

the ocean winds, that constantly blow inland during June, July, August and September. It is hence a plain inference that this heated atmosphere is highly charged with invisible vapor. In proof of, it is the fact that the dusty and sandy stage and farm roads are moist under the wagon-tires and feet of the team in the summer mornings. The dust and sand have, like a porous sponge, absorbed the air at night, cooled it below its point of saturation, and condensed its vapors in the loose soil. The heaps of earth dug out by the badgers on hill-sides and hill-tops are moist in the summer mornings by the same mode of condensation.

The well pulverized fields and gardens on the high plains and hills and in the valleys, are also moist in the early mornings of summer from the same condensation.

YET THE HARD, UNBROKEN GROUND OUTSIDE IS DRY.

The blankets of the campers are often wet after a night under the open sky, from condensed vapors within their porous fibers. Night watchmen and sentinels and scouts, in their flannel shirts and blouses, often feel these becoming damp in the still, cool evenings, and especially before daybreak, from the same cause. These facts have been stated in other articles, but they need to be repeated until all persons, especially farmers, gardeners, orchardists, timber-culturists and health-seekers see and know and profit by them.

A further proof is the fact that waterspouts have their origin in the heated air of these interior plains, and similar ones occur in Southern California and Arizona, far away from the forest-covered mountains which act as slow condensers on the western slopes of the Cascade and upper Nevadas. The cool wind from the loftier mountain peaks meet the vapor-laden ocean winds high over the heated plains, forming circles, or cyclones, which cool the air and condense its invisible vapors into storm-clouds out of a clear sky, and suddenly hurl its hail-stones upon the startled traveler or herdsmen below, and follow it with sheets of rain that deluge the land, and rush in torrents down the ravines. Whence all this flood of waters in a dry, hot day, under a burning sun? The only solution of the problem is, that the heated air has been the store house of the invisible vapor. The heated atmosphere, the world over, is the storehouse of invisible waters. They flow over all regions. They constitute an aerial ocean, to be condensed by mountains, forests and winds. They give life and health to the vegetable and animal creation.

HEALTH OF THE UPPER COLUMBIA BASIN.

The Indians of this upper country are noted for their vigorous health.

The hunters and trappers of the American Fur Companies, sixty years ago, and of the Northwest and Hudson's Bay Companies, fifty years ago, tested and found the whole region healthy for them. The missionaries for forty years have tested and proved its healthfulness. The army at these interior posts have enjoyed the salubrity of the climate during twenty-five years past. Farmers and business men and their families, have during the last twenty years, learned by experience that every portion of this vast area of 160,000 square miles, where settlements have been planted, has proved to restore and invigorate health. Animal life generally evinces the same fact.

#### EFFECT UPON CONSUMPTIVES.

Dr. Forbes Barclay, a thorough physician, from Edinburg, Scotland, and employed many years by the Hudson's Bay Company, informed the writer nearly thirty years ago, that it had become his rule to send consumptive patients to the Upper Columbia; usually to old Fort Boise; and that they very often recovered, and came back strong men. He had previously sent consumptives to the Sandwich Islands, but almost invariably with fatal results. While the air of the tropics tended to lassitude and debility, the cool and pure mountain and sea breezes renewed the vitality and vigor of this class of patients.

It is often found now, that persons just beginning to be affected with a hacking cough and a hectic flush—signs of the disease—get relief by changing to the Upper Columbia. Some defer it or try the warmer regions of California or the tropics, only to learn too late of their error.

If the valleys seem too hot or too chilly, resort can be made to the hills. Some go too late and fail of cure. Others win relief by a prompt change to that region.

#### ASTHMA.

This disease yields almost the instant the patient whether old or young, breathes the air of those higher plains and mountains. Many who cannot live west of the Cascades, become free from this difficulty and gain strength quickly, for work or business there.

#### EFFECT OF THE CHANGE OF CLIMATE.

No doubt many find benefit from a mere change of abode. Weary and worn out persons recover strength on journeys, especially from the good effect of sun and air. The trip from the sea shore or western valleys to the eastern, usually proves a means of health. Doubtless the lives of many overtaken and closely-housed women would be saved from sickness and death by this change. Very probably a change from the interior to the seaside might have a like restorative effect. When railroads are completed so that the exchange may be made in a few

hours either way, it will become no doubt a habit to make more such health trips and with success. The diseases that occur then, like typhoid, mountain fever or diphtheria, are no doubt due to local causes as in other regions.

The usual mildness and purity of air and water and sunlight, with food in abundance, surely invite and confer health.

"Meteorological observations at Lapwai or Kooskookie, Nez Percés Mission, Oregon Territory,—now within the limits of Idaho Territory, Lat. 46° 30' N., Lon. 118° 30' W., 468 miles (in a direct line) from the mouth of the Columbia river, kept by Rev. H. H. Spalding and furnished Lieut. R. E. Johnson, of the Wilkes exploring expedition, in June 1841. The tables were kept in full and the following results found:

"1837. Mean temperature, 56° 2'; fair days, 159; cloudy days, 77; rainy days, 85; snowy days, 14.

"1840. Mean temperature, 53° 6'; fair days, 172; cloudy days, 93; rainy days, 88; snowy days, 12.

"1841. Six months. Average mean temperature, 60° 30'; fair days, 70; cloudy days, 45; rainy days, 48; snowy days, 14."

These averages still hold true over the eastern portion of the Upper Columbia basin, so far as we are able to collate the testimony. They prove by so many rainy and snowy days the large degree of saturation of the air of the interior.

Commander Wilks, U. S. N., relates "that Mr. Spalding, during his residence of five years, kept a register of the weather, and that he regarded the climate as a rainy one, notwithstanding the appearance of aridity on the vegetation. There is no doubt of its being so in winter, and even during summer there is much wet. A good deal of rain had fallen the month before our visit. The nights were always cool. The temperature falls at times to a low point. On the 10th of December, 1836, it fell to 10°, and subsequently was not so low till the 16th of January, 1841, then it fell to 26°, and on the 10th of February it was as low as 14°.

The greatest heat experienced during his residence was in 1837. On the 23d of July of that year, the thermometer was 108° in the shade. In 1840 it was 107° and in the sun it reached 144°. The extreme variations of the thermometer are more remarkable, the greatest monthly change being 72°; while the greatest daily range was 58°. Mr. Spalding remarked that since his residence no two years have been alike. The grass remains green all the year round. Mr. Spalding's station at Lapwai, on the river between very high bluffs accounts for these very extreme ranges of the thermometer, which would not be the average for the higher plains a few miles distant.