

MOLTEN AND FLUID STATE OF THE GLOBE--ARTESIAN WELLS.

[For the Scientific American.]

There are many abstruse and inscrutable secrets of nature, constantly meeting the inquirer into the arcana of creation; yet it is perfectly legitimate to speculate upon all subjects and draw conclusions from known facts that coincide with evident results.

The molten and fluid state of the globe seems so palpable and conflicts so little with settled principles, that it has been received for a long time by the ablest reasoners as a settled fact; yet there are various speculations by able men, adverse to these views.

The thickness of the crust of the earth, the constantly and universally increasing temperature, as we descend by means of shafts, deep mines, and artesian wells, the numerous volcanic issues of melted fluid matter, the geysers and hot springs, render that assumption a fair and rational deduction.

The thickness of the crust before it reaches the fluid or semi-fluid center, is estimated at about 30 miles, covering the entire globe, like the shell of an egg, which forms a self-sustaining arch so strong and resisting that no one can crush it endwise between his clenched hands. A globe of paper filled with any yielding fluid, would resist more than its own weight; therefore it is preposterous to assume that the earth must be solid to bear up the weight of the Alpine and Himalayan Mountains, which are not even five miles in height: for it is reasonable to presume that the crust would sustain mountains of its own thickness.

The position, that heated or melted matter begins first to cool at the center, is entirely fallacious. During the war of 1812, the project was started to cast bomb shells and take them out of the molds as soon as the surface was chilled, tap the surface and run out the molten center; but it left so ragged and unequal a center that the project was abandoned.

The writer saw a large hammer cast for a pile driver and when uncovered it was a perfect casting. A workman heedlessly struck it with a hammer, when two or three hundred pounds of melted metal ran out, before it could be turned down and stopped. It was again filled and was a serviceable article for years.

These facts being admitted, the presumption of the inability of the assumed thickness of the crust of the globe to sustain the mountains, and the doctrine that the entire globe is a solid mass, deduced from the false position that heated bodies begin to cool at the center, must be abandoned, for they are the embodiment of absurdity.

ARTESIAN WELLS.

The theory advanced by your correspondent, D. C., does not meet the views of many speculators on that subject. That there are locations where the rocks have a strong inclination, with breaks, gulches and croppings out of the strata, where it would be impossible to succeed, is surely admissible: but that position is so rare, that it cannot be admitted as a rule.

Water from borings rises as freely on high table lands, where there is no higher land within leagues, as in the lowest valleys. To assert that water only rises from the perforation of veins and fissures between strata that have a strong dip from higher lands will not bear examination; as water from boring will rise in all situations if prosecuted to a proper depth, even in the primitive rocks, which are without any stratification. It is perfectly absurd to presume that every boring which has hitherto been made, must have struck and perforated a perfectly close impervious tube, or fissure—an inverted siphon, filled from a higher position and without issue for all time past.

The ascending power of these wells has been ascribed to the great superincumbent pressure of the rocks on the water contained in fissures and laminated joints, and an issue being created by boring and relieving the pressure, it rises by the law governing fluids in these circumstances: but in this case it is fair to presume that the source would become exhausted in time and fail to produce if there was not a provision for a constant production. The production and ascension of water in these wells may be accounted for by the production of steam from the heated masses of the rocks below—the water to produce it, from the pressure of the great masses of water in the seas by some disturbance forced into the heated regions and driven back in steam, penetrating natural fissures and crystalline portions of the whole suite of formations, where it is condensed under great pressure and forced upward. The hot springs are a strong position in support of this presumption. Water may be constantly forming in the great alembic of nature by synthesis of its original gases.

The constant cooling and contracting of the crust of the earth, of which there are numerous indications, would produce an immense pressure on the inferior portion and exert a powerful influence to cause water to rise whenever its sources were penetrated. All of these causes have been in constant action from the Creation. L.

