Scientific American

NEW-YORK, NOVEMBER 27, 1852.

Influence of Great Men.

There is no subject, apparently, upon which we differ so much from the opinions expressed by authors and editors in general, as to what constitutes "a great man." When mighty statesmen and triumphant warriors belonging to any nation fall before the scythe of death, the whole land puts on sackcloth, and goes into mourning. We have seen two recent instances of this kind in different parts ot the world; we allude to the death of Webster among ourselves, and that of Wellington in England. Intellects cannot be measured by rule and square, nor can greatness be measured by public requiems and monuments. We can only form an opinion as to the greatness of men by what they have done, "by their works ye shall know them." We hear men frequently boast of the genius of Hannibal, Cæsar, Napoleon, and Wellington; of the intellect of Burke, Pitt, Hamilton and Webster; but neither warriors nor orators stand in the front rank of intellect, they must take a lower place than many men of science, whose greatness we seldom hear a word about. What intellect among warriors and statesmen can take rank with that of Galileo, Kepler, Leibnitz, Bacon, Newton, Euler, Wollaston, La Place, Black, Lavoisier, Davy, Watt, Boyle, Franklin, &c. We might mention others, but these are enough for our purpose. The works which these men have accomplished, affect all men; they meet us on the right hand and on the left every day and every night, and they will do so to others through all coming ages. The victories of Hannibal were all shattered and blasted by the single defeat of Zama, and the whole of Napoleon's conquests sunk for ever on the single field of Waterloo. It is true that the speeches and writings of statesmen and orators do not perish so suddenly; they go down and are read bv succeeding generations, but at the same time new circumstances arise, which lead men who were considered wise in one generation to be looked upon by another as doubtful preceptors, or as false lights for a new age. It is different with those profound thinkers and discoverers in the scientific world; they are the intellectual Titans.—When we hear people speak of a great man, we ask what he has done, and we try his works to see if they are the genuine coin. The rolling stars by night continually remind us of Galileo, Kepler, Herschel, and La Place. There is not an apple falls to the ground but reminds us of the great Newton. The lightning fleeting from cloud to cloud, reminds us of our own Franklin, who brought it down from the skies as the hunter brings down the eagle in his flight. The lives of hundreds are saved every year by Davy's Safety Lamp. The invention of Watt has multiplied the power of man over inanimate matter more than a million fold; and the genius of Fulton has made a turnpike of the Atlantic. We would not perhaps have written upon this subject at present, but recently we have seen so much in our daily papers about great men and great intellects, and so much has been said about them by orators and others; and comparisons between this one and that one having been made, and seeing nothing at all said about men of science and inventors, whose reasonings often took sublimer flights than the imagination of Shakespeare, we have said this much and could say a great deal more to fortify our position, that warriors and statesmen must take a lower rank for genius and intellect than those men whose names we have mentioned. There are also others, of whom we have not room to speak, but assuredly our men of science, discoverers, and inventors, are the great ones (speaking of intellect,) of the earth. Time would fail us to tell how Kepler discovered the laws which govern the planets in their orbits; how Newton arranged the whole universe before his mind, and discovered the force which guides a planet in its course, a sparrow in its flight, and the great tides of the sea which refresh and fructify our shores; of Wollaston making metal threads finer than those of the spider; of Davy resolving metals out of stones by galvanism; of Stephenson driving his iron horse over mountain and moor; of Daguerre using the sun-beam for a pencil; and of Morse the lightning for his pen. Ignorant and circumscribed in intellect, must that man be, who, in speaking of great men, fails to perceive and mention the claims of philosophers and men of science.

Coating Iron with Copper.

On the 21st of last September, a patent was granted to Theodore G. Bucklin, of Troy, N. Y., for a new and improved mode of coating iron with copper, which promises to be an invention of no small importance to the arts. It has long been a desideratum to coat iron with some other and less oxidizable metal, in order to render it more enduring in exposed situations. It is more essential to have sheet and plate-iron than any other kind, covered with copper. For example, sheet-iron covered with copper, would be cheaper than tinned iron for roofs of buildings, &c., and plate-iron, if covered with copper, would be excellent for making steam boilers so as to prevent incrustations, &c. Cheapness is an important item in the process. If the process is expensive, then it can be of no general benefit, for pure copper would be preferable. It cheap it is a most important discovery. A method of covering iron with brass, copper, &c., has long been known, but to cover it and make the copper unite with the iron, like tinned iron, has hitherto been considered problematical. The invention of Mr. Bucklin promises to fulfill every condition desired in making coppered iron—cast, malleable, and wrought iron can be coated with copper by the new invention.

