An inquiry into the aetiology of infantile eczema : being a thesis for the Degree of Doctor of Medicine in the University of Cambridge / by Arthur J. Hall.

AN ENQUIRY INTO THE ÆTIOLOGY OF INFANTILE ECZEMA

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GONVILLE AND CAIUS

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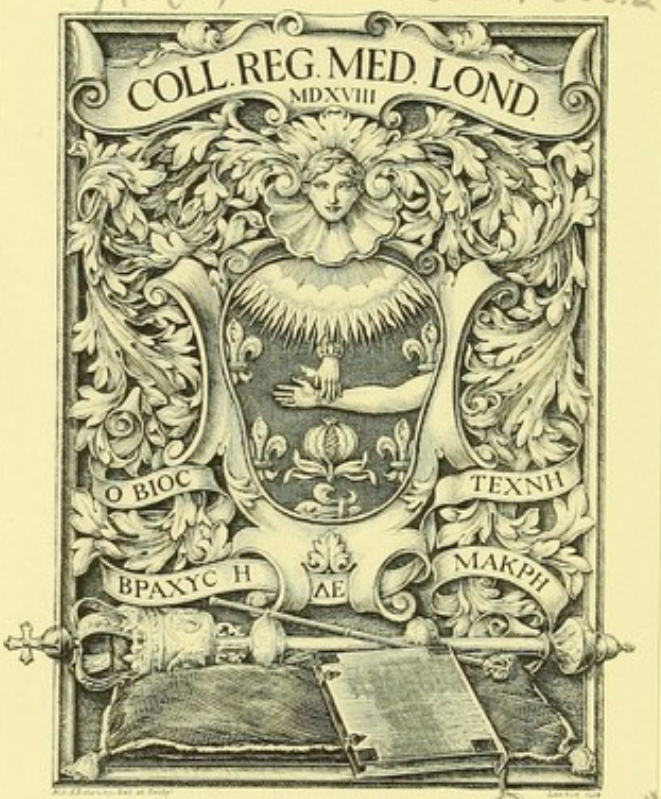

AN ENQUIRY

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ÆTIOLOGY OF INFANTILE ECZEMA.

SECTION I.—INTRODUCTORY.

The subject of eczema, although so much has been written about it, is one which still gives rise to the most varied and contradictory opinions. This is true, whether we consider its definition, ætiology, pathology, or treatment. This enquiry was undertaken in order to ascertain which of these divergent views might be confirmed or negatived by a carefully recorded series of cases. To attempt to include all varieties of eczema in such an enquiry promised little result. I thought it best, therefore, to limit myself to some form of the disease which would be universally accepted as typical, and of which it would, easily, be possible to obtain a series of comparable cases for investigation. It seemed to me that the variety known as infantile eczema complied with these two requirements. It presents further the advantages that, being usually of fairly recent occurrence, when first seen, the details as to its beginnings have not been forgotten; that information of all kinds can be readily obtained from the watchful mother or nurse; that the quantity and quality of the infant's "ingesta" and "excreta" can be easily ascertained; and, lastly, that there is, in such cases, no item of mental worry, overwork, etc., to

complicate the ætiological problem. I hoped that the evidence obtained from a careful enquiry into this single small variety of eczema might be of use in studying the affection at other periods of life.

The sixty cases which I have collected for this thesis have come under my care between the years 1897 and 1903, and are in no way selected. For this enquiry I have limited the term "infantile eczema" to cases beginning in the first year of life. I have attempted in each case to obtain full and accurate information concerning the life and surroundings of the infant prior to the first appearance of the disease. This has been supplemented by a careful physical examination of the infant and its mother, and a full inquiry into its family history. I hoped, at the outset, to add to this a physical examination of the father in each case, but I found this was practically out of the question in hospital patients.

The following printed form of questions has been used throughout this inquiry.

Date of admission
Date of birth
Date of vaccination
Name Age
Address
Age of mother Age of father Age of brothers
Age of sisters
What is colour of mother's hair? Has mother ever had any skin disease?
Has mother had a scurfy head? Examine carefully.
Has father had any skin disease? Has father had a scurfy head?
Examine if possible.
Has anybody besides the mother nursed the child regularly?
If so, examine carefully.
Have any other children had any skin disease?
Or got Pediculi capitis?
Has it slept in the same bed as mother? How long?
On her right side or her left?
When did the rash first appear? On what part?
Where did it spread to next?
Has it ever got quite well since it first appeared?
Did the child go out of doors before the rash appeared?
What soap was used to wash the child?
Has child been fed on breast? Since birth till when?
Were both breasts used equally?
Was any other food given besides the breast milk? What?

What is the child having now?

1 In morning.
2 In afternoon.
3 In evening.

Does it take well? Is it losing flesh?
At what age did it cut its first tooth? How many teeth has it now?
Does it vomit? Is there or has there been diarrhœa?
Can it walk? Since when? Can it talk? Since when?
Is there any peculiarity in shape of head? Are the ribs beaded?
Is spleen palpable? Is the belly prominent?
Are any joints enlarged? Does the head sweat at nights?
Does it kick off the bedclothes? Does it sleep well?
Character of eruption?

Some of the questions have proved of little value.

Thus, the question, "Did the child go out of doors before the rash appeared?" has little point in the case of hospital patients in whose houses the kitchen door opens into the street, for the child is, often, practically out of doors, when it is in the house. The question as to what soap was used, produced such an endless variety of answers, that nothing definite could be made of it. But the two questions have, now and again, elicited information of some value. Thus, in one case, the mother told me that the eruption suddenly came out violently, after washing the head with coal-tar soap, to get some scales off; and in another case, the mother said the rash appeared when the child was taken for the day to Cleethorpes.

I regret that the question as to vaccination was not systematically asked, until about half the cases had been recorded. My reason for not doing so at first was, that it seemed almost wrong, even to suggest such a possibility to the parent; but, from the experience I have obtained since I began to make systematic inquiry, I am more firmly convinced than before, that vaccination stands in no ætiological relation to infantile eczema.

Another question, from which I hoped much and got little, is that which relates to the side of the mother, on which the child slept in bed. I thought, that, possibly, the common site of the first outbreak on one or other cheek, might be determined by contact with the mother's sweating chest, possibly wet with milk. Whether this plays any part or not, the answers to my questions give no clue, for in the cases, some eleven in number, where the rash appeared first on the left cheek, about one third lay usually on her right side, one third on

her left side, and the remainder on both sides equally. And so on with cases beginning on the right cheek, etc.

The presence of Pediculi capitis in the mother's head is also, I think, of little value. These are so common in the heads of females, both young and middle-aged, amongst the poor of Sheffield, and are, for the most part, so harmless, that their presence is probably of no importance as a source of irritation to the child's skin. At any rate, the evidence I obtained is not sufficient to warrant any positive statement.

The details of these sixty cases are given in the accompanying tables. They are analysed in Section III, and are also, where possible, illustrated by diagrams and charts. Section II gives an epitome of the general views as to the ætiology of infantile eczema. Section IV contains the conclusions which I have formed from a study of these cases.

SECTION II.—THE VIEWS OF VARIOUS SCHOOLS OF DERMATOLOGY, DURING THE LAST CENTURY, ON THE SUBJECT OF INFANTILE ECZEMA.

In this section I have collected a few short extracts from the works of various authorities, who have written on diseases of the skin during the past and the present century. Though not intended to be complete, they are fairly representative of the various schools at different periods. They are arranged in the order of date of publication.

Alibert, in his Text-book and Atlas (1806), gives an illustration of a case, in which the hairy scalp is chiefly affected, together with the forehead and a few scattered spots on the forehead and nose.

His definition is as follows:

"A tinea showing yellow crusts, easily detached from the hairy scalp, or secreting a mucous material which mats the hair together. It not only attacks the hairy scalp, but also spreads sometimes to the forehead, face, temples, and ears."

He distinguishes between this and "croûte de lait," which term he keeps for the seborrhoic scales on the head of an infant at the breast.

These, he says, are natural and not a disease. He describes Tinea muciflua as occurring during the first two years of life, frequently associated with improper lactation, or dentition, or in children of scrofulous or lymphatic parents.

He also describes four cases, of which one beginning at three and a half months is a typical infantile eczema, whilst two of the others, at twelve months and two years respectively, appear to be rather Impetigo contagiosa.

Willan and Bateman (7th edition, 1829) give a long account of it, of which the following points may be quoted :

Porrigo larvalis, or "mask-like porrigo," with the following synonyms—Milk scall, Achor, Crusta lactea, Tinea lactea, Scabies capitis simplex (Plenck), Tinea muciflua, Die Kopfrande, Der Milchgrind, Croûte de lait.

"It is a disease of infancy, generally non-contagious. It appears first on the forehead and cheeks. There are numerous pustules on a red base, which burst and form scabs, yellow or green, until a mask is formed. The odour is rank and peculiar. It runs a variable course. The discharge may be slight or profuse. There are smaller patches on the neck and breast, also on the limbs. The ears and scalp are usually affected. The child's health remains good except for loss of sleep. The parotid and mesenteric glands may be enlarged. Marasmus with diarrhœa and hectic may kill the patient. It usually ends favourably, but the diarrhœa is long and uncertain. It may recur. It is due to undigested food."

He also quotes Dr. Underwood as saying :

"I never saw an infant much loaded with it, but it has always been healthy, and cut its teeth remarkably well. In general, however, although it appears in the most healthy children, yet it is the consequence of repletion and the irritation of undigested food upon highly excitable systems; and in these it probably prevents the attack of more formidable diseases."

Hebra, *Diseases of the Skin*, 1868, defines eczema as follows :

"A disease of the skin, of usually chronic course, characterised either by the formation of aggregated papules and vesicles, or by more or less deeply red patches covered with thin scales, or in other cases by a moist surface, while in any of these forms there may be developed in addition partly yellow and gummy, partly green or brown crusts. This affection is constantly accompanied by violent itching, which leads to excoriations, and it is not contagious."

He gives no special account of the form seen in infants, as all through his work he seems anxious to group together, rather than to split up, the eczemas. He does, however, refer to this condition in various places, thus :

"It may affect the whole of the face or only certain parts of it, and I may here remark that we usually observe this form of eczema occupying both sides of the

face in equal extent and intensity. That there are exceptions to this rule is not to be wondered at, and they are the more explicable when we remember that the exciting causes of eczema often affect only one side of the face."

Again :

"Crusta lactea runs in most cases, if not an acute no very chronic course, and is mostly over in the space of a few weeks."

Under Ætiology I quote the following points :

"Rachitis also frequently appears in company with eczema without, however, our being able to assign this diathesis as the cause of every case of the cutaneous affection at this age."

"As great abuse is made of the teething of children, as of their temperaments, and just as every cough, every colic, fever, diarrhœa, cramp, or fit in an infant is put down to teething, so eczema is ascribed to the same cause when it appears at the same period. Now, although I by no means ignore the influence which this physiological process is capable of exerting upon the whole of the organs and functions of an infant, yet I cannot admit it to be a cause of eczema; because any conscientious and accurate observer may convince himself, that this malady occurs just as much before, as during the period of dentition, and offers the same symptoms, the same intensity, and the same extent, without being the least affected by the completion or the delay of the eruption of the teeth."

Again :

"A favourite explanation of the occurrence of cutaneous diseases in general, and of eczema in particular, has been that of hereditary transmission. I cannot coincide with this view, for I have seen many women who, either while unmarried, or as mothers, have repeatedly suffered from eczema, sometimes during their pregnancies, and yet their children have never been attacked by it. I can even adduce the case of those who have been eczematous for years and have given birth during that time to seven, eight, nine, or ten children, all entirely free from this malady. The fact that in a few cases whole families may be found affected with it must be viewed as exceptional, when contrasted with the general results of experience, and can, at the utmost, only prove that eczema in parents does not exclude its occurrence in their children."

And again :

"Lastly, the symmetrical character of an eczematous eruption is more simply accounted for by an original participation of the nerves than by the supposed excretion of impurity in the blood. It is no very bold assumption to suppose that in eczema also it is faulty innervation which is the most important element in its production."

Erasmus Wilson, in his various writings, gave particular attention to the subject of infantile eczema (London : Churchill, 1870). He gives an account of an investigation which he made into the causes

and varieties of the condition. The investigation, as published, is lacking in many details, and seems to have been made with a somewhat preconceived bias towards dietetic causes, which somewhat impairs its value; but on many points he has some interesting observations.

He takes thirty-four cases which came to him in one year, and analyses them in many ways.

Sex.—Of thirty-four cases, twenty-two were male and twelve female.

Age at first appearance.—Twenty-one occurred during the first three months of life, seven between the third and sixth month, and six at a later date.

Season.—Of thirty-four cases, eleven began in December, four in January; that is, nearly half the number began in these two months, whilst, he says, twenty began in the colder months and fourteen in the warmer.

Vaccination.—His statements under this heading are vague and of no definite value.

Food.—Thirty of the cases were breast-fed, only four hand-fed.

Other children affected.—In four cases only had one other of the children in the family been affected.

In one case, four children out of nine had suffered.

As conclusions from his own observations Wilson gives the following five causes as prominent in their influence:

1. Food; insufficient or improper.
2. Temperature.
3. Diathesis.
4. Dentition.
5. Vaccination.

He further says (*Lectures on Ekzema*, 1870, p. 247):

"Ekzema infantile, like Ekzema adultorum, originates in mal-assimilation, and with good reason is commonly ascribed to a faulty secretion of milk on the part of the mother; but when once established, it is not remedied, as might be expected, by the withdrawal of the cause and the substitution of a different and less faulty food."

Neumann (*Text-book of Skin Diseases*, translated by Pullar, 1871, pp. 131 *et seq.*) does not give any separate account of infantile eczema, but merely alludes to it under the heading of "Eczema of the Scalp and Face." Under the general ætiology of eczema he writes:

"Eczematous affections are *idiopathic* or *symptomatic*; the former arise from direct irritation of the skin, as from the action of irritant ointments. . . . the prolonged influence of extreme degrees of temperature, etc. . . . It is difficulty to define the limits of temperature within which eczema is induced.

The origin of the symptomatic forms of eczema is more obscure. . . . to this category belong those eczematous affections dependent upon dyspepsia, which occur chiefly on the face and hands. . . . The relation subsisting between eczema and the rachitic and strumous diatheses is usually exaggerated. As the result of my statistics of 308 children affected with eczema, only thirty were rachitic, and seventy strumous, therefore, amongst 100 cases, 9·7 were rachitic, and 22·7 strumous. Again, more than 3000 strumous and rachitic patients came under my observation, amongst whom, not a single case of eczema occurred; we cannot, therefore, conclude that any great relation subsists between these two diatheses and eczema; further, the local treatment of eczema is successful, although these constitutional conditions exist. It is evident that only a small fraction of the cases of eczema occur in strumo-rachitic subjects, the majority being independent of any constitutional taint. . . . It may here be mentioned that the hereditary character of eczema, asserted by Veiel, is confirmed by my experience, only in so far that in certain families a predisposition to the disease exists, and that in such cases recurrence frequently takes place."

