

THE RELATION OF FORESTS TO CLIMATE AND SOIL.

Mr. F. C. Zimmerman, who is connected with the United States Consulate at Berlin, in a late report to the state department at Washington, gives some valuable information upon this subject, which is becoming a very important one to the people of this country. He says that the influence of forests upon the climate and the fertility of the soil is most carefully studied at the forest academies and stations in Prussia, and the conclusions that are reached there can hardly fail to be of value to those in this country who are interested in tree growing. As warnings to wood destroyers, large tracts of land are pointed out in various countries which formerly were covered with forests within whose borders were springs and brooks, where now, man having thoughtlessly stripped the land of its trees, the eye looks in vain for a grass plot. The sunbeams unhindered strike the naked earth and raise the temperature of it and the neighboring air to a high degree; in the night, however, this heat is quickly and freely given out into space and the temperature suddenly sinks. Sufficient rain does not fall, nor does it fall regularly, but pours down in torrents and no good comes of it. The arid ground cannot retain the moisture, but from the dry surface, the fallen water evaporates like ether, and vegetation receives but little assistance in its effort to grow.

These students are now satisfied that the forest moderates the extremes of temperature and ameliorates the climate. It is especially worthy of note that the daily temperature of forests does not reach so high a point in summer as that of open fields, nor in winter does it sink so low. Changes of temperature do not occur so suddenly in the forest, for ground shaded by trees becomes warm more slowly than uncovered land, and does not cool off so quickly.

If one examines the statistics furnished by the Prussian meteorological stations, relative to the temperature of the surface of the earth and the neighboring atmosphere in their districts, it will be found that the rise and fall of the same are quite gradual, and that the extremes of temperature are reached somewhat later in the forests than in the open fields. This gradual rise and fall of temperature is one of the chief requisites for the proper growth of forest trees as well as for plants generally. Young trees are often injured by sudden changes of temperature, and some species cannot thrive unless some protection from such changes is furnished them. The leaves of the trees retain a great deal of water, which is evaporated and thus given back to the air, the humidity of which is thereby increased, and the supply of moisture to the soil is rendered more equal and regular. That the soil receives is absorbed and evaporated very slowly. Much of the rain that falls upon open fields is wasted, the supply being often greater than the requirement for the time being. Forests, moreover, directly induce rain. The air within the forest becoming warm by the absorption of heat, both from the ground and the air next above it, leaves over the forest a current considerably colder than the neighboring air, and rain-clouds passing over are, in most cases, condensed by coming into contact with this colder atmosphere. To exercise such an influence, however, on atmospheric temperature, the forest must be of very considerable extent. Authorities on the subject of forest culture in Prussia are unanimous in the opinion that rainfall is more abundant and regular in districts well wooded than in bare lands. In this connection it is worthy of remark that the forests are generally rich in springs and brooks. This alone goes a great way toward showing the intimate relations between woods and water.

And further, while the forest tends to moderate climate, while it regulates the supply of moisture, the forest land is continually receiving a supply of the richest soil through the yearly fall of leaves. This soil increases the capacity of the ground for warmth, its moisture-retaining properties, and furnishes all the requirements necessary for the growth of plants. The important influence of forests on climate and the fertility of the soil having long been recognized, it has, therefore, often been attempted to forest lands sterile because of unfavorable conditions of climate. These attempts have often been

crowned with success. The foresting of the Lüneburg heath, a sandy plain near Hanover, was successful, though accomplished at great expense and in the face of various difficulties. In like manner the foresting of sandy stretches of land in Brandenburg and other Prussian provinces has resulted very favorably; the aim in all these cases being, of course, to counteract the influence that these sterile tracts exercised over the neighboring fertile soil and to convert them into useful and productive possessions.

Again, referring to the fact that considerable moisture is necessary for the growth of trees, it is proper to remark that when it is deemed desirable to change the course of a stream or rivulet, in order to irrigate fields designed for cultivation, it should be carefully ascertained by noting the rainfall, remaining springs, brooks, etc., whether such a change can be made without detriment to such woodland in the neighborhood as may be in part dependent on such waters for moisture.

Draining too much of the water from forest lands destroys the forests, as deforesting often dries up streams. In Prussia this is so well understood and appreciated that before any such course is pursued, very careful consideration is given to the subject, and the forest officials are called upon for, and they submit, reasons *pro* and *con*. A few years ago, for instance, it was desired to reclaim certain bog land near Chorn, in Brandenburg, but in order to do so, it was found that it would be necessary to reduce the Paarsteiner lake a square mile or more. To this the forest authorities strenuously objected, because they feared that such a reduction of the water surface would so materially lessen the moisture of the air and soil, that the very existence of the neighboring forests would be hazarded. The project was therefore not carried out. This one instance shows how thoroughly the science of forest culture is appreciated in that kingdom.

