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Contents:

(Illustrated articles are marked with an asterisk.)

PATENT MONOPOLIES IN CONGRESS.

Another of the overgrown monopolies, which not only oppress the people but retard the progress of industry in this country, is now before Congress attempting to induce that body to give it another lease of life. Some forty years ago, an American residing in England, invented a machine for forming felt hat bodies, which he subsequently brought to the United States for the purpose of patenting. Owing to an informality, his application was rejected; but some years afterwards, the right was granted to Mr. H. A. Wells, who presented the same machine, modified by one or two minor changes. Since 1846, the association owning this patent have held a complete monopoly of the business, and, by refusing to license others to use the machine (except a few whom they bought off to prevent opposition to their last extension), they force all the manufacturers of the country to send their fur to the ring factories to be manufactured at ring prices. The actual cost of forming a hat body is but two cents, and the charge is from six to twenty cents, showing the enormous profit of from two hundred to one thousand per cent on every hat of the ten million and over yearly produced in the United States. The actual loss to the hat makers over what the cost would be, if allowed to manufacture their own hat bodies, is estimated at over 42 per cent, and against this the trade can do nothing. If any dealer complains, the ring refuse to make his hats, and his business is ruined. Several years ago, Wells died, and since then, for the benefit of his "poor" widow, who has only made $111,000 out of the job thus far, two extensions were granted. Now, the ring comes before Congress again and asks for seven years longer, making thirty-five years in all in which to carry on their monopoly, and this in the face of the fact that the original form of machine patented by Wells, is not used and has not been for the past twenty-five years, but simply serves as a ground for litigation and the securing of damages for infringements. The hatters are resisting the attempt with all their influence, and they assert, that, with this oppressive tax abolished, they could not only produce more goods, and regain their lost foreign trade, but sell cheaper, and give their hands employment for the whole, instead, as is now the case, of only two thirds of the year.

These Wells patents, in common with those held by the sewing machine combination and the Woodbury planer ring, are infamous taxes on the people, and as such the country suffers for want of their abolition. We do not think the fault lies in our patent system, for the principles on which our laws are based are primarily the encouragement of the useful arts and the dissemination of knowledge concerning the same throughout the community. To foster their production upon the ground of expediency, and not of justice, limited monopolies are granted to the original and first discoverer, which, in accordance with the value of his invention, may yield him an ample remuneration for his thought and labor. Now if the inventor of a valuable article or process fails within a certain period to gain a just reward, then he may with justice be granted longer time; but if, on the other hand, he, or those representing him, succeed in obtaining a fair and adequate return during the lifetime of the patent, then there is clearly no reason for continuing the monopoly.

Mr. Sayler, of Indiana, has recently introduced a bill in the House of Representatives, the object of which is the suppression of the abuses we have pointed out, but the means taken are not such as will secure the desired result. It is provided that any article made under a single patent may be used, etc., by any one on payment of a royalty of 10 per cent on the market value, and that the user shall secure the patentee by a $10,000 bond, filed in the Patent Office. The royalty on patents for improvements, or on inventions covered by two or more patents, is to be fixed by the courts, and the same provision applies to copyrights. The trouble with this measure is that it strikes both ways; while benefiting the buyer, it injures the seller. It reduces the profits, perhaps, of the big corporations, but in like manner those of the smaller inventors whom it should protect. It puts into the hands of one man, the right to absorb the labor of another, carried on through years and at great expense, into a slightly improved device, giving the former individual all the profits, while the real worker must be content with a ten per cent royalty. Finally, apart from the crudity and ambiguity of its provisions (for on what basis is "market value," a fluctuating equivalent varying with locality, season, etc., to be estimated?), the law is open to the same objections as those relating to usury, as it arbitrarily restricts an individual's right to his personal property, and this we believe to be contrary to public policy, unless the need be imminent, clear and apparent, as in event of war.

