

hormones secreted by the testis or ovary. This suggests that to seek an explanation for some errors of development we may have to implicate the structures which control normal development—for example, the pituitary gland—and postulate an enzymatic dysfunction in these structures rather than in the organs whose development they control.

Conclusions

The modern view of the vitamins is that they are complex chemical substances, essential to life by virtue of their role in the biochemical processes of the cell. Vitamins have to be obtained from the diet because of the inability of the body to synthesize them. The increased demand by the pregnant woman for vitamins reflects the need of the embryo to build up a store of these substances for its own biochemical processes. It is evident beyond doubt from animal experiments that if the minimum requirement is not met the embryo will either die or be born congenitally deformed.

What validity these animal experiments have for conditions in the human is as yet impossible to say. It must be noted, however, that if human conditions do correspond to those in the animal the administration of vitamins during pregnancy is of little avail to the embryo. Minor degrees of experimental vitamin deficiencies exert their effect in producing malformations during the early months of pregnancy, at a time when even the existence of pregnancy may not be evident to the woman. In obstetric practice vitamins are commonly prescribed in the middle and late months of pregnancy. The results of the animal experimentation described above suggest that the only way in which the nutrition of the embryo can be safeguarded is by attention being directed towards the diet of women throughout their lives, and especially of girls in the later stages of adolescence. Only by reorientating our attitude in this way can we ensure that the members of the next generation develop in bodies which provide an adequate supply of essential foodstuffs from the very outset of pregnancy.

REFERENCES

Christian, H. A. (1947). *The Principles and Practice of Medicine*, 16th ed., p. 547. Appleton-Century, New York.
 Evans, H. M., and Bishop, K. S. (1922). *Science*, 56, 650
 Hale, F. (1935). *Amer. J. Ophthalmol.* 18, 1087.
 Lefebvres-Boisselot, J. (1951). *Ann. Med.*, 52, 226.
 Lévy, M. (1953). *Ann. Nair. (Paris)*, 7, 167.
 Liu, S. H., Chu, H. I., Hsu, H. C., Chao, H. C., and Cheu, S. H. (1941). *J. clin. Invest.*, 20, 255.
 McIlroy, A. L. (1935). *Proc. roy. Soc. Med.*, 28, 1385.
 Millen, J. W., and Wooliam, D. H. M. (1955). *J. Neurol. Psychiat.*, 19, 17.
 ——— and Lamming, G. E. (1953). *Lancet*, 2, 1234.
 ——— (1954). *Ibid.*, 2, 679.
 Moore, R. A., Bittenger, I., Miller, M. L., and Hellman, L. M. (1942). *Amer. J. Obstet. Gynec.*, 43, 1007.
 Nelson, M. M., Asling, C. W., and Evans, H. M. (1952). *J. Nutr.*, 48, 61.
 Reyher, P., Walkhoff, E., and Walkhoff, O. (1928). *Münch. med. Wschr.*, 75, 2087.
 Romanoff, A. L., and Bauernfeind, J. C. (1942). *Anat. Rec.*, 82, 11.
 Warkany, J. (1943). *Amer. J. Dis. Child.*, 66, 511.
 ——— (1947). *Advanc. Pediat.*, 2, 1.
 ——— (1953). *J. cell. comp. Physiol.*, 43, Suppl. 1, p. 207.
 ——— and Nelson, R. C. (1941). *Anat. Rec.*, 79, 83.
 ——— (1942). *Arch. Path. (Chicago)*, 34, 375.
 Willman, J. L., Asdell, S. A., Grams, N. T., and Hagan, N. A. (1931). *Proc. Amer. Soc. Anim. Prod.*, p. 231.

The Trustees of the Margaret de Sousa Deiro Fund wish to draw the attention of medical practitioners to the scope of this Fund. It exists to provide for the treatment and relief of women who normally support themselves by their own exertions but are temporarily incapacitated by pulmonary tuberculosis. There are grants to cover the cost of treatment, when this cannot be carried out in suitable conditions under the National Health Service, and grants towards convalescent holidays following institutional treatment. In approved cases the Trustees also give financial assistance for rehabilitation, if part-time work would mean an inadequate living wage. Further details are obtainable from the Trustees, 1, New Court, Carey Street, Lincoln's Inn, London, W.C.2.