The process consists in first removing the oxide from the iron to be coated, then covering it with a medium metal which has a great affinity for the iron, and afterwards dipping the iron so prepared into molten copper, which, by the galvanic action of the medium metal, makes the copper intimately combine with the iron, and form a complete coating. The oxide is removed from iron by means of diluted sulphuric acid, in which the castings or sheets are rubbed with sand; after this they are washed, and dipped into a solution of the muriate of ammonia dissolved in a suitable vessel, when they are ready for the next process. This consists in dipping the sheets or plates into molten zinc, immediately after they are lifted out of the salammoniac solution. The surface of the molten zinc should be covered with dry salammoniac, to prevent the evaporization of the metal. The iron is soon covered with a coating of zinc, and forms what is termed galvanized iron. At hand, the operator has a crucible or pot containing melted copper covered with some incombustible substance as a wiper, and he at once dips the zinced iron, into this, in which it is kept until it ceases to siss, when it is taken out and found to be covered with a complete and durable coating of copper, By dipping the iron thus coppered, into the solution of salammoniac, then into the zinc, and the copper—repeating the process—coat upon coat of the copper will be obtained, until it acquires any degree of thickness. The black oxide is prevented from forming on the copper by dipping it afterwards in the salammoniac solution, and then washing it in pure water. This process is entirely different from that of Mr. Pomeroy, for which a patent was granted a few years ago, and which was published on page 69, Vol. 6, Scientific American. We have seen samples of iron coated by Mr. Bucklin's process, which were very beautiful and well covered. Unless the melted copper was covered with a non-combustible substance, the plates would come out in a very rough state, but the covering acts as a wiper, and the coppered plates come out smooth, and well coated. Brass, or any of the copper alloys, can be made to coat the iron, in the same manner as the copper. We hope this new process will be the means of extending the use of sheet-iron, so as to save considerable to the country, that is now paid out for tinned sheets.

Models! Models! Models!

We require in all cases, when models are sent to this office, that the freight charges should be pre-paid or otherwise provided for. The name and residence of the inventor should also be attached to the model, as many times we are unable to determine the proper person to address. These regulations must be strictly complied with, otherwise we cannot be responsible for any errors that are otherwise liable to occur.

False Philosophy.

Macrocosm or the Universe Without.—This is the title of a new book by William Fishbough, a candidate for philosophic fame. As it is a work which treats of subjects connected with our legitimate pursuits, and teaches a philosophy at variance with ours, it is just and proper that we should at least point out *some* of its errors. The author is not a metaphysician, nor is he skilled in scientific lore; the brilliant passages in the book bear the impress of Prof. Nichol's genius, and there is not a single new scientific *fact* recorded in its pages. There is, however, a cool thread of egotism running through the whole of it, such a self-complacent, "I know it all" spirit exhibited that is really very amusing. Subjects that would appall Newton to approach, and about which Herschel and Humboldt would confess themselves ignorant, he rushes at with an audacity that is really exhilarating. Knotty points that baffle the most eminent men of science, he unravels as easily as flying a kite, and with a few flourishes like political cheers, he sets down his doctrine as *established.*

The author teaches the development hypothesis of animal life, and plainly states that "in the lowest of the fossiliferous rocks the principal animal remains are *Radiata*, which form the connecting link with the vegetable kingdom," and he presumes "that more minute and simple species preceded these."—The development hypothesis—for it is not a theory—assumes that animal life commenced at a point, and gradually in a multitude of ages went on developing itself until man arose out of a *mite.* We believe that some of the developists hold to it that the dolphin was a very near predecessor of man. The reasoning of some advocates of this hypothesis, is indeed no better than what might be expected of a dolphin or such like fish, and they are therefore welcome to a system which intimately relates to themselves, but it is one which Hugh Miller has smashed to pieces, and which Prof. Agassiz, the eminent philosopher in a recent lecture delivered in this city gave his testimony against. Here is what he said:—

"The extinct animals found in the lowest strata, it has been imagined by philosophers, were the first created, but this supposition has been overturned by modern science, which discloses the fact that *the lowest strata* contain *radiata, molusca, articulata*, and *vertibrata.* The plan which pervades the animal kingdom at the present day, is the same which was displayed at the first introduction of animals upon this earth. The same thought which planned the arrangement of animals now living and which has assigned to their different races their respective stations, is the same which has laid them from *the beginning.* Everywhere we see *one* active mind in nature from the beginning as now, from all time and all being, and have evidence of the Creator in space, in time, and in every individual, as well as the whole animal creation."

