



DAFFODIL DERMATITIS

The forearm and anticubital fossa of a non-industrial case.

(From a *Gevacolor* transparency by the author).

Individual Studies

THE TAMAR VALLEY "FLOWER RASH"

A Daffodil Dermatitis

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A seasonal dermatitis affecting daffodil pickers and growers on the Cornish side of the Tamar Valley has been a recurrent problem in my practice, and in that of my predecessors, for many years. The condition may vary from a trivial nuisance to a major disaster, and is known hereabouts as "flower rash".

Spread along the course of the River Tamar, from Saltash in the south to Gunnislake in the north, and westwards in a number of the smaller villages, are the holdings of hundreds of flower-growers, whose cut and boxed blooms are sent to the big-town markets all over the country. These holdings vary in size from the cottage front-garden, up to 30 acres solidly planted with daffodils. Other flowers are also grown in the open, especially many acres of anemones and also polyanthus, tulips, irises, chrysanthemums and pyrethrums. There are few glasshouses, one grower only, planting up to six tons of bulbs under glass, together with cyclamen, azaleas, chrysanthemums and primulas. Wild flowers are plentiful in the district, daffodils, primroses and snowdrops blooming in the hedges; indeed one elderly patient tells me that she pays her rates by picking wild primroses, bunching them, and sending to market.

The practice in which the cases herein studied have occurred this season covers only a part of the area described; in this part at least seven other general practitioners also practice. From enquiry I understand that all have seen a number of cases this season, therefore the total size of the problem of this dermatitis is greater than my figures alone would suggest. In the course of this year, six cases of dermatitis due variously to wood (trees) (2), animal feeding stuffs (1), primulas (1), anemones (1) and unidentified diet factor (1) have been seen in this practice, whereas in the short flower season about 30 cases of bulb-flower dermatitis were seen. In twenty cases (16 industrial, 4 non-industrial) records and follow-up were obtained personally in sufficient detail for them to form the material of this study.

Description of the Industry

Enquiry into my patients' work-habits showed so many potentially dermatitis-producing factors that a description of the industry, as carried on in this district, is here included. I am informed (Aitken, 1955) that there are many differences between these

methods and those employed in the flower and bulb industry in Lincolnshire.

Bulbs are hand-planted from August to October, sometimes newly bought-in, sometimes from the grower's own stock after "sterilization". Manuring may be by dung, or more usually by phosphatic "artificial". Most bulbs are naturally ripened, a few "vernalised" (a process of artificial wintering by refrigeration to promote early flowering). The rows are cultivated to reduce weed at intervals. The earliest greenhouse-grown flowers are picked from mid-December, the earliest outdoor vernalised flowers from mid-January, and those outdoor cloche-grown in middle February, all in small total quantity. The main crop of unforced outdoor flowers is picked, according to the general season, from early March until about the end of April. The flowers are of all classes of daffodil and narcissus, each grower planting several varieties, and some growers as many as 30, so as to extend the "picking-season".

The flowers are picked (in late bud or fully open, according to the varieties' ability to travel) by hand, carried on the opposite arm, then laid on trays or baskets, which are carried on to a central point. The blooms are then plunged, loose, to the necks in buckets of water. The buckets are stood in a "forcing-house" (which may be a shed at the growing-garden, or may even be the grower's kitchen) until the next day. The opened flowers are then taken from the buckets, laid on a bench, and "bunched" into the familiar market bunches, secured with rubber bands. The bunches are packed into special cardboard boxes, collected by van, and taken to the railhead.

About every third summer, the bulbs are lifted, dried where they lie, and the dead foliage rubbed off. They are packed in bags or wire-netting crates, and then immersed for a measured time in vats of a gently steaming temperature-controlled solution of an organic mercurial pesticide. They are gravity-drained, air-dried, and subsequently replanted. This "sterilization" process is for the control of eelworm infestation. No other chemical treatments or sprays are at present used.

