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Intelligent Mechanics.

From the means which we have of obtaining correct information upon almost every question, we are fully persuaded that we have very few intelligent mechanics in our country in proportion to the amount of population, and their own numbers. We are sorry to say this, but the truth compels us to do it. This should not be, for the means are abundant whereby they can obtain information to make them respected for every mental qualification. The desire, however, must exist in the mind, and it is for the want of this desire—this mental quality—to read good works and study good authors, that so much ignorance abounds.—Instead of reading useful periodicals and books, the great majority of them are delighted with the flashy stories and flippant literature of authors whose names and fame will never reach above nor beyond the very garbage of bookdom.

On our advertisement page there are two advertisements for men capable of conducting two separate trades; the one a practical chemist for dying and finishing woolen goods; the other a practical machinist. We know it is not easy to find a person who has toiled as a hard working mechanic in possession of the means required in the advertisement for the managing machinist, and this is the reason why such an advantageous offer is presented. This very fact should teach our mechanics how much it would be for their own benefit to employ their leisure hours in acquiring useful information, and obtaining such a mastery of their trades as to be able to conduct the same, and thus be ready to ascend to higher situations whenever opportunities like those on our advertising page are presented. We have frequent applications for practical intelligent mechanics who can superintend a business, and we know from experience how difficult it is to obtain them. Every man who works at a trade, no matter what that trade is, should learn it so thoroughly as to be competent to conduct the same in all its branches. Every mechanic should strive to be master of his business. There is philosophy in every trade, and why should not carpenters, tailors, machinists, dyers, millwrights, coopers, &c., be as intelligent as doctors, lawyers, and merchants? There is no use, as many mechanics do, of complaining about the aristocracy of this and that class; it is worse than foolishness; the aristocracy of mind is higher than that of wealth, and always commands respect. A gentleman writing to us some time ago, for a machinist to superintend his foundry and machine shop, said he would give him above \$2,000 per annum, but would be willing to give more could he get the proper person. "I want a good mechanic," was his language "and a gentleman, one who is courteous, intelligent, and with whom I can associate as a friend." The elevation of our working men is one object about which we are solicitous; we have often preached about it through these columns, and will continue to do so upon every proper occasion. It has been our object to present a chaste literature along with scientific and other useful information, but our circulation is only among the most intelligent of our mechanics, consequently the great mass for whom our remarks of this kind are designed will not see them. We will, however, thank those who do read them to talk upon the subject from time to time with their brother craftsmen, in order that they may feel the force of the old adage, "knowledge is power," and many be led to see the error and foolishness of their ways, and adopt a course of life which will lead them to ascend to the front ranks of Intelligent Mechanics.

Steam Engines.

The engines offered for sale in our advertising columns are worthy the attention of those desirous of purchasing a good article at a rare bargain. It should be remembered that the engines are new and the boilers have not been long used. We attend to the boxing and shipment without any additional cost to the purchaser. Such bargains are not often presented to the public.

The Ether Controversy.—Dangerous Legislation.

We have our regular elections for members of Congress, Senators, and chief officers of the general government. Men are sent to the seat of government to legislate for the welfare of the nation, by making such laws as are necessary for the good of the people, and adopting such measures as will add to the prosperity and honor of the United Commonwealths. It is supposed that these men are acquainted with the wants of the public, and that they will examine every subject legally brought before them, with scrupulous care, and act upon the same in all honesty, without favor, fear, or partiality. Within a few years there has grown up a most dangerous system of outer legislation; this is called the "Third House of Congress," and is composed of what are termed "lobby members." Our country must awake to the dangerous influences of this "house," for they are often seductive and unscrupulous. Of this we are fully persuaded by the evidence placed before us respecting the "Ether Discovery," and the attempt that was made to get a grant at the last session of Congress, of \$100,000 for its use in the navy, army, and hospitals of the United States. In 1846 Dr. C. T. Jackson, and W. T. G. Morton, dentist of Boston, secured a patent for rendering persons insensible to pain, by inhaling ether, so that surgical operations, such as extracting teeth, amputating limbs, &c., could be performed during the short period of insensibility. By some means it appears that Mr. Morton has obtained the ruling control of the patent, but a certain Mr. Eddy, of Boston has, (at least had) also an active share in it. To compensate Mr. Morton for his discovery, he petitioned last Congress, and the petition was referred to committees in the house and Senate. When Dr. Jackson heard about this attempt of Morton, he hurried to Washington to present his claims. An amendment, however, was tacked to one of the hurried appropriation bills in the Senate which proposed to award \$100,000 to Mr. Morton, but this award never was made.