Thus speaks a real practical man of science; how lofty and profound in comparison with the superficial development hypothesist. Our macrocosm author assumes the professorship of Doctor of the Nebular Hypothesis, which is quite in harmony with his materialist views, and development ideas.

The nebular hypothesis embraces the doctrine that the whole visible universe was once a mass of subtile gaseous matter, and that out of this, by rotation and cooling, the worlds *made themselves.* The author of this hypothesis is La Place, and his views have been embraced by many eminent philosophers, and were inculcated by Prof. Guyot, in his lectures in this city last winter, and although some portions of the heavens have lately been resolved into stars by superior telescopes, which stars were once held to be *nebulæ*, still many men are so hard or thick headed, that they cannot yet renounce their gaseous or nebulous notions.

The nebular hypothesis supposes that at one time the whole mass of matter of the sun and all the planets and satelites in our system was in a state of attenuated gas (fiery vapor,) and all rotated around the centre—a huge mass of rolling gas—the sun being the axis, and that in a multitude of ages, by certain parts cooling and shrinking, the planets were first formed into rings, then broke up into spheres, and finally assumed their present forms and positions. There are eight objections to this hypothesis, which, if removed, would leave us little to say against it.

1st. There is no evidence that the matter of this world was originally in a state of gas.

2nd. By the *known* laws of chemistry, all matter cannot be reduced to a state of gas.

3rd. By the known laws of chemistry, an isolated fiery mass of gas cannot have but a momentary existence, and by analogy never had.

4th. [Mr. Fishbough says that the mass of gas received rotation by virtue of gravitation.] Gravitation cannot produce rotary motion.—By the laws of mechanical philosophy, a body must be acted upon by two forces to give it a rotary motion.

5th. The nebular hypothesis does not account for our planets having two motions, one on their axes and another around the sun.

6th. If the whole mass of matter now forming the solar system, once rotated along with the sun as its axis, then the outermost planet should revolve round the sun in 25 days 7 hours, 48 minutes—this being the time the sun revolves on its axis (not in 27 days as Mr. Fishbough has it.) Instead of doing this, Saturn takes 29½ years to revolve round the sun.

7th. If all the matter composing our system rotated together around the sun as an axis, then all of it would still rotate in the same direction, but instead of this being the case, the satelites of the planet Uranus revolve in a contrary direction to the other planets, and not in the same plane. Well might Prof. Nichol say in reference to this fact, "a comet would be very acceptable here."

8th. The present positions, the forms, and motions of the planets cannot be accounted for by gravity nor gas. By none of the known laws of chemistry could the matter of which this earth is composed, ever have been in a state of gas. If it ever was, different chemical laws must have been in force which now have no existence, and to prove a hypothesis by a hypothesis as Mr. Fishbough does, is like exterminating problems by the following rule—0—0=1 an exceedingly convenient system of mathematics for dreamers.

Prof. Nichol asserted while in this city, that "no calculation or deduction can ever enable the human race to trace back our system to its origin," yet in face of this Mr. Fishbough does so with the greatest ease, and lays down his deductions with the utmost *sang froid* as established facts.

To show how he understands mechanical philosophy, let us just quote another paragraph from his work:—

"The kingdom of motion and forms, therefore, have ever been and still are (and we may confidently believe ever will be) making farther and farther encroachments upon the realms of *chaos and inertia*, and whatever is conquered by the former can never be fully reconquered by the latter, and this because the former power is positive and the latter negative."