In the course of picking, both of the picker's hands will be wetted by the sap of very many hundred flowers in the course of a few hours. The work, like most gardening, is back-aching, and hair and sweat will be brushed from the eyes at intervals; the trays or baskets are often carried hugged to the belly—forearms, or coat sleeves, and clothing over lying the thighs, may be soaked in the dribbling sap. The forcing-house becomes almost stinking with the lovely smell of the scented varieties, and, in the disturbance of benching, the

atmosphere becomes charged with pollen from the riper blooms. The buncher sits for some hours picking up wet stems with one hand and laying them on the other forearm, and then with the free sap-wet hand opening an elastic band against the outer surfaces of two fingers and the thumb, then slipping it over the bunched stem-ends. During bunching the thighs are generally protected by a waterproof apron.

In the course of much questioning I was told some odd things, several most graphically. For example "I daren't go in the forcing-house, my face would start burning at once"—one man added, "just like someone threw pepper in your eyes, quick as that". And "Oh! they gets it terrible bad in that house, Doctor, even the dog gets it."

History and Literature

The earliest reference to this complaint that has come to my knowledge is that of D. Walsh in 1910 in the Scilly Isles. He reviewed the evidence upon the allegedly poisonous nature of the narcissus family and concluded that there was then no trustworthy account of the plant's chemistry. He mentioned the possibility of patients being attacked once only, and remaining subsequently immune. He considered that abrasions in the skin were the portal of entry, and reviewed the effect of climate and sweating. Certain varieties or species were given a worse reputation than others. Subsequently he extracted specimens brought back to his laboratory, and tested the extracts against human skin—he did not specify whether of a sufferer or non-sufferer. Patch tests were negative on unbroken skin, but some were positive on abraded skin—his solutions were subsequently shown to be unsterile. In his opinion broken skin and individual susceptibility were the most important factors in causation, but the chemical irritant remained unknown. He also formed the opinion that the incidence among workers was about one in three.

W. H. Palmer described the condition occurring in Hayle, Cornwall, in 1934. He believed that the rash originated in abrasions and/or in the sweat glands. He performed intradermal tests (but gave no figures), claiming positive results to pollen in the sufferers and negative in non-sufferers. He successfully treated two patients by hyposensitization, using (inevitably) extracts of unknown potency and having no guidance for dosage. He noted a *delayed* positive reaction to intradermal testing with leaf extract. He also made the important point that this complaint may appear small or unimportant from the point of view of general dermatology, but that for the small grower whose living may depend on his flowers it can be disastrous.

A. P. Bertwistle (1936) followed a case over several years who suffered less in later seasons than in the first season in which she came under observation.

G. V. Stryker (1936) in St. Louis, in the first report of this condition from the U.S.A., described a case, mentioned several others occurring at the same grower's glasshouses, and, because of the local compensation laws, went very fully into the power of the plant species to cause sensitization and dermatitis. He was able to prove himself negative and subsequently sensitize himself by the repeated application of patch tests to the same area of skin. In this choice of area may, I believe, lie one answer to the many uncertainties of this condition (see discussion below). He found no cases after extensive enquiry in the florist-trade and considered that the standing of the daffodils in water diluted or removed an irritant factor in the plant sap. He compared results between "persons with previous contact with daffodil plants" in the industry, and "those with no previous contact". Today in this country, with gardening and indoor flower arrangement such common pastimes in all classes, I think it would be very difficult to specify that control patients had had "no former contact". Also the patient experimentally sensitized was later found to be "negative to pollen". The material used for that sensitization was not specified, and therefore I cannot accept unreservedly all of his conclusions, which were:—that the sap contains the active principle; that the complaint is worse under moist conditions (this may be true of house cultivation, but my cases occurred outdoors in a hot, dry period); that there is a high power of sensitization in the plant; and that the results are in accord with our concept of contact or non-atopic allergy. With these two last conclusions I entirely agree.

Similar types of dermatitis, with or without the proof of sensitization, are reported by various authors to occur sporadically as a result of contact with tulips, ragwort, pyrethrum, chrysanthemums, wild or cow-parsnips (family Umbelliferae), plantain, figs, rue, alfalfa, timothy-grass, agrimony and hops. Certain features of some of the cases described are relevant to this investigation.

