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Influence of Forest on Climate and Water Supply

definite conclusions.

On this continent nearly all statements as to soil or rock would be heated under the influence of the ground into the country, and thus local the influence of the forest on climate and water- of the sun, the leaves and trees, largely water, breezes are formed, and the influence of the flow are general. In Europe more extended and would absorb the heat without showing much forest felt at some distance. At night the curdetailed observations have formed a basis for change in temperature; consequently, while the rents are reversed, the forest checks the radiahot soil or rock is radiating and heating the tion of the earth's heat, and the air in the forest The discussion first began in France, when in air, the forest cover is still absorbing heat and becomes warmer than that in the open. The

1789 the success of the Revolutionary party led keeping the air beneath it cool. Further, the colder air then flows from the open country to to the removal of the restrictions on the cutting leaves of the trees and all vegetation give off the forest; thus the forest checks extremes of

of private woodlands, and a subsequent wholesale clearing of large areas. As early as 1792 a change in the climatic conditions was observed, and shortly after that time investigations by two distinguished scientists, Becquerel and Krutsch, were begun in France and Germany. For a long time results were not satisfactory, owing to the difficulty of taking observations, but about forty years ago a system was devised of having observing stations within the forest, and similar stations at some distance from the forest, so that results might be compared. By this means the difference between the heat and the moisture in the forested country and that in the open country may be learned. Where all other conditions are equal, the difference is ascribed to the presence of the forest

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Climate is the average weather condition, and is dependent upon the distance of the locality from the equator, the elevation above sea level, the distribution of land and water, the character of the country, whether level or mountainous, whether vegetated or barren, the winds, and the moisture of the atmosphere. The factors which the forest may influence are the surface cover, moisture and wind. Upon the surface cover, which influences the heat, and upon the moisture and wind are dependent the changes in climate which are most evident to human beings.

The influence of the forest on these climatic factors is evident in the following ways: The forest as it stands prevents the sunshine and rain from freely reaching the earth, is a barrier to air currents, and diminishes the

radiation of heat from the earth at night. The large quantities of water by transpiration. The rents of warm and cold water in the ocean, the them produce large quantities of vegetable is absorbed from the air. mould or duff, which checks and reduces extremes of waterflow in the ground.

the temperature of S. the air, the evaporation and transpiration of water from the earth, the rainfall and disposal of

rain water after it has reached the earth. will not admit that the temperature is affected by the presence of forest growth. Such observations as have been made go to show that it is only affected to a few degrees, and only by the presence of so much vegetable matter as is conained in the forest. Ine trunks, branches leaves of a tree stamin a large proion of water. aves being 50% water. Wa-mires more maise its tore one dealmost any



EFFECT OF EROSION Absence of timber leaves nothing to protect the soil or hold the water.

trees and the vegetation which accompanies evaporation of this water requires heat which presence or absence of large bodies of water and

The air thus cooled in the forest sinks to the vailing winds. Forests are cooler than the ground and a rising current of warm air takes surrounding country and obstruct the winds, and, These forest influences extend more or less to its place. The cool air flows off along the surface consequently, may influence local showers. Europ



temperature both at night and day. When this cooling of the air has been measured it has been found greatest in summer and of more effect in the mountains than

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on the level plains. Results of investigation in Bavaria show that the lowest daily temperature for a year was 2 degrees higher in the forest than in the open country, while the highest daily temperature was on an average lower by 4 degrees. The same observations showed that the hottest day in summer was $7\frac{1}{2}$ degrees cooler in a forested country, and that the coldest day in winter was 3 degrees warmer.

The figures are for Central Europe; there are none for America, but the same principles govern on both continents, and as we are in a country of greater extremes and more rapid changes of climate, we may expect to find that the forest has even more influence here in Canada than where the question has been studied in Europe.

The humidity of the air in the forest is greater than that of the air outside. The actual weight of water vapor in a cubic foot of air is the same as that of a cubic foot of air in the open country under similar conditions-but as the forest air is cooler, its capacity to contain mois-ture is less. Swiss experiments show that the relative humidity of forest air is 3%, to 10% greater than outside air. This is the reason that dew is more frequent near timber than at a distance.

The presence of forest has but little influence on the quantity of The chief rainfall in a district. causes of rainfall are the great cur-

mountain ranges, and the direction of the preean and Indian ob-

servations encourage the belief that forests in this manner increase the annual rainfall by about 10 per cent.

The forest has a in Dre venting the evaporation of water than in increasing the rainfall. The air of the forest being cooler cannot absorb moisture as quickly as the warmer air of the open country. The forest also retards air currents and obstructs winds, which, when blowing quickly, dry the plains and open fields. In this respect, the forest is of far more influence than the wind-break commonly planted. Bavarian experiments show that the evaporation from an open surface of water in a forest is only 40% of that from the same body

TREES RETARD EVAPORATION AND RUN OFF Where there are no trees the snew has include and run off; where trees give shelter snow still remains. This photograph was taken in Crow's Nest Valley, Alta.