The proper hygrometric and electric equilibrium for successful farming can only be maintained, it is estimated, when at least 20 per cent. of the total area is forest land. Mirabeau estimated, in 1750, that 32 per cent. of the land in France should be woodland. Rentzsch estimated that in the interior of Germany the proportion of woodland to the entire surface should be 23 per cent., while near the coast, where the air is supplied with humidity by evaporation from the sea, 20 per cent. would be sufficient and proper. In this connection one writer very pertinently inquires: "If the German states require 23 per cent. midway between the North sea, the Baltic, and the Mediterranean, what is demanded for the great area between the Mississippi and the Rocky Mountains, almost without water from the Gulf of California to the Polar sea?"—*Nor'western Lumberman*.

To Harden and Temper a Saw.

Fix it by its hole to a bar or rod, as though it was an arbor. Heat evenly over a charcoal fire to a good cherry red. Dip it evenly in a horizontal—level—position into a bath of whale or lard oil, moving it horizontally until it is cool. Remove it, and with the oil on it heat it over the fire until the oil flashes or flits over the surface. Do not allow the oil to burn. In all cases the saw must be hardened horizontally not vertically. Experiment has proved this method to be a perfect success.

Steel Bands for Transmitting Power.

A patent recently granted in Vienna and Berlin uses bands of steel, tempered and hardened, to transmit motion from one pulley to the other, the faces of the pulleys being turned perfectly flat and then faced with a varnish of resin, shellac and asphalt. The fastenings of these belts are of a peculiar structure and can not properly be described without engravings.

Invaluable to the Trade.

THE CANADA LUMBERMAN.—This paper, which was formerly published in Toronto, will in future be published in Peterborough, Messrs. Toker & Co., of the REVIEW, having become the proprietors. The LUMBERMAN, being a purely trade organ, and devoted exclusively to the lumbering interests, will contain information such as will render it invaluable to those engaged in that business.—*Hastings Star*.

TARIFF OF RATES.

To be levied during the ensuing season (1881) by the Upper Ottawa Improvement Company, in connection with the undermentioned works:

I.—THROUGH DRS JOACHIM ROOM.

	Tolls	Working
	Per piece.	Per piece.
Saw logs, 17 feet and under.....	1 cent	2 cents
Red and White Pine, Tamarac, Spruce and Hemlock, round or flatted, over 17 feet and under 25 feet long.....	4-9 ct.	24 cts.
do do 25 to 35 feet long.....	5-9 ct.	31 cts.
do do 35 feet and upwards in length.....	8-9 ct.	54 cts.
Red and White Pine, Tamarac, Spruce and Hemlock, square.....	14 ct.	8 cts.
Oak, Elm and other hardwood, square or flatted.....	2 cts.	12 cts.

II.—THROUGH FORT WILLIAM ROOM.

Saw logs, 17 feet and under.....	1 ct.
Red and White Pine, Tamarac, Spruce and Hemlock, round or flatted, over 17 feet and under 25 feet long.....	4-9 ct.
do do 25 to 35 feet long.....	5-9 ct.
do do 35 feet and upwards in length.....	8-9 ct.
Red and White Pine, Tamarac, Spruce and Hemlock, square.....	14 ct.
Oak, Elm and other hardwood, square or flatted.....	2 cts.

III.—THROUGH ALLUMETTE ROOM.

Same as No. II.	
IV THROUGH MELONS CHENAL ROOM	
Saw logs, 17 feet and under.....	1 10 ct.
Red and White Pine, Tamarac, Spruce and Hemlock, round or flatted, over 17 feet and under 25 feet long.....	2-15 ct.
do do 25 to 35 feet long.....	1-6 ct.
do do 35 feet and upwards in length.....	4-15 ct.
Red and White Pine, Tamarac, Spruce and Hemlock, square.....	2-5 ct.
Oak, Elm and other hardwood, square or flatted.....	3-5 ct.

V.—PASSING LAPASSE ROOM.

Tolls same as for No. IV. No charge for Working Expenses.

VI.—THROUGH IMPROVEMENTS IN MISSISSIPPI CHENAL, CHATS RAPIDS AND QUIC BOOM OR ANY ONE OF THEM.

Saw logs, 17 feet and under.....	14 ct.
Red and White Pine, Tamarac, Spruce and Hemlock, round or flatted, over 17 feet and under 25 feet long.....	4-9 ct.
do do 25 to 35 feet long.....	5-9 ct.
do do 35 feet and upwards in length.....	8-9 ct.
Red and White Pine, Tamarac, Spruce and Hemlock, square.....	14 ct.
Oak, Elm and other hardwood, square or flatted.....	2 cts.

VII.—THROUGH IMPROVEMENTS FROM DUCHESNE TO HEAD OF HULL SLIDE, NORTH SIDE.

Saw logs, 17 feet and under.....	1 ct.
Red and White Pine, Tamarac, Spruce and Hemlock, round or flatted, over 17 feet and under 25 feet long.....	14 ct.
do do 25 to 35 feet long.....	14 ct.
do do 35 feet and upwards in length.....	23 cts.
Red and White Pine, Tamarac, Spruce and Hemlock, square.....	4 cts.
Oak, Elm and other hardwood, square or flatted.....	6 cts.