W. J. O'Donovan (1942) describing an outbreak of a peculiar linear dermatitis among soldiers, found that it was due to the exposure to sunlight of the skin after contact, when sweaty, with *Agrimonia eupatoria* (a downland low-growing plant).

R. Klaber (1942) described similar cases due to wild parsnips, and mentioned that patch tests only became positive after 10—48 hours' exposure to sunlight. He called this a phyto-photo-dermatitis, and cited certain Viennese reports identifying furo-coumarins as the chemical basis of the condition.

N. R. Ingraham (1947) in U.S.A., describing minutely the methods of de- or hypo-sensitization used by him for treatment of plant-contact-dermatitis, remarked, "In our experience, patients whose recurrent dermatitis has persisted for a number of years, seldom show sensitivity to one substance only." He reported, among other cases, a number of patients desensitized satisfactorily only at a second or third attempt, because the full sensitivity-picture was missed at the first set of tests. He showed that, once established, such "desensitivity" remained for at least two or three years.

The general opinion of the growers is that one in every three or four persons becomes affected in some degree, and that the incidence is increasing. My experience of incidence in 1955 agrees closely with the opinion of Walsh in 1910 and I conclude that, while the total number of cases is increasing with the expansion of the industry, the proportion of sufferers is rising little, if at all.

J. S. Cookson and Ann Lawton (1953) reporting upon a dermatitis affecting hop-pickers in Herefordshire, succeeded in showing that a volatile oil in the blossom was the major factor responsible. This oil is removed in the kiln-drying process, and those handling the material after drying did not suffer from the dermatitis. This finding is similar to Stryker's experience, i.e. that the risks and results of exposure differ at various stages of the material's progress through the "industrial pipe-line". They were unable to prove any correlation between the incidence of the rash and records of the hours of sunshine.

Incidence

The only available method by which a satisfactory measurement of incidence might be made, was to collect every possible case in my own practice, and to relate the numbers found to the known total numbers in the family unit who were engaged actively with bulb flowers. (Ten of the series consulted me direct, and ten were found, either by a knowledge of their past history, or when attending them or their families for other complaints.) Should there be a familial factor, the figure thus obtained will be biased. Therefore a check was made with three of the larger employing units to determine the numbers employed and the number of cases. Figures obtained this way are also open to question, as not all the cases would be patients of the practice, and therefore the diagnosis could not be personally confirmed. However, the condition is now so familiar with the growers, and the seasonal association with occupation leaves so little room for doubt, that the patient or his employer is frequently a more able diagnostician than the physician!

Sixteen cases occurred among 43 persons actively engaged, 27 not suffering; the total family-unit population, including school-

children, was 59, suggesting an incidence of approximately 25 per cent. of population, but 35 per cent. of workers.

Among the individual firms (where enquiry was made of a responsible foreman or grower), the following figures were given:—

Four cases in 12 workers; four cases in 10 workers; eight cases in 24 workers;

giving a closely similar incidence of 34 per cent. among workers.

Four additional cases, included in this series but not in the above figures, occurred among persons not actively engaged in the industry, and are evidence of a sporadic incidence among the general population.

It appears therefore that approximately one-third of those working in the industry may expect the complaint in some degree; implying that above 300 persons may suffer in the Tamar Valley annually. An occasional case may be seen anywhere in the country.

Factors concerned in Morbidity

(i) **Family History.** In each case enquiry was made into the family history as shown in Table I. A positive family history of allergy in 14 of 20 cases is high, and there can be little doubt that the condition has, in general, an allergic basis.

TABLE I

<i>16 Industrial Cases</i>		<i>4 Non-Industrial Cases</i>	
Asthma	5		1
Eczema	6	1 case varicose eczema excluded	1
Hayfever	3		1
Migraine	2		1
Other skin disease	3		3
Flower rash	3		3
No <i>allergic</i> history	5		1

(Numbers of times that a positive family history was given in answer.)