Tilbury Fox (*Atlas of Skin Diseases*, 1877, Plate XVIII, p. 31) writes:

"There is no difference in character between the eczema of children and adults. Eczema, moreover, occurs in the same seats and in the same forms in the young as in those who have passed the age of childhood. But the disease is so very common, in both public and private practice, about the head and face of children, that it is clinically of advantage to direct special attention to the disease, as it attacks these parts in the child. . . . The main exciting cause of this *E. infantile* is, without question, in the majority of cases in hospital practice, *defective*, and in private practice, improper, and even—though more rarely—*defective* feeding.

Also in another place (*Text-book of Skin Diseases*) he believes that it is identical with the disease in adults. He ascribes it to:

1. Mal-assimilation.
2. Delicate skin.
3. Acidity of secretion.
4. Irritants.

H. G. Piffard (*Morrow's System of Dermatology*, vol. iii, part i, pp. 250–252, 1894) states, under "The Hygienic Treatment of Eczema," that insufficient or improper food may be the chief unhygienic condition. This author reports a series of observations which he made as to the quality of the breast milk in a number of infants suffering from eczema, and in every instance there was a notable deficiency in the fatty matters. Even where the infant was plump he found benefit from the addition of cod-liver oil to the diet.

McCall Anderson (*Diseases of the Skin*, 1894), writes:

"It may occur in several of the same family, but usually only in one. It usually begins in the first six months, on the head or face, which it often leaves entirely. It is aggravated by teething. In Vienna it forms quite half the skin diseases of children."

He also quotes Schiff. (*Wien. med. Wochenschr.*, xiv and xv) as stating that the three important factors are:

1. Thinness of epidermis and superficial position of the blood-vessels.
2. Excessive turgor of infantile cutis.
3. Habitual hypersecretion of infantile glands.

Anderson does not appear to refer to the gastro-intestinal causes in this condition, but under the head of "Treatment" he favours dieting and various internal remedies in infantile eczema.

Bulkley (*Diseases of the Skin*, 4th edition, p. 206, 1899) writes:

"In treating nursing babies afflicted with eczema it is often necessary to treat the mother carefully by diet and internal medication, as a faulty condition of the breast milk is often at the bottom of infantile eczema."

J. F. Payne (article on Eczema in Allbutt's *System of Medicine*, vol. viii, 1899) includes infantile eczema in his general statements, and does not refer especially to the ætiology of this variety of eczema. His general views on the subject of ætiology include (1) vulnerability of the skin, (2) derangements of the nervous system, (3) auto-intoxication, (4) traumatism, (5) action of bacteria in the skin.*

Allan Jamieson (*Gibson's Text-Book of Medicine*, vol. ii, p. 411, 1901) writes:

"In infants the child may be plump and sturdy, or thin, pale and weakly."

Besnier (*La Pratique dermatologique*, 1901), who, to my mind, gives the most complete and elaborate account of the condition which exists in modern literature, referring to treatment, writes (p. 230, which I have ventured to translate):

"Even though the types which have just been under discussion should be observed in their pure forms, none of them can be referred to in a single pathogenic condition which will serve to qualify it, so complex and composite is the pathogeny of the infantile eczemas. The knowledge of them can only serve,

* I shall have occasion to quote from this suggestive article later.

in any given case, to direct the doctor's attention towards the pathogenic and ætiological conditions, either local or general, the existence and exact nature of which it is necessary to ascertain in that particular case, in order to be able to deal with and check them.

"These indications are the first and most urgent to fulfil, and often, when this is done, one sees the eczematisation, and the impetiginisation rapidly improve, without any local treatment whatever, just as one sees local treatment fail, if the aforesaid indications are neglected. These indications have for their basis the setting right of the feeding and the functions of digestion and assimilation; they require, to be successful, a clear idea of all the conditions of nutrition in infancy, without forgetting to regulate everything which concerns the infant's nervous system, exciting reflex causes, dentition, etc., and all that goes to make up the hygiene of infancy—aeration, too warm rooms, etc."

Maffan (quoted by Besnier, *La Pratique Dermatologique, La Semaine Médicale,* March, 1894, p. 138), distinguishes two types due to different kinds of mal-assimilation.

1. Seborrhoic eczema.
2. Dry eczema in scattered patches.

1. Begins on the hairy scalp, usually succeeding the common seborrhoic crusts of sucklings. It covers the whole of the head, and there is much exudation. It then reaches the face and behind the ears. It sometimes reaches the neck and also forms the face mask. It may not be eczematous on the scalp if that is kept very clean, but only on the face. The pruritus is moderate. The children are often large and fat, and frequently have intertrigo. They are breast-fed.

2. The scalp usually escapes. It may be complicated with seborrhœa, but not seborrhoic eczema. Affects cheeks, brow, chin, behind ears, umbilicus, and other parts of the body. Usually in hand-fed children, defective nutrition, dyspeptics, cachectic or rachitic.

Fagge and Pye-Smith (*Text-book of Medicine,* vol. ii, 4th edition, p. 830, 1902) write, under "Ætiology of Eczema":

"It appears to be waste of time to discuss the vague speculations, at once unscientific and unpractical, which ascribe eczema to such common disorders as dyspepsia."

Stelwagon (*Diseases of the Skin,* p. 298, 1902) writes:

"Over-feeding is occasionally a factor, though not so frequently as improper and deficient supply."

He agrees with Bohn ("Eczema," p. 133, in Gerhardt's *Handbuch der Kinder Krankheiten* (Nachtrag), Tubingen, 1883), who placed great stress on obesity (*Fettsucht*) as a factor of infantile eczema in the first and second years, due to the character and the often unnecessary quantity of the nourishment given.

Also, under the heading of "Etiology of Eczema," he makes the following statements. Under "Heredity," he thinks, there is merely an hereditary tendency to irritable skin, most seen in blondes of the florid type, more in males than females, and especially in infancy and old age.

Under "Constitutional Causes"—he thinks dyspepsia and constipation are most important, especially in children, over-feeding, incomplete metabolism, improper food, imperfect oxidation, incomplete food supply; also "struma," especially in children; reflex effects of dentition: adherent prepuce, vaccination (which, however, is sometimes beneficial).

Under "External Causes" he classes all irritants, chemical, thermal, or mechanical, but says they often do not exist, or do exist, but are not recognised for a long time.

Radcliffe-Crocker (*Text-book of Skin Diseases*, 1903) says that one third of all cases in children begin in the first year of life. He refers to Unna's three varieties of infantile eczema—

1. Tuberculous (impetigo),
2. Nervous (due more to food than to teeth),
3. Seborrhoic, preceded by seborrhœa for some time;

but says that for himself he can draw no hard and fast line between the two. Of the so-called nervous form he says:

"Irritation of the alimentary canal from unsuitable food being the most frequent factor in the majority of cases."

To heredity he gives but slight claim. He further adds:

"In infantile eczema irritation and consequent catarrh of the alimentary canal is even more common as a cause of eczema than in older people. The imperfect feeding, of which infants are too often the victims, is a fertile cause of the skin troubles, and is much more often the *fons et origo mali* than teething, which for infantile diseases often takes the place of suppressed gout of the middle-aged: at the same time I cannot go so far as Hebra, who denies that it has anything to do with the matter."

Brocq (*Ann. de Dermatologie et de Syphiligraphie*, Tome iv, No. 3, 1903), under the title "L'Eczéma Considéré comme une Réaction Cutanée" gives the following *résumé*:

"Il y a des dermatoses caracterisées au point de vue objectif par des vésicules spéciales d'aspect: nons leur donnons le nom d'eczéma vrai, *quelle que soit la durée de la dermatose, quelle que soit son évolution ulterieure, qu'elle se développe*

d'emblée sur la peau primitivement saine, du moins objectivement, ou qu'elle se superpose d'une autre affection cutanée pré-existante."

"Ces dermatoses peuvent être provoquées par nombre de causes occasionelles chez certains sujets qui semblent y être prédisposés. Ou n'a pu encore y déceler un microbe pathogène. Nous sommes donc autorisé, jusqu'à plus ample informé, à les considérer non commes des maladies vraies, mais comme de simples réactions cutanées. L'organisme d'un sujet peut être orienté vers ce mode de réaction cutanée pendant des phases plus ou moins longues de la vie. Quand ces phases sont prolongées, ces périodes de réaction eczématique correspondent à ce que nons avons appelé autrefois, avec les autres dermatologistes, la *maladie eczéma*."

He also classifies the infantile eczemas as follows, in four large divisions, which I have put in tabular form:

	I.	II.	III.	IV.
First appears	2nd to 8th month	4th to 8th	4th to 8th	4th to 8th.
Situation	Face first, cheeks, forehead, temples, later, buttocks, limbs, extensor trunk, if severe	Scalp, ears, naso-labial, mouth, neck, anal fold, groins, articular folds	(*a*) Legs (severe); (*b*) face, arms (milder)	?
Characters	Minute vesicles on Eryth. base; "Ecz. vesic. vulg."; successive crops; irritables; lichenification	Red areas, often nearly dry and squamous or moist, oozing; eczematised seborrhoides	Urticarial papulo-vesicular spots run together and form sheets, with true vesicular eczema on top; lichenification	Intense itching followed by vesicular eczema; lichenification.
General conditions	Faults of alimentation; neurotic parents	Fat, overfed, much improved by proper diet and local treatment	Arthritism of parents; neurotic intoxications (tea); lymphatism tuberculosis, syphilis	Alternate bronchitis or asthma.
Duration	Till 15 or 24 months old		Throughout life or till later childhood	3rd to 10th year.

W. B. Warde (*British Journal of Dermatology*, October, 1903. p. 365) writes:

If it can be established—and I think it can—that such agents as heat and cold are adequate to produce and maintain an eczema, and that the form produced depends on the agent that is acting, then it should also be possible to establish that other irritants, playing an important part in the production of eczema, could do the same, and that each form so produced could be distinguished from all the rest. The differential diagnosis would depend, not so much on the actual lesions, but on their grouping, time of appearance, behaviour, etc.

SECTION III.—AN ANALYSIS OF SIXTY CASES OF INFANTILE ECZEMA, WITH COMMENTS.

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(*a*) Sex. (*Vide* Chart No. 3.)

Of the sixty cases, forty-seven (78·3 per cent.) were males; thirteen (21·7 per cent.) were females.*

* Erasmus Wilson (*Lectures on Eczema*), in a series of thirty-four cases, gives 22 males to 12 females, and suggests that the male preponderance is purely accidental; possibly it is so, but considering that there are as many, if not more, female than male births, the male preponderance is worth consideration. No

(*b*) AGE OF MOTHER.* (*Vide* Table I and Chart No. 4.)

It will be seen from Table I that the average age of fifty-five mothers is twenty-nine years.

The details are as follows:

Age of mother.	No. of cases.
Below 25 years	16
Above 25, but under 30 years	17
„ 30, „ 35 „	12
„ 35 years	10
	55

Or

Below 25 years	16 (29 per cent.
Above „	29 (71 per cent.)

It must be remembered that the usual time for marriage in the class from which these cases are taken, is at a very early age, probably under twenty years.

(*c*) NUMBER AND RELATIVE AGES OF OTHER CHILDREN, ETC. (*Vide* TABLE I AND CHART NO. 5.)

Out of fifty-seven cases:

	No. of cases.
The affected child was first-born	8
„ „ second-born	14
„ „ third-born	15
„ „ fourth-born	9
„ „ fifth-born	5
„ „ sixth-born	5
„ „ seventh-born	1

That is, in over 50 per cent. of the cases the affected child was either second or third born; in 14 per cent. only was it first-born, leaving 86 per cent. in which the child was other than first-born.

Table 2 shows that, as a rule, eczematous infants are not children of very large families, nor is the average interval between the birth of the affected child, and of the preceding one, of short duration. This point is of some importance, as very frequent child-bearing not only

question can here arise of extra exposure, different work, or food in the two sexes, such as may be raised in the case of adults.

* In compiling these figures the age is that of the mother *at the time the child was born.*

tends to exhaust the mother, and thus possibly to affect her milk supply injuriously, but also it increases her domestic duties, and hence tends towards neglect in the care of the children. There is no evidence of either of these factors in these cases. (*Vide* also (*l*).)

II. Evidence of Skin Disease in Mothers. (Table II and Chart 6).

It is not easy to classify these into distinct and clear groups, owing to the vagueness of the histories, and the absence of any exact definition of eczema. Many of the mothers, as will be seen from Table II, show distinct signs of what some would call seborrhoic eczema. Others, however, would decline to accept these various slight skin lesions as eczema, and would designate them seborrhœa, rosacea, pityriasis, etc.

For the purpose of this thesis I shall not consider these "stigmata" as "definite outbreaks of eczema."

I have divided the mothers into four classes:

(*a*) Those in whom there is evidence of "definite eczema outbreaks" at some time or other.

(*b*) Those in whom there is some present abnormal condition of skin, such as seborrhœa.

(*c*) Those in whom there is a vague history of some "skin disease" in the past.

(*d*) Those in whom there is neither history of past skin disease, nor evidence of present skin lesion of any kind.

Class A.—In seven out of fifty-four mothers from whom information was obtained—that is, in 12·9 per cent.—there is a history of definite eczema outbreaks. Of these two had it in infancy, three have had it in recent years, and the remaining two are suffering from it at present. Of the two who had it in infancy, the notes are as follows:

Case 2.—"Mother had 'scald head' when a baby, cutting her teeth."

Case 60.—"Mother had similar rash on face after vaccination, which lasted till she was twelve years. Had outbreaks on her knees towards the end."

Possibly others also had it in infancy, and were never told of the fact, but I cannot think that is likely to happen often.

Of the remaining five cases the notes are as follows:

Case 21.—"Has had papular eruption on face since childhood."
Case 34.—"Was under my care in hospital two years before with eczema."
Case 42.—"Just before becoming pregnant with this child had breaking out on face, all over, lasted one month; has now remains at backs of ears and back of neck."
Case 49.—"Mother has eczema of ears and eyelids."
Case 56.—"For last five years, off and on, rash on head, at back of neck, and down sides of cheeks, varies in severity, never quite gone from ears."

Class B.—No history of any definite outbreak, but present evidence of slight skin affections. Of these there are seventeen (31·4 per cent.). The notes on each are as follows:

Case 4.—"Scaly patches on nose and chin."
„ 5.—"Dry scaly patches, cheeks, and sides of nose."
„ 6.—"Dry scaly face."
„ 8.—"Dry patches on nose, chin, and cheeks."
„ 12.—"Dry skin of face."
„ 20.—"Dry patches at hair roots, with few crusts; rosacea."
„ 21.—"Face dry and scaly."
„ 23.—"Dry scaly patches at corners of mouth."
„ 27.—"Dry scaly face."
„ 38.—"Dry face."
„ 44.—"Right cheek dry and scaly."
„ 45.—"Dry patches at corners of mouth."
„ 46.—"Rough dry patch behind right ear."
„ 47.—"Dry scurf about temples and neck."
„ 57.—"Dry patches on cheek; rosacea."
„ 58.—"Dry patches on cheeks, inflamed lids."
„ 59.—"Dry scurfy face."

