

In medicine climate is an adjuvant, not a specific. The absence of a particular malady from a place does not prove that the place is a prophylactic against that malady. A climate may have tonic and exciting properties which favor the nutrition and the good health of persons born in that climate, and employing a diet and mode of life suitable to it. Yet these same tonic and exciting qualities may not suit subjects already attacked by such and such maladies, and having irritable or vulnerable organs. These qualities favorable to the one class may be unfavorable to the other. The immunity of the natives of a place from any particular disease only furnishes a reason for studying it in its climatic relations.

Immunity of itself affords no guarantee for patients; but if it is proved that there are fewer sick of a given malady, say at a certain elevation, this fact is so far favorable to altitude. If, further, it is verified by direct observation that patients in such or such stages of their complaints derive benefit from residing in the mountains, this is enough to recommend mountains, especially if they have already tried other climates without advantage.

It seems now to be generally admitted that the number of cases of phthisis diminishes as the elevation increases. How is this to be explained? We must in the first place allow that many of the factors of phthisis are absent at a certain elevation, that is, all of them that are connected with social life and aggregation; but besides this, what further explanation have we?

1. Hirsch says that it is because the alternations of temperature are less marked in the mountains than in the plains.

2. Brehmer says that the air is more tonic and favorable to nutrition.

3. Jourdanet says that the cause is the deficient supply of oxygen.

It is true that the relative proportions of oxygen (21), and of nitrogen (79), are the same in the mountains and in the plains, but, as the higher layers of the air have less density, the quantity of oxygen in them for each inspiration is less. Experiments have shown that the quantity of oxygen in a liter of air at the height of 15,000 feet is about one-half what it is in the plains. The result of this is that, in order to get the necessary supply of oxygen, the inspirations become deeper and more complete, and that the thoracic cavity increases in capacity. The pulmonary cells, dilated and enlarged, become to a certain degree emphysematous, and in the end produce the dyspnoea called *asthma montanum*.

Two pathological facts appear in the mountains, which stand in relation to each other, the rarity of pulmonary phthisis and the frequency of emphysema. It seems also probable that the increased expansion of the pulmonary cells leads to a certain degree of anæmia of the lungs, and this anæmia, like emphysema, is considered to be antagonistic to tuberculosis.

The diminution of atmospheric pressure causes a derivation from the centre to the circumference, and produces a real revulsion towards the cutaneous

surface. Add to this the tonic action of the air and its influence in promoting appetite and digestion, and we see some explanation of the rarity of phthisis in mountain climates.

To these causes Lombard adds a certain excess of carbon in the system, consequent on the diminished supply of oxygen, and he thinks that this has something in common with the state induced in Icelanders (who enjoy immunity for phthisis) by the free use of oils and animal fats or butter.

To these influences Lombard adds the effects of hydro-therapeutic treatment and of muscular exercise at the mountain sanatoria, along with the use of wine and fruit and nutritious diet.

Besides other objections that may be raised to Lombard's views, it is difficult to suppose that this real or supposed anæmia is a prophylactic of phthisis in the mountains, when we so often in the plains see anæmia to be a prelude of tuberculosis.

In the place of Dr. Lombard's anæmia, Dr. Gouraud would prefer to assign more satisfactory reasons for the beneficial effects of mountain climates in phthisis.

The purity of the air of mountains consists practically in the absence of all organic particles; and when we consider the effect of vitiated air in crowded workshops in producing phthisis, we can understand the prophylactic effect of mountain air. The transparency of the air which is dependent on its greater dryness, and the more powerful action of light, depending upon the same cause, aid materially the operation of the purity of the air. The effect of residence in the mountains on the dimensions of the chest is also worthy of careful consideration, and has been studied by M. Armieux, at Barèges, at a height of more than 3000 feet. He ascertained that in the case of ninety-six soldiers who were sent up to Barèges there was, after four months residence there, a distinct increase in the measurement of the chest. If this result be fully established, it is evident that it will have a very important bearing on cases of threatened phthisis in the young, and that a mountain climate is to be considered as favorable to the development of the thoracic cavity, and, consequently, as improving the respiration.

We thus understand how mountain air may be useful in certain cases and in certain periods of phthisis. It acts by its purity, by its dryness and transparency, as well as by the diminution of atmospheric pressure. Dr. Gouraud observes that these principles have only, or nearly only, been applied in Switzerland, and thinks that mountain stations for such cases might very well be selected in some parts of France.

He concludes by observing that after all neither barometer nor thermometer, neither hygrometer nor anemometer, can determine what is the suitable climate for such and such phthisical patient. All depends on the nature of his constitution, and on the way in which the various meteorological conditions affect him.—J. M. Epherson, M.D., in the *London Medical Record*.