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American Climatology.

A recent number of the New York *Tribune* contains an interesting article on the above-named subject. The main idea which the author endeavors to present is the dependence of a country for its agricultural products on the quantity of its rains. The amount which falls annually in different parts of our country is given, and the fertility of the Mississippi valley —where no less than sixty inches fall—is described correctly. The causes of those rains, however, and of their unequal distribution over our continent, are not mentioned.

A country without rain, unless it possesses some compensating substitute, must be a barren waste. A plant cannot grow without water, any more than a human being can live without it. Egypt is, indeed, "a land without rain," but its well-known fertility is due to the river Nile, which regularly overflows its banks and saturates the soil, and affords it at all times a supply for artificial irrigation. Rains are produced by evaporation from large bodies of water—seas and lakes. The atmosphere which holds the vapor in suspension is drifted towards mountains, where it is condensed, and then becoming heavier than the air, it falls down in showers to cheer the thirsty ground. Cold atmospheric currents, when they meet warm moist currents, also act the part of condensers to produce rain. The winds of a country, therefore, have much to do with its climatology.

The geographical features of North America exercise a marked influence in the atmospheric disturbances which takes place in various parts of it. The Appalachian range of mountains—3000 feet high—running parallel with the Atlantic from Maine to Alabama, give a peculiarity of climate to the country east of them, from that which lies west—the vast valley of the Mississippi. This great basin is bounded on the west by the Rocky Mountain range, which has an average elevation of 10,000 feet, stretching from the Arctic regions to the Isthmus of Panama, and it has a gentle descent from the northern lakes to the Gulf of Mexico, where it opens its arms to the warm moist winds of the Carribean Sea. These warm breezes, freighted with moisture, flow up, and are confined in the valley, where they are expressed by a cold upper current from the west, and drop down in fertilizing showers on the land beneath. This is the reason why so much rain falls in the Mississippi valley, and it is, and always will be a land of great fertility.

A cold upper west wind flows steadily across the Rocky Mountains and towards the east. This current, owing to the geographical features of our country, is nearly a due west wind in the Southern States, while it forms the piercing north-west wind of the Eastern States and Canada. It was the cause of the severe cold which lately prevailed over such an extent of territory, and explains the reason why the cold visited our Western States before it was felt in the east. The exceeding coldness of this wind arises from its being robbed of the moisture it carries from the Pacific Ocean as it crosses the Rocky Mountains, and this furnishes a solution of the cause of those large rainless tracks on this side of these mountains. A vast quantity of rain falls in Oregon, by these west winds leaving their moisture behind them on that side of the mountains, just as the "Ghauts" of Madras express the moisture from certain sea winds, making them pour down rains on their one side, clothing all nature with the richest fruitage, while on their other side rain seldom falls, and as a consequence, vast tracks become barren wastes there.

The Mississippi valley seems to be formed by nature to be the granary of the world. Its soil is of unequalled richness, and its clouds drop down fatness—there is no other country equal to it. The future of this great valley—the richest on the globe in fuel and fruitage—who can contemplate without being deeply impressed with visions of unrivalled power, greatness and wealth?

Fire Proof Floors.

A great number of fires take place in all our cities; by these much valuable property of all kinds is consumed annually, and a dead loss of real wealth is thereby caused to our country. Great quantities of grain, cotton, and merchandize is often destroyed in stores having good fire-proof walls and roofs, but which have timber floors. When a fire breaks out in one of such stores or warehouses, it cannot well be confined to the department in which it originates, but spreads throughout the entire building, and destroys everything from the lowest story to the roof.

We believe that every room and every story in city buildings of all kinds, ought to be fire-proof, and the time will yet come when this will be the case. We use too much wood in our buildings, and for common and cheap houses we will have to do this for many years to come, but when we see a large new store in the course of erection, witness its thick fire-proof walls, and then see its floors (as we often do) made of the most combustible materials, we cannot but conclude that some person is responsible for want of wisdom and forethought in designing and erecting it. Every store and building containing valuable property should be so built, that if a fire were to break out in any apartment it might be confined there. Fire-proof floors are necessary to effect this. Why, therefore are not all our stores built with rolled iron or other incombustible floors, so as to render them fire-proof. Some, we know, are thus built, but not many. We look upon the French as a volatile people, but nearly every house in Paris is fire-proof, and in this respect the French exhibit more forethought than we do. Let our people see to it that they put up fire-proof floors, as well as walls, in all new buildings designed to contain valuable property.

Steamboats.

