Scientific American.

NEW-YORK, JULY 5, 1856.

### The Weather and its Signs.

There is no subject of more importance, and yet there is none with which men of science, and others, are so superficially acquainted, as that indicated in the above caption.

The heat of summer and the cold of winter, the rain and the snow, the thunder and the lightning, the hurricane and the gentle breeze, how many mingled associations of pleasure and grief are connected with these. Our enjoyments, yea, our very existence, it may be said, are dependent on those operations of nature, which we call *the weather*.

Sometimes, as in 1854, the clouds will refuse their refreshing showers for a long period, and over extensive tracts of country the grass withers, and the corn and wheat fields become parched and barren: the lowing kine perish for want of the water-brooks, and then famine comes and desolates many once-happy homes. Sometimes, again, the clouds will pour down their torrents for long periods, and the floods will come and sweep resistless over broad lands, carrying the crops of the farmer from his fields, and his flocks from the vales. Again, the hurricane will sometimes come on swift wing, bearing destruction in its pathway; and, if accompanied with red bolts of lightning, may consume well filled barns and storehouses, and level many beautiful dwellings to ashes. Were those weather changes governed by immutable laws, and were we well acquainted with these, we might adopt special means to meet special ends, and provide against the coming drouth, the floods, and the hurricane. Hitherto the weather has been considered fickle as the human temper, and if it is governed by fixed laws, the whole world lieth nearly in gross darkness respecting them. The sky may be cloudless to-day, and to-morrow, yea, in a few hours, the lightning and the tempest may come, and no man living, so far as we know, can predict the event with certainty.

The astronomer has watched the motions of the distant planets, has weighed them in a balance, and can tell the exact period when the moon, after a long interval, will hide the sun's rays from the earth by day; and also when the eccentric comet, after long journeys in unseen regions of space, will revisit our system again,—but he cannot positively tell the particular atmospheric changes that will occur to-morrow in the city where he dwells; and yet a correct knowledge of coming atmospheric changes would be most useful to all men.

Can such information ever be obtained? Not unless such phenomena are governed by fixed laws. Well, when we consider that the planets roll, and the tides flow, by immutable decrees, can any person doubt that the weather is governed by fixed laws? That such laws do exist, no one in his senses can doubt, and that they will yet be discovered, we have as little doubt, and it is a shame that so little has been done to discover them. We are glad, however, that something has been done, and there is a promise of something more. Various stations have lately been established in our own country for taking meteorological observations, and all the leading nations of Europe have also entered upon the same course of investigations. Such observations extending over various parts of the globe, and for a number of years continuously, will no doubt lead to astonishing results. Already, by private enterprise and keen observation, Prof. Espy and Mr. W. C. Redfield, of this city, have made valuable discoveries relating to gales and hurricanes, and the latter has laid down some practical rules for navigators, regarding the rotary progressive course of tornadoes, which have proven to be of great benefit, by teaching seamen how to withdraw from their power. The spots observed on the sun's disk, take place at regular intervals, and these, Sir Wm. Herschel asserts, affect the weather, on our globe, to such a degree, as to regulate the very price of wheat. Lieut. Maury has done much to reduce the weather changes on the ocean to a science. It is believed by Humboldt and other eminent philosophers, that the sun is the source of magnetism as well as heat, and that the vibrations of the magnet are to our globe, as the beating of the pulse to the human system.

In an article in the last number of the *North British Review*, believed to be written by Sir David Brewster, he says, "Had Hipparchus and Ptolemy made hourly observations, and had they also been made by their cotemporaries and successors in different parts of the world, we might now be predicting the weather with as much certainty as we do the planetary motions." The great number of meteorological observations now being made in various parts of the world, inspire us with hope that such a result will yet be accomplished. We hail every effort that is made to reduce "the weather and its changes" to a positive science, because, as we have already stated, such knowledge will be most useful and important to all men.

### The Hughes Printing Telegraph.

"[1.] This wonderful invention, which is destined to effect a complete revolution in the Telegraph business, is now being subjected to the severest test at Boston, upon a wire upwards of five hundred miles long, and is found to realize the most sanguine expectations of the inventor and the owners of the Patent. [2.] There is found to be no practical difficulty whatever in working the instruments in perfect unison in a circuit of five hundred miles, and there is no reason to doubt but that they will work with complete success through a circuit of one or two thousand miles. [3.] Nor is there found to be the least difficulty in transmitting messages from opposite ends of the wire at the same instant of time—[4.] the two operators being thus enabled to exchange about twenty to twenty-five hundred letters per hour.

