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The Effects of Dry Atmosphere on Chronic  
Inflammation of the Larynx and Nares.

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MEDICAL COLLEGE, ETC.

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*Read before the meeting of the American Climatological Association  
held in Denver, September 2 to 5, 1890.*

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THE EFFECTS OF DRY ATMOSPHERE  
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In this paper it is my object to invite your attention to a subject upon which unfortunately we have little precise information, hoping thereby to elicit a discussion in which the observation of others may help to remove the deficiencies which I am obliged to confess. The views which I shall here express are based on the study of a large number of cases, but I shall make no attempt to present the histories of these cases in substantiation. Most of my patients live in low altitudes, many of which are damp; though I frequently see patients who live in a high and dry atmosphere.

In trying to analyze these cases I have been unable to decide satisfactorily what particular phases of the disease are benefited and what injured by the dry atmosphere. In the majority, I presume at least four-fifths, dryness of the atmosphere seems beneficial, but in some it is certainly injurious. At first sight it would seem that cases in which there is excessive secretion would be benefited by residence in a dry atmosphere, whereas those suffering from the opposite condition would be injured, but numerous cases attest that this does not follow in all instances: for example, in simple chronic rhinitis with excessive discharge, we find a given number of patients improved by removal from the shores of large bodies

of water inland, but a limited number of cases with the same disease will be benefited by moving from inland districts to the damp climate of the sea shore, or the borders of our great lakes. We find now and then a patient greatly improved by going to a high altitude with a dry atmosphere, but usually catarrhal cases are injured by this change.

The more we see of these diseases, the more we are impressed with the fact that catarrhal inflammations are found alike in the damp, chilly atmosphere of the sea shore, or upon the arid plains of Arizona, in the most favored localities of our southern States, and in the delightful atmosphere of Colorado, though not to the same degree in each section.

We may assume that the inflammatory affections of the nares and larynx are essentially of the same character, and that therefore they will be influenced in a like manner, though in different degrees, by various climatic conditions.

These affections we will therefore class together as catarrhal excepting in those instances where we use a qualifying phrase, as for example, tubercular laryngitis.

Usually these catarrhal affections are less frequent in warm climates, therefore, a warm, equable atmosphere would seem best adapted for their prevention or cure. However, in equable climates the air is loaded with moisture, a condition which undoubtedly favors the development and maintenance of certain forms of catarrhal inflammation, yet the opposite condition of dryness also has its disadvantages, for it favors the formation of dust and allows the air to be laden with various irritating substances which might be absent in the damper atmosphere. As certain palpable substances in the atmosphere cause

asthma, so in some cases similar substances will excite chronic inflammation of the mucous membrane of the upper air passages. The damp, and often chilly atmosphere of the Atlantic sea shore, and the sudden changes along the borders of our great lakes are peculiarly favorable to the development of this disease. Nevertheless, a considerable number of the cases that come to those of us who practice in these localities have originated inland. We frequently find that a person having developed the disease in any given locality will be relieved of it by a change to some other locality, though the latter may be either dryer or more moist than the original residence. I know many that are afflicted with the disease upon the shores of Lake Michigan, who, upon going but a few miles into the country are at once relieved. I have known those who could not live with comfort on the sea shore to have but little difficulty upon the shores of our lakes. I have seen those who have attributed their whole trouble to the sudden and severe atmospheric changes on the borders of our great lakes to become much worse by residence in an equable climate. For example, a patient suffering from a moderate degree of hypertrophic rhinitis went from Chicago to Southern California in hopes of obtaining relief, but there he was unable to breathe through the nose at all, and he was compelled to return to Chicago.

With these conflicting facts before us, how can we determine what climate to recommend to our catarrhal patients? We have observed that as a rule they do best in a comparatively dry climate not more than one or two thousand feet above the level of the sea, but there are many exceptions to this. Occasional cases are greatly benefited by a sojourn in high altitudes, and I hope to hear from the physicians of this locality what

particular phases of the disease improve in Colorado.

