

# NIGHT WAKING IN EARLY INFANCY: PART I

BY

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## The Problem

The tendency for babies to wake in the night is a fact frequently deplored but comparatively little studied. In ordinary social life one meets parents of children of 1 or 2 years of age who have scarcely known an unbroken night since the child was born. The experience of the longitudinal research at the Child Study Centre, confirming the relative frequency and severity of this problem, prompted the following questions:

(a) What is the usual pattern of adjustment to sleeping through the night, and what proportion of babies make such a normal adjustment?

(b) Can differences be found between cases where such normal adjustment is made within the usual time and cases where it is not, as regards (i) characteristics of the child, (ii) characteristics of the physical and social environment, (iii) characteristics of the parents?

(c) Can such differences be found in relation to a more general tendency to wake at night after the initial phase of adjustment?

## The Literature

Theories of sleep are reviewed by Kleitman (1939). Despert (1949) surveys the studies of children's sleep up to that time, and Sperling (1949) gives the results of psychoanalytic experience. Paediatric experience in the field is distilled by Shepherd (1948) and Illingworth (1951, 1953).

Electro-encephalography reveals that delta waves, found in adults only in somnolent states, are the characteristic pattern of early infancy and first begin to lose prominence at moments when the child is attentive 'sometimes as young as 2 or 3 months' (Walter, 1956), *i.e.*, when the 'twilight state' of the newborn is giving way to a sharper demarcation between sleep and mental activity (Ribble, 1943).

That apparently unbroken stretches of sleep are not homogeneous has been demonstrated by observational studies (Buhler, 1930; Irwin and Weiss, 1934; Wagner, 1937, 1939). Aserinsky and

Kleitman (1955) found a cycle of activity and quiescence averaging one hour in duration for infants of any age between 3 and 26 weeks; at the end of the 'deep sleep' phase movements of body and eye suddenly occur, at which point the child may either wake or begin a fresh sleep cycle.

Though there are wide individual variations, more sleep is taken by night than by day, and in longer spells, even in the earliest weeks (Kleitman and Engelmann, 1953). The difference increases rapidly in the first three months, then more slowly. The fact that infants fed on self-demand progressively lengthen the intervals between their night feedings (Gesell and Ilg, 1937; Marquis, 1941) is further proof that maturation plays a large part in this process. Our present purpose is to study deviations from this normal pattern of adjustment to the 24-hour cycle.

## Material for the Present Enquiry

The material of the present enquiry is part of that collected on a sample of about 200 central London children who are being studied longitudinally from birth onwards at the Child Study Centre. This sample is fairly representative of the population using the National Health Service, and includes cases from each of the five major categories of the Registrar-General's classification of social class. A previous paper (Moore, Hindley and Falkner, 1954) sets out the aims and methods of the study. Sleep is only one of many topics covered in the routine interviews with mothers at the Centre. For purposes of the sleep study, the information so gained on 160 cases was supplemented in a subgroup of 45 cases (Group D) by means of home visits.

Although it is recognized that mothers vary considerably in the accuracy of their reports, it was found in general that the home visits to the subgroup, involving more detailed enquiries, confirmed the testimony given in the ordinary research programme. In addition, some 30 mothers kept daily records of the number of times their babies woke in

the night, and what was done, until they began regularly to sleep through the night.

**Definitions.** We are here concerned with the problem of the baby that wakes its parents in the night. Although young infants wake many times in the course of the night, often remaining quiet and content, this creates no problem, and indeed parents are generally oblivious until fussing or crying disturbs them. Again, the baby that is wakeful during the evening may create a problem for parents who feel it should be asleep or who wish to have the time to themselves; but this is a different problem.

The question of how to define the night was not easy to decide. In the end we confined our attention to cases where the baby woke and cried or fussed between midnight and 5 a.m. at least once a week.

Two aspects of the problem are to be distinguished; the age at which the child first 'settles' (starts regularly sleeping through the night, as defined above) and its general tendency to wake at night during any given period. Criteria are needed for both.

For the first we have taken the age (as estimated to the nearest week from the mother's reports) at which the child began its first period of four weeks or more of sleeping through the night, waking less than once a week.

For the second criterion (of the general tendency to wake) we have a rough estimate of the number

of nights broken in the year, or any part thereof. This estimate, called the 'waking score', is only approximate, being based on such generalizations by the mother as, 'He has woken three or four nights a week for the past month or so; before that it was every night', but it does take account of fluctuations, including temporary upsets due to illness. In the case of children who were reported to wake more than once nightly (between 12 and 5 a.m.) the nightly score was multiplied for the period in question by 10/7. The first two weeks of life were excluded from these scores, since most of the infants were born in hospital, where, apart from the special conditions of the night nursery, information was available only for the subgroup. Any subsequent period in hospital, if less than four weeks, was scored as for the average of the periods immediately before and after; if longer, the child was excluded from scoring. The possible score for the whole period from two to 52 weeks of age ranges from 0 to 500 (10/7 by 350 nights).