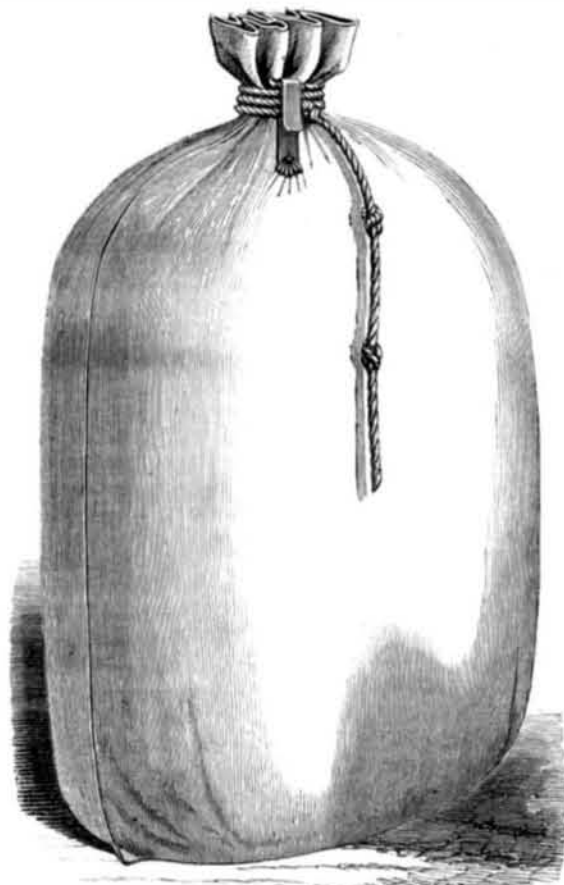
A Prize Establishment.

A letter to *Punch* thus describes one of the industrial and social organizations that may come in for the \$20,000 prize of the Paris Exhibition:—"I read your reply to the ladies of Wolverhampton on my return from visiting one of the great iron foundries of France, which, though under one proprietorship, is a small 'black country' of itself. I will tell you what I saw in that great French factory. I saw a town of 25,000 inhabitants, wholly built and owned by the miners and ironworkers themselves, who buy their land in fee simple from their employers as they require it for building. I saw 10,000 of these people, some few of them women, who do light out-

door work, go daily to their duties, and 4000 of their children go daily to their schools. I saw drawings and attended historical and scientific examinations in the higher classes of these schools which would have done credit to Rugby and Eton, and heard, with a longing wish that it were so in England: how none were allowed to leave the school for the workshop till they could read and write well and do some arithmetic; and I heard, with no surprise, that several of the higher boys have passed up into the school of Government Engineers in France. I saw the chateau of the proprietors standing in the very midst of this town of workmen, and within it, assembled round the venerable founder of this great industry, a little society, principally composed of the officials of the place, which in refinement and intellect would have done honor to any capital in Europe. I saw all this, Sir, but I did not see a policeman or a soldier. I believe there were in the place (of course not near the areas) three of the former, but none of the latter; and finally, during a ten days' stay, I did not see a drunken man, though I once heard one. This is no community of hammer-men in Utopia—no black country of Cloud-land—but an actual translation of Bilston, Tipton, or Dudley, out of the vernacular of our Black Country, into French. This happy valley is called Le Creusot, situated in the department of Saône-et-Loire. The proprietors are not angels, but plain men, trading under the designation of 'Schneider et Compagnie,' and the head of the firm is M. A. Schneider, Vice President of the National Assembly. Will some great firm, or cluster of firms, in our Black Country go and do likewise?"

GOFF'S BAG FASTENER.

The engraving explains the object of this simple catch so fairly that a verbal description is hardly necessary. A cord is fastened to the upper part of a metal hook and also to the bag, and when the bag is filled the cord is passed twice or thrice around the mouth of the sack and secured by being slipped under the loop, which is sewed or riveted by its lower end to the bag. Knots may be tied in the cord as a security



against slipping, although the elasticity of the hook will generally be found sufficient to hold the bag firmly closed. It is a convenience which will be appreciated by farmers, millers, and others who use sacks for any purpose, as the means of fastening are always at hand, being attached to the bag itself. The cost can be but trifling, and the relief from the annoyance of looking for a missing string just when it is most wanted, and of tying up the mouth of a bag, sometimes under difficulties, as when the fingers are numb with cold, is worth some consideration. A patent is pending on this device to J. M. Goff of Ionia, Ill., who will furnish information as to rights, etc.

Soda Ash.

A firm in Detroit, during the season of navigation, ship sulphurets of copper in large quantities to England, to be there used in the manufacture of soda ash and reshipped to this country, for consumption in the various forms of salts of soda. Michigan has in her salt and sulphurets the elements of the manufacture of soda ash. A trifling increase of the present duty on the imported articles only half a cent a pound would suffice to establish in the Saginaw district the profitable business of making this article of indispensable necessity. England has the monopoly of supplying us. In Jan. and Feb. of 1866, owing to the prevalence of head winds and gales which drove back to England the vessels loaded with soda ash, and wrecked many of them, the stocks in the United States got exhausted—several glass factories had to stop—and the price of ash advanced from 4½ cents per pound to 11, 13, and 15 cents, and remained there for nearly sixty days! Not a pound of soda ash is now made in the United States.

