synchrony among all-female living groups, she designed an investigation of the changes in menstrual onset dates of a group of 135 dormitory residents at a women's college, on the hypothesis that social groupings influence some aspect of the menstrual cycle. Data were collected three times during the academic year, including the onset dates of the previous two cycles, and the amount of social contact with males and with female room-mates and closest friends. Final results showed that through the year there was a significant increase in synchronization of onset dates between those individuals spending the greatest amount of time together. The amount of time spent with males correlated significantly with the length of the menstrual cycle (more time = shorter cycle), but this factor could not be shown to affect the synchrony pattern. After ruling out maturational factors and the possible influence of awareness of the cycle phase among friends, McClintock proposes that there is some interpersonal physiological process, perhaps the secretion and detection of a female pheromone, which affects the menstrual cycle.

Recent interest in biofeedback mechanisms, which enable some individuals to consciously alter body functions mediated by the autonomic nervous system, may bring a new perspective to the interaction of mind and body in relation to the menstrual cycle. Explanations of such interactions have been proposed before, but there may soon be enough information on the physiology of the nervous system to justify and support a scientifically based body of knowledge to replace the mystique and myth of menstruation in its cultural context.

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