## Results

**Incidence of Night Waking.** The best general view of the extent of the problem can be obtained by considering the frequency of night waking age by age for the first year (Fig. 1). (Calculations of incidence are based on 104 cases comprising two sampling groups, graphed separately to show their

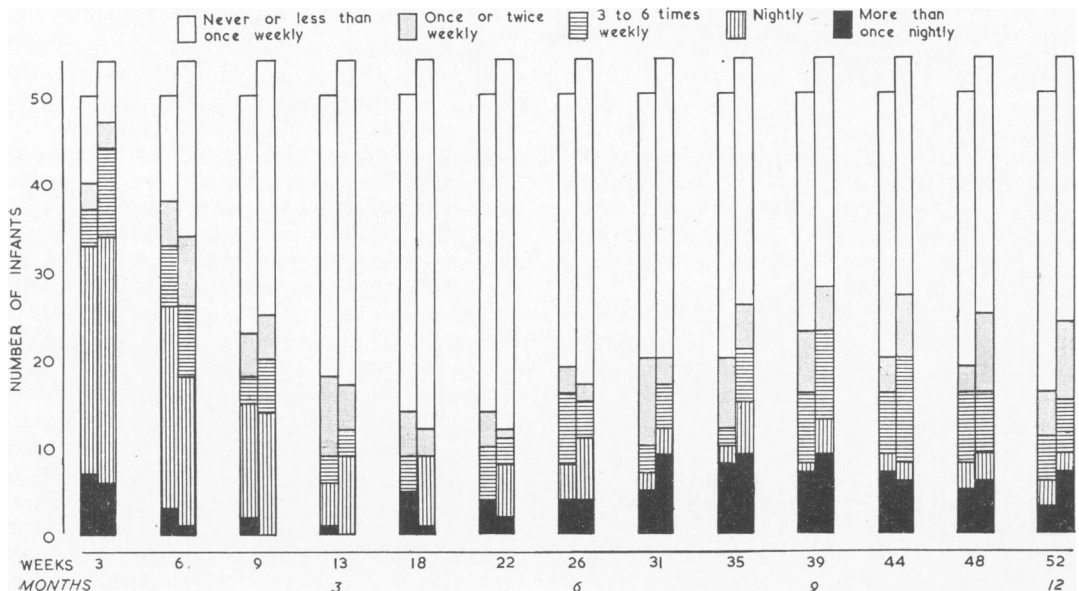


FIG. 1.—Incidence of night waking in two groups of infants through the first year of life.

TABLE 1  
DISTRIBUTION OF INITIAL SETTling AND LATER RELAPSES DURING THE YEAR

Month of Life	(a) First Settled				(b) Onset of Relapse	
	No. without Relapse	No. with Later Relapse	Total Number	Cumulative %	No.	Cumulative %
1	12	8	20	19.2		
2	18	22	40	57.7		
3	8	6	14	71.2	2	
4	5	5	10	80.8	4	5.8
5	1	1	2		3	
6	1	0	1	83.6	8	16.4
7	0	2	2		11	
8	0	1	1	86.5	7	33.6
9	1	0	1		7	
10	3	0	3	90.4	2	42.3
11	0	0	0		1	
12	0	0	0		0	
Not settled in 1st year	49	45	94	90.4	45	43.2
			10	9.6		
			104	100.0		

Information available on 104 cases.

close agreement. The remainder of the sample was excluded because enquiry as to age of settling, etc. was less specific; but the same trend emerges.)

The percentage of children waking drops steeply in the first four months, after which there is a distinct rise from 5 to 9 months, followed by a slighter drop.

To understand this curve of incidence, we need first to know how many children had never fully settled by any given age, and how many had settled but later resumed waking.

Table 1 shows the distribution of initial settling, month by month, together with the number of those settled in each month who relapsed for four weeks or more at any time during the first year.

It will be seen that about 70% of the babies had ceased waking in the night by the age of 3 months, and another 13% by the age of 6 months. Ten per cent. never settled completely at any time in the first year. Of those who had settled, almost a half reverted to night waking, and this happened largely irrespective of the age of first settling. The correlation between waking scores for the first three months and for the rest of the year, though positive and significant ( $P < 0.05$ ,  $N = 95$ ) is only  $\rho = 0.21$ . One cannot, therefore, predict the later nocturnal behaviour of a particular baby from his early sleeping.

The age of onset of relapses is given in Table 1. Evidently new causes of night waking begin to operate in a considerable number of cases between the sixth and ninth months, as Shepherd (1948) has noticed.

We may now look at some individual waking patterns. Those of Group D children are graphed in Fig. 2. It will be seen that they vary widely. It

is not uncommon for a baby to sleep through the night for the first two or three weeks of his life, and then to have a short spell of waking, sometimes, but not always, beginning on discharge from the maternity ward. Of the majority who begin by waking nightly, some do so with gradually decreasing frequency; others start suddenly sleeping through, 'forgetting' to wake for their 2 a.m. feed; others again wake a little later every week; still others are erratic in their pattern.