[5.] The mechanism of the Hughes machines is extremely simple, and can be manufactured for about $100 each. Mr. Phelps, of Troy, the ingénious gentleman who has charge of the invention, has, however, since seeing the machines working in a long circuit, projected several important improvements, by which, without detracting anything from the efficiency of the instruments, they can be considerably simplified and cheapened. Any child who can read will be able at one hour's practice to transmit messages with perfect accuracy, and at a fair rate of speed. We understand that the American Telegraph Company, who own the Hughes Patent, have decided to have the style of the instruments improved in accordance with the suggestions of their machinist, which will cause a delay of a very few days in introducing the invention to the public."

We copy the above from the *New York Times*. The same statement, word for word, appeared the same day in the *New York Tribune*. We have had occasion, heretofore, to comment upon errors put in circulation in regard to "this wonderful invention." We have now to make a few more inquiries.

[1.] What is the nature of this "severest test?" Where is the wire, 500 miles long, located? Is it under cover in a dry apartment? Or is it stretched on poles, like other Telegraph lines?

[2.] The successful working of a Telegraph instrument on a circuit of 500 miles, is no proof that it will operate well on a circuit of one or two thousand miles. Experience proves that beyond a maximum of 800 miles, difficulties are always encountered which augment with an increased length of the circuit. What is it that exempts Hughes' invention from the difficulties common to other electrical telegraphs?

[3.] It is an utter impossibility to send two messages, in contrary directions, over the same wire, at the same instant of time. As well might it be expected to send two streams of water, in adverse directions, through the same pipe, both at the same time. What is the object of such incorrect statements? A similar publication was made, not long ago, but we took it for granted that the meaning intended to be conveyed was that, *during the interval* elapsing between the striking of letters or signals sent in one direction, signals could be sent in a contrary direction. This is a well-known system, and was long since practically realized—probably before Hughes' invention was thought of. We repeat, two messages cannot be sent over the same wire, in different directions, *at the same instant of time.*

[4.] Does this mean that the combined labors of both operators results in the sending of 2,000 to 2,500 letters per hour? Or does it mean that each individual sends that number of letters?—making an aggregate for the two operators of 4,000 to 5,000 letters? We suppose the latter. This combined speed is less than that practiced by single operators on the Morse lines, for they send 6,000 letters per hour.

In several previous statements, it has been alleged that each operator, with the Hughes' instrument, could send from 20,000 to 25,000 letters per hour. Has the late practical trial caused a reduction of speed from thousands down to hundreds?

[5.] Here it is stated that the instrument is extremely simple and cheap, costing only $100, but that since the trial, Mr. Phelps has ascertained that they can still be considerably simplified. What will be the cost of the instruments that will be considerably simpler than those extremely simple machines, which cost only $100?

So far as we can judge, from the interested reports that have been issued, Hughes' Telegraph has proved defective, in one way or another, at every trial. Notwithstanding these facts, it is still proclaimed as a "wonderful invention;" "destined to effect a complete revolution," in Telegraph matters. We hope no one will be led to sacrifice their interests or lessen their confidence in Morse's, House's, and other Telegraphs, in consequence of the puffs that are so often appearing in our daily prints of this machine.

### Recent American Patents.

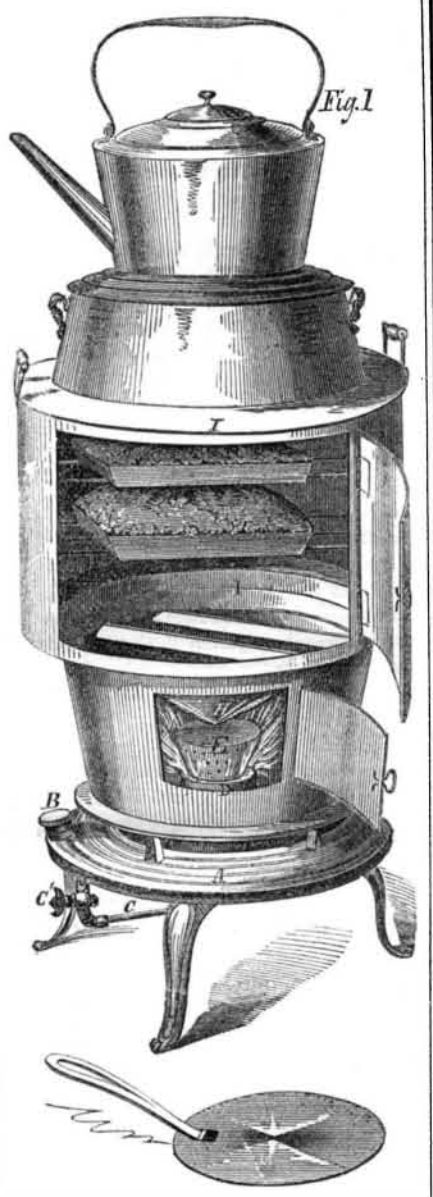
*Improved Carriage Clip.*—By William Cox, of Doylestown, Pa.—The irons on the shafts instead of being made of single pieces, with an eye for the admission of the clip bolt, are made in two parts, hooked shaped, and when put together they clasp the bolt, thus making a connection. One of the parts is elastic. They are fastened together by means of a screw, by loosening which the shafts may be detached from the carriage. This improvement prevents rattling, avoids wear, &c.