The conditions common to most of the above are, localised, or, more or less diffuse, dry, finely scaling areas about the face, head, ears, or neck, such as one sees so frequently in children and adults, in these regions. If these are, as is suggested, stigmata of seborrhoic eczema, then these seventeen mothers are eczematous persons, who have never had any severe outbreak all their lives, but in whom the morococcus, or whatever organism may be the cause, has a footing. If so, they may be capable of directly infecting their offspring, and the affected children should have seborrhoic eczema like the parent. Whether they have or not we shall discuss later.

Class C.—No present evidence of any skin lesion. Vague history of past skin disease. Of these there are six (11 per cent.) of which the notes are as follows:

CASE 10.—"Bad hands a year ago."
„ 14.—"Face scurfy in winter."
„ 15.—"Bad ear when a child."
„ 35.—"Scurfy face in summer."
„ 39.— „ „

And lastly, Case 29, "Rash on face after vaccination;" but as I have no note as to whether this was in childhood or not, I cannot definitely classify it under infant eczema, so leave it here as vague.

Class D.—No evidence of any skin disease at any time. Of these there are twenty-four (44·5 per cent.).

We get, then, the following table in round numbers:

	Mothers.
CLASS A.—Definite outbreak of eczema . .	13 per cent.
„ B.—Present slight evidence of seborrhœa .	31·5 per cent.
„ C.—Vague history of skin disease. . .	11 per cent.
„ D.—No past or present skin disease . .	44·5 per cent.
	100·0

(*e*) EVIDENCE OF SKIN DISEASE, PAST OR PRESENT, IN OTHER CHILDREN. (*Vide* TABLE I AND CHART NO. 7.)

Out of the sixty cases, we can eliminate eight, in which the child affected was a firstborn, and two, in which no definite statement is made, so that there are fifty cases of which particulars were obtained.

In these fifty cases there have been born, exclusive of the patients affected, one hundred and twenty-three children (that is, an average total family of 3·5).

Of the 123 children:

There has been an outbreak of eczema in . .	3 (2·43 per cent.)
„ „ some vague skin disease in .	9 (7·29 per cent.)
„ „ *no skin disease at all in* . .	111 (90·28 per cent.)

When we look into the details, we find that of the three in whom an attack of eczema is recorded:

CASE 4.—"Had a rash on head, starting two weeks after birth in July, 1895, mother having a bad head at the time."
CASE 24.—"Little boy began like this at three weeks and it still remains."
CASE 59.—"Little boy has eczema now, since one year old."

These three seem to be fairly definite infantile eczema.

CHARTS 1 AND 2.

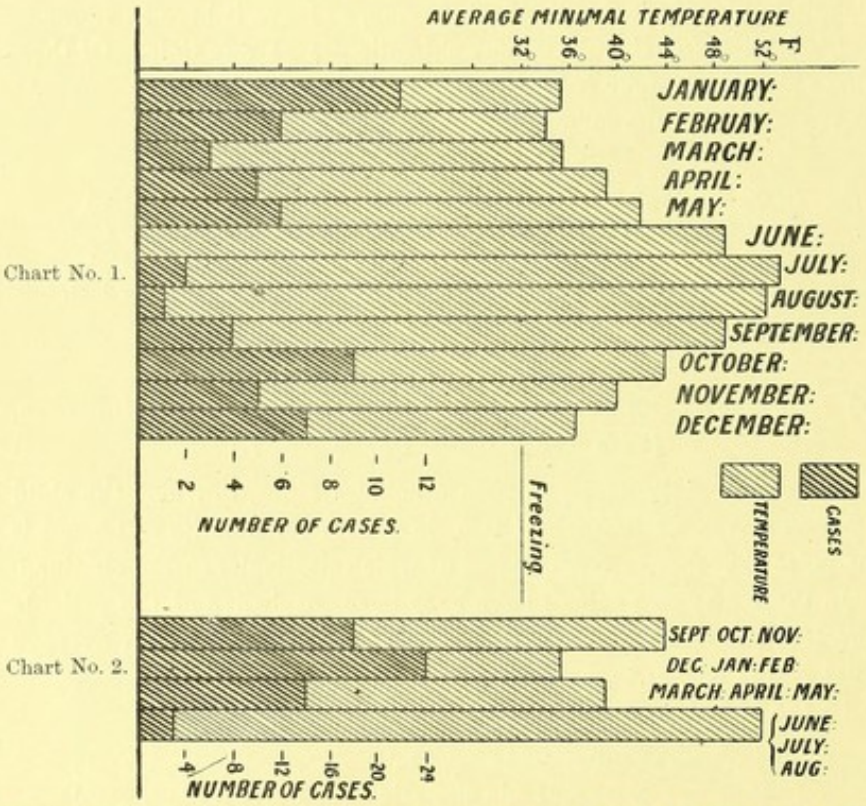
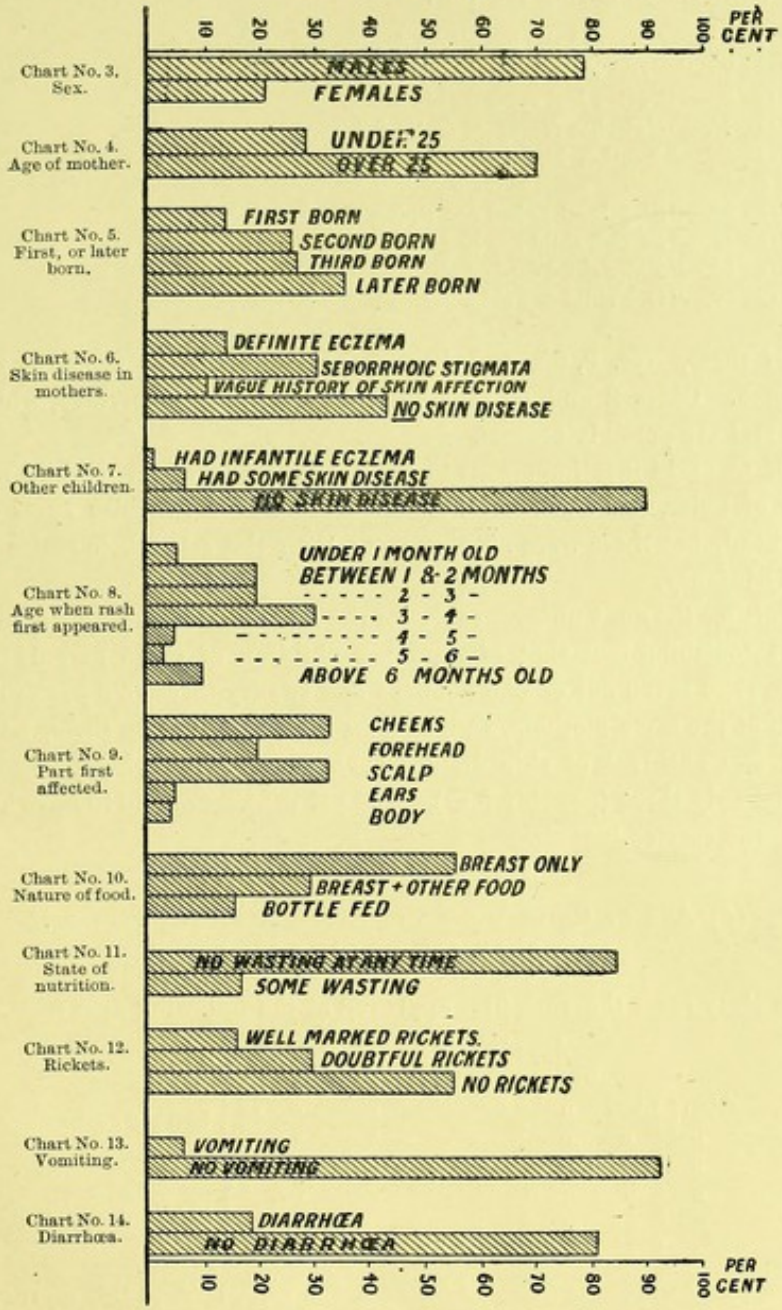


Chart No. 1.—Actual number of cases beginning in each month (shaded dark), with average minimal monthly temperature in Sheffield during the six years 1897 to 1902 (shaded light).

Chart No. 2.—The same arranged in periods of three months according to the seasons.

CHARTS 3 TO 14.



Of the nine cases where there is some vague history of skin disease there are the following records:

Case 2.—"Younger baby has slight dry scaling of cheeks."
Case 7.—"Eldest child (step-brother) had breaking out of head every year."
Case 8.—"Brother had spots on his heels."
Case 14.—"Twin has few spots on head."
Case 26.—"Brother broke out on top of head two years ago, eyes sore, not well yet."
Case 32.—"Step-brother had something very bad, left scars."
Case 42.—"Second child has had spots on legs for last twelve months."
Case 52.—"Elder child died; ? similar rash."
Case 59.—"One child dry skin."

Of these, Nos. 8, 32, and 42 may be eliminated as probably not eczema. Cases 2 and 59 may be looked upon as seborrhœa, whilst the rest are possibly eczema.

Of Case 14 it is important to say a word: the affected child was one of twins, and the mother said the other twin had also spots on its head, but these were nothing more than the seborrhoic scales of early infancy.

Putting the most unfavourable construction on these cases, we have the astonishing fact that of the other children of these parents not more than seven out of one hundred and twenty-three (5·6 per cent.) born of the same mothers, and, in most cases, suckled by them, have had any outbreak of skin disease that is, even probably, eczema; whilst only three (possibly four)—2·43 per cent.—are said to have had infantile eczema.*

(*f*) Age of Child when the Eruption First Appeared.
(*Vide* Table III and Chart No. 8.)

In sixty cases the rash first appeared at the following ages:

Age of child.	No. of cases.	
Under 1 month	4	
Above 1 but „ 2 months	12	
„ 2 „ „ 3 „	12	78·3 per cent.
„ 3 „ „ 4 „	19	
„ 4 „ „ 5 „	4	
„ 5 „ „ 6 „	2	21·7 per cent.
„ 6 „ „ 12 „	7	

* McCall Anderson (*Diseases of the Skin*, 2nd edit., 1894, p. 132) says: "It may occur in several of the same family, but usually in only one."

Thus about three quarters of the cases began between the ages of one month and four months.

This point will be referred to again later in connection with dentition.

(*g*) Situation of First Appearance of Eruption.

(*Vide* Table IV and Chart No. 9.)

Site of first eruption.	No. of cases.
Cheeks, forehead or temples	32
Scalp or behind ears	25
Elsewhere	3
	60

Further details are as follows:

Cases.		
On right cheek: 11, 13, 20, 21, 33. 35, 45, 57	8	20
„ left cheek: 2, 3, 18, 25, 26, 29, 53, 54, 60	9	
„ both cheeks: 9, 24, 59	3	
„ forehead: 5, 17, 28, 30, 32, 37, 39, 41, 44, 49, 50, 62	12	12
„ vertex: 6, 7, 8, 10, 12, 22, 23, 27, 31, 36, 40, 42, 43, 46, 48, 51, 55	17	21
„ occiput: 4, 16, 34, 38	4	
„ right ear: 15	1	4
„ left ear: 14, 58	2	
„ both ears: 47	1	
„ Elsewhere: 1, 19, 56	3	3
	60	60

The large percentage (95 per cent.) of cases in which the eruption first appeared on some part of the face or head, is a very striking feature of infantile eczema.

(*h*) Time of Year in which the Eruption First Appeared.

(*Vide* Tables VIII and IX and Charts 1 and 2.)

In fifty-nine cases the actual month of onset was very carefully ascertained; in one case it was impossible to verify the accuracy of the record, and this case has therefore been omitted.

The accompanying chart (No. 1) shows more clearly than any verbal description, the variations in the incidence of these cases of infantile eczema during different seasons.

It will be seen from the chart that there is a very distinct drop in the number of cases occurring during the warmer months of the

year. In order to make this more clear, I have also placed alongside the number of cases of infantile eczema occurring in each month, a chart of the average minimal temperature in Sheffield for the years during which the cases occurred.*

It will be noticed that the largest number of cases in any single month occurs in January, the next largest in October, whilst no cases occurred in June. It will also be noticed that there were more cases in May, than in April. This is, at first sight, somewhat contrary to what one would expect from the previous statement, but it is easily explained. Of the six cases which occurred in this month, two occurred in May, 1902, and three in May, 1903. In both these years May was, for a considerable part of its time, exceptionally cold. In one of the 1902 cases there is a note that the rash first appeared on Whit Tuesday, which was a particularly cold wet day in the Sheffield district.†

Chart 2 shows the relation of incidence to temperature more distinctly. Here I have taken the year in quarters, according to the temperature. Thus, December, January, and February, represent the coldest quarter, June, July, and August, the warmest. In this chart we see very clearly the correspondence between the number of cases and the variations of temperature. It may be objected that there are fewer cases during March, April, and May, than during September, October, and November, although in the latter three months the average temperature is higher than in the former. But it must be remembered, that it is probably relative change of temperature which acts on the skin, as well as extremes of cold; hence the first cold season of autumn, the end of September or October, is fruitful in new cases, as is seen in Chart 1.

* These temperatures have been calculated from the very valuable records kept for the Sheffield Corporation by E. Howarth, Esq., Curator of the Weston Park Museum, to whom I am indebted for permission to make use of them.

† During the six years 1897 to 1903 inclusive, the mean air temperature (Greenwich) during the summer quarters was, in round numbers, as follows:

1897	1·5	per cent. above average.
1898	4·5	„ „ „ „
1899	5	„ „ „ „
1900	3	„ „ „ „
1901	2·8	„ „ „ „
1902	·5	„ „ below average.
1903	16·5	per cent. below average.

In confirmation of this statement I may add, that the four cases which occurred in infants under one month old, were all in cold months—namely, January, February, March and December; whilst those which appeared later than the common period of four months or under, of which there were twelve, were with two exceptions born in the warmer months—two in April, two in May, one in June, two in July, two in August, and one in September. The exceptions to this rule were one child, born in October, who did not begin till February; the other, born in February, began in the following October, but even these do not really oppose the view that relative cold is an important factor. As compared to October, February is the colder; whilst in the case of the child born in February, it may have been well protected in its early days of the spring quarter, then passed safely through the warmer months, only to acquire eczema in the first cold of October, the month in which so many of the cases began.

Again, as regards the four cases occurring in September, one of them (Case 1) began on the body, and probably its origin is different, whilst in the other three, it is expressly stated that it began in the last week of the month; in fact, one of them (Case 20) is uncertain as to whether it was not in October. Frequently, as for example during 1903, there is a short cold spell in late September. As regards the one case that occurred in August (Case 3) the infant was taken by train to Cleethorpes (on the East Coast) for the day, where the rash was first noticed. Whether this was due to the sun, or whether to a cold day, or to exposure in a railway carriage near the open window, I do not know. It occurred in 1898, and I find that in August of that year there was a particularly cold spell of weather from August 7th to 10th, the minimum temperature falling to 45·9° F., after having been ten degrees higher.

As regards the two cases which first appeared in July, one was in 1899, the other in 1903; as regards the latter, the rash appeared during the last week of the month, which, as a matter of fact, was particularly cold for the time of year.

It will thus be seen that the evidence points to cold season as playing an important part in determining the eczema outbreak in most of these sixty cases.