Not to speak of the grammatical richness of this sentence, here we have *motion* and forms called a kingdom, and a conquering power, and *inertia* and *chaos* called realms having no motion; the man takes states and condition of matter for its properties, as all men who are ignorant of mechanical philosophy do. Inertia is simply the passive mechanical property of matter, whereby it has no inherent power to change its condition; it belongs to a body in motion as well as a body at rest, it is as much positive as negative. Men talk about chaos with great freedom; who knows anything about it? Inertia belongs to all bodies in motion, and which have form; matter in every state, in every place, and at all times, has been, and is endowed with the property of inertia.

We might easily fill a page in pointing out erroneous views put forth in this book, but perhaps we have said enough.

Reported Officially for the Scientific American

LIST OF PATENT CLAIMS

Issued from the United States Patent Office.

FOR THE WEEK ENDING NOVEMBER 16, 1852.

EXPANDING BITS—By Charles L. Barnes, of New York city: I claim so forming and combining the movable and stationary parts of an expansion bit, for boring different sized holes, as that a cutting edge shall at all times be preserved entirely across the bit; and at the same time, the cutting point on the moveable part thereof, shall always be parallel with the shank of the bit, or the line of the hole, as described.

I also claim the rising and falling of the movable part of the bit, as it is contracted and expanded, by means of the inclined slots and set screws or their equivalents; so that the lip on the movable part, shall become the cutter, when boring the largest size of holes, (the other lip being at rest,) and the lip on the stationary part shall become the cutter, when boring small sized holes; the other lip being at rest, by which means I am able to form the lips of the proper shape for different sized holes, without changing the cutters, as described.

SEED PLANTERS—By H. Davis, and Samuel and Morton Pennock, of Kennett Square, Pa.: We claim, first, the employment of the sigmoid, or other similarly curved or angular receiving and discharging openings, in combination with the reciprocating slide and feeding stubs, for the purposes specified; the said reciprocating slide having angular points projecting into the said sigmoid openings, for effecting the discharge of the seed from the outlets from which the stubs are receding, while the latter are feeding the seed toward the opposite extremities or outlets of the openings, during each movement of the slide, by means of the inclined sides of said points, and the movement of the slide.

FLAX PULLERS—By Lewis S. Chichester, of Brooklyn, L. I.: I do not wish to limit myself to the mere construction or arrangement of the parts.—I claim the employment of one or more pairs of rollers, as described, in combination with the fingers or separators, or their equivalents, for presenting the stalks to the bite of the rollers, to be drawn in as described; also, in combination with the rollers—the revolving arm, or arms, for collecting and drawing the stalks to the bite of the rollers, and also the employment of the fulcrum bar, as described.

CARPET LOOMS—By Jno. A. Van Riper, of New York city: I claim, first, actuating a positive let-off for the delivery of yarn, a positive take-up of the woven cloth, and a variable winding upon a beam of the cloth, delivered from the take up rollers, by the combination of the crank pin or cam on the disc, or the equivalent thereof, with the alternating bar and its appendages, as set forth.

Secondly, the method of working the trap-boards, by means of the crank cam, rock shaft, and arms, lifting rods, cam and lever, and the other devices acting in connection with these for raising and lowering and oscillating the lifting rods—the whole operating as described.

Thirdly, the temples, constructed, arranged, and operated as described; so that they will be open during the time the take-up rollers are acting, closed at the time the lay beats up.

MACHINE FOR MAKING THIMBLES FOR RIGGING, ETC.—By Wm. Field, Providence, R. I.: I claim the arranging the two halves of the forming groove, upon the adjacent ends of two independent revolving mandrels or shafts, which are free to slide towards and from each other, so as ao hold the two halves of the groove in contact, while the article is being shaped, and to separate the two halves of the groove, to allow the finished article to drop out: also the combination of the divided shaping groove, with a reciprocating former operating in connection therewith, as set forth.

COTTON SEED PLANTERS—Wm. A. Gates, Mount Comfort, Tenn.: I claim, in combination with a rotary cylinder or box, having apertures in its perimeter, the projecting edges or wings, radial ribs or plates, and projecting fingers or prongs, arranged around the axle; the whole operating to separate or disentangle the seeds to be sown, immediately previous to the disposition thereof, in the furrow—as set forth.

SASH FASTENER—By J. B. S. Hadaway, of East Weymouth, Mass.: I claim, first, the combination of the rocking plate with the angular lever, the swinging lever, and the spiral spring, constructed and arranged and operating in the manner and for the purposes specified.