SUSPENDER DERMATITIS AND NICKEL SENSITIVITY

BY

C. D. CALNAN, M.R.C.P.

AND

G. C. WELLS, M.R.C.P.

St. John's Hospital for Diseases of the Skin, London

Dermatitis and eczema of various patterns comprise the largest and most difficult part of dermatology for the practitioner and specialist. A certain proportion of these cases appear to be due to external contact with substances which behave as allergens. These cases assume especial importance, because if the cause is identified and further contact avoided the patient may have no further trouble.

Contact dermatitis from allergy to nickel has been known for a long time, especially in industrial processes, but none of the recent literature reflects the fact that it is now such a frequent occurrence among women apart from industry. Reviews of the subject have been published by Goldman (1933) and Foster and Ball (1935). More recently, Morgan (1953) used a series of 54 cases over a ten-year period to investigate the persistence of allergic contact sensitivity.

Incidence

Allergic contact dermatitis has been studied in a special clinic at St. John's Hospital for Diseases of the Skin over the past three years. At an early stage in this work we became very impressed by the enormous frequency of allergic sensitivity in women, manifest by patches of dermatitis under their suspenders. Unfortunately, we have no earlier records to prove whether the true incidence of this condition has increased or not, but its significance and importance are becoming better recognized. It is now by far the commonest type of sensitivity dermatitis encountered in routine dermatological practice. The results of patch tests in our clinic over the past three years are as follows :

	Total Positives	Nickel Positives
1953	478	131
1954	412	198
1955	420	180

By no means all cases are patch-tested, and we estimate that these figures represent about half the true incidence of nickel sensitivity in women among the 18,000 to 20,000 new patients seen each year at this hospital. It is possible,

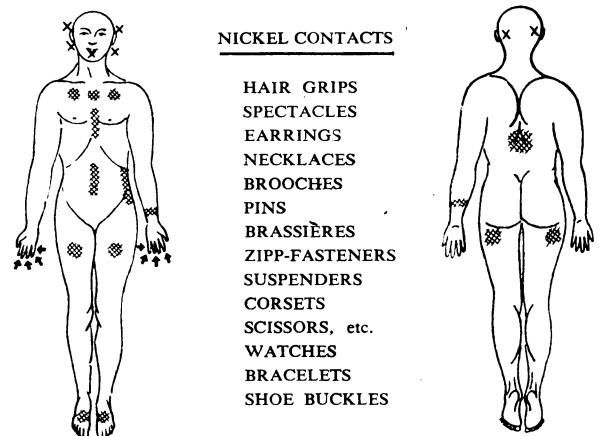


FIG. 1.—Schematic drawing to illustrate sites of primary eruption.

therefore, that as many as 3% of women attending skin departments will show this allergy. Virtually every case of dermatitis from suspenders is allergic, and not due to friction and trauma alone.

Clinical Features

The pattern it produces is now a familiar one. It consists of primary and secondary lesions. The *primary sites* (Fig. 1) are where metal produces a patch of dermatitis as a result of

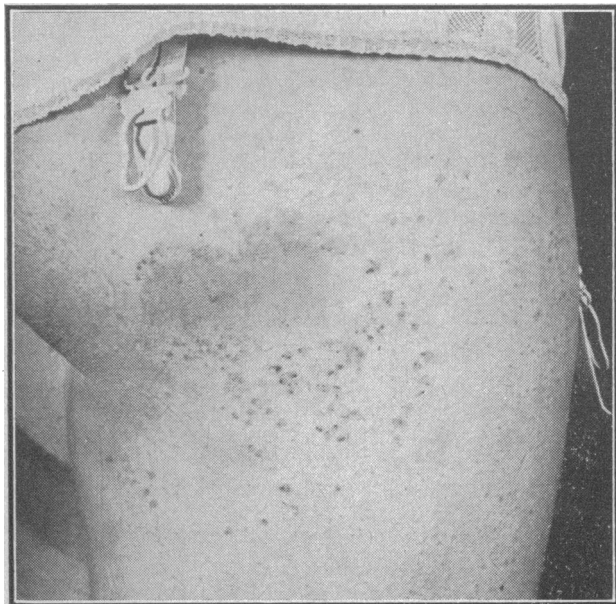


FIG. 2.—Typical patch of suspender dermatitis.