*Improvement in Harvesters.*—By Owen Dorsey, of Triadelphia, Md.—Consists in a peculiar method of operating the cutters, so that they receive twice as many vibrations at every turn of the driving wheels, as the cutters of the common machines. This invention, together with other improvements, embracing a novel and ingenious method of operating a series of rakes, so as to sweep off the cut grain from the machine to the ground, and leave it in regular piles, convenient for the binder, previously patented, were fully illustrated and described a short time since in our paper—No. 39, present volume. The invention is, apparently, one of value

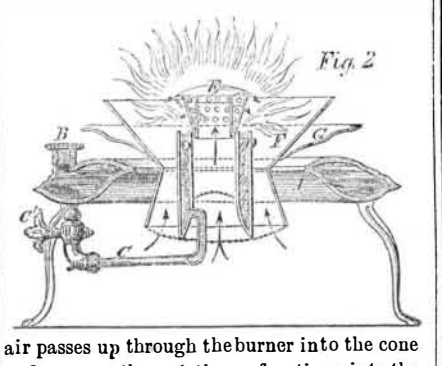
*Implement for Cutting Down Trees.*—By G. C. Ehrsam, of New York City.—Consists in giving a rotating motion around the body or trunk of the tree, to a cutting blade; also, in giving to the blade a feed motion into the tree, by means of an annular rack or toothed rim, and a spiral thread. The rack or toothed rim is attached to a collar, which is fitted around the trunk of the tree, the screw thread being cut on the upper edge of the collar, and fitting in or between corresponding threads on the under side of the chisel or cutter. Power being applied the cutter revolves around the tree, and cuts inward, until the trunk is severed. This is a novel invention.

*Improved Vise.*—Horace B. Chaffee, of New York City.—Consists in having a supplementary jaw pivoted to the stationary jaw of the vise, the lower end of the supplementary jaw being connected by a rod with a weighted pawl. The arrangement is such that the pawl is made to catch into a rack which is attached to the lower end of the movable jaw. When the jaws come in contact with the article which is to be clamped between them, the pawl serves as a self-acting stop to the rack and enables the movable jaw to be secured firmly up against the article, without requiring the insertion or alteration of pins, as in the common vise.

*Cooking with Alcohol.*—By W. J. Demorest 375 Broadway, N. Y.—A few days since the inventor called at our office, bringing under his arm a small apparatus like that shown in our engraving. Within, on the wires, were a couple pans of genuine dough. Having placed the thing on the floor, he lighted the alcohol, and closed the doors. In a very short time the apparatus became hot, and in twenty minutes from the commencement we took out a loaf of thoroughly baked bread and a dish of excellent biscuits. The fuel used was alcohol, and the value consumed two cents.




The construction is such as to insure a great economy of the heat. The alcohol is contained in the hollow ring reservoir, A, being introduced through an aperture at B, which is covered with wire gauze to prevent accident. C is a pipe which conducts the fluid to the burner, D, (fig. 2.) The burner is made simply of two tubes placed one within the other, and sealed at the bottom, the space between them being filled with fine pebbles which serve to conduct and spread the alcohol. E is a hollow perforated cone placed above the burner, so as to deflect the flame, as shown. Cold




air passes up through the burner into the cone and escapes, through the perforations, into the flame, thus increasing the supply of oxygen, causing most perfect combustion, and augmenting the intensity of the heat. F G are reflectors, which throw the heat upwards into the oven and increase the temperature in that direction, while they keep the alcohol holder,