I wish particularly to call attention to the fact (which will be

referred to again) that those months (July, August, and September) in which all kinds of gastro-enteric affections are particularly prevalent in infants, are the very months in which the smallest percentage of my cases occurred. This is an important point in considering the supposed connection between digestive disturbances and infantile eczema.

I cannot refrain from referring to Erasmus Wilson (*loc. cit.*), who gives a very interesting account of a case. A lady took her suckling child a long journey (by train, or coach, I do not know), and in doing so, the mother was so exposed to severe weather that her milk began to fail, and the child immediately began with eczema. Wilson seems entirely to have overlooked the possibility, that the severe exposure of the mother meant, probably, more or less exposure of the child also; although he is one of the few who point out, that cold season plays a part in this condition. (*Vide* Section 1, *supra*.)

(*i*) Nature of Food at the Time when Rash first appeared.

(*Vide* Table III and Chart No. 10.)

Of the sixty cases there is a definite statement in fifty-nine.

Nature of food.	No. of cases.	
Breast only	33	86·6 per cent.
Breast and other things	18	
Bottle-fed entirely	8	13·5 per cent.

These data have been very carefully obtained, and I believe they are as accurate as is possible, when the answers have to be given by the uneducated.

As regards the food other than the breast given in the eighteen cases—

Nature of food.	No. of cases.
Patent foods	2
Crusts	4
Rusks or biscuits	7
Sago	1
Uncertain	4
Total	18

Thus, in 86·4 per cent. of the cases the child was solely or chiefly breast-fed, whilst only in 13·6 per cent. was it entirely artificially fed.

(*j*) The Relation of Vaccination to Infantile Eczema.

(*Vide* Table V.)

Unfortunately, definite systematic inquiry on this point was not begun until Case No. 38, so that we may divide the cases into two divisions:—

Division A, cases 1–37, or thirty-seven cases. (No systematic inquiry.)
„ B, „ 38–60, or twenty-three „ (Systematic inquiry.)

In Division B definite information was obtained in nineteen cases.

The child was *not* vaccinated before the rash appeared in eleven.

The child *was* vaccinated before the rash appeared in eight.

In these eight cases the interval between vaccination and the appearance of the rash was as follows:—

Less than one month	2
Between one and two months	2
Three months or over	4

(In one case ten months.)

In Division A, thirty-seven cases.

In six cases the vaccination date was given voluntarily (and ascribed as the cause), leaving thirty-one cases in which the parents never alluded to the subject. It is fair to consider that in all probability the children in most of these thirty-one cases had *not* been vaccinated before the rash appeared, otherwise it would certainly have been assumed as the cause, and we should have heard of it.

We have thus thirty-seven cases:—

	No. of cases.
No mention of vaccination	31
Vaccination before rash	6

In these six cases the intervals are as follows:

Less than a month	5
More than a month	1

Of the five above:

Case 30	"Rash three days after vaccination."
Cases 25 and 28	„ one week „ „
Cases 17 and 34	„ two weeks „ „

If these summaries be accepted, we should have sixty cases as follows:

	No.
Cases in which vaccination preceded rash . . .	14
Cases in which rash preceded vaccination . . .	46

If we allow three months as the outside limit of time for vaccination to cause eczema, we have only ten cases out of the sixty (16·6 per cent.) in which one might fairly describe the two events as *propter hoc* and not *post hoc*.

When one considers the comparatively close approximation between the ages at which vaccination is usually performed and infantile eczema commonly appears, such a percentage as 16·6 does not seem to me to warrant our assuming *in any case* that the vaccination causes the eczema.

(*k*) Evidence as to Dentition.

(*Vide* Table V.)

In fifty-six cases:

	No. of cases.
First dentition preceded rash	7
Rash preceded first dentition	49
	56

Of these forty-nine:

Interval between rash appearing and first dentition was less than 2 months	1
Interval between rash appearing and first dentition was greater than 2 months	37

In the remaining eleven no tooth had been cut when the child was first brought up, but the interval was then less than two months.

Of the seven cases in which first dentition preceded the eruption:

Case 32.—"Was born with two lower incisors cut and the rash did not appear till six weeks old."

Case 19.—"Cut first tooth at five months and rash did not appear till two months later."

Case 15.—"Cut first tooth at five months and rash did not appear till seven months later."

Case 1.—"Cut first tooth at four months rash appeared one month later."

Case 8.—"Rash and first tooth both appeared when six months old."

Case 56.—"First tooth at seven months, rash four months later."

It will, I think, be agreed that if a tooth has actually been cut for a month, the worst of the irritation likely to produce reflex nervous trouble is by then over; also it is fair to assume that a tooth does

not begin to cause reflex trouble more than two months before it is actually cut; if, then, we add together all the cases in which the rash first appeared within these very wide margins, we get the following:

That in fifty-six cases:

	No. of cases.
The above conditions were complied with in . .	3
„ „ „ not complied with in . .	53
	56

In other words, in a little over 5 per cent. only, had dentition begun within the space of a month before, or two months after, the appearance of the rash.

Surely we may, once and for all, eliminate dentition as an ætiological factor in infantile eczema, and feel quite clear that when the two coincide it is a simple chance as regards their relationship to one another.

(*l*) Evidence of Gastro-intestinal Disturbances.

(*Vide* Tables VI and VII, and Charts No. 11, 12, 13, and 14.)

In order to ascertain how far gastro-intestinal disturbances are a causative factor in infantile eczema inquiry was made as to any symptoms which might point to such disturbances. The word "disturbances" is used purposely; because, it is evident that various authors who refer to this point, not only differ from each other as to the particular character of the alimentary trouble, but, individually, attribute the disease to diametrically opposite conditions, as may be readily seen from the quotations in the historical sketch. We may suppose, for the sake of argument, either that (*a*) the food is insufficient in one or all its constituents, hence that the child does not receive sufficient food; or (*b*) that the food, though sufficient, is of a kind which does not agree, so that the child suffers from some form of infantile dyspepsia; or (*c*) that the food is too "rich," and that the child is being overfed.

In considering these *seriatim*, what evidence do we get that the food is insufficient in one or more of its constituents? A food of the former kind must show itself in one way, and in one way only, namely, by the child not "getting on," by its being deficient in size and weight.

Inquiry on this point was made in fifty-two cases (and I fancy in

the other eight cases the child was so obviously well nourished that the question seemed ridiculous, and was not asked in consequence).

Out of the fifty-two cases:

There was some malnutrition in	8 (15·3 per cent.)
None whatever at any time in	44 (84·7 per cent.)

These are the actual figures, but it must be remembered that frequently the child, when seen, had been suffering from the affection for weeks or months, and that the wasting had, quite as likely, occurred long after the disease appeared. This is quite sufficient to account for the 15 per cent. Apart from figures, however, anyone who has seen many such cases, knows that the sufferers are, usually, not in the least undeveloped or wasted, at any rate, in the earlier stages. On the other hand, there are scores of wasted, starved children come up to an out-patient department with never a trace of eczema.

Is it, then, that some one of the constituents of the food is deficient, or possibly more than one?

This question is more difficult to answer with certainty. If it were so, we should naturally expect the disease more often in hand-fed than in breast-fed children; but as we have seen above, in only 13·6 per cent. of them was there artificial feeding. the remaining 86·4 per cent. being breast-fed.

Again, the average age at which the eruption appears is so early, that the mother's milk is much less likely to be getting poor, and insufficient in any particular, than it might be, say, after a nine months' suckling; and I may say that in this district twelve to fifteen months is the common period for suckling to continue. Nor do my inquiries point to any great frequency of child-bearing in these cases, such as might be expected to cause a defective milk supply, through exhaustion of the mother; for I find, that in thirty-seven cases in which the period between the birth of the affected child and of the one which preceded it can be accurately reckoned, the results are as follows:—

Interval between birth of previous child and of affected child.	No. of cases.
Less than one year	0
One but less than two years	5
Two but less than three years	16
Three years or over	16
	37

Thus in 86·4 per cent. of cases there had been an interval of at least two years between the two children, and in 43·2 per cent., or nearly half the whole number, one of over three years. To those who know the average rate of child bearing in our populous cities this is not a high birth frequency.

Then, looking at the mothers themselves, although I have no definite statement, I am quite sure that they are usually well nourished and in good health. For although a certain number are somewhat run down from sleepless nights with a fretful baby, after the disease has lasted long, yet I do not remember a single case in which the mother of an eczematous baby has asked for treatment for herself on account of ill health. There are large numbers of worn-out suckling mothers who come to hospital, complaining of all sorts of aches and pains, dizziness, fainting bouts, etc., and who are terribly anæmic, so that one wonders how they can secrete any milk at all, and yet I do not remember, in a single such case, the child developing eczema. I am well aware that Nature's laws, especially as regards everything connected with reproduction, are so strongly in favour of the offspring, that she does not spare the mother in order to nourish the child, and possibly the exhausted anæmic mother is giving her all to provide what is really a perfect food supply, and is thereby suffering.

Lastly, the one disease which we believe to be caused by food being defective in certain constituents is Rickets. How far, then, are eczematous infants rachitic? It is obvious that in such cases the rickets and the eczema might be common results of the same causes, for it is hardly usual to find marked evidence of rickets at the age when eczema usually appears. In attempting to get information on this subject, I have found considerable difficulty in arriving at definite results, and I am convinced that my statistics as regards the presence of rickets would be modified in the direction of lessening the percentage, had I to examine the cases again.

Inquiry was directed to the following points: (1) Beading of ribs; (2) Enlargement of joints; (3) Sweating on head during sleep; (4) Prominence of belly.

Of these No. 3 is, obviously, in cases where the scalp is extensively covered with eczema, impossible to observe, and the answers are practically worthless.

But the greatest difficulty I have found is in estimating Nos. 1 and

2. The fat wrist of a young baby with the skin attached lightly close over the wrist itself, and the flesh bulging out above, often looks exceedingly like an enlarged lower end of the fore-arm bones, and, I am sure that, in my earlier cases, I have frequently mistaken it for such. Again, I am inclined to think that many babies have a very slight prominence at the junction of the ribs with the cartilages, which does not necessarily indicate rickets. In my desire not to minimise the presence of rickets, I am afraid I have marked these as beaded ribs. If, however, one looks at these statistics, and notes how many cases of well-marked rickets there are, one finds that out of fifty-one cases where the patients were examined—

There was evident rickets in . . .	8 (15·6 per cent.)
,, certainly NO rickets in . .	28 (54·9 per cent.)
Doubtful in	15 (29·5 per cent.)
	51

Of course it is possible to say that the fifteen doubtful ones were early cases, which probably became fully developed rickets later, but even then we have more than 54·9 per cent. of the cases examined showing *no signs whatever of rickets*, often at considerable periods after the appearance of the eczema, and about 85 per cent. in whom the signs were insufficient to point to certain rickets.

The next point is, whether the food was of unsuitable character, so as to disagree, and produce what I may call, "infantile dyspepsia." So far as I can see this can only be diagnosed either by vomiting, flatulence, colic, or diarrhœa.

On these points, the answers, with one or two exceptions, have been absolutely negative.

	No. of cases.
Vomiting:	
Present	4 (7·5 per cent.)
Absent	49 (92·5 per cent.)
	53
Diarrhœa:	
Present	10 (18·1 per cent.)
Absent	45 (81·9 per cent.)
	55

In six of the cases it had been "very slight," "only for a day or two," etc.

These sixty children, in fact, have shown a quite remarkable exemption from gastro-intestinal trouble of this sort. And I would here refer again to the very striking fact that the months during which, in these cases, eczema occurs least frequently, are exactly the months when the incidence of gastro-intestinal derangement generally is the greatest. If irritation of the digestive tract as a cause had the importance usually assigned to it, one would expect a large increase of infantile eczema during the very months when, according to my limited statistics, the fewest cases occur.

In many cases constipation has been complained of; but that is, surely, evidence, not of intestinal irritation by improper food, but rather of sluggish reflex action of the lower lumbar centres.

The last of the food questions is the most hopeless to try and answer. Some authors say the child is being over-fed, hence it gets eczema. They do not define whether they mean that the child is receiving more into its alimentary tube than it can absorb, or, whether they mean it is absorbing more than it can build up into tissue. In the former case there would be sure to be gastro-intestinal symptoms before long—vomiting, abdominal pain, or diarrhœa—which, as we have seen, rarely occur. In the latter case, it seems impossible at present to obtain any definite proof; in adults it might be urates and gout; at any rate, it would be heaviness and drowsiness. The infant does not have gout, and I have never heard any complaints of thick high-coloured urine, whilst, in my experience, the eczematous baby is oftenest bright, happy, and lively.

If, however, we have no direct proof of this, which is a mere assertion, we have indirectly much against it; the children are breast-fed, not artificially fed; their mothers are usually wives of working men, amongst whom rich food is not much known, and except for the eczema they are frequently in particularly good health.

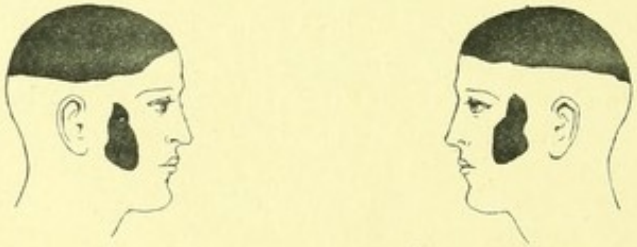
For me, the statement without further evidence does not carry conviction.

(*m*) Distribution of Eruption. (*Vide* Table IV and Figs. 1, 2, 3, and 4).

The following conclusions may be fairly arrived at from a perusal of the Table (IV) and Figs. 1, 2, 3, and 4.

CASE 60

CASE 50



CASE 53

CASE 47 (a)

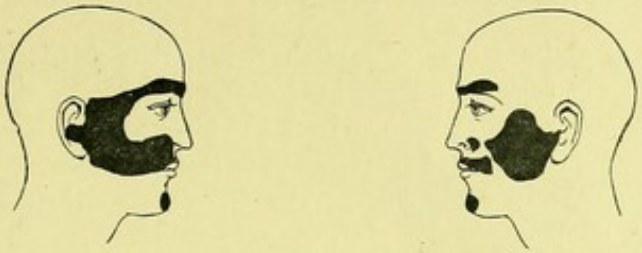
FIG. 1—Types of distribution on head and face.

CASE 60.—Began at outer angle of left orbit. Duration one month.

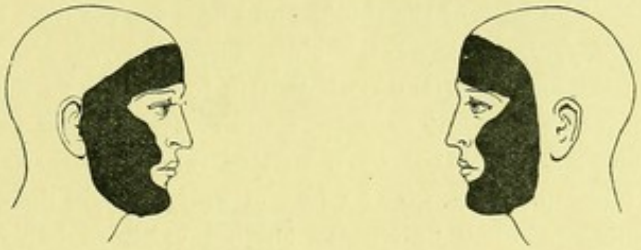
CASE 50.—Began on forehead. Duration seven months.

CASE 53.—Began on left cheek. Duration two months.

CASE 47 (*a*).—Began behind ears. Duration ten and a half weeks.