Several of the cases toward the bottom of the chart show a period of less frequent waking in the second or third month, as though beginning the settling process, which is then interrupted by a fresh access of waking that sometimes persists for the remainder of the year. Consideration of these later disturbances will be deferred to a second paper.

In the following section we propose to examine the factors that may help or hinder the initial process of adjustment to sleeping through the night, by comparing infants who settled within the usual time with those who did not. For this purpose it was found empirically that the age of 13 weeks gave the best dichotomy. Some of the factors will also be viewed in relation to waking scores for the first three months, and where appropriate for the whole year, to take account of any general tendency to wakefulness. All differences reported in the following sections were tested for significance by the  $\chi^2$  technique, with correction for continuity in all  $2 \times 2$  classifications (McNemar, 1949). ( $P < 0.01$  indicates that the chances of an obtained difference being an accidental one are less than 1 in 100: such a difference is said to be significant at the 1% level.) The number of cases (N) varies with the availability of the information concerned.

**Relation of Night Waking to Constitutional Factors.** The sexes show no significant difference in age of first settling, but over the whole first year boys wake significantly more than girls ( $P < 0.01$ ,  $N = 104$ ) and this tendency is already apparent, though not statistically significant, in the waking scores for the first three months. This is consistent with Erwin's (1934) findings that girls sleep slightly longer on the average than boys; even as babies they seem less ready to wake.

Neither birth weight, nor weight at 3 months, nor weight increment over this period, shows any relationship to age of settling or to waking score for the period; nor do caliper measurements of the

amount of subcutaneous fat. This is in agreement with Thompson (1936).

Developmental quotients (Griffiths, 1954) at 3 months and at 6 months both give correlations of the order of zero with age of settling.

An attempt was made to assess certain characteristics of the children by rating their behaviour on each visit to the Centre on a series of five-point scales. Four qualities which it was thought might bear on sleep adjustment were selected; activity, excitability, intensity of crying and cheerfulness, but none of the four showed any relationship to age of settling or waking score for the first three months. This, of course, does not prove the absence of a