(ii) **Personal History.** No case was found, or has been known in former years in this practice, where attack had occurred in an earlier year, followed by non-occurrence when industrially exposed in a later year, contrary to the belief of Walsh. A personal history of "Flower-rash" was obtained in all 14 "old" industrial cases, and personal other allergy in three and other personal skin complaints in three. A personal history of "flower-rash" was given twice, and of allergy twice in the four non-industrial cases.

(iii) **Duration of Contact or Exposure.** Enquiry was made in the industrial cases into the number of years spent in active seasonal contact before the first occurrence was noticed; also into

the number of days contact this season before the first symptoms occurred.

TABLE II

<i>"Picking-day" of 1st attack this season</i>		<i>"Picking-year" of 1st attack</i>	
Before contact	1	1st year	5
1st day	2	2nd—6th	4
2nd—4th day	7	22nd—27th	3
5th—14th day	4	Uncertain	4
21st day or later	2		

One patient showed her first symptoms on her third day of her first year in regular picking. Previous contact was only the normal "social-contact" of house-decoration with cut flowers (which is often on a lavish scale in this district). The patient who developed symptoms before contact has suffered severely in each of the last three years, and had previously picked 27 years without trouble. One other case will be discussed later wherein the rash recurs yearly without contact.

Duration of contact does not seem significant except that similar lack of regularity in incubation is commonly found in allergic complaints.

(iv) **Type of job in the Industry.** The 16 industrial cases showed between them 15 "pickers", 8 "carriers", and 15 "bunchers".

Some correlation was found between the site of the lesions as defined above, and the type of work performed. There was no significant positive correlation between severity of the complaint and site of the attack except for those cases affected in "other parts of the body" (scrotum, thighs, shoulders) which occurred exclusively among those classified as "major", and also among those persons undertaking all three types of job. Lesions on the dorsum or sides of the fingers (not finger-webs) occurred (four cases) exclusively in "bunchers and ringers". The question of right- or left-handedness will be discussed when considering the description of the complaint.

(v) **Season and Light.** Climate during the picking season might well be expected to affect incidence, or severity, or both. This year the season was almost uniformly dry (for earlier climatic reasons the season was also extremely short), and the only noticeable worsening when the weather broke occurred in two patients who had coincidentally had a patch test applied. This effect was

balanced by the co-incidental improvement (under treatment) of other cases. I can offer no positive evidence as to the effect of sun upon the naturally-occurring dermatitis, but believe, from the experience of a number of seasons, that the effect is very slight indeed.

(vi) **Type of flower.** Walsh recorded that certain varieties of daffodil (in his report, species hybridization was less advanced in 1910) caused more trouble than others. Many of my patients insisted that certain named varieties were worse, for them, than others. One patient was in fact patch tested with two varieties, and gave a positive result to her personal choice, and a negative result to the other. Of the varieties specified by patients as their "personal poison", 23 votes were cast for 14 varieties, the variety "Brilliancy" scoring 5 (in one village the complaint used to be known as "Brilliancy rash") and the varieties Emperor, Helios, Actaea, Verger and Monique, scoring 2 each. King Alfred (Stryker's case) was incriminated once only. Through the kindness of the secretary of the Royal Horticultural Society, I have been informed that neither of Walsh's species (*N. ornatus* and *N. odoratus*), were concerned in parentage of all these varieties. I understand also that the bad repute in which "Brilliancy" is locally held was unknown to the R.H.S. or to the original raiser. The nearest approach to a common factor is a small and highly-coloured corona. Aitken (1955, personal communication) tells me that in the Lincolnshire bulb fields, both the list of commonly grown varieties, and the severity and the major presenting symptom of the dermatitis, differ considerably from the Cornish picture as presented here. I believe therefore that more detailed investigation of this point might throw valuable light on this condition, and perhaps also on the general field of plant-dermatitis.