What would the price of it be if we got into a war with Great Britain?—*N. Y. Tribune.*

FOREIGN AND HOME BUILT MACHINERY.

The article copied from a North Carolina paper and published in our issue of the 2d inst., in regard to the superiority of European machinery for the manufacture of cotton and wool, has awakened considerable interest. From several letters which have reached us we feel pretty certain that our suggestion that the article in question was an advertising dodge for the agency of some foreign manufacturers, is correct. One of our correspondents, James E. Hooper, of Woodberry, Baltimore County, Md., writes:—

I am a cotton manufacturer, spinning about 12,000 lbs. of yarn per day often hours, on yarns from No. 7 to No. 18, and I do this on American made and American patent machines. Concerning the throwing out of American and substituting English machines, I have heard of a few such, but they have all expressed themselves sorry for the foolish act.

There are mills in and around Philadelphia that are throwing out *new English machines* and substituting American. One of my neighbors (who is considered one of the best manufacturers in our State) was induced last year to put in his new mill English cards, drawing frames, slubbers and speeders. He says he wishes he had never seen or heard of English machinery. He has given the Lowell Machine shop an order for new speeders, to take the place of the English speeders bought last year.

I have no doubt our Southern English friends can buy as much new English cotton machinery as they want without going very far for it, and at about one half the cost of American. The English machinery is heavy and clumsy, hard to keep clean, and hard to manage. I can card as much on the cards made by the Bridesburg Manufacturing Company, per inch, and make it better than can be done on any English card that was ever run.

It has been proved that the speeders made by the Lowell Machine Shop can turn out more work at less expense, and do it as well as the most improved English speeders. As regards spinning, Mr. Wm. Higgins, of Higgins & Son, Manchester, the great English card and frame builders, said he saw more and better work produced on the frame made by the Bridesburg Manufacturing Company than he ever saw on the best English frame. The ring spinning is an American invention, and the patent card stripper was invented by an American.

Thinking all things into consideration, I think the American machinery is neater, as durable, easier to manage, and cheaper to run, and turns out more work of as good quality as any English machinery ever built, and no doubt our Southern friends will find out to their sorrow that they have made a great mistake.

As concerning Mr. Johnson being the best manufacturer in the country, it is all "hush," because you know as well as I do that there is just as good fish in the sea as were ever caught.

From a long communication by Thomas Pray, Jr., of Providence, R. I., we make some salient selections. Referring to the statement of the writer of the article which we copied, that with two sets of 48-inch English cards running night and day he produced 5,073 pounds of clean scoured wool, he says:—

I have three sets of 40-inch American cards running only ten hours per day, and I card on them 4,500 pounds every six days.

With all deference to his purchase of 36 mules, I can explain to the satisfaction of every cotton spinner who is "posted" the probable reason why this was done. English machinery can be imported about 27 to 30 per cent cheaper than our makers can or will sell it new.

His assertion of throwing out "Whitons"—which should be "Whitins"—lappers may all be perfectly sensible, the latter being the machine that has to do its work in dirt, wears out about two sets when very well used to one of cards, drawing, or speeders, and it is very probable that he replaced old lappers by English, because he could do it cheaper.

Perhaps the writer of this article referred to can give us Mr. Johnson's address and the location of his mills: all good or prominent manufacturers love to show other manufacturers their good mills or their recent improvements.

The oldest firms do not use much English cotton machinery. Some, however, give the English lappers the preference; but it is oftener where capitalists desire to humor their whims and have something foreign in their mills than because their practical knowledge teaches them foreign machinery is better for them as regards quality of work or economy of management.

If my friend of the article referred to is a practical operator I would like to ask him if he can produce an English lapper that will do more work or do it any better than the iron frame three-beater lappers made by John C. Whitin, Whitinsville, Mass., or produce an English mule that will do as much work and as well as Wm. Mason's improved self-operating mule. If so, I am open to conviction, and when I see the thing done, will acknowledge the "corn."