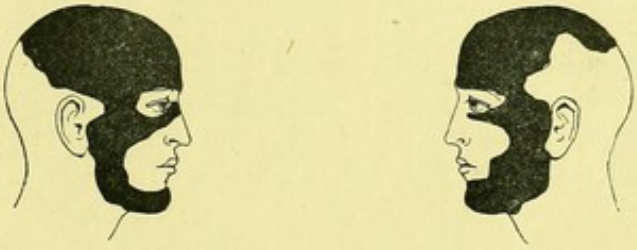


CASE 15



CASE 33

CASE 39



CASE 47 (b)

FIG. 2.—Types of distribution on head and face.

CASE 15.—Began by right ear. Duration one month.

CASE 33.—Began on right cheek. Duration seven months.

CASE 39.—Began on forehead. Duration three months.

CASE 47 (*b*).—From same patient as 47 (*a*), two months later.

1. *Site of first appearance.**—We have seen that this is in almost all the cases on some part of the head or face.

2. *Distribution on trunk.*—The back and abdomen are about equally often affected, the frônt of chest and neck less so.

3. *Distribution on upper limbs.*—The forearms and hollows of the elbows are the most common places.

4. *Distribution on legs.*—The extensor surface of the legs is the part most commonly affected and next to that the extensor surface of the thighs. The back of the thighs and knees are the least so.

Head and face.—Out of the sixty cases I have diagrammatic outlines of the cranio-facial distribution in forty-six. Of these eight are shown in the illustrations, Figs. 1 and 2.

These diagrams must not be translated into more than they are intended to mean. They give an idea of uniformity in the character of the eruption. Such uniformity did not exist, probably, in any single case. They are intended only to show distribution, and, as far as possible, they do accurately represent the areas of affected skin.

In attempting to group them one finds it very difficult to find any definite means of classification.

Thus, placing the diagrams according to length of duration, one finds that a similar area is affected in Case 46, which had only lasted one week, to what exists in Case 40, which had lasted nearly three years. On the whole, however, the cases which have lasted more than six months, appear to have the scalp less affected than the face. In other words, the eczema on the scalp, whether it appears first or later, seems to tend to disappear sooner than that on the face.

Thus, Case 23 began at the top of the head when four months old; twelve months later the scalp is unaffected, and the facemask remains. Case 47 began at the back of the ears when six weeks old; thirteen and a half months later these are well, but the face and forehead mask remains. With the exception of these two cases, the rash in all the others remained, when the diagram was made, at the site of the original eruption.

* Besnier (*La Pratique Dermatologique*, vol. ii, pp. 57 *et seq.*) refers in detail to these primary sites of eruption in all classes of eczema: "Régulièrement, alors même qu'il oocupera plus tard diverses régions de la surface tégumentaire, l'eczéma commence a un début *localisé*, foyer vaccinal, primaire, localisation maitresse, élément initial, dont l'importance pratique est considérable."

As regards types of distribution, they may be divided as follows :

	Case No.
1. Head mask . . .	27, 44, 8
2. Head mask with lappets .	49, 12, 34, 48, 10, 31, 53, 38, 39, 29, 25, 40
3. Face mask . . .	15, 60, 58, 14, 33, 50, 23, 54
4. Head and face mask .	51, 5, 47, 45, 13, 17, 30, 36, 52, 24, 35, 51, 32, 4, 42, 43, 55, 57, 37, 41, 28

These types gradually merge into one another, sometimes presenting a distribution which might be placed under either of two types.

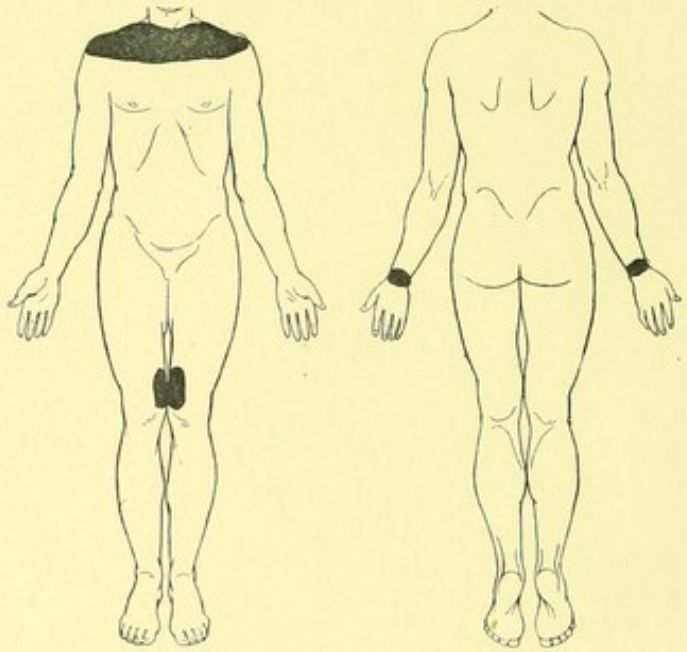
Again, the types may, any of them, be complete or incomplete, patches in these areas being affected which, when grouped together in a diagram, show very strikingly the type arrangement. For instance, Cases 15, 60, 58, 50 are good examples of incomplete Type 3; whilst Cases 5, 9, 12, 13, 25, 29, 30, 31, 36, 45, 47, 49, 51, 53 are all examples of incomplete Type 4. In some of these it will be noticed that the patchy, incomplete part is on the face, in others it is on the head.

It will be noticed that in the type diagrams I have not included the external ear, or the fold of the ear as being affected.

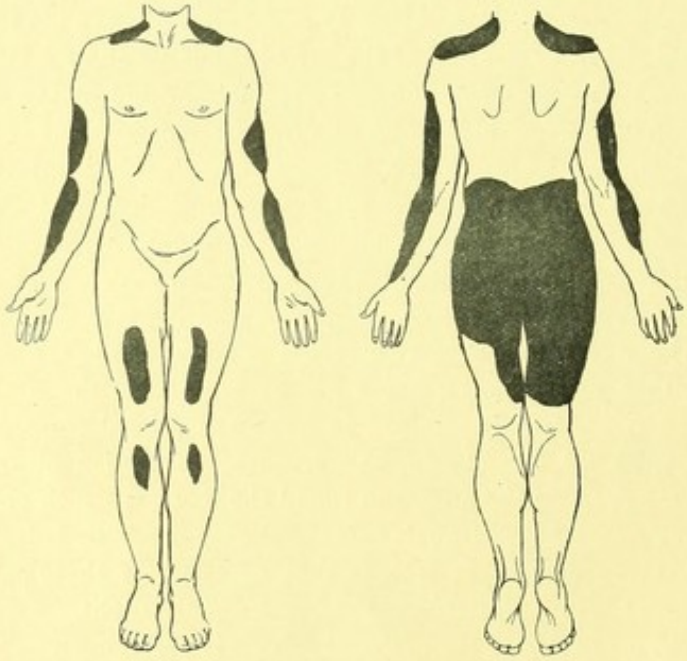
In about half the cases the ears were not affected at the time of making the diagram; in the other half, the extent to which they were involved was variable; thus, sometimes the face mask involves the front of the ear, at others there are fissures in the ear fold above or below. Sometimes one ear is affected, the other not; at others the whole of both lobes is affected. The most striking features, however, of the diagrams are :

(1) The way in which certain areas are almost always affected, whilst other neighbouring areas are exempt; thus the neck, both back and front, is only affected in quite exceptional cases, such as Cases 32, 35, or 37. Again, the frequent exemption of the skin around the eyes, on the nose, and round the lips has struck observers for a long time; hence Unna's name of the "mask with holes cut in it" for these cases. It is true that occasionally these parts are affected, but it is comparatively rare, and usually slight.

(2) The symmetry of the outbreak. This is particularly noticeable in the cases of incomplete facial masks, where, although the patches on

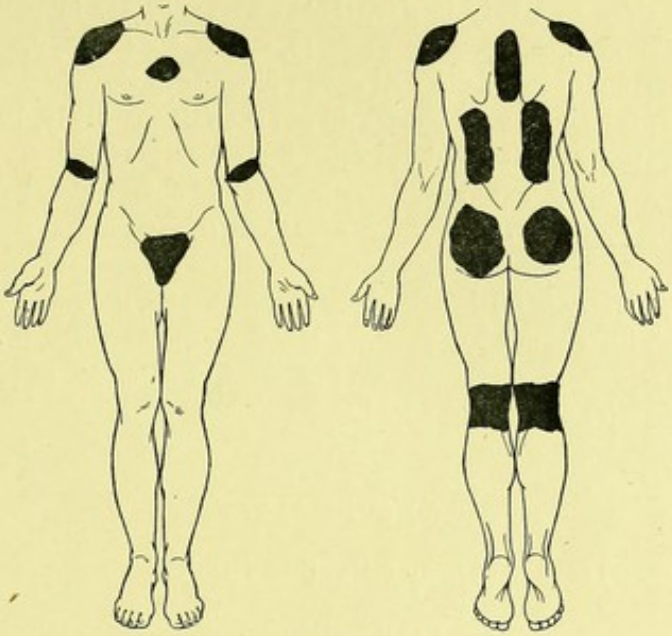


Case 9.

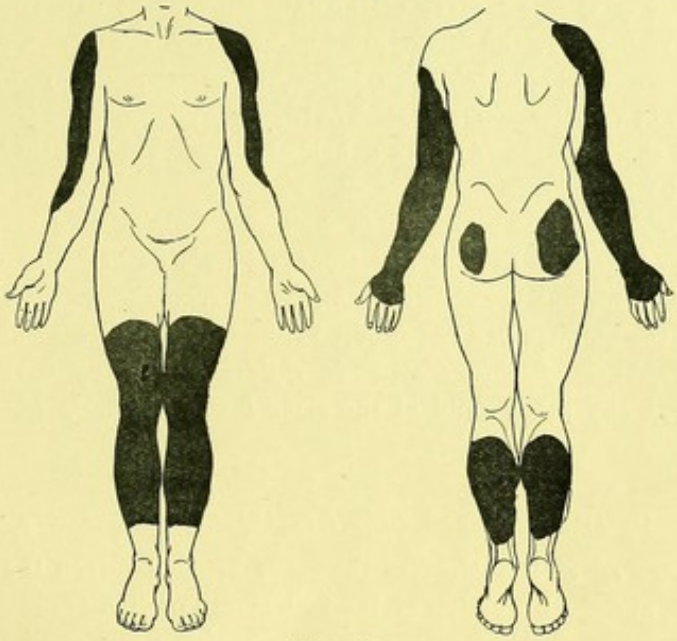


Case 37.

FIG. 3.—Types of distribution on trunk and limbs.



Case 5.



Case 35.

FIG. 4.—Types of distribution on trunk and limbs.

the two sides may vary in size, their correspondence in position is very striking. See especially Cases 15, 60, 53, 50, 47, 45, 9.

This symmetry is equally well shown in many of the more complete cases. It is true that some cases do not show it markedly, but they are comparatively few, and sometimes their very asymmetry, probably representing new areas starting, or old ones which have disappeared, confirms rather than negatives the general symmetrical distribution.

The symmetry is further seen in the trunk and limb distribution, varying with circumstances. The trunk diagrams (Figs. 3 and 4) do not represent whole areas of eczema, but often a patch is merely a series of grouped papules or vesicles.

(*n*) SUMMARY.

(*a*) *Sex.*—There were more males than females.

Family History.

(*b*) *Age of mother.*—More of the children were born in the middle or late, rather than the early period of maturity.

(*c*) *Number of other children, etc.*—On the whole, they were not children of very large families. First-borns were not more frequently affected than others. About one half of the cases were either second or third born.

(*d*) *Evidence of skin disease in mothers.*—Only a very small percentage of mothers had suffered from an actual outbreak of eczema. A considerable number showed stigmata of seborrhœa. Nearly one-half of the mothers had not suffered from any skin disease whatever.

(*e*) *Evidence of skin disease in children.*—In only a very few cases was any other child of the same family similarly affected in infancy.

Details regarding first Appearance of Eruption.

(*f*) *Age of child.*—Most of the cases began between the end of the first, and the beginning of the fifth month of life.

(*g*) *Site of first appearance.*—In ninety-five per cent. of the cases the rash appeared first on some part of the head.

(*h*) *Season of year.*—Out of fifty-nine cases, spread over a period of six years only, three occurred during the quarter June to August, the warmest quarter of the year, whilst twenty-four began in the quarter December to February (the coldest quarter). The number for the quarter September to November was eighteen, for the remaining spring quarter, fourteen.

(*i*) *Nature of food.*—Eighty-six and a half per cent. of the cases were breast-fed when the rash appeared. The remainder were bottle-fed.

Details as to Vaccination and Dentition.

(*j*) *Vaccination.*—The greater number of the cases had not been vaccinated before the eruption appeared. In those that had been vaccinated, the interval between that and the first appearance of the eruption varied considerably in different cases.

(*k*) *Dentition.*—In most of the cases the eruption preceded first dentition, often by an interval of months (*vide* also *f*).

Condition of Child.

(*l*) *Evidence of Alimentary Disturbance and Rickets.*—In most of the cases there was no wasting, vomiting, or diarrhœa. In about fifteen per cent. there was well-marked rickets, in more than fifty per cent. there was none.

(*m*) *Character and Distribution of Eruption.*—The character varied according to the duration, cleanliness, amount of secondary infection, etc. The distribution was frequently extensive; certain parts were almost always, others hardly ever, affected. The symmetry of the eruption on the two sides of the body, in all parts affected, was usually noticeable.

Table I.