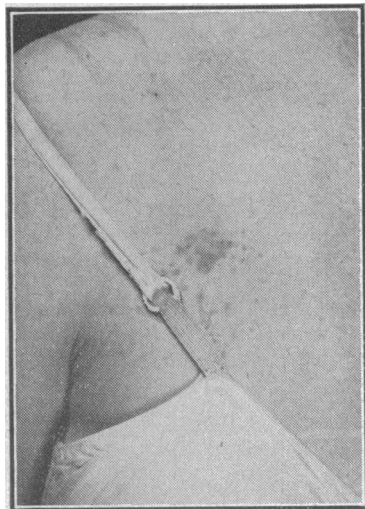


FIG. 3.—Dermatitis from brassière clip.

direct contact. It is exceptional for the first affected site to be other than under the stocking suspenders (Fig. 2); but occasionally earrings, brassière clips (Fig. 3), or a wrist-watch are the initial cause. Any combination of these sites may be affected, even in an asymmetrical fashion. For instance, there may be dermatitis beneath only one, two, three, or all four suspenders, though the back of the thighs is more often affected than the front. These suspender patches do not always correspond

exactly with the contact site, but one must remember that there is a good deal of movement of the suspender.

The appearance at the primary or contact site is variable. It may be minimal, consisting of superficially excoriated small papules only sparsely distributed over a rather ill-defined area, or there may be a more confluent patch of dermatitis, again with signs of excoriation and friction. Less frequently it is acutely exudative, or sometimes thickened and lichenified. On the ear-lobes it is usually exudative and crusted, and may suggest impetigo (Fig. 4).

The *secondary sites* are unrelated to direct contact with metal. This secondary eczematous eruption may assume an

importance greater than the primary eruption. Although sometimes called autosensitization, or autogenous spread, or neurodermatitis, its mechanism is quite unknown. It is well known that many types of eczema, especially those on the lower leg, have a tendency to spread by means other than direct extension. This type of spread from suspender dermatitis patches is common (three out of four patients had it) and quite characteristic. The sites are shown in Fig. 5; in order of frequency they are as follows: elbow flexures (Fig. 6), eyelids, sides of neck, inner thighs, and generalized. The eruption is most often symmetrical. It consists of scattered papules and papulovesicles on a background of erythema. Sometimes it is confluent, exudative, and crusted, and the upper eyelids always show erythema and oedema with exudation or scaling. Itching is more prominent a symptom than in the case of the primary sites.

As mentioned above, the secondary eruption may be much more important than the primary. The reasons are these: (1) the patients do not usually present themselves to the doctor until they have a secondary eruption; (2) the patients rarely associate the two lesions, hence they may not mention, or may even deny, patches of dermatitis on the thighs; (3) the secondary spread lesions may recur at intervals, independently of the activity of the primary sites; and (4) recognition of the pattern of the secondary eruption commonly leads one to the diagnosis of nickel sensitivity.

Patch Tests.—Patch tests with nickel sulphate or chloride solution in a concentration of 2½% or 1% are always positive. About 10% of the patients showed a delayed positive reaction (Calnan, 1955), so that the patch site must be seen at 96 hours as well as at 48 hours after application. Care should be taken not to perform patch tests until the acute eruption has subsided, in order to avoid false positives and focal reactions. A nickel coin (post-1946 silver coins in England) will react just as well. So far as our experience goes this allergic sensitivity lasts for life.

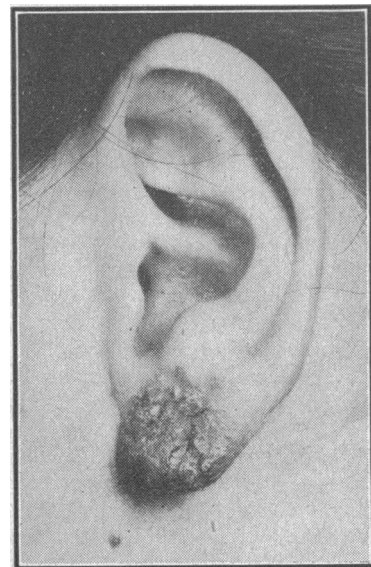


FIG. 4.—Crusted dermatitis of ear-lobe from clip-on earring.

