

THE 'CLIMATE GROUP' OF RESPIRATORY ALLERGY PATIENTS IN SOUTH AFRICA

THEIR SENSITIVITY TO HOUSE DUST AND DESENSITIZATION WITH EXTRACTS OF THE ALLERGENICALLY POTENT COASTAL HOUSE DUST

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It has already been shown¹ that in South Africa there are many sufferers from vasomotor rhinitis and bronchial asthma who maintain good allergic health inland but who develop more or less severe respiratory symptoms when visiting the coast and more especially the eastern shores of the Union. Indeed such symptoms have not infrequently been initiated at the coast. Similarly there are persons who suffer almost continuously from respiratory allergy at the coast but whose symptoms are ameliorated and often entirely cease when they move inland. These patients are referred to as belonging to the 'climate group' of respiratory allergy.

There are, of course, other sufferers from respiratory allergy whose symptoms are worse inland during the summer (October—March) but who are free from discomfort at the coast. These persons living in the 'grasslands' of South Africa situated mainly in the Highveld region in the interior, are sensitive to grass pollen. They escape this summer pollen hazard at the coast, where there is relatively little grass.

It has become our routine procedure in the study of patients who are subject to respiratory allergy to put the following critical questions to them. The answers at once reveal whether the sufferer does or does not belong to the 'climate group': (a) Have you lived or spent a vacation at any coastal town in the Union? and if so, when and where? (b) Is your condition the same, better, or worse at the coast? and if worse, in what way?

Patients in the 'climate group' unhesitatingly reply, or indeed spontaneously supply the information, that a visit to the coast is invariably attended by aggravation of symptoms. Analogous questions to patients of this group in coastal towns elicit answers which reveal their improvement in health on moving inland. The following are typical replies of such patients:

Inland patients

'My nose worries me at home, but at the seaside I get asthma as well.'

'We reserved accommodation at a coastal resort for a 3 weeks' holiday, but I had to return after 4 days because of severe asthma.'

'I had been perfectly well for more than 3 years in Johannesburg, but my asthma commenced the first night after arrival in Durban.'

Coastal patients

'I had never been ill until I came to live at the coast, where I suffer from constant colds and developed asthma after about 6 months' stay there.'

'My child had a constant cold at the coast, but he is quite well inland.'

'However much I suffer from nose and chest trouble at the seaside, I get better as soon as I drive out about 25-50 miles inland, and I am quite well as long as I stay there.'

The essential climatic differences between the coastal and inland areas are illustrated in a series of charts already

published¹ showing their respective climate patterns. In brief, the coastal climate is characterized by a high temperature and high relative humidity during the day and throughout the year, both within narrow range, whereas in inland regions their range is wide in relation to day and night and summer and winter. These different climates are contrasted in Fig. 1 in regard to the inland city of Bloemfontein and the coastal city of Durban.

The mediating agents between the almost constant warmth and humidity of the coast and the precipitation of symptoms in the patient in these circumstances are still under investigation and various lines of approach are being studied.

The evidence so far accumulated in explanation of the existence of the 'climate group' of respiratory allergies eliminates, as direct causative agents, pollens of the local vegetation, atmospheric moulds, and other exogenous allergens. The most striking fact, however, that has emerged in the skin testing of these patients over the years is their high degree of sensitivity to house dust.

It then became a matter of interest and importance to find whether there was any difference between inland and coastal house dust. As a preliminary measure to that end an investigation² was carried out on 123 patients who were each tested with extracts of coastal and inland house dust. Of these, 90 gave no reaction at all to the inland, but a marked positive (+++) reaction to coastal house dust extract, and often even to its one-hundredth dilution. It became abundantly clear, not only from this experiment but also from subsequent experience, that coastal house dust is without doubt allergenically more highly potent than that from inland regions. Recently with the cooperation of Dr. H. D. Barnes of this Institute, 'Standard Purified Antigen' was prepared, by the methods described by Rimington and Maunsell,³ from fresh batches of both inland and coastal house dusts. The high allergenic potency of coastal house dust was again amply confirmed. This is well shown in Table I, where the skin-test reactions with these purified coastal and inland antigens are compared.

TABLE I. COMPARISON OF SKIN-TEST REACTIONS WITH VARIOUS DILUTIONS OF THE STANDARD PURIFIED ANTIGENS OF COASTAL AND INLAND HOUSE DUSTS

| House Dust Purified Antigen Dilutions | Patient P. | | Patient L. | | Patient W. | |
|---|------------|--------|------------|--------|------------|--------|
| | Coastal | Inland | Coastal | Inland | Coastal | Inland |
| 1: 100,000 | ++ | — | +++± | — | ++++± | ±± |
| 1: 10,000 | ++++± | ± | ++++± | ± | — | ±± |
| 1: 1,000 | — | +++± | — | + | — | +++ |

The reason for the higher allergenic potency of coastal house dust is as yet not scientifically established, although