Case No.	Age of mother.	Number of other children.	Time since previous confinement.	Other children.		
				With eczema.	With uncertain skin disease.	With no skin disease.
1	23	1	2 years	0	0	1
2	29	3	?	0	1	2
3	33	2	8½ years	0	0	2
4	?	?	?	1	?	?
5	24	?	?	0	0	?
6	39	3	6½ years	0	0	3
7	29	4	2 „	0	1	3
8	32	2	?	0	1	1
9	20	0	—	0	0	0
10	34	4	3 years	0	0	4
11	26	2	2½ „	0	0	2
12	24	0	—	0	0	0
13	29	2	2 years	0	0	2
14	28	2	7½ „	0	1 twin	1
15	24	3	2 „	0	0	3
16	40	5	?	0	0	5
17	27	2	1½ years	0	0	2
18	33	3	1½ „	0	0	3
19	23	?	?	?	?	?
20	33	5	?	0	0	5
21	28	1	2¾ years	0	0	1
22	20	?	?	?	?	?
23	36	5	5 years	0	0	5
24	34	2	5½ „	1	0	1
25	28	4	3 „	0	0	4
26	28	1	2 „	0	1	0
27	24	2	3½ „	0	0	2
28	34	3	13½ „	0	0	3
29	30	3	2½ „	0	0	3
30	29	2	2½ „	0	0	2
31	23	0	—	0	0	0
32	26	0	—	0	0	0
33	37	1	?	0	1	0
34	33	3	2¾ years	0	0	3
35	37	2	3½ „	0	0	2
36	35	3	3½ „	0	0	3
37	42	4	1½ „	0	0	4
38	30	1	4¾ „	0	0	1
39	26	1	1 year	0	0	1
40	22	1	younger	0	0	1
41	39	5	3¾ years	0	0	5
42	27	2	2½ „	0	1	1
43	36	6	1¾ „	0	0	6
44	23	2 dead	?	0	0	2
45	28	2	2 years	0	0	2
46	35	1	8½ „	0	0	1
47	31	2	3 „	0	0	2
48	29	4 dead	?	0	0	4
49	?	1	2½ years	0	0	1
50	21	0	—	0	0	0
51	21	1	2¼ years	0	0	1
52	?	1 dead	?	0	1	0
53	?	0	—	0	0	0
54	36	5	2½ years	0	0	5
55	28	1	7 „	0	0	1
56	23	0	—	0	0	0
57	29	3	2½ years	0	0	3
58	23	2	?	0	0	2
59	?	2	?	1	1	0
60	20	0	—	0	0	0

TABLE II. *Evidence of Skin Disease in Mother.*

Case No.	Definite outbreak of eczema.	Indefinite past or present skin disease.	Case No.	Definite outbreak of eczema.	Indefinite past or present skin disease.
1	—	—	30	—	—
2	Yes; infancy	—	31	—	—
			32	—	—
3	?	?	33	—	—
4	—	Rash in head each spring; scaly patches nose and chin.	34	Yes; 2 years ago	—
			35	—	Scurfy face in summer.
5	—	Dry red scaly patches cheeks and sides of neck.	36	—	—
			37	?	?
6	—	Rash when pregnant, dry scaly face.	38	—	Dryness on face.
			39	—	Scurf on face in summer.
7	?	?	40	—	—
8	—	Blotches on face; dry scales on nose, chin, and cheeks.	41	—	—
			42	Yes; seborrhoic	Still has patches behind right ear and on neck.
9	—	—	43	—	—
10	—	Bad hands a year ago.	44	—	Right cheek dry and scaly.
11	—	—	45	—	Dry patches at angles of mouth.
12	—	Dry skin of face.			
13	?	?	46	—	Rough patch behind right ear.
14	—	Face scurfy in winter.			
15	—	Bad ear when child.	47	—	Scurf on temples and neck.
16	—	—			
17	—	—	48	—	—
18	—	—	49	Yes; 5 years ago	Now has eczema of ears and scalp.
19	?	?			
20	—	Dry scaly patches at hair roots, with crusts; rosacea.	50	—	—
			51	—	—
			52	?	?
21	Yes; all life	Face dry and scaly.	53	—	—
			54	—	—
22	—	—	55	—	—
23	—	Dry scaly patches at corner of mouth.	56	Yes; 5 years ago	Still has remains on neck and ears.
24	—	—	57	—	Rosacea, dry red patches on cheeks.
25	—	—			
26	—	—	58	—	Inflamed eyelids; dry red patches on cheeks.
27	—	Dry scaly face always.			
28	—	—	59	—	Scurfy face and head; dry hands in winter.
29	—	Rash on face after vaccination.			
			60	Yes; infancy	—

TABLE III. *Nature of Food when Rash first appeared.*

Case No.	Age when rash first appeared.	Breast and other food.	Breast only.	Bottle only.	Age when weaned.
	Months.				Months.
1	5	Yes; crusts	—	—	7
2	8	—	Yes	—	12
3	1½	—	Yes	—	—
4	½	—	Yes	—	—
5	3	—	Yes	—	—
6	3	—	Yes	—	—

TABLE III. *Nature of Food when Rash first appeared*—continued.

Case No.	Age when rash first appeared.	Breast and other food.	Breast only.	Bottle only.	Age when weaned.
	Months.				Months.
7	3	—	Yes	—	7
8	6	?	?	—	—
9	1	Yes; Neave's, crusts	—	—	—
10	2	—	Yes	—	—
11	2	Yes; bread and milk	—	—	—
12	6	Yes; bread, rusks	—	—	—
13	3	Yes; bread, biscuits	—	—	—
14	2	Yes; rusks	—	—	—
15	12	—	—	Yes	3
16	5	Yes; bread in tea	—	—	—
17	3	—	Yes	—	—
18	2¼	—	Yes	—	—
19	7	Yes; bread, biscuits	—	—	—
20	1¾	Yes; biscuits	—	—	—
21	3	Yes; ? what	—	—	—
22	3	—	—	Yes	—
23	4	—	Yes	—	—
24	¾	—	Yes	—	—
25	1¾	—	Yes	—	—
26	2¼	—	Yes	—	—
27	4	—	Yes	—	—
28	2½	Yes; Mellin's	—	—	—
29	2½	Yes; milk and sago	—	—	—
30	1	Yes; ? what	—	—	—
31	2½	—	Yes	—	—
32	1½	—	Yes	—	—
33	3	—	—	Yes	?
34	3½	—	Yes	—	—
35	1	Yes; ? what	—	—	—
36	3	—	Yes	—	—
37	3	—	—	Yes	1½ (Swiss milk).
38	¼	—	Yes	—	—
39	¾	—	Yes	—	—
40	2¼	—	Yes	—	—
41	1	—	Yes	—	—
42	3	—	Yes	—	—
43	3	Yes; rusks	—	—	—
44	6	—	Yes	—	—
45	3	—	—	Yes	1½ (milk and barley-water).
46	4	—	—	Yes	Birth (milk and Neave's).
47	1½	—	Yes	—	13
48	3	—	Yes	—	—
49	1½	—	Yes	—	—
50	2	—	Yes	—	—
51	4½	—	Yes	—	—
52	1	—	Yes	—	—
53	2	Yes; milk only	—	—	—
54	3	—	Yes	—	—
55	3	—	Yes	—	—
56	11	—	—	Yes	10(milk and bread).
57	3	Yes; milk and rusks	—	—	—
58	1¾	—	Yes	—	—
59	3	Yes; cooked bread	—	—	12
60	2	—	—	Yes	? (milk and barley-water).

In this table — signifies negative.

TABLE IV. *Distribution and First Site of Eruption.*

Case No.	Duration of Rash (Months).	Place First Affected.	Distribution when first seen by me.					
			Scalp.	Foreh'd	Cheeks.	Trunk.	Arms.	Legs.
1	6	Body.	0	+	+	+	+	+
2	12	Left cheek.	+	+	+	?	?	?
3	5½	Left cheek.	+	+	+	+	?	?
4	2	Occiput.	+	?	?	?	?	?
5	6	Forehead.	+	+	+	+	+	+
6	3	Vertex.	+	+	+	+	+	+
7	6	Head.	+	0	0	0	0	0
8	30	Scalp.	+	0	0	+	0	+
9	6	Cheeks.	+	0	+	?	?	?
10	1	Head.	+	+	+	+	+	+
11	3	Right cheek.	0	+	+	+	+	+
12	1	Vertex.	+	+	+	+	0	+
13	30	Right cheek and ear.	+	+	+	0	+	+
14	5	Left ear.	+	0	+	+	0	0
15	1	Right ear.	0	+	+	0	0	0
16	5	Occiput.	+	+	0	0	0	0
17	4	Forehead.	+	+	+	0	0	0
18	1¼	Left cheek.	+	+	+	0	0	0
19	2	Big toe.	?	?	?	?	?	+
20	?	Right cheek.	+	+	+	+	+	0
21	0	Right cheek.	+	?	+	?	+	?
22	2	Vertex.	+	+	?	?	?	?
23	12	Vertex.	+	+	+	+	+	0
24	4¼	Right and left cheek.	+	+	+	0	0	0
25	22¼	Left cheek.	+	+	+	0	+	0
26	33¼	Left cheek.	+	+	+	+	+	+
27	0	Head (front).	+	+	+	+	+	+
28	3½	Forehead, cheeks.	+	+	+	0	0	0
29	4½	Left cheek.	+	+	+	+	0	+
30	4	Forehead.	+	+	+	0	0	0
31	2	Head, right cheek.	+	+	+	0	0	0
32	4½	Eyebrows.	+	+	+	+	0	+
33	7	Right cheek.	0	+	+	+	+	0
34	½	Occiput.	+	+	+	0	0	0
35	4	Right cheek.	+	+	+	+	+	+
36	4	Vertex.	+	+	+	0	+	+
37	1½	Forehead.	+	+	+	+	+	+
38	2¼	Occiput.	+	+	+	0	0	0
39	3¼	Forehead.	+	+	+	0	0	0
40	33½	Vertex.	+	+	+	0	+	0
41	3	Forehead.	+	+	+	0	0	0
42	0	Vertex.	+	+	+	0	0	0
43	1	Vertex.	+	+	+	+	+	+
44	2	Eyebrows.	+	+	0	0	0	0
45	17	Right cheek.	+	+	+	0	0	0
46	0	Head and face.	+	+	+	0	0	0
47	10½	Behind ears.	+	+	+	+	+	+
48	1	Vertex.	+	+	+	0	0	0
49	½	Forehead.	+	+	0	0	0	0
50	7	Forehead.	+	+	+	+	0	+
51	4½	Vertex.	+	+	+	+	+	0
52	4	Forehead.	+	+	+	0	0	0
53	2	Left cheek.	+	+	+	+	+	+
54	27	Left cheek.	0	+	+	+	+	+
55	1	Vertex.	+	+	+	0	0	0
56	2	Back.	+	+	+	+	+	+
57	1	Right cheek.	+	+	+	+	+	0
58	1¼	Behind left ear.	0	+	+	+	0	0
59	15	Face and arms.	0	+	+	+	+	+
60	1	Left cheek.	0	0	+	0	0	0

TABLE V. *Dentition and Vaccination.*

Case No.	Age of child when: Rash first appeared.	Seen by me.	First tooth cut.	Vaccinated.	Case No.	Age of child when: Rash first appeared.	Seen by me.	First tooth cut.	Vaccinated.
		Months.	Months.				Months.	Months.	
1	5	11	4	?	31	2½	4½	—	?
2	8	24	9	?	32	1¼	6	2 cut when born, none since	?
3	1½	7	—	?					
4	½	2½	?	?	33	3	10	6	?
5	3	9	6	?	34	3½	4	—	3
6	3	6	—	?	35	1	5	—	?
7	3	9	?	?	36	3	7	—	?
8	6	36	6	?	37	3	4½	—	?
9	1	7	—	?	38	¼	3	—	—
10	2	3	—	?	39	¾	4	—	—
11	2	5	5	?	40	2¾	36	? (all cut now)	—
12	6	7	—	?	41	1	4	—	?
13	3	36	10	2	42	3	3	—	2
14	2	7	—	?	43	3	4	—	—
15	12	13	5 (none since)	?	44	6	8	—	3
16	5	10	7	?	45	3	20	13	—
17	3	7	—	2½	46	4	4	—	?
18	2¾	4	—	?	47	1½	12	8	—
19	7	9	5	?	48	3	4	—	?
20	1¾	?	4	?	49	1½	2	—	—
21	3	3	—	?	50	2	9	5	5
22	3	5	—	?	51	4½	9	6	4
23	4	16	12	?	52	1	5	?	?
24	¾	5	—	?	53	2	4	—	1
25	1¾	24	7	1½	54	3	30	6	—
26	2¼	36	5	?	55	3	4	—	—
27	4	4	—	?	56	11	13	7	1
28	2½	6	—	2¼	57	3	4	—	—
29	2½	7	? 2	?	58	1¾	3	—	1½
30	1	5	—	1 (3 days before).	59	3	18	9	6
					60	2	3	—	2½

In this table — means *no* tooth cut or *not* vaccinated.

TABLE VI. *Evidence as to Digestive Troubles.*

Case No.	Vomiting.	Diarrhœa.	Wasting.	Case No.	Vomiting.	Diarrhœa.	Wasting.
1	—	—	—	12	—	—	—
2	?	?	?	13	—	Yes.	Yes.
3	—	—	Yes.	14	—	Yes.	—
4	?	?	?	15	—	Yes.	?
5	—	—	—	16	—	—	—
6	—	—	—	17	—	—	—
7	?	?	?	18	—	—	—
8	—	—	—	19	?	—	Yes.
9	—	—	—	20	?	?	?
10	—	—	—	21	?	—	?
11	—	—	—	22	—	—	—

TABLE VI. *Evidence as to Digestive Troubles*—continued.

Case No.	Vomiting.	Diarrhœa.	Wasting.	Case No.	Vomiting.	Diarrhœa.	Wasting.
23	—	Yes.	—	42	—	—	—
24	—	—	Yes.	43	—	—	—
25	—	—	—	44	—	—	—
26	—	—	—	45	—	—	—
27	Yes.	—	—	46	—	—	—
28	—	Yes.	—	47	—	—	—
29	—	—	Yes.	48	—	—	—
30	—	—	—	49	—	—	—
31	Yes.	—	—	50	—	Yes.	—
32	Yes.	—	—	51	—	—	—
33	—	Yes.	—	52	—	—	?
34	—	—	—	53	—	—	—
35	—	Yes.	—	54	—	—	—
36	—	Yes.	—	55	—	—	—
37	Yes.	—	Yes.	56	—	—	Yes.
38	?	?	—	57	—	—	Yes.
39	—	Yes.	—	58	—	—	—
40	—	—	?	59	—	—	—
41	—	—	—	60	—	—	—

In this table — signifies negative.

TABLE VII. *Evidence of Rickets when Child first seen.*

Case No.	Duration of rash.	Beaded ribs.	Enlarged joints.	Sweating of head.	Prominent belly.	Case No.	Duration of rash.	Beaded ribs.	Enlarged joints.	Sweating of head.	Prominent belly.
	Months.						Months.				
1	6	—	Yes	Yes	—	31	2	—	—	Yes	—
2	12	Yes	Yes	?	—	32	4½	Yes	—	—	Yes
3	5½	Yes	—	Yes	—	33	7	Yes	Yes	—	—
4	2	—	—	—	—	34	½	—	—	—	—
5	6	Yes	Yes	—	Yes	35	4	?	?	?	?
6	3	Yes	—	—	?	36	4	—	—	—	—
7	6	?	?	?	?	37	1½	Yes	—	—	Yes
8	30	?	?	?	?	38	2¾	Yes	Yes	—	—
9	6	Yes	—	Yes	Yes	39	3¼	—	—	—	—
10	1	Yes	Yes	Yes	?	40	33¼	Yes	—	Yes	Yes
11	3	—	—	Yes	?	41	3	—	—	—	—
12	1	Yes	Yes	—	?	42	—	?	?	?	?
13	30	?	?	?	?	43	1	—	—	—	—
14	5	Yes	Yes	Yes	Yes	44	2	—	—	—	—
15	1	Yes	—	Yes	Yes	45	17	Yes	Yes	Yes	Yes
16	5	Yes	?	Yes	Yes	46	—	Yes	—	—	—
17	4	Yes	Yes	Yes	?	47	10½	—	—	Yes	—
18	1¼	?	—	—	—	48	1	—	—	Yes	—
19	2	—	—	?	—	49	½	?	?	—	?
20	?	?	?	?	?	50	7	?	?	Yes	?
21	—	—	—	—	—	51	4½	—	—	—	—
22	2	Yes	—	—	—	52	4	?	?	?	?
23	12	Yes	Yes	—	Yes	53	2	—	—	—	—
24	4¼	—	—	—	—	54	27	—	—	—	—
25	22¼	?	?	?	?	55	1	—	—	—	—
26	33¾	Yes	Yes	Yes	Yes	56	2	—	—	—	—
27	—	Yes	Yes	—	—	57	1	—	—	—	—
28	3½	—	—	—	—	58	1¼	—	—	—	—
29	4½	?	—	Yes	—	59	15	?	?	?	?
30	4	Yes	Yes	Yes	—	60	1	—	—	—	—

In this table — signifies negative.