Testing Methods

(i) Description

Patch tests. In all the industrial cases, and one of the non-industrial cases, a patch test was done. "Waterproof Elastoplast" patchettes were used (a circle of adhesive plastic with a gauze centre). Pollen of a variety current in exposure was placed on one gauze, a piece of stem greenery on another, wet sap was squeezed on a third, and one was left plain as a control. All four were stuck on the skin, generally volar forearm, and labelled. The patient was given a chart, instructed how to record the results, and asked to hand in the completed chart. Patches (with two exceptions) were left *in situ* 24 hours—then removed; results were read and recorded, and the limb exposed to sunlight over the next 24 hours; the marked areas were then re-read and results again recorded. The exceptions were patients believed to be highly sensitive; they were instructed to remove all patches when the first one produced permanent irritation. One of these patients removed the patches at 6 hours, and one at 22 hours. Positive results were clearly visible in each case. All the results were inspected personally at some stage, and as a tribute to my patients' conscientious co-operation, I

can say that in the case of only one patch was it necessary for me to "correct" the recorded result.

Intradermal tests. In 13 of the industrial cases, and in all of the non-industrial cases, an intradermal prick test was also performed. Early in the study, only the standard commercially available testing solutions were used (control, pollen, flower, and foliage extracts), but as it soon became apparent that sap was a frequent irritant, the manufacturers kindly made one specially for me; this was used in six cases later in the season. All intradermal tests were read personally at 5, 10, 15 and 20 mins. and a positive occurring at any of these times was recorded.

Results for the industrial cases are shown in Table III.

TABLE III

Case No.	PATCH			INTRADERMAL				Remarks
	Pollen	Foliage	Sap	Pollen	Foliage	Sap	Flowers	
1	+*	++*	+‡	±	—	/	±	Worsened after tests
2	—	/	++	±	—	+	—	
3	—	—	—	±	—	—	—	
4	—	—	+	—	+	/	±	Later history penicillin urticaria
5	—	—	++	/	/	/	/	
6	—	+	—	+	+	/	++	Worse after tests See text
7	—	—	+‡	—	+	/	—	
8	—	—	—	—	—	—	—	
9	—	+‡	+	—	±	/	+	See text
10	—	—	—	/	/	/	/	
11	++‡	—	—	/	/	/	/	
12	—	++	?	++	++	/	++ +	One patch fell off. Worse after tests
13	++	+	++	—	±	/	—	
14	—	±	±	±	—	/	—	Dermographia Worse after tests
15	—	+	++	?	?	?	?	
16	—	++	++	—	±	/	—	

‡At 48 hours or later only.

*At 7th day only.

±Weak positive result.

/Test not performed.

(ii) Control of testing

I have been unable to find any report wherein the numerical accuracy of patch tests can be judged for this type of complaint. It was originally intended to perform a number of "control" patch tests on subjects who handle flowers, but do not suffer from the dermatitis, but owing to the unexpected shortness of the season and general pressure of work this was not possible. However, 3 "normal" individuals submitted to identical tests, with 1 positive result (sap) out of 9 patches; 6 daffodil patches were applied without effect to a patient whose rash eventually proved to be due to primula, and in 3 cases in the series, all 9 patches were negative. The diagnostic implications in these cases will be discussed below, but from the above facts it can be reliably concluded that fresh daffodil material is far from being a "primary irritant."

I. B. Sneddon (1955, personal communication) informs me that this, at least in one section of current dermatological opinion, is all that is required to be proved of a suspected patch-test irritant. He also adds that it is normal dermatological practice to leave patches *in situ* for 48 hours. I was not aware of this timing until after the end of the season; in view of the possible effects of intra-seasonal testing on four cases, the omission was perhaps fortunate!

In the intradermal testing, a control solution prick was used on each case tested. In view of the generally held opinion of such tests in their wide use in asthmatic and other allergies (i.e. a positive result means something, a negative result probably means nothing) no intradermal tests were done on normal subjects for comparison.

The number of cases (13) in which the results of patch and intradermal tests can be here compared is not sufficient for such comparison to be either fair or informative. The numbers in which one method appears more sensitive than the other are almost exactly even in each direction. In view, however, of the possible variation in results with different named varieties of daffodil, I prefer to rely on patch-testing, where this possibility can be quite simply explored in every case.

Description

The appearance of a severe case, and the multiplicity of the lesions, can best be judged from the photograph appended.