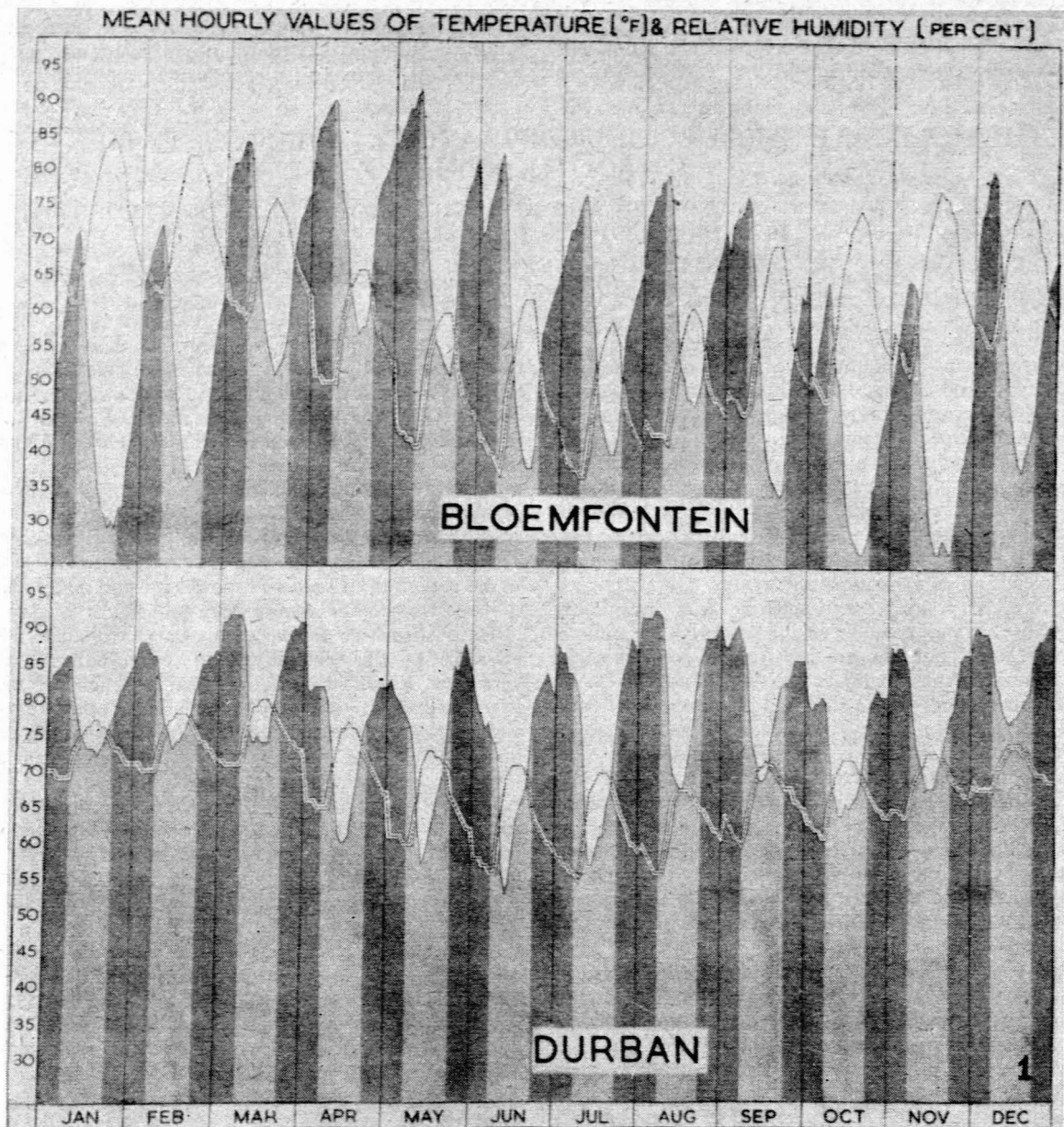


Fig. 1. Comparison of inland (Bloemfontein) and coastal (Durban) climates in regard to temperature °F (broken line) and relative humidity % (shaded). Mean hourly values. Dark shading 6 p.m. to 6 a.m. Light shading 6 a.m. to 6 p.m.

experimental studies to that end are in progress. It is, however, at present postulated that under the conditions of high temperature and high relative humidity existing at the coast there is a more prolific growth of atmospheric bacteria and fungi which biologically activate the local house dust to a greater allergenicity. Other lines of investigation into the causes of this increase in potency are being pursued. In the meantime, from the clinical angle it suffices to say that the 'climate group' patient is worse at the coast and that coastal house dust as an allergen is harmful to him.

A number of cases in the 'climate group' have been submitted to desensitization with extracts of coastal house dust, and although it is too early to be quite definite, there are indications that these patients often benefit by such desensiti-

zation to a degree which permits them to visit the coast or to live there with impunity.

As a result of the findings described above it has become necessary to regard house dust derived from the coast as an important and valuable allergen, especially for allergic patients in the 'climate group'. It is for this reason that house dust extracts are now being prepared in our laboratories from coastal house dust.

These extracts are issued at the request of practitioners both for skin testing and desensitization purposes.

SUMMARY

The 'climate group' of respiratory allergy patients in South Africa is defined as including those whose symptoms of

vasomotor rhinitis or bronchial asthma are aggravated at the coast, where the climate is characterized by constant high temperature and high relative humidity.

The 'climate group' of respiratory allergy patients invariably have a high degree of sensitivity to house dust.

House dust from the coast is shown to be more allergenically potent than that from inland areas.

There is evidence that the use of extracts of coastal house dust is of value in the desensitization of respiratory allergenic patients of the 'climate group'.

House dust extracts are now prepared from coastal house dust for skin testing and desensitization purposes.

Thanks are due to Miss S. E. McNeil, B.Sc. (Hons.), for her assistance in the drawing of Fig. 1, which was prepared from data in the Report of the Weather Bureau of the Union of South Africa, 1950 (Government Printer, Pretoria).

REFERENCES

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2. *Idem* (1956): *Int. Arch. Allergy*, **9**, 129.
3. Rimington, C. and Maunsell, K. (1950): *Ibid.*, **1**, 115.