TABLE VIII. *Month of Birth and of Appearance of Eruption.*

Case No.	Born.	Rash first seen.	Case No.	Born.	Rash first seen.
1	April, 1898	September, 1898	34	June, 1901	September, 1901 (end)
2	February, 1897	October, 1897			
3	June, 1898	August, 1898	35	October, 1901	November, 1901
4	January, 1899	January, 1899	36	July, 1901	October, 1901
5	July, 1898	October, 1898	37	August, 1901	December, 1901
6	October, 1898	November, 1898	38	December, 1901	December, 1901
7	August, 1898	November, 1898	39	April, 1902	May, 1902 (Whit-Tuesday, a bitterly cold, wet day).
8	?	?			
9	October, 1898	November, 1898			
10	March, 1899	May, 1899			
11	May, 1899	July, 1899	40	October, 1899	January, 1900
12	July, 1899	January, 1900	41	April, 1902	May, 1902
13	October, 1896	January, 1897	42	August, 1902	November, 1902
14	August, 1899	October, 1899	43	September, 1902	December, 1902
15	February, 1899	February, 1899	44	April, 1902	October, 1902
16	May, 1899	October, 1899	45	June, 1901	September, 1901 (end)
17	September, 1899	December, 1899			
18	December, 1899	January, 1900	46	September, 1902	January, 1903
19	June, 1898	January, 1900	47	March, 1902	April, 1902
20	August, 1898	September, 1898 (last week)	48	December, 1902	March, 1903
			49	February, 1903	April, 1903
21	July, 1898	October, 1898	50	August, 1902	October, 1902
22	January, 1899	April, 1899	51	August, 1902	December, 1902
23	October, 1898	February, 1899	52	September, 1902	October, 1902
24	March, 1901	March, 1901	53	December, 1902	February, 1903
25	November, 1898	January, 1899	54	November, 1900	February, 1901
26	November, 1897	January, 1898	55	February, 1903	May, 1903 (very cold in first half).
27	July, 1900	November, 1900			
28	October, 1900	January, 1901 (living at very exposed, bleak place on hills temporarily).	56	May, 1902	April, 1903
			57	February, 1903	May, 1903 (see above).
			58	March, 1903	May, 1903 (early) see above.
29	September, 1900	December, 1900			
30	December, 1899	January, 1900	59	October, 1901	January, 1902
31	February, 1900	April, 1900	60	May, 1903	July, 1903 (towards end, when weather turned very cold)
32	December, 1899	February, 1900			
33	December, 1900	March, 1901			

TABLE IX. *Cases Grouped according to Age when Rash first appeared.*

Case No.	Month of birth.	Month of rash appearing.	Case No.	Month of birth.	Month of rash appearing.
	(*a*)	DURING FIRST MONTH OF LIFE.		(*b*)	DURING SECOND MONTH OF LIFE.
4	January	January.	6	October	November.
15	February	February.	9	October	November.
24	March	March.	18	December	January.
38	December	December.	20	August	September (end).

TABLE IX. *Cases Grouped according to Age when Rash first appeared*—continued.

Case No.	Month of birth.	Month of rash appearing.	Case No.	Month of birth.	Month of rash appearing.
	(*b*)	DURING SECOND MONTH OF LIFE—*cont.*		(*d*)	DURING FOURTH MONTH OF LIFE—*cont.*
30	December	January.	22	January	April.
35	October	November.	28	October	January.
39	April	May (very cold Whit-Tuesday, 1902).	30	September	December.
			33	December	March.
41	April	May (1902).	34	June	September.
47	March	April.	36	July	October.
52	September	October.	40	October	January.
			42	September	December.
	(*c*)	DURING THIRD MONTH OF LIFE.	43	September	December.
			45	June	September (end).
3	June	August (after day at Cleethorpes).	48	December	March.
			54	November	February.
10	March	May.	55	February	May (1903).
11	May	July.	57	February	May (1903).
14	August	October.	59	October	January.
25	November	January.			
26	November	January.		(*e*)	DURING FIFTH MONTH OF LIFE.
31	February	April.			
32	December	February.	23	October	February.
49	February	April.	27	July	November.
50	August	October.	37	August	December.
53	December	February.	46	September	January.
58	March	May (1903).	51	August	December.
60	May	July (1903).			
				(*f*)	DURING SIXTH MONTH OF LIFE OR LATER.
	(*d*)	DURING FOURTH MONTH OF LIFE.			
			1	April	September.
5	July	October.	2	February	October.
7	August	November.	12	July	January.
13	October	January.	16	May	October.
17	September	December.	19	June	January.
21	July	October.	44	April	October.
			56	May	April.

TABLE X. *Cases Grouped according to Month of Birth.*

Month of birth.	Month of Appearance of Rash.												
	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
January	1	—	—	1	—	—	—	—	—	—	—	—	2
February	—	1	—	2	2	—	—	—	—	1	—	—	6
March	—	—	1	1	2	—	—	—	—	—	—	—	4
April	—	—	—	—	2	—	—	—	1	1	—	—	4
May	—	—	—	1	—	—	2	—	—	1	—	—	4
June	1	—	—	—	—	—	—	1	2	—	—	—	4
July	1	—	—	—	—	—	—	—	—	3	1	—	5
August	—	—	—	—	—	—	—	—	1	2	1	1	5
September	1	—	—	—	—	—	—	—	—	1	—	4	6
October	4	1	—	—	—	—	—	—	—	—	3	—	8
November	2	1	—	—	—	—	—	—	—	—	—	—	3
December	2	2	2	—	—	—	—	—	—	—	—	1	7
													58

SECTION IV.—CONCLUSIONS.

Synopsis of Contents.

Review and criticism of various theories as to the causation of infantile eczema.
The "digestive disturbance" theory.
The "external irritation" theory.
Characteristics of Traumatic eczema.
The external irritants of infancy.
The neuro-cutaneous system of infants.
Eczema as a (? protective) cutaneous reaction.

The various theories as to the causation of infantile eczema, which have been held during the last century, may be broadly divided into three groups. In the first place there is the theory of digestive disturbance, with its various sub-divisions; secondly, the theory of external irritation; and, thirdly, a group composed of all the remaining theories—vaccination, dentition, diathesis, etc.

Undoubtedly, the weight of opinion, judged by numbers alone, is in favour of the first of these; but, as I have shown previously, there is considerable division amongst those who hold it, as to the exact nature of the digestive disturbance in question.

The second theory also is variously interpreted by different writers. Hebra, its greatest supporter, thinks the irritants may be almost innumerable, whilst others, amongst whom Unna, by his brilliant work during recent years, stands out pre-eminent, lay stress on one particular form of irritant, namely, micro-organisms. Finally, there is the modern school, headed by Brocq, which denies the micro-organism as cause, and leans towards a modification of the teaching of Hebra.

It may be added that many writers combine the two theories of digestive disturbance and external irritation in various proportions.

On the various divisions which make up the third group it is hardly worth while to spend much time. A reference to my statistics shows clearly, that neither dentition, nor vaccination, can possibly be the cause in most cases; and as the three events, dentition, vaccination, and infantile eczema, all occur during the first half-year of life, it must frequently happen that they alter the order of their occurrence, and that, as a result, remarkable coincidences often take place. Nor

does my evidence give any strong support to an inherited diathesis, in the loose sense in which that term is usually used.

I propose, therefore, to devote the remainder of this section to the consideration of the first two of these groups.

We have two questions before us—Is infantile eczema set up by disorder in the digestive apparatus, either directly or indirectly, either in the alimentary canal or in the tissue metabolism? Or, is it set up by local external irritants acting directly on the skin itself?—it being granted, that, in either case, the various parts of the nervous system in connection with the tissues affected may be involved.

Basing my statements upon the examination of these sixty cases, I am of opinion that the evidence is insufficient to support the theory of digestive disturbance or malassimilation as the cause of eczema; that, on the contrary, there is a considerable weight of evidence, as regards the digestive system, which is strongly opposed to such a theory. My reasons for these conclusions are as follows:

(*a*) In most of the cases there is no history of any other symptom of digestive disturbance having preceded or accompanied the first appearance of the eruption.

(*b*) Most of the cases have shown no symptoms of digestive disturbance during the whole of the period during which the eruption has lasted.

(*c*) Neither rickets or malnutrition was present in any considerable number of cases.

(*d*) Most of the cases were breast-fed at the time of the first appearance of the eruption. Several were breast-fed *alone*; others had an occasional biscuit or other food in addition. Only a small percentage were bottle-fed entirely.

(*e*) In most of the cases the same mother had suckled previous children under similar conditions, none of whom suffered from eczema.

(*f*) There is no evidence of excessively frequent child-bearing, over-suckling, or illness of the mother.

(*g*) Only a very small percentage of the whole number of cases occurred during the three summer months, the period during which infantile gastro-intestinal disturbances are by far the most common.

I would also add a few general observations bearing upon this subject. If digestive disturbance is the cause, why does the eczema continue long after all the digestive disturbance has been regulated

or removed? Why is it that infantile eczema of the ordinary type does not begin, more often, at the stage of weaning, when far more irregularities of diet occur than during the first three months of life? How does the "digestive disturbance" theory explain the fact that severe generalised recurrences of the disease appear after the infant rubs itself, even though there be no change whatever in the diet at the time?

Having thus dealt with the first theory, I shall attempt to show what evidence an analysis of these cases gives for or against the second theory, that of external irritation.

And I may here state that I am unable to deny, from personal investigations, the presence of a constant pathogenic organism in all these cases, but that I think it rests with those who support the parasitic theory to demonstrate such, in accordance with the laws of bacteriology. Hitherto the constant presence of such a pathogenic organism in cases of eczema has not, in my opinion, been satisfactorily demonstrated. And even if it were, I am unable to understand how it alone could satisfactorily explain all the features of an infantile eczema. Certainly not, if we are to suppose that every vesicle, every papule, every patch, of erythema occurring in such cases, is due to local parasitic agency.

What, then, is the evidence in favour of external irritation? It may be stated briefly as follows:

1. In almost every case the eruption commences on some part of the head or face. In the infant, during the first few weeks of life, this is practically the only exposed part, at any rate when out of doors.

N.B.—In the adult the head is never, and the face but rarely, the initial site of eczema.

2. The secondary distal eruptions on other parts are, in most cases, of much less severity, and tend to disappear directly the original sites recover, unless they (the former) are irritated.

3. The comparatively constant age at which the eruption appears, about the time when the infant is first released from the more extreme protection which it has received during the first few weeks of life.

4. The greatly increased percentage of cases which begin in the colder months of the year, varying markedly with the temperature

changes in each quarter, and particularly indicating an increase in number where there is a sudden decrease of temperature.

In addition to these statements based on my statistics, I hope to show later that there are other considerations which support this theory of external irritation. Before doing so, however, I think it is necessary to state that eczema from external irritants is no novel idea: many examples of it in adults are all too familiar, such as washerwoman's eczema, grocer's itch, etc. Many other forms of traumatic eczema also occur, some of which are, perhaps, less commonly recognised as such.

In order to make clear my views as to the *modus operandi* of the external irritant, it is essential to study the characteristics of these so-called "traumatic eczemas." *

Cases of traumatic eczema present certain general features, which I have attempted to sum up as follows:

1. The irritant must not be too strong, so as to produce too marked a local inflammation.

2. It must be repeatedly applied, often for a considerable period before any general reaction occurs. This, however, varies in different persons.

3. The effect appears first on that part of the surface which has been more directly in contact with the irritant.

4. This primary local eruption may, for some time, be the only part affected.

5. Sometimes a corresponding area on the opposite side of the body may be partially or wholly affected, soon after the appearance of the primary eruption; it is usually less severe.

N.B.—This is most noticeable in the upper extremity and face, less so in the lower extremity, least in the trunk.

6. If the irritation is continued in the same way, and *limited to the original situations*, other distant parts of the skin gradually or suddenly become affected, the intervening skin being, apparently, normal.

N.B.—These distal eruptions are, in almost all cases, symmetrical, and appear at parts of the body which we know, as the common sites

* I shall use the term "traumatic eczema" throughout, meaning thereby to include all those cases in which eczema occurs from any external irritant, whether used in occupation, as therapeutic agent or otherwise.

of eczema. They are much less severe than the eruption on the primary site. They may persist for a long time after the original irritant has been removed. They are even more readily reproduced than before by a repetition of the original stimulus.

7. After a time the reaction is capable of being produced or kept up by other, and less powerful, irritants than that which first produced it.

The following case, which I published in the *British Journal of Dermatology*, vol. xi, No. 125, illustrates most of the preceding characteristics of these "traumatic eczemas."

Mr. X—, aged 30 years, Demonstrator of Chemistry in a University College, was engaged in some research work, in addition to his ordinary duties in the laboratory. In July, 1894, he began to suffer from an irritable eruption on t[illegible] fingers which kept appearing from time to time. After a whi[illegible]e, this was accompanied by an acute vesicular eczema, affecting the face, ears, neck, elbows, inguinal regions, and scrotum. He was compelled to give up his work and undergo treatment, and after a time completely recovered. He returned to his work in the laboratory, and remained free for some time, when he had a recurrence of the generalised eczema, more severe than before. About this time he consulted a leading dermatologist in London, who confirmed the diagnosis of eczema. (I merely mention this point in order to emphasise my previous statement, that such cases are, clinically, indistinguishable from so-called "idiopathic eczema.") Suitable diet, more exercise, and less work were advised, and for a whole summer the patient was allowed only to do the minimum of demonstration work, and was out of doors golfing a large part of his time. With this *régime* his general health improved, and his skin recovered, to all appearances. After some months, thinking he must now be quite cured, he recommenced his research work in organic chemistry, only to be seized with a violent general recurrence worse than ever, and more widely spread. Being a man of keen observation, he began to put two and two together. He bethought himself that these attacks, at first limited to his hands, had only occurred since he had been engaged in this particular research; that each recurrence had followed attempts to continue the research; that so long as he was only doing his ordinary laboratory work he remained free from any attack. Convinced that

there was something in his research work which was the cause of these attacks, he proceeded to ascertain what it was by a process of exclusion, and, eventually, he proved conclusively that the offending irritant was one single substance—phenyl-hydrazin hydrochloride. A small quantity of this, touching his finger, produced within a few minutes great local irritation, followed by a vesicular eruption, and in a few hours by a severe, widely-spread acute eczema. After removing every trace of this substance from his laboratory, the attacks ceased completely, and although it is now six years ago, they have never recurred. There is not a trace of any eruption on his body at the present time.