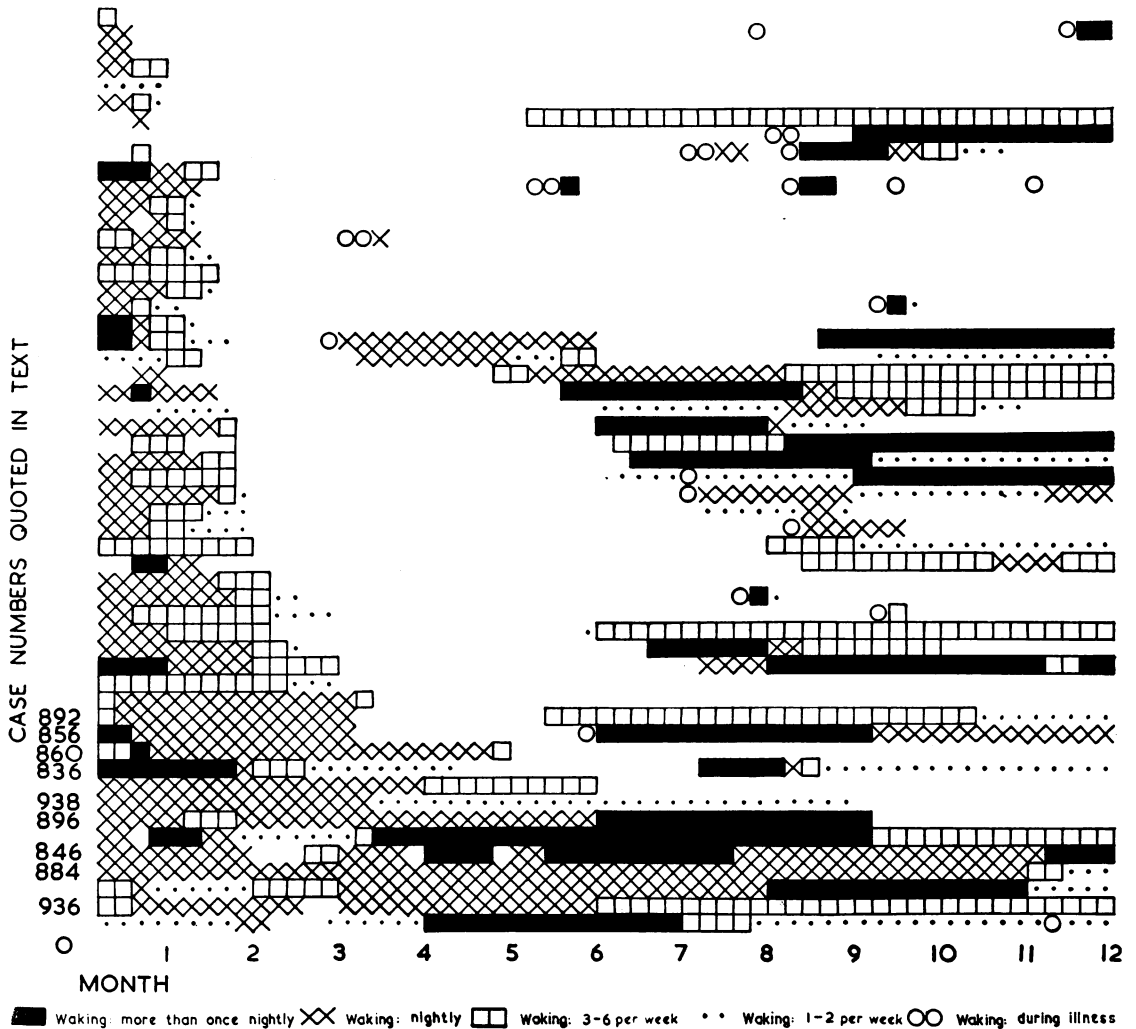


FIG. 2.—Individual patterns of night waking of 54 infants through the first year of life.

relationship, since the ratings were made in a situation which may not reveal the child as he usually is.

Many investigators have stressed the wide variation in the amount of sleep taken by different children, even in the first few days of life (Wagner, 1937). May readiness to wake at night mean merely that the child is one who sleeps less than most? The present study is not adapted to obtaining exact durations, and only 50 mothers were asked to estimate the hours their babies spent in sleep at 3 months of age. These 50 cases show a slight but consistent tendency for those who took less sleep in the aggregate to wake more at night and to settle later ( $P < 0.10$ ). The question remains whether those who slept more by day were readier to wake in the night. There is a negative correlation ( $r = -0.34$ ,  $N = 50$ ,  $P \sim 0.02$ ) between duration of day and night sleep estimated separately, but no association between the amount of day sleep and the number of broken nights. It seems, therefore, that whereas length of night sleep may be reduced in some cases by the amount taken in the day, its continuity is not; and that it is unusual, though perhaps not unknown, for a baby under 3 months to wake regularly in the night merely because he has got into the habit of sleeping his fill in the daytime. Conversely, lack of sleep by day does not guarantee unbroken nights, as is illustrated in the case of an exceptionally wakeful baby described later (Case 936).

**Relation of Night Waking to Circumstances of Birth.** Asphyxia at birth, as recorded in the obstetric records, occurred in 40 infants, 19 of whom (47.5%) failed to settle by 3 months, as against only 28% of non-asphyxiated infants. The asphyxiated group continued to show a greater tendency to wake throughout the year as a whole. Both differences are significant at the 5% level.

It is recognized that the diagnosis of neonatal asphyxia is a somewhat subjective matter. The obstetric records for the whole sample were obtained from as many as 79 observers—labour ward sisters in five hospitals and midwives of two home nursing associations—of whom 33 reported asphyxia in one or more cases. Thus there is ample scope for differences in diagnostic criteria and standards. Such differences, by tending to randomize the allocation of children to asphyxiated and non-asphyxiated categories, would have the effect of obscuring any real association with an independently assessed factor such as sleeping disturbances so that the chances of this association being accidentally obtained are probably much lower than 5 in 100. The possibility of such an association first occurred

to the authors while studying the histories of certain children who showed unexplained sleeping disturbances together with general unpredictability and over-reactivity. Among these children were the following (*cf.* their sleeping records in Fig. 2):

CASE 938 (boy). Severe asphyxia pallida; respiration established only after three-quarters of an hour, cried after two hours. Somewhat irritable on handling in first 24 hours. A restless and ultra-rapid feeder, prone to vomit back his feeds and difficult to settle by night and by day. Tended to wake at night, though not regularly, until 9 months.

CASE 884 (boy). Medium blue asphyxia, cord round neck. A difficult feeder whose mother found him awkward and unresponsive to cuddling after the early weeks. Continued to wake nightly to 11½ months of age.

CASE 892 (girl). Infant anaesthetized at birth (caesarian). Demands frequent feeds but does not take them well. Reported at the lying-in stage and later to be exceptionally sensitive to noise. Prone to wake at night.

CASE 846 (boy). Blue asphyxia; responded quickly to treatment. Though generally of a happy and stable disposition, this child is subject to violent prolonged disturbances affecting feeding, sleep and general physical and emotional condition, without obvious cause. Convulsions at 6 months. Apart from three weeks in the third month, never regularly slept through night in the first year.