SECONDARY SPREAD

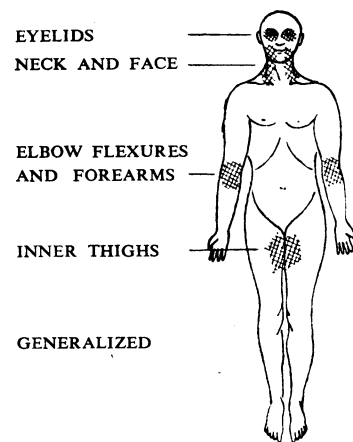


FIG. 5.—Schematic drawing illustrating secondary sites.

Associated Eczema

In these patients one often sees other patches of eczema which do not appear to form part of the primary and secondary eruption described above. Calnan (1956) has tried



FIG. 6.—Typical secondary eruption on elbow flexures.

to classify these other patches into some of the standard types, from an analysis of 200 consecutive cases :

Eczema of hands ..	42 (21%)	Exogenous dermatitis	
Seborrhoeic dermatitis ..	2	(allergic) ..	8
Nummular eczema ..	3	Atopic dermatitis ..	2
Otitis externa ..	2	Unclassified ..	6
Hypostatic eczema ..	1		
			66 (33%)

The striking feature is the high incidence of eczema of the hands. We did not feel they were directly caused by nickel contacts (such as coins, taps, instruments, cutlery, etc.), and most of them were simply labelled "housewife's dermatitis." The association has also been noted by Kroepfli and Schuppli (1955). In most instances the nickel sensitivity preceded the hand eczema, and it is possible that the one has at least predisposed to the other.

Very few of the patients had evidence of neurodermatitis elsewhere, though we realize that it is an ill-defined term, and is a difficult factor to evaluate.

Treatment

Treatment is not always easy. Patients with only a primary eruption will respond quite readily, but if a secondary spread has occurred the condition is more difficult to clear up and recurrences are more frequent. In the first place, all metal clips and fasteners as well as jewellery must be removed. Many fasteners can be replaced by buttons. The problem of alternative suspenders is dealt with later. Simple local applications are used for the skin, but not infrequently the suspender dermatitis patches are slow in resolving even in the absence of further contact, and tar paste, x rays, and hydrocortisone ointment may be required. The same problem may arise with the patches in the elbow flexures. Occasionally cases merit admission to hospital.

Aetiology

Four hundred cases have been analysed. The age incidence at the onset of 381 cases is shown in Fig. 7; details of age of onset of the remaining 19 cases are unavailable. Naturally enough, patients with very long histories may not be able to remember the age of onset very accurately. Our figures agree with those of Wilson (personal communication, 1956) in a smaller series.

The duration of sensitivity is recorded in Fig. 8. Since we believe that this type of true contact allergy is not lost, these figures may be evidence that nickel sensitivity has increased over the past 20 years.

Sweat and friction almost certainly play some part in initiating the dermatitis, for nickel ions would need to be released from the metal and be absorbed through the skin to produce a reaction. Wells (1956) has shown that nickel is given off from an ordinary metal suspender immersed in an artificial sweat solution. Although suspender dermatitis is often seen in women with thick thighs, where one would expect more friction and closer contact, it is by no means rare in those with slim legs.

Few of our nickel-sensitive patients (about 1%) had a background of atopy (eczema, asthma, hay-fever syndrome), and this supports the majority view that atopic eczema and specific contact eczema are unrelated.

Prevention

While an eczematous eruption is often elicited by articles of clothing or jewellery containing nickel, the sensitivity has so consistently been induced in the first place by the nickel-plated suspenders that their structure is worth considering. Many suspenders have a large area of nickel plating of the buckle and adjustment slide in direct contact with the skin. Friction and sweating gradually wear off the nickel, as may be seen in old buckles which are worn down to the iron and show rust. Contact between the skin and nickel can be reduced by suspenders which have a fabric backing or which have the metal parts covered with enamel. However, once nickel sensitivity has been established, these modifications cannot be relied upon, as the fabric gets twisted or moistened with wear or the enamel chips off, exposing the nickel plate.