VIII.—THROUGH IMPROVEMENTS IN THOMPSON'S DRY.

Saw logs, 17 feet and under.....	1 ct.
Red and White Pine, Tamarac, Spruce and Hemlock, round or flatted, 17 feet and under 25 feet long.....	1 ct.
do do 25 to 35 feet long.....	14 ct.
do do 35 feet and upwards in length.....	2 cts.
Red and White Pine, Tamarac, Spruce and Hemlock, square.....	3 cts.
Oak, Elm and other hardwood, square or flatted.....	4 cts.

IX.—THROUGH IMPROVEMENTS IN LINCOLN EDDY.

Saw logs, 17 feet and under.....	1 ct.
Red and White Pine, Tamarac, Spruce and Hemlock, round or flatted, over 17 feet and under 25 feet long.....	3 ct.
do do 25 to 35 feet long.....	6-12 ct.
do do 35 feet and upwards in length.....	3 ct.
Red and White Pine, Tamarac, Spruce and Hemlock, square.....	1 ct.
Oak, Elm and other hardwood, square or flatted.....	14 ct.

X.—THROUGH BOOM BELOW THE OUTLET OF HULL SLIDE.

Same as No. IX.

Mothers who are startled at the hour of midnight by that ominous howl of your little one, what would you not give for a prompt and certain means of relief from that dread destroyer of your children, Croup? Such a means you may have for the trifling cost of 25 cents. It is Hagyard's Yellow Oil, the great household remedy for all inflammatory and painful disorders. Do not rest over night again without it.

FOREST FIRES.

Forest fires are numerous during this month, and too stringent measures cannot be taken to prevent carelessness on the part of settlers, and incendiarism by tramps. In New York such offences are criminal. Under the revised statutes of that State, every person negligently setting fire to his own woods, or negligently suffering a fire kindled upon his own wood or fallow land to extend beyond his own land, is to be deemed guilty of a misdemeanor, and, on conviction, is liable to a fine not exceeding a thousand dollars or imprisonment for a term not exceeding one year. A peculiar rule also applies to civil suits for damages occasioned by forest fires in Suffolk county. Wherever a person who has kindled a fire on his own land permits it to extend beyond, to the land of another, he is deemed to have done so negligently, and the law imposes upon him the burden of proving "beyond every doubt"—these are the words of the statute—"that there was no negligence on his part, and that the fire extended from his own land from causes entirely beyond his own control." These laws are found to have a wholesome effect.—*Mail*.

A Wood-Splitting Machine.

A novelty in mechanics is a wood-splitting machine, which E. W. Peck has used near Cambridgeburgh, Vt. It acts exactly upon the guillotine principle. An enormous axe, weighing with its fixtures, 200 pounds, runs up and down between two uprights, and is controlled by a pair of levers. As the section of a log drops from the buzz saw, it rolls down an incline to the splitter. Here a workman places it under the axe, which, descending, splits it with incredible ease and despatch. The toughest and knottiest "old settlers," which it would take a man half a week to split with an ordinary axe, are disposed of in a second. The rapidity with which it works may be imagined from the fact that it can split wood as fast as it can be sawed in a mill. It does as much work in a given time as twenty men could accomplish.

Timber Seasoning and Preserving.

A foreign exchange describes a method which it says has been utilized to a large extent in France. By this new process, the antiseptic properties of carbolic and other tar acids are carried through the heart and the innermost pores of the largest log, all the free water and fermentable sap being extracted by superheated steam. It is said that all kinds of wood may be preserved. A noteworthy thing reported is, that the timber if first so softened by the process, under appropriate treatment, it may be pressed into various shapes, after which it hardens and resists the attacks of fungi or of insects. As licenses have been taken out in England, we hope for fuller information as to the process itself and its practical results.

Growth of Trees.

As the result of observation and from the testimony of reliable men, the following is about the average growth in twelve years of the leading desirable varieties of trees when planted in belts or groves, and cultivated.—White maple, one foot in diameter and 30 feet high; ash-leaved maple or box elder, one foot in diameter and 20 feet high; white willow, one and a half feet in diameter and 40 feet high; yellow willow, one and a half feet in diameter and 35 feet high; Lombardy poplar, 10 inches in diameter and 40 feet high; blue and white ash, 10 inches in diameter and 25 feet high; black walnut and butternut, 10 inches in diameter and 20 ft. high.

Sharpening Old Files.

The edge produced on files by acid does not hold; a recut file differs from a new one in temper, as drawing and replacing the temper injures the steel, the original temper seldom being attained. The only method of sharpening a file and making it as good as new, is by the application of the sand blast. I have been using this in my shop about six months, and can sharpen an old file equal to new (without disturbing the temper) in from one to three minutes. I prefer old files thus treated to any new files, as it makes them keener and smoother cutting, and preventing breakage of teeth.—*W. A. Foster in Blacksmith and Wheelwright*.