(i) **Types of lesions encountered.** Lesions (other than on the face) vary from "cracking" of the physiological creases of the dorsum of the fingers (bunchers and ringers), through a dry hyperkeratotic scaling of the finger-webs, or a cheiopompholyx-like vesiculation of the contiguous borders of the fingers, to a papular or pustular rash, largely of the forearms, occurring follicularly (hair-follicles, gland-orifices) which may coalesce to form irregular plaques (sometimes as big as a five-shilling piece), similar in appearance to a psoriatic plaque which is regressing under treatment (i.e. has lost its surface scales). There may be a typical "flexural eczema" in the elbow, or more generalized secondary eczematization. In many of the cases, several types of lesion occur together on the same arm.

The facial lesions appear different. They are either a dry, branny scaling, with, if on the eyelids an underlying œdema and erythema, or they are macular or papular, red or purplish blotches, varying from the size of a lentil to that of a sixpence.

No linear lesions have been seen on abrasions or scratches. There is a general belief among the workers that abrasions are the portal of entry, and this belief was accepted by Walsh, specified by O'Donovan in his agrimony cases, and postulated and discussed by Sneddon in the very different circumstances of his recently reported case of Berylliosis. Visible abrasions here are evidently neither recurring nor causal.

All the lesions itch, generally severely. Spreading bacterial (septic) superinfection has not been seen clinically. No bacteriological laboratory examinations have been done, but the frequently observed resolution of a widespread pustular eruption to

near-normal skin in the space of three to five days and in the complete absence of any antibacterial treatment, seems sufficient basis for dismissal of conventional bacterial infection from consideration as a major factor. (This happy sequence unfortunately occurs only at the end of the season.)

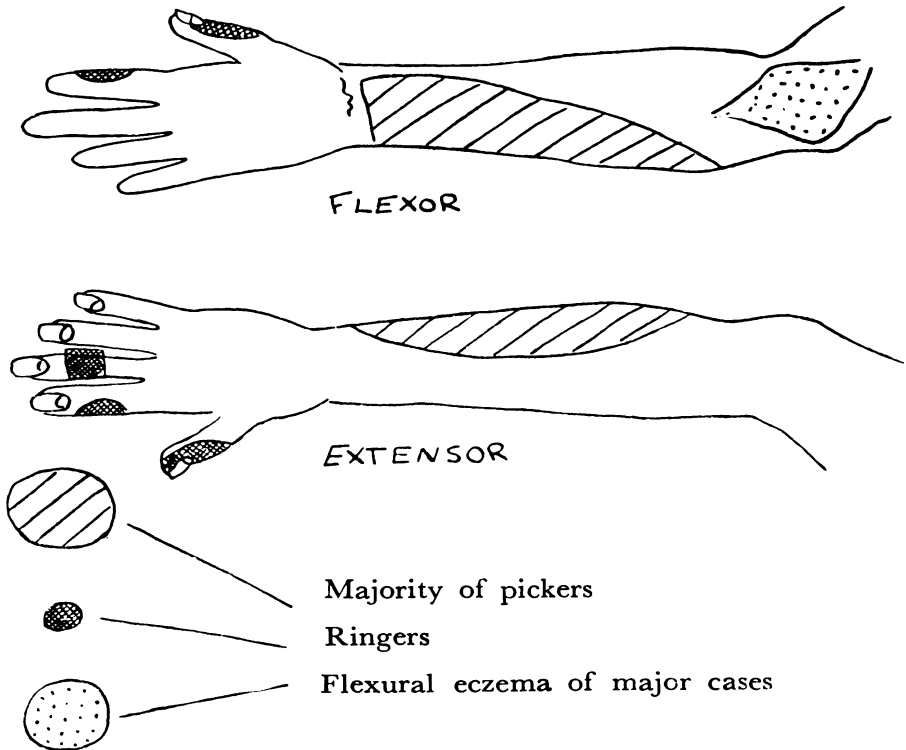


FIGURE 1.
Showing typical distribution of rash

(ii) **Distribution of lesions.** In no case this season has the dorsum of the hand proper been affected except marginally, and in no case the palm. I believe that lesions on the actual hand, with the possible exception of desquamatory lesions considered below, do not occur.