Secondly, the rocking plate combined with either a simple or compound lever, in the manner and for the purpose specified.

BLIND ANE SHUTTER OPERATOR—By Robt V. Jones, of Birmingham, Pa.: I claim, the tubular shanked box hinge, with roller contained therein, as arranged with respect to the roller within the building, when the rollers are connected by a chain, and the whole is constructed as described.

TANNING—By David Kennedy, of Reading, Pa.: I claim, the use of borax in combination with nitre, alum, and terra japonica, in solutions of tannin, for the purposes set forth.

BOTTLE STOPPER—By E. & D. Kinsey, of Cincinnati, Ohio: We claim, the combination of the ball stopper together with the rod attached to it, and the guides, in the manner and for the purpose set forth.

CYLINDER PRINTING PRESS—By Joel G. Northrup, of Syracuse, N. Y.: I claim, first, such a combination and arrangement of a horizontal bed and cylinder of a printing press, as will enable each forward movement of a bed to impart a revolution to the cylinder, for the purpose of taking or giving an impression, and permit it to remain stationary during the reverse movement of the bed, as described.

Secondly, in combination with a horizontal cylinder moving in one direction, with alternate rest and motion, the inking and flying apparatus as described.

PERSPECTIVE DRAWING APYARPTUS—By Prof. Adolph Richter, of New York city: I claim, delineating natural and other objects, in a diminished or increased size, with a lens, whan used with the apparatus and in the manner described.

PRINTING PRESSES—By Stephen P. Ruggles, Boston, Mass.: I claim, hanging or balancing the bed which holds the form and moves up and down for each impression, upon springs, so as that its own weight shall compress the springs to a great extent, and the entire compression of them be completed by drawing the bed further down whilst in motion and so that the elasticity of the springs, when the bed is to rise, will raise it up to the extent of their power, and the upward motion be completed by a separate arrangement, whilst in motion, for the purpose of relieving the machine from overcoming the inertia in moving the bed from a state of rest, the power to complete its motion being applied near the termination of its movement, as described; also, the arranging of the frisket and the inking rollers in separate carriages, moving on the same ways, with such relative velocities as not to interfere with each other, and so that the frisket may carry off and bring back the sheet quickly, whilst the inking rollers may travel more slowly and do more perfect work, as described; also, the pointing of the sheet, whilst being prepared for receiving the first impression, by an automatic movement attached to some moving portion of the press; also the application of a blast of air, or its equivalent, for the purpose of forcing the sheets upon the registering points, when the paper is being prepared for the reverse impression; also the removing of the sheet from the frisket, or from the press by means of atmospheric pressure, applied in the manner described, or its equivalent; also, making the registering points adjustable in the paper table, by passing it through a friction plate, secured between two plates: also, the combination of the open toggle and adjustable eccentric shaft or pin, which operate the bed.

CARD TEETH—By Cornelius Speer, of New York city: I claim the application of the material herein described, to the front side of the leather fillet, holding the card teeth, for the purpose of bracing and supporting said teeth.

SERVING MALLETS—By Daniel H. Southworth, of New York city: I claim, first, the attachment and use of the clasp or hook to the hollow or concave part of saddle of a serving mallet, for holding it to the rope while the operator brings the end of the marline from the spool over the pulley in the handle and upper edge of the saddle to the rope, where it is made fast without being wound round both saddle and rope.

Second, the attaching to a serving mallet, one or more set or thumb screws, or any analagous devices, for the purpose of pressing upon the spool, for enabling the operator to serve the rope with any degree of tightness the yarn will bear, without winding it round both saddle rope and handle; the said screws being attached and operating in the manner and for the purpose described.

RAIL ROAD CAR SEATS—By Daniel H. Wiswell, of Buffalo, N. Y.: I claim the employment of the double jointed slides and jointed rods, with the jointed arms, jointed seat and back, pillars, and supports;—arranged and operating in the manner and for the purposes herein fully set forth.

CORDAGE MACHINERY—By H. S. Jennings and C. S. Collier, of Bethany, N. Y., and T. P. How, of Buffalo, N. Y.; (Assignor to H. S. Jennings, and C. S. Collier, of Bethany, N. Y., D. Perry and A. Beardsley, of Middlebury, N. Y., and A. Hemingway, of Perry, N. Y.:) We claim regulating the speed of the receiving reel, by the tension of the rope, as described.