We might urge other objections to the act—which we trust will not pass—but we dismiss it for the present to consider that which we believe to be the only true remedy to the existing difficulties. Mr. Sayler, in his argument, brings forward a mass of suggestive statistics; the india rubber industry pays 59 per cent on the capital employed, the cabinet organ business, 69 per cent, agricultural implements, 52 per cent. In seventeen months the capital invested in sewing machines doubles itself, besides paying all expenses; and finally comes the Wells hat manufacture, with the immense profits already pointed out. Now, with the full comprehension of these and other like cases: and there is no reason why a perfect understanding of the nature of these grinding *incubi* on the industries of this country should not be afforded us, for we, in common with other journals, have reverted to the matter again and again: why, we ask, do Mr. Sayler and his associates in Congress not strike directly at the roots of the evils and end them at once by refusing to extend their existences when the prescribed limits are reached? This hat body outrage has been fastened on the country for the last seven years by an innocent looking amendment tacked on the end of a bill on the last night of a session. Members failed to investigate, the measure passed, and the work was done. In other instances which we might mention, wealth is unsparingly used, opposition is bought off, professional talent employed, "poor" widows brought out as figure heads, Congressmen coaxed and cajoled, if not bribed, and, in fact, every art and trick of the lobby practised to ensure the passage of a desired bill—the object of which is simply to impose additional burden on the backs of the people.

The remedy needed is an enactment which will do away with these Congressional extensions, which will fix certain limits to the lifetime of a patent, subject to the discretion of the proper officials in the Patent Office. These limits should include one extension, to be acceded after careful investigation and for cause; but beyond the period so granted, not a day should be allowed. During twenty-one years, if the invention be of value, abundant remuneration can be gained; and monopolies of half a century's standing should be effectually abolished and rendered impossible.

SLIPPERY PAVEMENTS.

It takes but a short stroll along Broadway, during winter time, to convince one that, excellent as the Belgian pavement is in many respects, it nevertheless becomes, when well worn down by use and when covered with snow or ice or even with thin mud, a prolific cause of falls and injury to the heavily burdened horses constantly traveling over it. We know of no statistics which will show the average yearly amount lost through animals thus becoming maimed; but judging from our own observation and from the isolated fact that, quite recently, in passing once up and down Broadway on a single frosty day, we counted fifteen falls and four horses left by the roadside to die, it may be imagined that the aggregate must reach a considerable figure. The street, at times, becomes dangerous even to pedestrians in crossing, and hence doubly perilous for the horses from the insecure footing of their metal shoes. It would seem that the wooden pavements now on many of the side streets in this city, offer great advantages in point of security over roads of stone; but experience has so proved the unsuitability of the former, to meet the requirements of a street constantly alive with a heavy traffic, that their use on such thoroughfares as Broadway is practically out of the question. The subject is one to which we think the attention of inventors might be profitably turned, and a substantial pavement, combining the durability of stone with the supporting capability of wood, produced. In this connection, we notice that an investigation has been conducted in England, by Mr. William Haywood, engineer and surveyor to the Commissioners of Sewers of the city of London, which mainly consisted in observations as to the number of accidents befalling horses on asphalt, wood, and granite pavements. The investigations extended over fifty working days, and were principally made during the rainy weather of spring. The granite was found to be most slippery, the asphalt next so, and the wood the least. Considered in respect to moisture, asphalt was most slippery when merely damp, and safest when dry; granite most slippery when dry, and safest when wet; wood most slippery when damp and safest when dry. Wood, on the whole, is less slippery than either asphalt or granite in a marked degree, it being only inferior to granite when the pavements were wet, and the difference then between the wood and the granite being considerable. Of the accidents most obstructive to traffic, as well as most injurious to horses, asphalt had the greatest proportion, granite next, and wood least.

HERSCHEL, TYNDALL, AND DRAPER ON THE SUN RAY

Studying the solar spectrum, about the beginning of the present century, the elder Herschel passed a sensitive thermometer through the successive colors and observed that the greatest heating effect was not at all coincident with the brightest illumination. At the violet end of the spectrum, the heat was scarcely apparent. As the thermometer passed toward the red, the temperature slowly increased, the maximum appearing sometimes in the red, sometimes at a distance beyond the red, where no rays were visible.

The inference which he drew from these observations was that the heating rays were separate and distinct from the luminous rays and of a lower refrangibility. By the use of photographic papers, it was subsequently ascertained that the chemical action of the sun ray appeared to be greater toward the violet end of the spectrum, the maximum power apparently residing in the violet or ultra-violet radiations. Thus, as the rays of high refrangibility diminished in brilliancy, they seemed to increase in chemical power, much as the rays of low refrangibility increased in heating power with their lessened brightness. Hence arose the belief, which the scientific world has generally entertained of late years, that the solar radiation was triple in constitution, and so likewise the emanations from other self-luminous bodies. A favorite illustration of this view has been a cable woven of three strands, which were regarded as being separated by the prism into three independent yet slightly overlapping spectra: a visible spectrum culminating in the yellow; a heat spectrum at the red end and beyond the red; and a chemical spectrum chiefly in and beyond the violet.