Preston (1945) also found that children who had suffered a mild degree of anoxia at birth showed a permanent tendency to hyperactivity and over-responsiveness, with much crying and disturbed feeding and sleep in infancy, while those with a greater depth of anoxia showed a serious degree of apathy. Darke (1944), Hellström and Jonsson (1953) and others have pointed out the possible connexion of severe asphyxia with later physical and mental impairment. Rosenfeld and Bradley (1948), studying older maladjusted children with a history of neonatal asphyxia, described a syndrome comprising unpredictable variability of mood, hypermotility, impulsiveness and short attention span with certain associated difficulties in learning. Our findings, while affording no positive proof of causal connexion, do therefore support those of other workers and strongly suggest the need for collaboration between obstetric and paediatric specialists in following up the asphyxiated neonate.

**Relations of Night Waking to Temporary Conditions.** It is remarkable that illnesses seem to have no lasting effect on night sleep in the first three months. Sometimes ill health may cause a few broken nights, but the sleeping pattern is resumed at once on the passing of the acute phase. Later in

the year, an illness may set in train a sleep disturbance lasting for months.

In one case circumcision at 11 weeks (done at parents' wish, not medically indicated) initiated a four-month spell of nightly waking in a baby who had settled at 6 weeks.

Unsatisfactory feeding is generally the first thing to be looked for in a wakeful baby. We find, in fact, an association at the 2% level of significance between feeding difficulties reported at 3 months and failure to sleep through the night. Where breast feeding proved unsatisfactory, weaning to bottle or complementary feeds sometimes had an immediate beneficial effect on sleep; in other cases, strengthening the formula or introducing solids settled the child. The two problems do not always coincide, however. Of 27 infants with feeding difficulties, eight slept well through the night; eight continued to wake a month or more after the feeding trouble had cleared; in the remaining 11 cases the feeding and sleeping problems cleared about the same time. There were also a number of good or excellent feeders who persisted in waking at night.

Colic, found by Illingworth (1953) to be a frequent cause of sleep disturbance between 6 and 10 p.m. during the first three months, was not identified as a cause of regular waking later in the night among our cases.

Moncrieff (private communication) has suggested that teething pains can cause much distress to infants as early as the third month, when the points of the teeth begin to stretch and finally break through the periosteum lining the outside of the jaw bone, some weeks before they cut through the gum. This may well cause spasmodic sleeping disturbances, but unfortunately our mothers were not briefed to identify the symptoms. No significant differences in age of settling were found between infants who cut their first teeth before 6 months, between 6 and 9 months, and after 9 months of age.

Other bodily discomforts such as overclothing, skin chafing, muscular discomfort from a faulty cot or mattress, etc., are listed by Shepherd (1948) as causes of restless and disturbed sleep. Systematic information on these topics is not available, though such conditions were noticed in certain individual cases.

The amount of crying reported by mothers was taken as a rough index of faultiness of adjustment, irrespective of cause. It shows a linear but statistically insignificant relationship to night waking ( $P < 0.20$ ,  $N = 105$ ), those who cried most tending to wake more and settle later. As an estimate of the amount of crying, mothers were asked whether the child cried—usually, sometimes, rarely or never

—in each of 11 typical daily situations (the questions being spaced through the interview to reduce stereotyping of response) and her replies at both 6 weeks and 3 months were combined in a total 'crying score'. This total could be broken down into three sub-scores for crying (a) before and after feeds while still in the mother's arms; (b) when put down, left alone, or ignored; (c) when handled as in dressing or bathing, when taken out of the bath, and when wet or dirty. Of these three sub-scores, the first and third showed similar relationships to night waking as did the total crying score, while the second did not. From this it would appear that failure to sleep through the night may be associated with dissatisfaction around the feeding situation, or with sensitiveness to physical discomfort, but not at this early stage with a need for company. These findings should be viewed with caution in view of the possibility of chance association ( $P$  lies between 0.1 and 0.2 for (a), and between 0.2 and 0.3 for (c)), but credence is strengthened by the fact that they were first observed on two groups (105 cases), and then again on a third group (49 cases).

The average sucking time per feed, so far as mothers could estimate it, shows no relationship to the tendency to continue waking at night.

The frequency of sucking fingers or fist, again estimated by mothers, shows, on the other hand, a relationship to unbroken sleep which is probably but not certainly significant ( $P < 0.10$ ,  $N = 144$ ), those who sucked least numbering more persistent wakers. When finger and dummy sucking are taken together, there is a similar association at a lower level of significance. The connexion between sucking and sleep is obscure, but is frequently pointed out in psychoanalytic writings (Lewin, 1951; Sperling, 1949; Ribble, 1943). Our findings, tentative as they are, point to the desirability of further study of the inter-relationships between these factors.

**Relation of Night Waking to External Stimuli.** Seasonal differences of light and temperature show no relationship with age of settling, babies born at different times of year settling in equal proportions by the age of 3 months.

Nor has sharing a room any demonstrable effect on settling age, though as only 16 out of 158 babies had rooms to themselves at 3 months, the evidence here is rather tenuous. It was remarkable how easily those babies who slept in the living room would go to sleep with the whole family present making no special effort to be quiet.