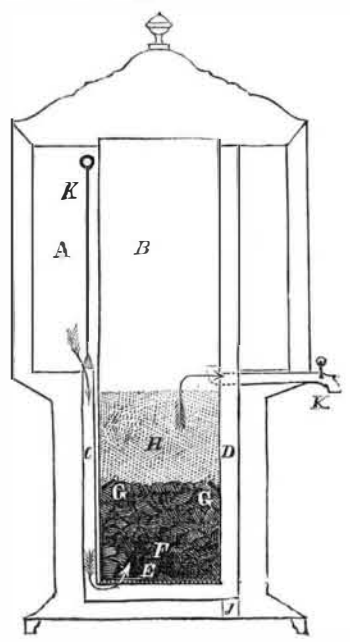
A, perfectly cool. There is a space left between the ring, A, and burner, D, through which cool air always circulates; ring A, therefore, never becomes warmed.

H is a deflector which spreads the heat as it ascends into the baker, I. All the parts above the flame and cone, E, are made of tin, and can be removed or changed for other cooking utensils, when desired. Beefsteak and meat of all kinds may be quickly broiled, and in the very best manner. The article to be broiled is brought in direct contact with the flame, and the results are said to be far superior to those obtained with other fuel. Various operations, such as baking, boiling, heating flat-irons, &c., may be done at once.

This is a very excellent practical invention. It reduces the art of cooking to a very simple business, divests it of all nuisances, saves much time, greatly lessens labor, creates no smoke soot, dirt, or ashes, requires no previous preparation of fuel. It may be used anywhere, in any apartment, out doors or in. It needs no stove pipe or chimney, and is always ready for use.

The peculiar mode of economising the heat and perfecting the combustion, renders the use of alcohol, even at its present high prices, a comparetively cheap fuel. This apparatus sells for $7·50 and upwards, according to size. When desirable, the ordinary illuminating gas used in cities, may be used instead of alcohol, with the same advantages. Apply as above for further information. Patent applied for.

*Improved Water Filter and Cooler.*—By C. Warner, of New York City.—The outline of our engraving will give an idea of the external form of this improvement. The shell is made double. The water to be filtered is placed in the chamber, A, whence it passes down tube, *c*, and then rises in direction of the arrow through diaphram E, charcoal dust, F, and sand, H, to the inner chamber, B. In its rise through the charcoal and sand, the water is thoroughly purified. From B the pure liquid is drawn off through faucet K. G are flanches to prevent the charcoal from rising, in consequence of the smoothness of the sides of the vessel. The superincumbent sand, H, aided by flanches, G, keeps the charcoal always down in proper place. J is a plug, by opening which the water in chamber B may be drawn off, and by its downward or reverse movement made to cleanse the sand and charcoal of their impurities. During this cleansing operation the plug, K, should be shoved firmly into the mouth of *c*, so as to prevent the passage of water from A.




This invention is adapted to the filtering of water on a large as well as a small scale. It may be made in the form of a cistern, and sunk in the ground. In such cases the water from the eaves spouts is conducted to chamber A, and is raised by a pump from chamber B. The filter is cleansed by the application of a pump to the upper end of the tube, D. The water in B will thus be drawn down through the filtering materials, bringing away the impurities and discharging them through D.

This invention appears to be admirable for the purpose intended, and will, no doubt, come into extensive use. Patented June 3d, 1856. For further information apply to the inventor at No. 7 Beekman st., New York City.

*Improvement in Oil Lamps.*—By Nicholas Linden, of Jersey City, N. J.—Relates to what are known as fountain lamps, or those that are provided with a reservoir for holding the oil; the reservoir being connected with the wick by a tube. The common lamps are very inconvenient to fill, cause a waste of oil by dripping, create dirt, &c. The present invention consists in a peculiar construction of parts, whereby the oil is conveniently introduced without removing the reservoir cup, and a regular supply of oil to the wick is at the same time insured.

*Improved Washing Machine.*—By V.R. Stewart, of Weedsport, N. Y.—Consists in the employment of a corrugated cylinder combined with a curved reciprocating corrugated board. The clothes are introduced between the cylinder and board and rubbed most thoroughly.

*Cooler for Beer Casks and other vessels.*—By F. Espenschade, of Williamsport, Penn.—Consists in a cooler peculiarly constructed. provided with a pump, and connected with the barrel, so that liquids may be drawn from the barrel in a cool state without admitting air into the barrel. The liquid passes from the barrel into a chamber surrounded by ice, and is thence drawn out.

*Machine for making Elastic Hay Rake Teeth*—By Charles R. Soule, of Fairfield, Vt.—Consists in a peculiar arrangement of a roller. and other parts, for bending the wire into proper shape. The work is done with great expedition and perfection.