DESIGNS.

FRANKLIN STOVE—By Joseph Pratt, (Assignor to Bowers, Pratt & Co., of Boston, Mass.)

PARLOR GRATE—By Joseph Pratt, (Assignor to Bowers, Pratt & Co., of Boston, Mass.)

Properties of Iron.

Mechanical Properties of Metals.—By Mr. Fairbairn.

After some preliminary observations, Mr. Fairbairn stated that having been requested by the British Association at their last meeting to undertake an inquiry into the mechanical properties of cast-iron, as deducted from the repeated meltings, and feeling desirous of ascertaining to what extent it was impaired or deteriorated arrangements were made for conducting a series of experiments, calculated satisfactorily to determine this question, and to supply such data and such information as will enable the engineer and iron-founder to ascertain with greater certainty how far these re-castings can be carried with safety, or till such time as the maximum of strength is obtained, and such other properties as appear to affect the uses of this valuable and important material. Mr. Fairbairn further stated, in connection with this subject, that it was his intention to investigate another important process, which, to a considerable extent, affects the stability of some of the most important iron constructions —viz: the rate of cooling as it affects the adhesive properties of the material, and the more complete and effective process of crystalization. On these points it is well known that a rapid rate of cooling is invariably attended with risk, that an imperfect crystalline structure is obtained, and that irregular and unequal attractions are not only present, but they are frequently the forerunners of disruption, as well as exceedingly deceptive as regards appearances, or the dangerous consequences which invariably follow in cases of rapid cooling and unequal contraction.

On the Form of Iron for Malleable Beams or Girders.—By Mr. T. M. Gladstone.

It is, said Mr. Gladstone, on the application of wrought-iron beams or girders, that I propose to make some remarks by contrasting their powers and properties with those of cast-iron; to show what form of iron I conceive best adapted for such use, and to state as a manufacturer, what may be expected of the capabilities of iron-works to produce the same beyond previous efforts, so as to meet the increased requirements of the times. It is found, that by converting iron from a cast into a malleable state, the adhesion of the fibres of the metal under tension, becomes increased from 7 to 27, and indeed much beyond that when the best quality of material is manufactured. At the same time it is stated that the compressive strength is somewhat reduced. In this latter assumption I do not altogether concur from a permanent feature in the experiments not being sufficiently taken into account—namely, that in experimenting with wrought-iron, of a given extension, from pressure, it is necessary, before you obtain even a medium value of the resistance, a modicum of deflection must take place to bring into play each of the fibres; consequently, not like as in a rigid cast beam, where the full action of compression acts at once, some allowance must be made for the chance from the first position, in calculating the compressive forces. Assuming generally that the increased strength or tensive power of wrought, compared with cast-iron is 27 to 7, it at once reduces the six-fold area of the bottom web of the iron beam, and nearly reduces to one-half the required sectional area throughout, yet retaining an equal strength, for every purpose. In many cases this increase of strength, enabling to reduce the weight, will fully compensate for the difference in price, so that up to this point the market and effective value of both may be said to be equal. The wrought iron beam, however, possesses this material advantage, and that is, it will always give good warning before the point of danger is reached, and this, mainly from its vastly increased deflective power—indeed, before its maximum is reached a great deflection can safely take place; therefore, both for life and property, its advantage is most conspicuous. With regard to the best form for carrying the greatest weights with the least metal, I have come to the conclusion, from actual experiment on a large scale, that the double T section is the best, provided the flanges are sufficient to prevent lateral action from the load. At the Belfast iron works, the members can see iron of the section shown in the bars, of twenty-six feet long, and weighing nearly half a ton, so that it will be seen that the mills are now constructed so as to roll iron of almost any dimensions which may be required, and such bars, from the breadth of the flanges, have never before been attempted in the three kingdoms. When I had the honor, four years ago, to read a paper at the society of Arts, on the means of constructing bridges without any centreing of such proportions of iron, no iron-maker would attempt to produce such proportion of material, while now I have accomplished it, and would have no hesitation in making them much larger if required. No doubt, for warehouses, mills, public buildings, and bridges its value will now become exclusively applied and appreciated. As these bars are rolled solid throughout, on comparison I have found they will bear nearly one-third more than any made beam of equal sectional area—that is, with a beam of which the centre-rib is of plate iron, and the flanges of angle iron, and riveted thereto, and so distributed as to make the double T form. This is easily accounted for, as you necessarily weaken the whole by its being requisite to introduce riveting, while a due and equal resistance is offered from all parts by the solidly-rolled bar.