These findings are in line with experimental evidence. Irwin and Weiss (1934) found that

continuous fairly strong stimuli—visual, auditory or cutaneous—are inhibitory in effect, at least on the newborn infant. We should not therefore expect the period of initial adjustment to be affected by a light room or noisy surroundings or by having to share a bedroom, however undesirable on other grounds.

Change of cot or of sleeping room was experienced by 46 infants under 3 months of age, only two of whom reacted with increased night waking. Such changes in themselves seem to have little effect at this stage, whereas from the fourth month on they fairly frequently produce temporary disturbance.

Changes of routine sometimes have a dramatic effect, either settling or unsettling, on young infants. In at least three cases a period in hospital for mother and child seemed to settle a baby that had always been wakeful before. The following case is an example:

CASE 856 (boy). First child, professional parents sharing part of house, living in one cheerful room. Some asphyxia at birth. Child woke and was fed nightly until mother (with child) admitted to hospital at 3 months. Child slept alone in hospital, was not fed, and stopped waking in night. Slept through after return home until two days of minor ailment at 5½ months started sleep disturbance which lasted through the remainder of the year.

Improved sleeping at night was also noted in one baby (836) who was in hospital alone from 18 to 23 weeks for gastro-enteritis. Mother visited daily and no serious adverse effects of separation were noted. The child had been prone to wake, though not nightly, and this had been indulgently but inconsistently handled. After her time in hospital she slept regularly through the night.

One of several possible reasons for the improvement shown in these two cases could be the change to a different and more stable routine. The change may have effectively broken up a situation which was unsatisfactory for both mother and child.

Even a minor change of routine, such as shifting the bath time from morning to evening, proved helpful in settling some infants. In other cases a temporary change, for example a holiday away, appeared to upset a good sleeper. Generally, as with illnesses, such upsets pass easily during the first three months, but at later ages they can be the signal for a prolonged spell of waking.

**Relation of Night Waking to Social-demographic Factors.** The father's occupational class shows no relationship with age of settling. There is, however, a difference between classes, significant at the 6% level, in the tendency for babies to wake over the year as a whole, more waking occurring in the skilled manual class (III) than in any other. This difference

is not easy to explain; if not accidental, it would suggest subcultural differences which have yet to be elucidated.

Neither the mother's education nor the mother's age shows any relationship to settling age or tendency to wake.

The child's position in the family shows a relationship with age of settling significant at the 5% level, and a similar but rather less significant relationship with waking scores for the year. The significant difference lies not, as might have been expected, between only children and others, but between first and second children on the one hand and all subsequent children on the other. The figures are as follows:

	Total No.	Not Settled at 13 Weeks	% Not Settled
1st children ..	56	22	39.3
2nd children ..	55	21	38.2
Subsequent ..	43	9	20.9

We can conclude that the experience of having had previous children counts for more in mothers than age or education.

#### Relation of Night Waking to Parental Handling.

The age of weaning from the breast shows no relationship to settling age or tendency to wake in the first three months, breast- and bottle-fed babies falling into roughly equal proportions on both criteria. The actual weaning had a settling effect on sleep in at least a dozen cases. In no case did weaning from the breast before 3 months, however sudden, lead to increased waking (we are not here considering other effects of weaning).

Flexibility of feeding times ('demand' v. 'clock' feeding) shows no relationship, the three groups, classed as 'demand fed', 'clock fed', and 'latitude allowed', containing approximately equal proportions of settlers and non-settlers and of children with high and low waking scores. Certain children, however, benefited from reasonable adaptation of timing that had proved too rigid.

Feeding in the night when the child cries can be considered separately. Mothers were classified as (i) feeding always (62 cases), (ii) feeding sometimes or after other methods tried (64), (iii) never feeding (22). Only three of the unfed babies or about 13% failed to settle by 13 weeks, as against 32% of those fed regularly and 40% of the variable group. These differences are of only borderline significance ( $P < 0.07$ ) but are confirmed by similar trends in each of three subsamples (Groups B, C and D). When we turn to tendency to wake in the

year as a whole, however, the groups that were consistently fed and unfed in their early months have evened out their scores, while the group that received variable handling contains a significantly higher proportion of chronically wakeful babies ( $P < 0.01$ ).

While some of the wakefulness of group (ii) may be attributed directly to inconsistent handling, which gives a child no firm basis on which to establish a regular sleeping rhythm, there may, too, be an indirect effect in that rapid shifts from method to method can be one expression of maternal anxiety, which probably communicates itself to the child through stresses and tensions during nursing, or in other ways, thereby affecting his ability to relax and sleep soundly. It must, however, be considered only rational in the parents of a persistently wakeful child to try a variety of methods. It is very probable that some of the mothers who never fed at night because their babies slept well without it would have done so had they persistently awakened.