### Recent Foreign Inventions.

*Hardening Fatty and Oily Bodies.*—R. A. Tilghmann, of London, has secured a patent for hardening oil and fatty bodies, by subjecting them to the action of a small portion of sulphur or phosphorus at a high temperature. This appears to be a useful invention in the manufacture of candles.

*Vegetable Charcoal Prepared for Sugar Refineries.*—J. Stenhouse, of London, has obtained a patent for rendering good wood charcoal suitable for decolorizing in sugar refineries. The charcoal is steeped for a short time in a solution of the oxyd of iron, clay, and superphosphate of lime. It is then dried and heated to a red heat in close vessels such as retorts, until the water and acid are expelled.

*Extracting Coloring Matter from Lichens.*—The most beautiful light shades of purple dyed on silk, are produced from archil on the extract of lichens. Archil used to be manufactured by steeping the lichens in urine, or a liquor of ammonia. A few years since M. Robiquet, of Paris, France, improved the process of manufacturing it, by first extracting the resin of the lichens with alcohol, then bringing the extract thus obtained in contact with ammonia. J. Murdoch, of London, has received a patent for improving the art not to obtain a superior extract, but to simplify and quicken the process. He boils the litchins in an ammoniacal liquor in a close vessel, and condenses the ammonia as it is carried over. Thus the whole coloring matter is extracted rapidly, and none of the ammonia lost by boiling. It is rather surprising that this method was not sooner brought into use.

*Mexican Grass Mattrasses.*—W. Staufen, of London, has taken out a patent for the use of Mexican grass as a substitute for hair in mattresses. The bark or skin of this grass is first removed by passing it between rollers, and skutching it, and it then forms a good mattrass material. In England such patents are as easily obtained as any other; that is, substituting one material for another—applying it to a purpose for which it had not been previously used—and these patents are fully sustained by law. Our Patent Office generally pursues a contrary course, not in accordance, at all times, with the spirit of the patent code.

*Reducing Gold and Silver Ores.*—J. Forrest, of London, has received a patent for the following method of treating ores containing the precious metals. The quartz is first broken into small pieces, then immersed for about two hours in a hot solution of caustic soda, or any other alkali. After this the ore is removed from the alkaline bath and subjected to a white heat in a muffle retort, or other suitably constructed furnace. While under this heat the alkali will become fused, and, forming a flux, will facilitate the fusion of the metallic matter contained in the ore, and the separation of the precious metals from their combinations. Another part which this flux plays is to cause the small particles of gold or silver to agglomerate in large beads on the surface of the broken pieces of ore, and thus to prevent loss of the precious metals by sublimation. The ore having been subjected to a white heat sufficiently long to reduce the gold to a pure metallic state, is discharged into cold water, whereby it is rendered very fragile, and capable of being readily reduced to powder. The precious metals may then be separated by any of the ordinary washing or amalgamating processes.

*Railroad Car Wheels.*—John and William Olive, of Woolfield, Eng., have secured a patent for manufacturing railroad car wheels formed of two wrought-iron disks connected together at their circumference by a hoop, and at the center by a tube which forms the nave. The hoop and the tube are united to the disks by welding. The tyre is secured to the wheel thus formed by screws tapped into the latter. By this method a strong wheel must be the result, and cheaper, we think, than the wrought-iron spoke wheels.

*Silvering Metallic Articles.*—The following very simple method of producing the result indicated by the foregoing caption has been patented by Louis B. Advielle, of Paris:—

Dissolve 3 1-4 ounces of silver in 6 1-2 ounces of nitric acid, and thus produce the nitrate of silver. In ten quarts of soft water dissolve 2 lbs. of the cyanuret of potassium, and pour the nitrate of silver solution into it, and thus obtain the cyanuret of silver, which is white and soluble. To this is added 6 1-2 ounces of fine whiting, which, when well stirred, forms what is called by the inventor "Argentine water." It is kept for use in bottles or stone-ware baths or dishes having covers, and is diluted with twice its bulk of water. The articles to be treated are immersed in this liquor for a few minutes, then taken out, rubbed with dry whiting, washed, and rubbed with a dry cloth, and are stated to have a brilliant silvery appearance. The Argentine water must always be stirred up in the bath before the article to be silverized is immersed in it. Another method of applying it, is to keep it in stoppered bottles, which must be well shaken up before being applied to the metal article, which is accomplished by simply rubbing it on with a piece of cotton or linen. When the metal article has received a good coating of the Argentine water, it is rubbed with dry whiting, then washed in soft water, and dried with a soft cotton cloth. The Argentine water is applied successively by dipping the articles in it, or rubbing it on the articles until all parts of them are silverized; but one dip will be sufficient in most instances, when the operations are carefully conducted.