Fires—From the annual report of the Supervising Inspectors of steamboats, we learn that no less than nineteen steamboats were burned last year, involving an estimated loss of $1,105,500. Such a destruction of valuable property is a great loss to our country.

Every means should be adopted to prevent the fires, because such a loss as that mentioned is equal to the labor of 1515 men at $2 per day, for 365 days,—a vast amount of labor; and what is wealth but the fruits of labor?

The steamer *Herald* took fire in Chesapeake Bay, when the engineer immediately opened the steam valve for letting the steam into the hold, then set the fire pumps to work and extinguished it in a few minutes.

Just before the passage of the Steamboat Law, the steamboat *Columbus* took fire in the Chesapeake Bay, and by not having fire pumps it was entirely consumed. The good service done by the fire pumps, which the new law compels boats to have, is gratifying, still the loss from fires given above is so great, that we hope the Inspectors will hereafter exercise as severe a scrutiny into the safety of boats from fires, as from explosions. A positive fire-proof paint for wood work is something yet to be discovered; a solution of lime, glue, and alum, or common salt, is that recommended in the Report; it is a very good composition. An improvement in its use, we would add, is to employ the glue and lime in one solution, then before it is quite dry, wash it over with a strong solution of alum and the sulphate of copper.

Inflated Life Preservers Unsafe—The Inspectors condemn the use of inflated life preservers for steamboats, because they are stated to be unreliable. The steamer *Bulletin*, which was destroyed last March, by fire at Tompkins Bend, involving a loss of the boat, 3,500 bales of cotton and 23 lives, was provided with inflated life preservers, which proved to be entirely useless. When new life preservers are required on any boat, the local Inspectors are not to pass any of the inflated kind.

Cheap Sewing Machines.

Some few weeks since, in noticing the sales of a number of valuable patents, we alluded among others to a ten dollar sewing machine, and distinctly stated that the machines were being manufactured by Messrs. Jerome & Co., Co., New Haven, Conn. We were very particular to give the address of the parties in order to save our readers the trouble of sending to us for information. There appears to be an extraordinary demand for the invention, and we have been flooded, greatly to our annoyance, with letters and inquiries relative to the same. We have concluded that we will not be annoyed any longer. We repeat the address of the makers for the benefit of all those who want the machines or information respecting them, and hereby give notice that we shall consume no more time, paper, or postage money, in replying to letters upon the subject.

Copper and its Uses.

This ancient metal—named *Cuprum*, from the Isle of Cyprus, where it was once obtained in considerable quantities—exists native in the metallic state, as an oxyd, chloride, carbonate, sulphuret, arseniate, and phosphate. The metal is obtained abundantly from the sulphuret ores, by roasting and repeated smeltings. In color it is ruddy; it is malleable, fusible at a yellow heat (about 1996,) and it boils and volatilizes at a white heat; and burns in oxygen gas with a green flame. It was the principal metal used by the ancients for armor, instruments of war, and domestic utensils before the discovery of malleable iron. It has great tenacity, and can be beaten into thin leaves, or drawn out into fine wire. It oxydizes slightly in a moist atmosphere, and becomes covered with a thin green crust, after which it is almost proof against the action of the weather, hence it makes the most durable covering for houses, and were sheet copper as cheap as tin plate, it would be used exclusively for roofing purposes.

The World's theater for smelting copper ores is the valley of Swansea, in the Bay of Bristol, England. The smelting foundries in that place are seventeen in number, and to them nearly all the copper ores raised in England, Wales, Scotland, Ireland, Australia, Chili, Mexico, Cuba, New Zealand, aud many parts of the United States—yea the whole world—are brought to be smelted. The ores are purchased by agents of the works, who are very skillful in determining their quality. Anthracite coal mixed with one-fourth of its weight of bituminous, is the fuel used for smelting, and about 750,000 tuns of it are consumed annually at Swansea. The ores are reduced in reverberatory furnaces, which are kept in full blast day and night, and never suffered to cool. The workmen, or smelters, have a somewhat terrible life of it, owing to the deleterious gases—arsenious, sulphurous, copper, &c.—which impregnate the atmosphere when they are drawing their charges. The sulphur expelled into the atmosphere from the ores smelted in Swansea, amounts to 188 tuns per day. The country around gives sad evidence of their deleterious effects. They are continually rising in thick white clouds, which, when condensed, drop down and injure vegetation, and give to the very sheep and cattle in the neighborhood peculiar diseases. Various plans have been tried to render the copper ore smoke innocuous, such as tall chimneys, and the showering of the gases with water where they escaped. Tall chimneys did not effect the object, and the showering plan was found too expensive. As the business prosperity of the place is dependent on the copper works, the inhabitants put up with the evils attending them.