By ascertaining in individual patients the season of the year, and the kind of days when they feel most comfortable, we may often be able to judge of the most suitable climate for them. Yet it frequently happens with these cases, as with asthmatics, that the climate must be tried by each patient for himself in order to determine what atmospheric condition is best suited to his disease.

Before sending such cases from home we should try faithfully the methods of treatment which have been found most beneficial by expert laryngologists. If these do not succeed we should recommend a dry or moist climate, according to the kind of weather in which the patient feels best—at an altitude of not more than one or two thousand feet above the sea, or even less than this. High altitudes should be tried only incidentally, as they are not apt to prove beneficial.

My observation, which embraces several thousand patients, leads me to the following conclusions:

A dry atmosphere at a comparatively low altitude will generally be found beneficial in the following diseases:

In rhinitis intumescens, which is characterized by intermittent swelling of the tubernated tissues with obstruction of one or both nares, and the consequent discharges into the throat.

In simple chronic rhinitis, with or without excessive secretions; providing there is but little irritation of the mucous membrane.

In atropic rhinitis with excessive muco-purulent discharge, with but little tendency to drying.

In such cases of hyperæsthetic rhinitis as improve during the dryer portions of the year.



However, most cases of hyperæsthetic rhinitis will be more benefitted by an equable climate even though the atmosphere be loaded with moisture.

A high and dry atmosphere is usually prejudicial in rhinitis intumescens and in atrophic and hypertrophic rhinitis, and indeed in all catarrhal affections occurring in patients of nervous temperament. These injurious effects may be ascribed partly to the dryness of the atmosphere, partly to the irritating dust often found in high altitudes, and partly to the effects of the rare atmosphere upon the nervous system which undoubtedly has much to do with the etiology of catarrh.

A high and dry atmosphere may be expected to prove beneficial in cases where there is excessive secretion with little or no nervous irritability; in some cases due to syphilis, and in exceptional cases of atrophic rhinitis with excessive secretion.

In inflammatory affections of the *larynx* we may expect benefit at a low altitude with a dry atmosphere; in simple chronic laryngitis, and in some cases of tubercular laryngitis. In the latter, however, I prefer an altitude of from 1,500 to 2,500 feet, and there is no objection to the atmosphere being impregnated with the odors of pine and fir which the laity consider of so much importance; but I doubt whether these are of any benefit.

In cases of laryngitis with deficient secretion, or excessive irritability of the mucous membrane, the moist atmosphere of equable climates is generally preferable.

A high and dry atmosphere is usually injurious to persons suffering from chronic laryngitis, but it is beneficial in exceptional cases. My observation, however, does not enable me to decide what cases will be improved by this condition. But it

seems probable that benefit would be derived in certain cases of simple laryngitis in phlegmatic patients; in some cases due to syphilis in which the mucous membrane requires stimulation, and in exceptional cases of tubercular laryngitis, in which the beneficial effects of the atmosphere upon the constitutional disease more than counterbalance its deleterious influence upon the local affection. The latter are most likely to be found in patients in whom the mucous membrane of the larynx is not very sensitive. In laryngo-pulmonary tuberculosis patients usually do best at an altitude of from 1,500 to 2,500 feet, in a warm and dry atmosphere, but it is often difficult to determine what is best for them because of the beneficial effects of high altitudes on tuberculosis of the lungs and their baneful effects on the same disease affecting the larynx.

The injurious effects of such an atmosphere on the larynx are often attributed to the dust which it contains, but the explanation is unsatisfactory, for in persons who are continually inhaling much more dust, in planing mills or machine shops, the injurious effects are oftener manifested on the lungs than the larynx.

It seems probable that the action of this atmosphere on the mucous membrane of the upper air passages is not very dissimilar to that of the wind and sun upon the skin unused to exposure.

Owing to its dryness it causes rapid desiccation and destruction of the superficial epithelial cells with consequent irritation of the subjacent tissues, which in addition to the increased flow of blood to the part, resulting from diminished air pressure, necessarily increase the inflammatory action.