(Our Foreign Correspondence.)

### Crossing the Alps by Railroad.—American Locomotives in Austria, &c.

VIENNA, Austria, May, 1856.

MESSRS. EDITORS—Once more among railroads and far away from the "unprogressives" I have at length reached this city after an exciting ride over a railway known here by the name of "Semmering," because it crosses a range of the Alps thus called. With a powerful locomotive we rushed up an inclined plane and shot through a tunnel, from whence we emerged upon the edge of a cliff, where we could see snow a thousand feet below us, and a couple of thousand feet below that, green valleys stretched away in the distance. After reaching this altitude, of course our "iron horse" required some refreshment, and I was amused at the manner a couple of women were sawing up his "dessert" of pine wood—for hard coal (and a hard, stony coal it is, too,) is used upon the railroads of Austria, aided in its combustion by pine wood frequently thrown in the furnace to keep the flames alive. The contrivance operated by these women consisted of an upright triangular frame, and another wooden triangle hung down from the top of this frame, to which was attached a common buck-saw. A saw horse, placed beneath this arrangement, was loaded with wood, and the "ladies" moved the saw forwards and backwards, thus cutting the wood up into the dimensions. As the teeth of the saw penetrated the wood, the instrument was made to descend by the weight of a box of stones ingeniously arranged on top of the movable triangle, working in grooves made at the summit of the original frame.

By the time I had noted this mechanical novelty the conductor's horn warned us all aboard, and we commenced descending into the valley. Our train of cars wound like a snake around the bases of high mountains; whenever it came to a mountain standing on the track, the locomotive dashed right through its bowels, and came out on the other side, described a short curve, and then bolted across a long viaduct over a very high valley, into the vitals of another snowy mountain, thus continuing onwards for more than twenty-five miles, passing through twenty-three mountains or parts of mountains, and over thirteen valleys, until we reached the plains. I then began to smooth down the hair that had risen up, on my head, upon commencing this almost fearful portion of the trip.

The Semmering railway is, unquestionably, one of the most extraordinary works of the kind in Europe. It was built by the Austrian government over a branch of the Alps, which, from their steepness, long presented serious obstacles to the construction.

The road, as we descended, often ran, for a mile or two, parallel with the track we had just left on the other side of the valley, but always on a descending grade, varying from between one in forty to one in one hundred, as indicated upon painted boards stuck up alongside of the road, whenever the grade varied. I was fortunate enough to get acquainted, in the cars, with a nephew of one of the contractors, who gave me considerable information about the length and hight of the various tunnels. The main tunnel, which is also the highest, is fifteen hundred and sixty-one American yards in length, (4683 feet) at an elevation of twenty-nine hundred and eighty-three Yankee feet above the sea—the decline, from the highest tunnel to the level ground, being over twenty-five hundred feet in a distance of barely seventeen miles. It is a single track, occasionally sweeping around the mountains in such rapid curves that I momentarily expected the train would pitch over into the yawning chasms beneath.

Arriving in this city, after passing over such a railroad, so substantially constructed in the bargain, has impressed me greatly with the progress of these Austrians, not at all depreciated by the fact that they use upon this same railroad many locomotives of American manufacture.

As we came along I saw many cotton mills, and bales of our southern staple being unloaded at the doors of the factories, which were, apparently, working under all the advantages that steam and labor-saving improvements could supply.

Since we have been here I have been into some of the workshops, and have there seen, in operation, various contrivances that denote the Austrians to be an enterprising go a-head sort of people, very different from those I have left behind me in Italy. J. P. B.

### The Raining Tree.

The island of Fierro is one of the largest in Canarie Group, and it has received its name on account of its iron bound soil, through which no river or stream flows. It has also but very few wells, and these not very good. But the great Preserver and Sustainer of all, remedies this inconvenience in a way so extraordinary that man will be forced to acknowledge that He gives in this an undeniable demonstration of His wonderful goodness. In the midst of the island there grows a tree, the leaves of which are long and narrow, and continue in constant verdure, winter and summer, and the branches are covered with a cloud which is never dispelled, but resolving itself into a moisture, causes to fall from its leaves a very clear water, and in such abundance that cisterns placed at its foot to receive it, are never empty.