

In proportion to the elevation above the sea, the atmosphere becomes cooler, the temperature being 1° lower for every 200 feet of elevation above the sea. This difference is not arbitrary, being subject to modification by soil and prevailing winds. The rapid absorption and radiation of heat give rise to great extremes of temperature. As compared with the sea-level, the fluctuations of temperature in Colorado are indeed large, the variation in Colorado Springs in July being 30° daily and 63° monthly, as contrasted with San Diego, where the difference is 13° daily and 31° monthly, the climate of the California resort being tempered by the moist warm winds of the Pacific.

Physiologically, heat is opposed to the stimulation of the nervous centres, as is shown in the greater energy of northern than southern races. Its influence upon respiration is also depressing. The observations of Dr. Parkes show the number of respirations to be about thirteen to the minute in the tropics, and sixteen and a half in England. The value of a cool climate in arresting incipient phthisis is well known. Dr. F. I. Knight, of Boston, has expressed the general sentiment of the medical profession by asserting that "the cold, dry air of high elevations is beneficial in cases of incipient disease of the lung." That the symptoms of consumption are often palliated by moist, semi-tropical climates is true, yet the digestive organs lack the stimulus of cold, the patient is exposed to the dangers of malarial poisoning, and the heat of summer forces the invalid to leave his winter sanitarium, and seek a cooler and less debilitating climate.

With the rise above the sea-level the air becomes rarefied, and the atmospheric pressure is considerably diminished. At the height of 5,300 feet the atmospheric pressure is twelve and a half instead of fifteen pounds to the square inch, and the proportion of oxygen is diminished 16 per cent. This extreme attenuation of the air produces important changes in the economy. The mechanical effect of the rarefied air is to increase the frequency and depth of respiration, and to accelerate the pulse. A greater amount of air must be inhaled to satisfy the demand for oxygen. Hence the lungs have a tendency to be completely filled, the elastic tissue of the vesicles is stretched, and the thorax is expanded to its fullest capacity. At moderate elevations the system quickly adapts itself to the lessened atmospheric pressure, but, when great heights are rapidly attained, as with aeronauts, copious hemorrhages from the lungs ensue, and even at the altitude of Denver hæmoptysis frequently occurs in consumptives in the stage of excavation. Dr. Denison says: "The lessened tension of the air and the increased frequency of respiration force the blood to pass more quickly through the lungs, and the rapid and perfect renewal of capillary circulation is opposed to the stasis of early and chronic inflammation. This improved capillary circulation, together with the more perfect expansion of the thorax, loosens and promotes the expectoration of mucus and inflam-

matory debris." Tissue changes take place more rapidly near the sea than at considerable elevations. The usual experience of new-comers to Colorado is that they lose flesh, and that the sensible perspiration is considerably diminished. With the expansion of the thorax and the increased depth of inspiration, a development of auxiliary muscles of respiration takes place, and the children born in Colorado have a wider girth of chest than children born in the Eastern and Middle States. As the natural stimulus of an organ is the element upon which it acts, a lung filled and obstructed with pneumonic, caseous, or tubercular matter is mechanically aided to throw off the adventitious substances which obstruct the air-passages. The symptoms of hectic fever abate, and the consumptive, relieved from his night-sweats, chill, and harassing cough, is placed in a favorable condition for recovery. Finally, the rarity of the air produces complete and constant ventilation, which invalids secure by active or passive outdoor exercise. The purity of the air in Colorado is preserved by elevation above the sea, a thin population, and the constant influence of the sun.

The elements of atmospheric electricity and ozonized air I will not here discuss. Authorities state that the electric tension of the air is increased with elevation, as is also the amount of ozone.

The advantages of Colorado for pulmonary consumption have been too recently appreciated to enable me to present extended statistics as to its benefits. Relief is more certain to the consumptive who seeks the aid of its climate in the preliminary stages of the disease, before there is much loss of tissue. Of 202 patients, having been ill an average of two years before reaching Colorado, at the end of a year and nine months 47 per cent. were much improved, 22 per cent. were slightly improved, in 11 per cent. there was favorable resistance to the disease, and in 20 per cent. there were extension and advance. Among those of this number in whom the disease had reached the stage of excavation, at the end of two years, 35 per cent. had died, 40 per cent. were resident in the State, and the remainder had been lost sight of. Even this is a favorable showing for the last stage of a fatal disease. Often patients who reach Colorado with tubercular lungs in the stage of softening are obliged to seek a lower altitude, the morbid process being hastened in Colorado. Cases of uncured or chronic pneumonia and fibroid phthisis are frequently aggravated by the altitude and dry air, and cases in which tubercular infiltration is actively progressing, and those in which much lung tissue is involved, are not favorably influenced by Colorado. A contra-indication to high altitude exists in consumptives of advanced years with rigid chest-walls, and in patients with valvular disease of the heart.

A disputed point now comes up regarding the influence of elevation in hæmorrhagic cases. Patients in whom large cavities exist, with denuded blood-vessels near the pulmonary excavation, are