I have given this case somewhat fully, because of its particularly clear and definite history. Similar cases, however, are of daily occurrence. Perhaps the most common instance is that of general eczema which so often follows a local varicose ulcer of the leg when it is irritated by an unsuitable application. At first the application makes the neighbouring skin on the leg inflamed and angry. Further applications are applied daily, and probably, but not necessarily, the other leg begins to be irritable; later the arms, neck, and face become itchy, and very soon a symmetrical eczematous eruption appears in those situations without any trace of eruption in the intervening skin. That these distal eruptions are of nervous origin, and possibly of a reflex nature, is probable from their symmetry, their appearance after the application of the irritant, their much milder type, and their frequent disappearance, without local treatment, very soon after the soothing of the originally irritated ulcer of the leg.

A similar condition is also common in cases of eczema of the hands,* but it is here often difficult to prove, owing to the many irritants to which both the hands are daily or even hourly exposed.

That distal symmetrical eruptions can be produced by a localised irritant alone there is abundant evidence, but, that an irritant, applied

* J. F. Payne (*loc. cit.*, p. 511) writes: "The hands are often affected by various traumatic causes, such as those proceeding from certain occupations—washing, friction of tools, irritating substances, and so forth—that it is difficult to draw the line between traumatic dermatitis and eczema. But when an inflammation with the characters of eczema spreads beyond the part injured, continues when the irritation has ceased, and tends to become distributed in a typical manner, unrelated to the original seat of injury, and especially if it affect both hands when only one was subject to the trauma, it seems right to call the affection eczema."

to one side only of the body, can set up a dermatitis on a corresponding area of the opposite side, is not easy to prove.* It is difficult to show that the same external irritant has not also reached the opposite side directly. Thus, anything irritating one leg for several days, is often transferred to the other by the stockings being common to both; anything on one hand, is readily transferred to the other in the ordinary movements of daily life; anything on the trunk, is easily conveyed to the opposite side by the movements of the body in bed, or by the hands; so also with the face or head.

The following case appears to be one in which most of these objections may be fairly eliminated.

A girl, aged 11 years (O. P., No. 3458), noticed some pimples on

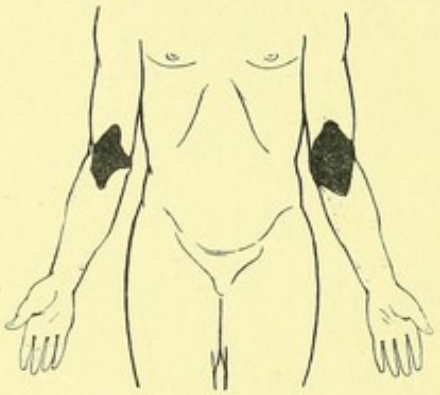


FIG. 5.—Symmetrical eruption on both arms following the application of irritating ointment to the left arm only.

her arm seven days before coming to hospital, for which her mother bought some green ointment. This was applied daily on a piece of rag, over the front of the *left elbow only*. Three days later the left elbow began to be sore and painful; the ointment was continued. The day before I saw her she noticed that the hollows of the *right elbow* began to be sore. She had never applied any ointment to it.

When I saw her first, the left elbow was covered with ointment

* J. F. Payne (Allbutt's *System of Medicine*, vol. viii, p. 501, 1899), on this point writes as follows: "If, for instance, artificial dermatitis of one hand or arm is followed, not only by local extension, but also by appearance of the same lesion in the corresponding region on the other limb (as I can aver from personal experience) or in other parts untouched by the original irritant, no one could refuse to call the secondary eruption eczema whatever hypothesis might be framed to account for its appearance."

spread on a rag and bound up with an old bandage; there was no dressing on the right arm.

Present condition (*vide* Fig. 5).—There is an acutely swollen, weeping area over the left elbow, on its flexor aspect, consisting of papules and vesicles on an inflamed base. The edge is fairly defined, and gives the patch a roughly diamond shape. Beyond this, and extending down the flexor surface of the forearm to the wrist, and a little way up the arm, there is a papular "lichenisation." On the right arm, situated in a corresponding position over the hollow of the elbow, there is a diamond-shaped area of dry, finely scaling erythema, without vesicles, which in extent and shape is an almost exact replica of that on the left elbow. Extending from this down to the forearm there is very slight dry "lichenisation."

One week later, after the application of boracic fomentations to the left elbow *only*, the patch on the right elbow had disappeared, and that on the left had become dry, with much exfoliation.

The green ointment which had been used was found to contain resin and wax, coloured with a green aniline dye.

My reasons for believing this to be an instance of what I referred to previously are as follows:

Direct transference of the irritating ointment by contact of the front of the right elbow with the front of the left is, as one can readily ascertain for oneself, a physical impossibility. Indirect transference of ointment from the left elbow to the right, by means of the hands, requires the intervention of both hands. Only the right hand can touch the left elbow, whilst only the left hand can touch the right elbow. No garments are worn in which the sleeves are used for either arm indiscriminately. The area on the right elbow corresponded almost exactly in shape and size with that on the left; it did not appear until the inflammation of the left elbow was at its height; it disappeared absolutely without treatment, when the opposite elbow was soothed and the irritant removed.

It may be said that in this case the dermatitis was not really caused by the ointment at all, that the spots on the left elbow, for which the ointment was bought, were "eczema," that the ointment merely irritated this and made it worse, and that the corresponding patch on the opposite elbow was simply another patch of eczema on a very common site, which, not having been irritated by the green ointment,

was consequently less inflamed. Even if it be granted that the original left elbow lesion was eczema, that the injudicious application of the resin ointment irritated it unduly, the fact still remains that the corresponding patch on the right elbow did not arise until the area on the left elbow had been raised to a high state of inflammation, that it corresponded very closely in shape with it, and that it subsided and disappeared absolutely in a very few days, *without any local treatment* whatever, merely by the application of boracic fomentations to the opposite (left) elbow.

If the above case is accepted, it follows that in certain persons it is possible for an irritant, applied to one elbow only, to set up, not only a local irritation, but also to set going an eruption on the corresponding skin area of the opposite elbow. How far this statement can be extended to other parts of the body I am not prepared to say, but, so far as my observations go, I think that this power is more developed in the limbs and head than over the trunk. Possibly this may be associated with the relatively greater quantity of grey matter in the spinal segments of these parts, than in those segments connected with the trunk.

I have attempted during the preceding pages to make clear what I believe to be the characters of that form of eczema which for simplicity I have called traumatic, and I shall now endeavour to show that the period of infancy is one in which the opportunities of traumatism are, and must necessarily be, numerous. There are certain surrounding conditions present in infancy, which cease, as infancy emerges into childhood. These are necessary accompaniments of this period of life, and I shall endeavour to show that they are just as likely to produce irritation of the skin as those conditions of various kinds to which persons are exposed in adult life, in their various occupations or otherwise, and which we call "occupation or traumatic eczema." In other words, I believe that many, possibly most, cases of infantile eczema are, so to speak, the "occupation eczema of infancy," and that they usually get well when the occupation (in this case it is that of being an infant) is given up—namely, in the course of the second or third year of life, sooner if efficiently treated, but, usually, whether treated or no.

What, then, are the particular duties in this "occupation of infancy"? During nine months previous to birth the infant has been surrounded, as to its surface, with a dilute saline solution at a constant

temperature of about 100° F., the amniotic fluid. At birth, that constant warm liquid medium is suddenly changed for one which differs from it in three respects; viz. it is gaseous, instead of liquid, its temperature is considerably lowered, and its temperature is no longer constant. To these great changes the infant's neuro-cutaneous apparatus has to accommodate itself. *As regards its skin*, therefore, the infant at birth changes from a subtropical aquatic existence, to a terrestrial life in a temperate zone.

Its skin, also, for the first time, makes acquaintance with various potential irritants—alkalis in the form of soap, micro-organisms which infest the hands and faces of all who handle it, sweat from its mother's skin, the surface of its clothes, and of towels used for drying it. These are all new irritants to which the infant has to accustom itself. In other words, the infant is starting with some entirely new external conditions, which may or may not suit its skin, in which respect it is in a similar position to a person commencing a new occupation involving contact with material to which his skin has not previously been accustomed. Moreover, it must not be forgotten that an infant, during its first six months of life, has little or no power of localising or removing any of these irritants. Thus, if its clothes tickle and irritate, it has no power to remove the local irritant; it can merely cry; it is too young to scratch. When it is washed with bad soap which irritates its skin it cannot indicate the fact; when it is dried after washing, it cannot point out whether it is thoroughly dried or not. This last point is one of considerable importance. We all know that no one can dry our hands or face after washing as efficiently as we can do it ourselves; we also know that inefficient drying in cold weather is a fruitful source of sore hands and face. In an infant efficient drying depends entirely upon the nurse. The infant also has, as part of the "occupation of infancy," to grow hair to cover his scalp, to produce teeth, to accept food which is given to him, and to be vaccinated. Of these I have already referred in detail above.

It is a well-established fact that, as regards its nervous system, the infant is more allied to a lower type of creature than is the adult. Its highly developed and uncontrolled lower reflexes show this clearly, as, for example, the bladder, the rectal, or the stomach reflex. In the same way its neuro-cutaneous reflexes are present to an extent

which is largely lost in adult life. Thus, whilst in an adult the so-called superficial skin reflexes are limited to a few particular areas where they still persist, viz. the soles of the feet, the groins, the flanks, etc., in the infant, the skin of the whole body is an almost continuous sheet of reflexes. If the back of an infant is stroked or prodded with the finger, there is a reflex flinching at every point touched. Sometimes this persists even into adult life, but this is an exception to the rule. In familiar language, we say that a child is "ticklish."* This reflex irritability of the infant's skin shows a hypersensitiveness to external irritants, which, coupled with the impossibility of removing them, plays an important part in the starting of eczema.

As the infant develops, its power of removing irritants from any spot becomes greater, and, if it is already affected with an irritable condition, such as eczema, this power is made use of to the detriment of the patient, so that what originally was intended to prevent and protect, becomes, under these circumstances, a source of further irritation. This makes infantile eczema, once it is thoroughly established, so difficult to treat successfully.

Any one or more of these external conditions which make up this "occupation of infancy" may be accredited with starting eczema. There are at least six which are more or less constantly present. They are: (*a*) chill to the skin (sudden changes of temperature); (*b*) imperfect drying; (*c*) soaps; (*d*) irritating dust in atmosphere; (*e*) micro-organisms; (*f*) sweat of mother's skin.

The most striking reason for suspecting that such external irritants are, some or all of them, the cause is the fact that in 95 per cent. of these cases the rash first showed itself in practically the only exposed part of the whole infant, namely the head or face, the rest of its surface during the first month being swathed and protected at every point. And I may here remark that the scalp of the average infant is so scantily provided with hair that for all practical purposes it is hardly more protected than the face.

Of these six classes of irritants, there is, in most cases, a likelihood of some or all of them acting together, and to attempt to say which of them, alone, is the chief cause of the eczema, is often impossible. But

* It is worth noting in this connection that many of the "ticklish" parts of the body surface in adult life are common sites of eczema—the elbow hollows, the axillæ, the neck and ears, the insides of the thighs, and about the scrotum.

in certain cases one or more may predominate and play a larger share than the rest. As we have seen, there is evidence that the bulk of the cases begin in the colder periods of the year, and therefore I should be disposed to give the greatest importance to cold as the predominating irritant. This will undoubtedly also influence any imperfect drying of the skin after washing. We are all familiar with the readiness with which persons get chapped hands in winter if they have to wash frequently, and especially if they fail to dry their hands carefully, and there is no reason to see why the infant should not get repeated and very effectual irritation from what may be termed chapped face. If to that be added an irritating soap, such as is so frequently used by the poor, and even by the well-to-do, we have a combination of very powerful irritants. And one can readily see why this is more likely to affect the face than the rest of the body in a young infant; because, after the general bath, in which the same soap, the same water, and the same inefficient drying, may be used, the body and limbs are at once covered with clothes, so that moisture is absorbed and the clothes prevent evaporation or the contact of cold air with the newly-washed surface. In the case of the face and head this is not so. Then, again, the child's face is the only part which is freely exposed when the child is taken out, or, in the cottages of the poor, with the room door opening on to the street, when it is near the door in that room.

How far irritating particles, such as smuts, etc., in the atmosphere, help with the other irritants, it is difficult to say; but, inasmuch as they tend to soil the face, and consequently increase the vigour and frequency of washing, I can readily believe that they may do so indirectly. That micro-organisms may, and do, play an important part in infantile eczema, I fully believe, but that they act in any other way than secondarily, I am not convinced. These micro-organisms may be classified under two heads, representing the only varieties with whose frequent action we are at all familiar in these cases. Of these two, there is, first, the group which causes Impetigo contagiosa. These, it is generally agreed, are always a secondary infection following the eczematous lesion, and often almost masking it. We may, therefore, dismiss them for the present. The other group is that which is believed to cause the lesions which we know as seborrhoic dermatitis, which I believe is a clinical entity, but which

I cannot accept as being equivalent with eczema. Now, whilst I am quite prepared to admit that some of these cases of infantile eczema may, and do, begin as a seborrhoic dermatitis, by direct infection from the skin of a seborrhoic mother or nurse, yet I am quite unable to accept the statement, that they are such from beginning to end, and, that every portion of eruption, even those on distant parts of the body, every vesicle, every papule, every patch of erythema, is due to a local infection by these organisms. If this were so, it would be impossible to find the symmetry which one does find, or to see why the lesions should not spread peripherally to a greater extent than they do. But I feel that, besides these cases in which, possibly, a direct seborrhoic infection from the mother's skin may be the primary source of irritation, there are many more in which the seborrhœa becomes, as does the impetigo, grafted on the already irritated and eczematous skin, so that, whilst helping to keep up the irritation and to complicate the picture, it has been in no sense causative of the original condition.

Lastly, the irritation which may be caused by the mother's sweat is merely referred to, because the child is repeatedly in contact with the mother's warm breast, when suckling, and the seat of commencement of eruption is so frequently the cheek, which would during those times be exposed to such irritation. But, as I said before, I have no conclusive evidence to support any definite statement on the subject.

I have thus endeavoured to show that (1) An infant is exposed to many new external surroundings, which are capable of acting as irritants; (2) that the most exposed part of its surface is in almost all cases the starting-point of the eruption; (3) that the skin reflexes are far more widely distributed, and easily called forth, in an infant than in an adult; (4) that whilst, in most of the points upon which inquiry has been made in these sixty cases, the evidence has been uncertain or distinctly opposed to their being causal, there is evidence that most of the cases began in the colder seasons of the year.

In conclusion, I venture to suggest that what is generally called eczema, whether it occur in infants or adults, is a form of reaction or response of the neuro-cutaneous apparatus to external irritation; that it does not exist in most people; that in many it is only called forth under exceptional forms of irritant, or at times of exceptional

nervous irritability; that in a few it is so readily aroused, even by the ordinary external stimuli of daily life, that they are constantly affected.

One can hardly suppose that such an elaborate neuro-cutaneous response is purposeless, any more than that inflammation is purposeless. It seems more rational to suppose, that such a reaction is intended to serve some purpose, possibly to remove the irritant or to protect the skin surface. May it not be the rudimentary remains of some once-important function of the skin? A function which, under the present conditions of life, has ceased to be effective, and which, like other rudimentary organs and functions, is more often detrimental than useful.