When the detailed sites of lesions are considered, there is some correlation with the type of job, in that those predominantly employed on " bunching and ringing " provided all the finger and

thumb lesions in this series. Where "handedness" for ringing was recorded, those lesions were always on the ringing hand (four cases). Among six cases of known right-handed pickers, in no case was the condition worse on the left side than on the right. Among three cases of known left-handed pickers, one was a right-handed ringer and had only right finger lesions; one had no lesions on right hand or arm, and a moderately severe attack on left arm only; and one had a severe bilateral affection of both forearms, with elbow flexural eczema and facial and neck lesions, but worse on the right than on the left.

In the twelve cases where forearm lesions occurred the distribution of these lesions was flexor and ulnar border in eight cases; and flexor and radial border in three. I can suggest no explanation of this discrepancy. One case showed lesions equally on both borders.

The diagram (figure 1, p. 155) shows the most usual features of distribution.

Discussion

(i) **Reaction-types.** Three main reaction-types can be broadly drawn; a generalized allergic reaction of exposed skin, a more simple contact reaction to an applied irritant (allergic or non-allergic), and a cheiropompholoid-desquamatory reaction. The first two are frequently mixed, but in varying proportions and predominance; they can be together classified as follicular erythema with or without eczematization; while the latter, though not necessarily exclusive, is most commonly so. All of this season's three cases of this type have been dramatically improved (either upon their former state this season, or upon their last season's showing) by the use of an efficient silicone barrier cream. In my view this is the treatment of choice for this type of case.

(ii) **Aetiology.** There are certain aspects of the general causative process which are either unclear as yet, or even a matter for conjecture.

Firstly, there is a possibility that the desquamatory reaction-type described may be the result of contact with the rubber rings, and not due to the plant. It should be remembered that the rolling of the rubber rings produced a more abrasive contact of the plant-moisture on the skin than occurs elsewhere. This uncertainty I hope to decide another season.

Secondly, no satisfactory conclusion can be drawn upon the locally-held belief of variety-specificity. Such industrial worker's beliefs, in common with old-wives' tales, are sometimes based on intelligent lay clinical observation, and may be experimentally

proved to be correct. The single inter-variety patch-test referred to above is interesting, but further elucidation of this possibility requires a more laboratory-like atmosphere than the "curative" approach of general practice permits.

Thirdly, the site of origin of, and chemical nature of, the irritant and sensitising substance(s) in the plant, has not yet been determined. The lack of uniformity of results seen in Table II may indicate either (i) several separate irritants in the various parts of the plants, and varying individual susceptibility thereto, or (ii) a common irritant in all parts of the plant, perhaps in varying proportions, again with varying patient-susceptibility. In both cases, the individual susceptibility-variation must occur; this variation is in accord with the everyday experience both of simple drug-dosage, and of allergic phenomena generally.

The nature of the triggering irritant becomes even more obscure when considering individual cases. In one, this season's rash started before known exposure, although the possibility of a pollen-cloud-effect occurring from a neighbour's early varieties cannot be excluded. In another, the rash recurs regularly, seasonally, though now in yearly diminishing intensity, seven years after leaving the industry and in the positive presence of precautions by the entire family, reminiscent of fever-hospital barrier-nursing!

Fourthly, the distribution of some lesions, which are plainly and evidently allergic in character, is in this complaint unusual, in that they are confined to areas of skin which have suffered previous contact. Recognition of this fact leads only to a consideration parallel to the endocrine target-organ-sensitivity concept; i.e. a variation in local skin sensitivity conditioned entirely by the previous experience of the area of skin concerned. (Case 15 reacted with severe urticaria to his patch test but the lesions were seen only on previously exposed skin; Stryker's successful experimental sensitization was performed by repeated application of patches to the same piece of skin.)

(iii) **Use of testing-methods.** For the diagnosis of an industrial case the highly specific history is sufficient, and skin-testing is unnecessary. For the sporadic or "social" case, skin-testing (patch or intradermal) may well be required; two of the four social cases in this series were diagnosed by these methods, and another similar case excluded (not only by negative daffodil patch and intradermal tests but by a positive patch to *Primula obconica*).