In the spectrum produced by a prism of flint glass and prisms of highly refracting gems, the greatest heat was found below the red; with a crown glass prism it was associated with the pale red; with a prism filled with alcohol it appeared in the orange; while a prism of water gathered the heat chiefly in the yellow. Yet in spite of the evident connection which these facts would seem to point out between the position of the heat spectrum, so called, and the nature of the prism employed, no attention was paid to the suggestion, made by Dr. Draper as early as 1844, that the phenomena observed must be due not to any inherent property of the sun ray but to the prism, which crowded together the rays of the red end of the spectrum and greatly dispersed those of the blue and violet portion. In other words, the red end of the spectrum is warmest as the earth is warmest at the equator, not because the heat rays tend chiefly to that region, but because a greater number of solar emanations fall upon a given area there.

Perhaps the person who has been most influential in giving currency to Herschel's error is Professor Tyndall. In the eighth of his classic lectures on "Heat, considered as a Mode of Motion," he illustrates the subject with characteristic force and felicity. Using the thermo-electric apparatus devised by Melloni, he brings to bear upon the face of the pile the spectrum of electric light passed through a prism of bisulphide of carbon, and says: "I turn the handle and the slit gradually approaches the violet end of the spectrum; the violet light now falls upon the slit, but the needle does not move sensibly. I pass on to the indigo, the needle is still quiescent; the blue also shows no action. I pass on to the green, the needle barely stirs; now the yellow falls upon the slit; the motion of the needle is now, perhaps, for the first time visible to you; but the deflection is small, though I now expose the pile to the most luminous part of the spectrum. I will now pass on to the orange, which is less luminous than the yellow, but you observe, though the light diminishes, the heat increases; the needle moves still farther. I pass on to the red, which is still less luminous than the orange, and you see that I here obtain the greatest thermal power exhibited by any of the visible portions of the spectrum. The appearance, however, of this burning red might lead you to suppose it natural for such a color to be hotter than any of the others. But now pay attention. I will cause my slit to pass entirely out of the spectrum, quite beyond the extreme red. Look to the galvanometer; the needle goes promptly up to the stops. So that we have here a heat spectrum which we cannot see, and whose thermal power is far greater than that of any visible part of the spectrum. In fact, the electric light with which we deal emits an infinity of rays which are converged by our lens, refracted by our prism, which form the prolongation of our spectrum, but which are utterly incompetent to excite the optic nerve to vision. It is the same with the sun."

Subsequently Professor Tyndall, by means of a prism of rock salt, determined a heat curve in the region of the dark rays below the red, which, as he expresses it, "suddenly shoots upwards in a steep and massive peak, a kind of Matterhorn of heat, which quite dwarfs by its magnitude the portion of the diagram which represented the visible radiation." The same teaching was represented in the American lectures, the "Matterhorn" diagram occupying page 148 of Appleton's edition of the lectures. These lectures, it will be remembered, were delivered many times among us during the winter of 1872-3.

In the month of August, 1872, Dr. Draper published, in the leading scientific periodical of Great Britain, a memoir (a digest of which was shortly after given in the SCIENTIFIC AMERICAN) on the distribution of heat in the spectrum, in which he not only repeated his belief that the method employed by Herschel and subsequent investigators must necessarily lead to incorrect results, but furnished an overwhelming array of observations disproving them. As for Professor Tyndall's estimate of the proportions of heat on the two sides of the "extreme red," he held that "they were valueless for lack of care in determining the point of division." The red light shades off gradually, so that it is almost impossible to tell where it really comes to an end. "A linear thermopile, such as is commonly used, is liable under these circumstances to give deceptive results; and any error in its indications counts in a double manner; it not only diminishes the value of one spectrum, but adds that diminution to the value of the other." Thus an error of only two millimeters in estimating the position of the extreme red would have taken so much from the invisible and added it to the visible that the two would be brought to an equality; then the slightest turn of the screw, that carried the pile toward the dark space, would have given a preponderance to the visible. "It is obvious, therefore, that there cannot be certainty in such measures unless fixed lines are resorted to as standard points."