Until recently we have advised nickel-sensitive patients to wear suspender buckles made entirely of plastic, but these are unsatisfactory, as they break easily and do not grip the stocking well. The manufacturers of suspenders have been most helpful in considering the problem, and have recently produced a suspender made of nylon, with no metal parts. In use these have proved entirely satisfactory, and as they are very strong we are confident that they will meet the needs of the nickel-sensitive patient. Undyed nylon never sensitizes the skin, and if nylon suspender buckles should become widely used the incidence of suspender dermatitis might well be reduced.

Summary

The present-day frequency of allergic contact dermatitis in women from suspender clips is stressed. The pattern of the dermatitis, and its primary and secondary manifestations, are described. The secondary eruption is often more important than the primary, from the point of view of both diagnosis and treatment. Patch tests will confirm nickel sensitivity. About one-third of the patients have some associated eczematous eruption, the majority (21%) having eczema of the hands.

The age incidence and the duration of sensitivity are given. Treatment is described, with special emphasis on prevention by the use of all-plastic or all-nylon suspender buckles.

Dr. B. M. Buck helped in the early part of this work and Dr. R. H. Meara has been closely associated with us in almost every

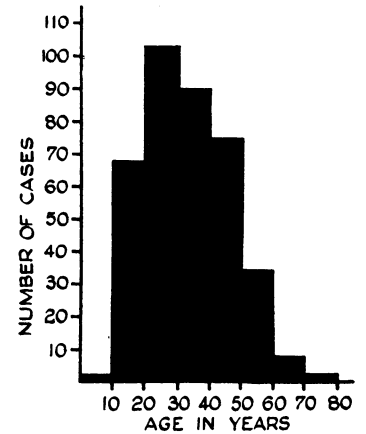


FIG. 7.—Ages of onset in 381 cases, arranged in decades.

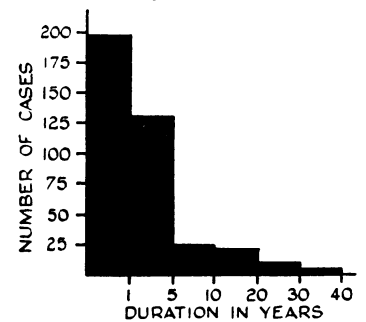


FIG. 8.—Duration of sensitivity in 381 cases.

phase of it. Mr. R. J. Lunnon and Miss Milne took the photographs. To them and to all the physicians of St. John's Hospital for Diseases of the Skin who allowed us to investigate their patients we are most grateful.

REFERENCES

- Calnan, C. D. (1955). *Trans. St. John's Hosp. Derm. Soc.*, 34, 37.
 — (1956). *Brit. J. Derm.* In press.
 Foster, P. D., and Ball, F. I. (1935). *Arch. Derm. Syph. (Chicago)*, 31, 461.
 Goldman, L. (1933). *Ibid.*, 28, 688.
 Kroepfli, von P., and Schuppli, R. (1955). *Dermatologica (Basel)*, 110, 1.
 Morgan, J. K. (1953). *Brit. J. Derm.*, 65, 84.
 Wells, G. C. (1956). *Ibid.* In press.

OBSERVATIONS ON ACNE, SEBORRHOEA, AND OBESITY

BY

STANFORD BOURNE, M.B., B.S.

AND

ALLAN JACOBS, M.B., B.S.

The Royal Hospital, Wolverhampton

A survey of 2,720 unselected soldiers was made in order to clarify the natural history of acne and its correlation, if any, with seborrhoea, obesity, and colouring.

Acne and Seborrhoea.—Nearly every textbook of dermatology refers to the association between acne and seborrhoea and the need to treat coexistent dandruff, which is taken to be the hallmark of seborrhoeic dermatitis. According to Molesworth (1937), "a certain degree of seborrhoeic dermatitis, at least in the form of a scurfy scalp, is invariable and should be treated simultaneously." Becker and Obermayer (1947) say the same thing and give standard instructions to all patients: "Unless it is otherwise specified, shampoo twice weekly." "Milder degrees of dandruff are almost always present" (Mitchell-Heggs, 1950). Acne is "worse in those who have coarse oily skins and pityriasis of the scalp" (Andrews, 1954). We have found only one attempt (Cohen, 1945b) to verify this belief objectively, but, on the other hand, there has been some speculation on the mechanism of the supposed association. Some writers mention the frequency of acne around the hair margin in cases of dandruff and suggest an infective process. We have not been able to observe this, and the results obtained in our investigation of a large series strongly suggest that there is no relation between the occurrence of dandruff and acne.