From the rough ore, until the copper comes forth cast into malleable ingots, it undergoes no less than ten different smelting operations, all of which are troublesome, expensive, and unhealthy; and require great skill and care on the part of the superintendents and workmen. It would naturally be inferred that if great deposits of metallic copper existed anywhere, that the expensive and troublesome smelting of ores at Swansea and all other places would cease; but such an inference has not yet been found by experience to be correct. In the Lake Superior region there are immense beds of the metal, and yet we have been told that copper can be obtained cheaper from some ores by smelting, than the pure copper can be mined. It is said that the expense of cutting and blasting it exceeds the cost of smelting the ore, which is easily mined. This to us appears almost apocraphal. If the expense of mining the metal is really greater than smelting the ore, it appears to us that the copper regions of Lake Superior present a fine field for the exercise of the inventive genius of our country, in devising improved plans for facilitating cheap mining. Last year, a single copper foundry in Swansea produced, from ores, 6250 tuns of saleable copper, or about double the quantity of copper mined in all the Lake Superior region. It is our opinion, however, that America will yet throw England all into the shade in the production of metallic copper. As the metal can be obtained in our country in exhaustless quantities, we cannot but believe, it will yet be mined much cheaper than it can be smelted from the ores. Copper is extensively used for making large kettles or pans for many purposes, such as distilling various kinds of spirits, boiling sugar cane juices, dyeing silk, cotton, and woolen goods, in processes where acids are employed. It is also used in sheets for sheathing ships, to prevent the attack of barnacles; and although yellow metal or brass is also much used for this purpose, because it is cheaper at first, we believe that copper is cheapest in the end, because the yellow metal is liable to become rotten (the best term we can use) in a few years, when exposed to salt water. For worm-tubes, to boil liquids by steam, copper is superior to iron, and is almost exclusively used for this purpose. Copper rollers are employed for printing calicoes. The pattern can be partly engraved and partly rolled in with steel dies, or it can be electro-plated. Copper is used in strips to make the patterns on blocks for hand calico printing—a very intricate and peculiar art.—It is used in engraved plates for printing, an art now practiced to but a limited extent in comparison to what it was a half century ago. All electrotype plates are deposits of pure copper, from solutions. The impressions which present the ideas embraced in this article to the reader's mind, were produced by copper deposited on the face of common type. Many boilers for steamships were at one time made of copper. It was believed they could generate more steam from the same quantity of coal than iron boilers; but the latter have entirely superseded them. Iron tubes, for boilers, are also superseding copper and brass ones.

"Copper-smithing" is a peculiar art, because the metal has many peculiarities, which must be known to the artizan, or he cannot manage it. It is tempered by the very process that softens steel, and *vice versa*. Most of the craft-knowledge is hid in the workshop, and has never appeared in print. Tubal-Cain, more than five thousand years ago, no doubt knew many things concerning this metal, of which the compilers of modern encyclopedias appear to be profoundly ignorant.

[Concluded next week.]

Recent American Patents.

Improved Method of Painting Window Shades —By D. Lloyd, of New York City—Readers are doubtless familiar with the method employed by merchants and others for marking boxes, called stenciling. The stencil plate consists of a very thin sheet of metal with letters cut out. The plate is laid upon the box, and a brush, wetted with paint or ink, is passed over the same. The ink passes through the apertures, and the box cover is thus neatly printed, in accordance with the lettering of the stencil plate.

The present improvement consists in an adaptation of the stenciling process to the production of ornamental window shades or curtains. By the employment of different colored inks and numerous stencil plates, it is said that very beautiful pictures and figures can be produced.

Universal Joint.—By Jonas Hinkley, of Huron, O.—The inventor provides each end of the shaft with a hub, through which passes a pin; each pin is provided with a peculiar shaped frame, and these are so united as to leave a certain degree of play, and thus communicate rotary motion from one shaft to the other.

Improved Pinch Bar—By Henry N. DeGraw, of Orangetown, N. Y.—This is a railroad contrivance intended for use in and about locomotive stations. It is often necessary to move a locomotive for a short distance when there is no steam up. This is generally done by means of a crow bar, or more properly a pinch bar. If the track does not happen to be perfectly level, great care must be taken to wedge the wheels, otherwise the locomotive will be likely