For the planning of treatment for any case, very full skin testing may well be necessary; here it is well to remember the varying patient-reaction to different parts of the plant, and the possibility that one named variety of daffodil may be responsible and another named variety prove innocuous. Also, it is wise to choose for the

tests an area of skin which has been exposed to the plant, e.g. a forearm and not the small of the back.

Many authorities advise against skin-testing (in conditions other than daffodil dermatitis) during the season of exposure. Their patch tests are performed with ether or acetone extracts of the plants concerned, and mine have been performed with fresh material. With this latter method there is no alternative to intra-seasonal testing. Possible disadvantage was seen in four of the sixteen cases, as mentioned above, although in only one of the four was this disadvantage plainly due to the method chosen. In such a highly sensitive patient similar disadvantages might also occur out of season.

Cases 8 and 10 gave negative results to all tests performed. In case 8, the industrial history, cross-checked by observed increase after four days' continuous picking and remission after a week-end's abstinence, left little room for doubt about the diagnosis, and he was confidently included in the series. In case 10, the rash was in the first few days of the first year of occurrence when first seen and treated, and had recovered before patch tests were performed at the second visit.

(iv) **Aims of treatment.** In the sporadic social case, the aim of any treatment given is that the patient shall recover a normal skin. In the industrial case, the aim is that the patient shall be kept in as good a condition as is possible *while still continuing his regular and intensive exposure*. Palmer (1934) drew attention to this necessity; I need only add that the smaller grower may receive, as a result of his six-ten weeks' exposure, up to a total of 60 per cent. of his entire annual income.

Cessation of exposure is excellent treatment, but the resulting financial penalty is so great that such advice is useless. Further, cessation of exposure may imply bodily removal of the patient from the pollen-cloud, which is usually impossible.

(v) **Treatment given.** In this series treatment was given, on a basis of clinical appraisal, at the first consultation. This has included "Covicone" silicone barrier-cream, a weak antihistamine concentration in ung. aquos., oral antihistamine ("Benadryl"), oily calamine lotion, "Caladryl", calamine lotion with 5 per cent. chloral hydrate, and a mixture containing magnesium sulphate, belladonna, potassium citrate, and phenobarbitone. Because this series occurred in general practice, no controlled trial of any treatment has been attempted; indeed, in view of the case-variability, I doubt if such is possible.

The next most logical step is a true palliative treatment. The condition would seem suitable for trial of local or general use of

an appropriate cortisone preparation. These were not obtainable in 1955, but antihistamines were, and in some of my cases reasonably satisfactory results followed the combination of local and oral antihistamines. Three of the industrial cases had to stop work, at some stage, in spite of all treatment.

Summary

- (1) The occurrence of a dermatitis due to daffodils, up to 30 cases yearly in one medium-sized country practice, has led to this investigation.
- (2) The industry as carried on in this district is described.
- (3) The literature is reviewed.
- (4) The disease as it occurs locally is described and illustrated.
- (5) The experimental methods used are described and discussed.
- (6) The conclusion is reached that the condition is in almost all cases a mixture of allergic-sensitisation and direct-contact elements. Abrasion-trauma is not causal or necessary. Several differing reaction-types are noted. The possibility of individual variety-specificity is emphasized and the implications discussed. No firm conclusion is reached about the effect of light. The opinion of Stryker that there is "a high power of sensitization in the plant" is confirmed.
- (7) Treatment is discussed.

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Messrs. C. L. Bencard kindly provided the intradermal testing solutions and made one specially to order.

Footnote, August, 1956.—The author hopes to continue and expand the study of this condition in the next season, and has been in touch with Dr. Pinsent, chairman of the College Research Committee, to explore the possibilities. Proposals under consideration vary from a geographically-extended survey of incidence to a controlled trial of special treatments. Comments, suggestions, opinions, and ideas from readers will be welcomed. Will any members who would be willing to collaborate in further investigations please communicate direct with the author or with the College Research organisation?

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