Acne and Weight.—There is less unanimity concerning the value of diet in the treatment of acne, but most writers recommend the elimination of chocolate and many advise reduction of carbohydrates, fats, and fried foods. Andrews (1954) says that acne is aggravated by "excess of fats, sweets, starchy food in the diet or overeating." Sutton (1941), proposing acne as a "pustular lipoidosis," even suggests that acne is worse in summer, owing partly to "gross increase in oil intake on account of the popularity of ice-cream." Mitchell-Heggs (1950) advises correction of obesity; but MacKenna (1952), while recommending reduction of carbohydrate and fried food, counsels regular weighing to avoid undernourishment.

If such factors do play a part in the aetiology of acne, they would probably be reflected in some degree of obesity; and an association between acne and obesity might be taken to lend support to these or other theories

concerning acne. Our investigation suggests that there may be such an association.

Acne, Dandruff, and Colouring.—The association between acne, dandruff, and colouring has received less notice—possibly because there are no obvious therapeutic implications. The general belief appears to be that acne and dandruff are commoner or more severe in dark people. Bloch (1931), in his important paper establishing the correlation between the onset of acne and puberty in 4,191 Swiss children, says "darker pigmented persons are more subject to acne," but he gives no figures. Hinrichsen and Ivy (1938) had 93 negroes in their series of 1,120 American high-school students, and state that acne was commoner in the negro children; severe acne was slightly commoner in negro boys than in white boys, but the girls were about equal. The figures they quote do not strongly support the conclusion. Ormsby and Montgomery (1954) state that comedones are "somewhat more frequent in coarse-skinned brunettes." On the other hand, Cunningham and Lunsford (1931), using the records of 12,530 entrants to the University of California, state that acne and "complexion" are not related; and Lynch (1939) found no connexion between hair colour or texture and acne in the records of 4,235 entrants to Minnesota University. In the present series there is no significant correlation between acne and colouring, but dandruff is commoner in ginger subjects.

Material

The series consists of 2,720 soldiers aged between 15 and 40 years, each of whom was seen once only at a routine medical examination. All men attending during the period of the investigation are included except for three with psoriasis. The degree of acne was noted in 2,629, and a further 91 men were examined only for the presence or absence of acne. 2,220 of the men were examined for dandruff and colouring. The age distribution is shown in Table I.

The men were examined stripped, in good daylight. Age, height, and weight were recorded and compared with standard tables (Sunderman and Boerner, 1949). Weights were then expressed as the deviation in pounds from normal for the age and height.

Acne.—We followed Bloch's classification for recording the severity of acne: nil = no comedones present; grade 1 = comedones only; grade 2 = comedones with a few papules and/or pustules; grade 3 = many comedones, papules, and pustules. Grades 1, 2, and 3 together constitute the "total acne" or "acne in the broadest sense" of other writers. Grades 2 and 3 make up "clinical acne" or "acne in the narrowest sense." The presence of acne on the face, chest, back, and nape of the neck was recorded separately.

Dandruff.—Nil = no scales on the scalp—occasional flakes in the hair were ignored; grade 1 = any scales on the scalp, often symptomless; grade 2 = gross dandruff all over the scalp; the patient would usually be aware of it.

Colouring.—The range from blond hair to black was divided into groups. A separate group was formed of men with ginger hair. The distribution of the groups is shown in Table V.

Incidence of Acne

The incidence of acne in this series is shown in Table I. There were 49 men with grade 3 acne. These formed about 3% of each year from 18 to 22; apart from this period, there were three aged 17 and one aged 33 years. Our figures at 18 years are shown in Table II together with those of the comparable series of Bloch (1931), Hinrichsen and Ivy (1938), and Forbes (1946). These all deal with young men and use the same criteria of acne.