I admit that during the season of immense profits of the last four years many men commenced the manufacture of cotton and woolen goods, and as it was more from matters of pecuniary interest, and the earlier procuring of machinery, they have procured the bulk of their machinery in England. Neither do I dispute the fact that in some respects perhaps some kinds of English machinery are superior to American of the same kinds, from the very fact that some branches of the woolen manufacture have not been introduced into this country long enough to allow our mechanics and machine builders to learn what was wanted.

And again, during the war our machine shops were crowded with work, and the owners assumed an arrogant tone, and in many cases, as I know from personal experience, parties wanting machinery were coolly told to leave their orders and wait until they could get it, or not.

All these causes may have tended to drive men to procure their machinery in England or go without from six to eighteen months.

And now I would ask any candid practical operator if any mills in the country are doing better work than the Atlantic Delaine Company, at Olneyville, R. I., and does my Southern friend know of any better goods than those of the "Arkwright" or the "Williamsville," the James Steam Mill and the Hill Manufacturing Company, and does he know of any mills that have paid handsome dividends? The cotton thread of Green & Daniels or the Stafford threads are known as American productions, as well as the Willimantic Linen Company's standard thread, and in every establishment which I have named there is little or no English machinery.

I shall take the bold ground of challenging the author of the article in question to show the actual production of any of his Southern mills with English machinery and improvements to equal in quantity or quality of cotton goods some of our best purely Yankee machinery cotton mills, and I shall contend that it is not so much the advantage derived permanently as it is the temporary financial advantage gained that has induced the importation of English cotton machinery.

If I am not getting too prolix, I would ask him if the speeders made by Thomas J. Hill, of this city, are to be beat by any English machine? Mason, of Taunton, Mass., builds most excellent geared speeders, and the Whitins, of Whitinsville, Mass., have recently commenced their manufacture. James S. Brown, of Patucket, R. I., has introduced some very valuable improvements in the geared fly frame, and the mechanics of Lowell have not been idle in the same line. If men choose to build first-class mills and fill them with the best machinery built, they are not of necessity compelled to go over the water for it: it is here, and our mechanics are continually improving upon it. Men that left the cotton manufacture ten years ago as thorough practical operators, are to-day nowhere. This shows that to keep posted to what is going on in the world, and to be able to calculate for a museum of curiosities than a woolen factory—100 lbs. on a set of those cards being considered a great day's work. But he says he intends this for those of his Southern friends who intend to commence making goods so they may start right, which I know by experience is very important. The question is, which is that right way? I would say, as there is a difference of opinion between us, look for yourself: come to Massachusetts, where more goods are made than in all the Southern States, and talk with the proprietors of mills. They will be ever ready to give you all the information in their power, and you will not only be pleased but benefited by this tour.

D. S. Esten, of Monson, Mass., referring to the statement in regard to the carding feat, says:—

The carding of 5,073 pounds of wool on two sets of 48-inch cards in one week, running day and night, is only 222 pounds to each set for twelve hours, not half of which could be done on American cards according to the writer in the North Carolina paper. Now 225 pounds of some kinds of wool is only an average day's work on a set of cards of that width made in Worcester, Mass. This includes all the necessary time for cleaning, repairs, etc. The next peculiarity of his statement is that the goods of American and wool from these cards should find such a ready sale. Having been a practical manufacturer of woolen and cotton goods most of the time since 1837, I have seen the operation of not only English but other European as well as American machinery, and say that the machinery imported before they adopted some of the improvements of American mechanics was of very novel construction and better calculated for a museum of curiosities than a woolen factory—100 lbs. on a set of those cards being considered a great day's work. But he says he intends this for those of his Southern friends who intend to commence making goods so they may start right, which I know by experience is very important. The question is, which is that right way? I would say, as there is a difference of opinion between us, look for yourself: come to Massachusetts, where more goods are made than in all the Southern States, and talk with the proprietors of mills. They will be ever ready to give you all the information in their power, and you will not only be pleased but benefited by this tour.

Trueing Grindstones.

J. G. Garland, of Me., and John King, of Conn., both send similar instructions for trueing grindstones when first hung and also when worn out of round. The plan, which is as follows, appears to be feasible: In the same frame with the stone to be used suspend another—a nearly worn out stone will do—so that the faces shall run together. The small stone has a cam on one end of the shaft and journals longer than the boxes so that it has a traverse across the face of the larger stone. The faces of the stones are adjusted by right and left screws for setting up the boxes of the razing stone.