Other methods of handling night waking are used in many combinations with varying immediate effect, but it is worthy of note that in contrast with feeding no other method is used solely and consistently as the effective answer by more than a handful of mothers.

Perhaps our most interesting finding is one that emerged as a by-product. Differences between settlers and non-settlers had been sought, but not found, in total duration of feeds (time in mother's arms) and in actual sucking time. It then occurred to us to take the difference between these as a measure of the time given by the mother to the baby for contact and play, over and above what he needs for feeding. (Where a mother props up the bottle and leaves the infant to take a part or the whole feed on his own, this difference can have a negative sign.) This quantity, which we have called 'excess nursing time', estimated at the three-month interview, turns out to discriminate very significantly between babies who settled by 13 weeks and those who did not. Not only are the differences significant at the 1% level, but similar patterns are found in each of the three sampling groups, B, C and D.

Whereas the babies that received least nursing had the greatest tendency to wake, those that received a rather excessive amount were the next most wakeful group, while those that had between 10 and 20 minutes in addition to their feeding time settled best. It is true that examples of both extremes appear among good sleepers and bad; but apparently for most children an adequate amount of contact with mother is an important factor conducing to the establishment of the sleeping rhythm.

Efforts were made to extend this finding to certain aspects of the mother's methods and personality by using a variety of rating and other methods.

In general, these indices failed to discriminate reliably between infants who settled and those who did not. The ratings on the subgroup receiving extra visits mostly gave differences in the expected direction, *i.e.*, the settled babies had mothers who were judged, as a group, to be more positively accepting, more self-confident, less anxious and showed less negative feeling towards their children; but of all the ratings, only those of one observer on positive acceptance reached the 5% level of significance for the 45 cases. With improved techniques and larger numbers it is quite possible that more of these maternal traits would turn out to be significant for sleep. For example, though rigidity, as judged by answers to certain questions, gave no discrimination, there were cases of very persistent waking which could only be attributed to the obsessional rigidity of the mother, such as the following:

CASE 896 (boy). Second child of professional parents, living in cramped top flat, kept very tidy. Mother felt guilty about having been inconsistent with her first child, who proved difficult, and determined to 'stick' to a pattern of handling with the second. Accordingly, though fond of the baby in her own way, she refused to feed in the night, or even to pick him up, in case he got used to it; fed strictly to clock times, even waking the child when he had just fallen asleep after several hours' crying; gave up nursing at feeds because 'his hands get in the way'; and when asked if she played with him, replied, 'only if I have time. I'm afraid he has to wait on my convenience'. Child continued waking once or more nightly to 9 months.

The following shows a very different maternal attitude which is also consistent with delayed settling:

CASE 936 (boy). First child of professional parents from Mediterranean country. Living in two rooms, good condition, clean and cheerful. Normal birth, healthy child, feeding satisfactory, breast to 8 months. Fed on demand, intervals remaining highly irregular. Optimal nursing times at feeds. Much finger sucking at 3 months. Mother very fond of child, but over-anxious and cannot bear to let him out of her sight as she is afraid he will suffocate, so carries him about and talks to him constantly during the day. Child scarcely ever sleeps by day; total sleep at 3 months estimated at 11½ hours. Fed regularly on waking at night. Waking falls below nightly level for a few weeks at the normal third-month settling period, but reverts to nightly from 3 to 6 months, then somewhat less to end of the year.

Finally we present two cases which may give some idea of the complex interaction of the various factors we have discussed:



CASE 884 (boy). Second child, superior working class family, living in grandparents' flat, well furnished and well kept. Blue asphyxia at birth. Healthy child. Mother, aged 40, had insufficient milk; complementary feeding from start, weaned at 2 weeks. 'Lazy' feeder; would not finish bottle but wanted it early. Mother would have preferred to feed to the clock, but allowed latitude after 6 weeks. Much sucking of fingers and of dummy after initial refusal. Long nursing time at 6 weeks, none at 3 months because mother said child 'preferred' to take bottle on his own. Mother an anxious person with little natural aptitude for handling children. Inconsistent at night; usually ended by taking child into her bed until he ceased to respond to this method. Stopped night feeding about 6 weeks, though child responded regularly. Continued waking once nightly to 11½ months.

CASE 860 (boy). First child, working class family in poor tenement flat. Normal birth, healthy child. Fed well but started refusing breast occasionally and preferring bottle from 7 weeks on; this coincided with mother's resumption of part-time work, during which father cared for the child. Weaned at 8 weeks. Excess nursing time nil at 3 months. Mother fond of child but worried by serious friction with husband. Child cried much during first two nights at home, then nightly; weaning from breast made no difference, until solids were introduced at 20 weeks. Inconsistent handling at night.

### General Discussion

Do babies 'learn' to sleep through the night? There is a philosophy which assumes that anything that can be learnt can, and should, be taught. As regards sleep, this places the full responsibility on the parents. 'A sleepless baby is a reproach to his guardians', wrote Sundell in 1922. This idea is still current, especially among mothers who rely on out-of-date advice from their own parents and others, and is readily embraced by those with a tendency to rigidity or to anxious self-reproach.