This done, the destruction of Tyndall's position is complete. The optical center of the spectrum is the ray which, according to Angstrom's determinations, has the wave length of 5,768. Now if the rays on two sides of this line be brought to seperate foci and their thermal effects carefully measured, it is obvious that any excess of heat at either end of the spectrum will be speedily detected. By an ingenious apparatus described at length in the memoir, Dr. Draper did so compare the heating power of all the less refrangible rays with that of all the more refrangible, using prisms of various material, and making some hundreds of observations on an unclouded sun. Taking 100 as the standard for the heating power of the entire spectrum, the mean of four sets of measures, with a prism of rock salt, gave 53 for the heat of the more refrangible region, and 47 for the less refrangible. Another series of three sets gave for the two regions 51 against 49. With a prism of flint glass, two series, one of ten sets of measures and the other of eight, gave respectively 49 to 51 and 52 to 48. Two series of the same number of experiments with a prism of bisulphide of carbon gave 52 to 48, and 49 to 51, respectively for the more refrangible and the less refrangible rays. With a quartz prism, twenty-seven experiments gave 49 to 51; while another set of twelve gave 53 as the mean for the more refrangible and 47 for the less. These are given as fair examples of results obtained by a multitude of experiments during several months, including winter and summer. The heating powers of the two halves of the spectrum show such close correspondence that we may safely follow Dr. Draper's lead and impute the differences to errors of experimentation.

The second memoir on chemical action of the spectrum, published in December, 1872, proves even conclusively that every part of the spectrum, no matter what its refrangibility may be, can produce chemical changes: and that the "actinic curve," so-called, does not represent any peculiarities of the spectrum, but simply the habitudes of certain compounds of silver. As a logical consequence, the supposed triple constitution of the sun ray must be dropped among the myriad other dead delusions that mark the onward course of Science, as the skulls of perished camels mark the course of a caravan. There is in the sun ray neither light nor heat nor chemical power, as such, but simply vibrations, which, when stopped, may manifest themselves in one or other or all of these phases of phenomena according to the nature of the extinguishing substance. "The evolution of heat, the sensation of light, the production of chemical changes, are merely effects, manifestations of the motions imparted to ponderable atoms."

It was a matter of surprise to many that, during his lectures here, Professor Tyndall did not so much as mention these important researches, not even to question the justness of Dr. Draper's conclusions. It is perhaps still more surprising that he has since as carefully refrained from publicly discussing them, yet still continues to teach the old doctrine.

It would be asking too much, perhaps, to expect Professor Tyndall to reconsider his subject in the face of the numerous and imperative engagements, that had been made for him here, but surely time enough has since elapsed to allow him to do so. The omission of any reference to Dr. Draper's later work, even in a foot note in the edition of the lectures published by the Appletons, might be excused for the same reason. But what can we think, when the English reprint retains the old teachings without the suggestion of a doubt in regard to their correctness? To put it in the mildest form, it places Professor Tyndall in a slightly equivocal position for one who boasts himself an unprejudiced seeker after truth, for the truth's sake.

It is reported that, when his attention was called to Dr. Draper's researches, Professor Tyndall—repeating his favorite Alpine figure—said that his investigations had raised such a Matterhorn of heat at the red end of the spectrum that it was impossible to get over it, short of a year at least. The year has passed; is there still a Matterhorn of pride to be surmounted?

WHITWORTH STEEL.

Sir Joseph Whitworth has recently published a valuable work, in which he gives an exhaustive account of his method of casting and rifling steel guns. It will be remembered that, some time ago, we published an account of the remarkable performances of the nine pounder cannon of the above inventor, and also referred to the crucial test caused by the explosion of 1½ lbs. of powder in a cylinder of fluid compressed steel, in which no other opening was left save that of the vent. The cylinder was a copy of the breech of the nine pounder gun, and it was estimated that the strain would be six times greater than if the shot were allowed to leave the piece. The projectile was screwed in, and the charge fired. Although all the gas escaped through the vent, which was thereby enlarged from one to two tenths of an inch, no alteration could be detected in the external or internal dimensions of the cylinder.