[The above are abstracts from papers read before the recent meeting of the British Association for the Advancement of Science. A great many excellent papers on real practical and scientific subjects, were read before the last meeting. Of course we could not publish them all, but as we deem it of interest and profit to our readers, without any continuance from week to week, we will sometimes present other condensed abstracts like the above.

Cheap Fuel.

A noted agriculturist, Mr. Bergen, says that fuel of an excellent quality can be grown quicker, easier, and cheaper from peach-stones, than any other mode within his knowledge. From this source he thinks the settlers upon the Western prairies might furnish themselves, within three or four years, with a constant supply.

Photographic Pictures.

Photography is but in its infancy in our country, and although it is a far more important art, and is as old as the daguerreotype, still it is but little practised in America. The difference between it and the daguerreotype, consists simply in the former embracing sun drawn pictures on paper, while the latter relates to sun-drawn pictures on metal plates. "The Talbotype" is also a name given to sun-drawn pictures on paper, after Fox Talbot, the discoverer.

When we consider that with a number of sheets of prepared paper, an artist may go forth into the woods and wilds, and with his camera copy the gigantic pine, the leaping waterfall, the snow capped mountain peak, or the embowered cottage, we may well conclude that the Talbotype is an art which is yet destined to achieve wonderful results.—Let us explain how the paper is prepared and the process conducted.

White paper of a good quality is selected, which is thoroughly impregnated with white wax by placing it upon a hot clean tin plate, and covering it with the wax in a melted state. All the superfluous wax is removed by pressing the waxed paper between sheets of blotting paper, and pressing upon the top with a hot flat iron, until the waxed paper appears to be evenly saturated. Some rice water is then prepared by infusing about 8½ ounces of good rice in 5 pints of water.—When the glutinous portion of the rice is dissolved, the clear is poured off, and one ounce and 140 grains of the sugar of milk, one-half ounce of the iodide of potassium, 12½ grains of the cyanide of potassium, and 12 grains of the fluoride of potassium are dissolved in it.—This solution is then to be filtered through clear white filtering paper, and the waxed paper allowed to soak in it for half an hour, after which it is removed and dried carefully with a moderate heat in a clean place (not in sunshine.) With these ingredients in the proportions mentioned, it is best to make up a quantity of this liquid, and place a number of sheets in it at once, taking care to have them loose and perfectly covered. When dry, these sheets can be kept in a moderately cool place, wrapped up, for any length of time.

To render them sensitive, a solution is made up as follows:—One-half ounce of distilled water, into which are dissolved 150 grains of the nitrate of silver to which are added 186 grains of acetic acid. (Any quantity of liquid may be made up according to the proportions given, so as to prepare a number of sheets at one time. The quantities given are only for small experiments). In this solution the sheets are immersed for a short time, care being taken to remove all air bubbles from the surface of the paper; which, when it is taken out, must be dried in the dark, and may be kept afterwards (covered up from light) two or three days.

The paper is now ready for the camera obscura, in which it is placed to take the impression of any object desired, like a daguerrean plate. The time required to take an impression is from one up to thirty minutes, as experience determines, which time depends on the character of the light and the object, the picture of which is to be taken. After the paper is taken out of the camera, it is placed in a bath of two pints of distilled water, and 64 grains of gallic acid; this brings out the picture on the paper, which, when fully developed, is fixed by soaking it for some time in a quart of distilled water, into which have been dissolved two ounces of the hyposulphite of soda. After having been taken out of this, it is well washed in clean water and dried, when it forms a well-defined negative picture, from which any number of positive impressions may be taken.

The best light to work with for obtaining good pictures on the prepared paper is under a clear sky, when the sun is shining, and when the light falls chiefly on the darker shades of the object, or scene, leaving such as are of light color under the influence of diffused light only. It requires practice to judge by the eye how to manage the time in the camera, according to the kind of light, and the object or objects to be represented.