The truth appears to be that there is a natural tendency for infants to lengthen their period of continuous night sleep while curtailing that taken by day.

What we have called the 'settling' process, a form of learning at the level of biological adaptation, requires no consciously directed training by the parents. There are indications that it is connected with fundamental physiological changes affecting the whole pattern of mental and physical activity. Generally it takes its course, and if disturbed by illness or change, will be resumed when the disturbance is past. If it is delayed beyond the fourth or fifth month, however, this automatic gravitation to the diurnal cycle may be lost, and adjustment may then be very difficult to attain, perhaps because the organism has reached a point of stabilization

on a different rhythm. Where such children sleep through after a spell in hospital or a holiday away, it may be that the radical change in daily routine, by breaking up this heterodox rhythm, has cleared the way for a final adjustment to the ordinary pattern.

More surprising than the number of deviants from the norm, when all is considered, is the number who adhere to it in the face of difficulties. Of all the adverse factors we have discussed, not one but applied to some children who slept through the night notwithstanding.

An examination of the factors associated with continued waking suggests that failure to settle may sometimes be due to lack of wisdom in the parents: if so, it seems quite likely to result from insufficient nursing by the mother, either on principle or for lack of time or lack of inclination; or, on the other hand, from excess of anxious, over-solicitous mothering; or from erratic behaviour springing either from fecklessness or from ambivalence to the child; or, in some cases, from a rigid, controlling attitude which seeks to impose an unsuitable régime. Equally, it would seem, the failure may have nothing to do with the parents, but may come from some cause within the child—delayed effects of asphyxia or other birth trauma, perhaps, or just constitutional sensitiveness, as in the baby who cries when handled. Sometimes there is a failure of adaptation on both sides, which can lead to a kind of war of attrition. Indeed, the interaction of these numerous factors is so complex that it is seldom possible to say definitely that a given child's failure to sleep is due to one particular cause.

Of the possible types of parental failure concerned, we wish to call particular attention to deficiency of nursing time. Its connexion with night waking appears to be established unequivocally, but the reasons for the connexion are not. What is the nature of the child's unsatisfied need? If it were merely for nursing as such, it would be difficult to explain why some children do sleep and thrive with a minimum of nursing. We suggest that the need is more probably for a certain basic quality of feeling in the mother, which finds expression in a number of ways, usually but not invariably including adequate nursing.

Where a child is nursed very little because the mother believes it is too restless to feed steadily in her arms, we have to ask, (a) Is it a physiological restlessness (*cf.*, Case 884)? (b) Has the child's interest in nursing been lost, or never developed, for lack of mutual enjoyment? (c) Or is it, as with some babies whose mothers complain that 'he only wants to play', that what is really a desire to play and

communicate with mother between sucks is misinterpreted as unwarrantable dalliance and lack of interest in food?

Making full allowance for domestic and other commitments, it still appears probable that the mother who takes very little or no time for cuddling and fondling her baby is failing to follow the normal maternal instinct.

The better sleeping record of third and subsequent children is of interest in this connexion. Their mothers, as a group, may be presumed to be more practised in handling babies, less anxious about minor disturbances, and less emotionally involved with the individual child than the mothers of only one or two; also busier, but probably more maternal, and thus in general likely to mother their babies in a warm, competent and healthily balanced way.

It remains true, however, that some mothers give insufficient time to nursing on principle, thinking it best not to 'spoil' the child, or acting on advice. Where advice is to be given, our findings suggest that a moderately generous amount of nursing and play is to be recommended from the earliest months, as conducing to sound sleep as well as to happy relationships.

Finally, we have to remember that sleep is by no means an invariable sign of good health nor of good adjustment. Indeed, many children suffering from faulty adjustments of various kinds seem to sleep particularly soundly, as though recovering energy expended in crying or otherwise combating their difficulties. On the other hand, in a well and happy infant, even nightly waking need not be regarded as too serious a problem, provided the parents can accept it without resentment, self-reproach or other ill-feeling, deal with it efficiently and get enough sleep. Prolonged spells of waking more than once in the night are, of course, likely to indicate some faulty adjustment in the child or family calling for a thorough review of the whole situation with professional advice.

#### Summary

Of 160 infants whose mothers were seen at intervals from birth, about 70% had ceased night

waking (between midnight and 5 a.m.) by the age of 3 months, and 83% by 6 months. Ten per cent. never started sleeping regularly through the night for as long as four weeks during the first year.

Of those who settled, about one-half had subsequent spells of night waking of more than four weeks' duration. The majority of these fresh disturbances had their onset between the ages of 5 and 9 months. A tendency to night waking was found to be associated with neonatal asphyxia, deficiency of nursing time and a number of other factors. Possible causes are discussed.

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