In explaining the nature of his steel, the author states that it is impossible to cast a large gun of highly carbonized steel that can be relied upon as perfectly sound. With a small amount of carbon in its composition, however, the metal becomes so ductile that it will elongate under pressure from 30 to 50 per cent before breaking, and then will not fly in pieces, but only bulge and tear. To obviate the defect of honeycombing in steel of this description, recourse was had to extreme pressure upon the metal while in a fluid state, equal in some cases to twenty tuns per square inch. As a measure of the quantity of air expelled by this process and the consequent improvement in density and soundness, it is stated that, within five minutes after the application of pressure, the fluid column will be shortened by an inch and a half per foot of length; and drawing out and forging develops, in a still higher degree, the strength of the material. It is cast in hollow cylinders, for reasons connected with rapid cooling and the more complete exclusion of air, and is manufactured in thirteen qualities, ranging from a tensile strength of 40 tuns per square inch to one of 72 tuns, the ductility at the two extremes being respectively 32 and 14 per cent.

The invention is of the highest importance, not only in its application to weapons of war, but to the more useful implements of peace. For steam boilers and railroad axles, it would seem that steel of such extreme strength must be invaluable.

A PAPER AND GLASS DEBATE.

A correspondent sends us a couple of interesting questions, which, he informs us, are to be the subject of a debate, relating to the merits of paper and glass. The first is: "Providing we had no paper, what other substances may be mentioned that would take its place?" and the second, "Providing we had no glass, what are its possible substitutes?" Of course the idea is to bring out, in the present connection, not names of substances which may be advantageously used instead of the above named almost indispensable materials, but of such as we probably would employ (and of many of which in fact our ancestors did avail themselves) did glass or paper cease to exist or become unattainable. The case is imaginary but leads to much instructive thought.

In lieu of glass, we can find materials suitable for window panes, for drinking vessels, and in some cases even superior to it for small lenses, but nothing that combines all its properties, or is capable of its ready manipulation into desired forms. For windows, perhaps the best substance other than glass is simple mica, which may be readily split from the rock in thin translucent sheets It is now used for doors of stoves, to protect paper shades around gas lights, and in other common employments. The Romans filled their windows with *lapis specularis*, a fossil of the class of mica, which is readily cloven into thin smooth laminæ. The same substance is found in the Island of Cyprus, in masses a foot in breadth and three inches in thickness. It is used for the construction of hot houses, and for the protection of delicate plants. Up to the present day it is also much employed in Russia, in place of glass for windows.

Horn cut into sheets is still used for lanterns, and for drinking vessels, and, if made sufficiently thin, would answer for illuminating purposes. Oiled linen or other fabric, similar to that now used by draftsmen for tracing, would also be available, and so would very delicate sheets of india rubber. Skins, prepared like parchment or vellum, would be translucent though not transparent. Gelatin, however, might be treated with bichromate of potash so as to be insoluble, and if it would stand the weather would give quite clear window lights. Collodion films, we should imagine, if made thick enough, could also be used for the purpose, as also animal membrane.

In addition of mica, the mineral kingdom offers a variety of substances. There is the Brazilian pebble, a species of quartz, now used in an immense extent for spectacles and other lenses. We have seen perfect spheres of this material three inches in diameter, without a single speck or flaw to blemish its complete transparency. Rock crystal and other varieties of quartz might also be employed, if means could devised to cut them properly; so could plates of selenite, of thin alabaster, or even of rock salt, though the latter would not be very durable. Some shells are sufficiently thin to be translucent, and ivory could be made into plates having the same property. Amber would be transparent enough but difficult to obtain while, like ivory it would be rather costly. Large leaves of trees, if chemically treated, might have their texture preserved and serve to cover windows if other means failed; or if the dwelling were located in polar latitudes, one might follow the example of the Esquimaux and use blocks of clear ice.

In recalling substitutes for paper, many of the materials, suggested in place of glass owing to their translucency, would, from their flexible nature, answer even more suitably for writing purposes. Such is evidently the case with parchment, membrane, cloth, horn, rubber, collodion, or gelatin sheets. We might go back to graven tablets, like the Moabite stone, or write with the stylus upon wax, as did the ancients; in fact, there are numberless modes of inscribing our thoughts on solid substances. But paper has a multitude of other uses, especially in these days of paper clothing, paper furniture, paper churches, and paper money. Hence materials are needed with more of its attributes than simply its use as a vehicle for the dissemination of our ideas. The same source of supply, open thousands of years ago, is still at hand, for the papyrus tree flourishes yet in Egypt and Sicily. The bark of the common white birch may also be employed; or by ingenious machines we can cut shavings of fine grained wood to serve in place of hangings for our walls. Sheets of metal, rolled to almost infinite attenuation, would, however, probably form the most favored substitute. About two years ago the Upper Forest Tin Works, in Wales, rolled the most delicate sheet of iron ever made. The metal was worked in a finery with charcoal and the usual blast, then forged into a bar, and finally passed through the tin rolling mills. When finished, the sheet was 10 inches by 5½ inches in dimensions or 55 inches in surface, and weighed but 20 grains. It would require 4,800 such layers to make up a mass one inch in thickness. Letters have been sent across the Atlantic on iron thinner than ordinary paper, and nearly as light. Steel, iron, and copper could thus be pressed into service; and where flexibility was necessary, probably alloys could be made to answer the purpose.

SCIENTIFIC AND PRACTICAL INFORMATION.

A TEST OF THE AUTOMATIC TELEGRAPH.

A public test of the automatic system of telegraphy recently took place on a single wire between this city and Washington. The matter transmitted was the President's late message, with the Spanish protocol attached, numbering 11,130 words, it having been selected in consequence of the declaration that its transmission over eight wires by the Western Union Company, on December 2, 1873, was a fact unparalleled in telegraphy.

The President of the Automatic Telegraph Company submits a report, which is corroborated by the testimonials of various well known gentlemen who witnessed the trial, to the effect that the entire document was copied complete in New York in 58 minutes from the time of the beginning of the sending in Washington. Ten perforators, thirteen copyists, and two Morse operators were employed, as against sixteen expert Morse operators by the Western Union people. The average pay of perforators and copyists is $40 per month; of operators, $100.

A NEW ACOUSTIC PYROMETER.

It will be remembered that, some time ago, we gave an account of an acoustic pyrometer, devised by Professor Mayer, of the Stevens Institute. The principle on which the instrument is based is the variation of the length of a sonorous wave in air, when the temperature of the latter is changed.

Mr. Chautard states, in *Les Mondes*, that in his opinion the method proposed by Dr. Mayer is difficult in application, and he suggests the following arrangement as more suitable for practical requirements:

The sound is produced by the aid of an organ tube, Ut 4, for example, disposed with reference to a resonator which is put in relation with the two branches of a König improved interference apparatus. To the movable branch is attached a long tube of copper, which enters the furnace or other locality, the temperature of which it is desired to determine. This tube returns on itself and communicates with a small manometric capsule. The fixed branch of the apparatus is terminated by another capsule, which, like the first, is in relation with the same source of heat. The arrangement is completed by a revolving mirror, in which the state of the flame is seen.

Thus disposed, if the pipes which separate the resonator from the capsules each contain an equal number of half wave lengths, the flame will be edentulated; in the contrary case, the indentations will diminish, and this as much more as the difference of length of the tubes is more nearly equal to an unequal number of half wave lengths. In the latter event, the flame takes, in the mirror, the aspect of a ribbon; and by noting the changes in its appearance the calorific state of the air in the tube in the furnace is determined. If the temperature is elevated, the length of wave augments, and a clearly defined interference is shown by the flame in the mirror. If, during the continuance of the experiment, the movable tube be gradually elongated, it will be easy to bring the flame back to its primitive state, that is, to cause the indentations to re-appear. Then, by the aid of a scale previously determined and empirically translated into thermometric degrees, the degree of temperature in the tube can be easily noted.

TO NEW SUBSCRIBERS.

All subscriptions to the SCIENTIFIC AMERICAN will be commenced with the year, unless persons, at the time of remitting, request to the contrary. Nearly all subscribers preserve their numbers for binding; and in most cases where subscriptions are received during the first quarter of the year, if the back numbers are not sent, they are subsequently ordered. To save both the subscribers and ourselves trouble, the back numbers from January 1 will be forwarded, unless we are advised to the contrary. This course will be pursued till April 1, after which date the paper will be sent from the time of receipt of remittance; but subscription. may commence at any time, at the request of the subscriber, The above regulation applies only to those who give no instructions, at the time of remitting, as to when they desire to commence.

G. D. says: "I think there is a great deal of humbug about the Troy chainmakers, in the paragraph from the Troy *Times*. Any good smith can make chain, and England is full of them; they would be glad to get one half of the wages mentioned."

A CORRESPONDENT, O. A. O., reports that in Sebastopol, Cal., from November 1, 1873, to January 14, 1874, the enormous quantity of 33 inches of water fell, in the form of rain and snow.