The minority report of the House of Representatives, by the Hon. Edward Stanley, of N. C., and the Hon. Alex. Evans, of Md., the latter a scientific gentleman of reputation, completely establishes the fact, as we believe, that Mr. Morton has no just claims to the discovery of etherization. It is an able and strong report, but we cannot agree with some of its conclusions. The claims of Mr. Morton are founded upon having first applied etherization in October 1846, to perform a successful operation on a patient. The claims of Dr. Jackson are not upon having performed the first experiment upon a patient, but in having discovered anaesthesia in the winter of 1841 or 1842, by inhaling ether vapor to destroy the injurious effects of chlorine gas, upon his own lungs, which he had inhaled during some of his experiments. The experiment upon himself convinced him, to use his own language, "that he could be rendered insensible to pain for some time before unconsciousness took place, and that this state of insensibility of the nerves continued for a sufficient length of time to admit of a surgical operation, and that ether could be safely inhaled into the lungs to an extent before believed to be dangerous." He never, it seems, did perform a surgical experiment with it before 1846, but he communicated his opinions and experience to a number of respectable gentlemen whose testimony is beyond reproach. It is also asserted, and proof is adduced, that he informed Mr. Morton how to make his first experiment, and gave him his first idea of etherization. So far, Dr. Jackson's claims are impregnable; but what constitutes the true foundation to the title of this discovery. The report of the minority says, "no experiments of verification performed by another can take the right of a discovery from him who first formed the induction, and prescribed the means of verifying it." By this principle of judging, Sir Humphrey Davy has previous claims. He said, "as nitrous oxide in its extensive operation, appears capable of destroying pain, it may probably be used with advantage during surgical operations, in which no great effusion of blood takes place." Here is the induction, and we find that in November 1844, about two years previous to the first experiment by Mr. Morton (as directed by Dr.

Jackson,) Dr. Wells, of Hartford, Conn., at his own suggestion, had one of his teeth extracted by Dr. Riggs, while under the influence of nitrous oxide gas. From the evidence before us, Dr. Wells was the first person in the world who applied and practised etherization in surgery.

It may be said that nitrous oxide is a dangerous gas, and the claims of Dr. Jackson will rest upon the safety of discovering sulphuric ether. This is a different question; such a claim would be for the kind of substance used, not the effect obtained beyond its greater safety. By the remarks of Dr. Warren of Boston, in the November number of the Boston Medical and Surgical Journal, it appears that he does not consider chloroform, or sulphuric ether safe agents; and he prefers a compound chloric ether.

What is it that constitutes a true title to a discovery? This is an important question, and one very difficult to settle sometimes.—For example, it is suspected that oxygen is a compound body; this view has been published in the series of articles, Vol. 5, Scientific American, by Dr. Nelson, but as yet it has not been demonstrated. If it should yet be discovered that oxygen is a compound body, who will be entitled to the claim of discoverer? The one who gave the hint which led to the experimental proof, or the demonstrator? The latter surely, but the former deserves his share of the honor also. Upon this principle of reasoning, Dr. Wells' claims to etherization stand out practically the strongest. Dr. Jackson is said to be very cautious, and in this respect not unlike some other discoverers, but if a person has made a valuable discovery, why is he cautious about it, if he has confidence in its merits; At the present day, when the means of establishing honorable claims to new discoveries are so easy, only a few lines published in a proper journal, there is no excuse for any man allowing his claims to be usurped some years afterwards. In this respect we greatly blame Dr. Jackson; if he had acted right, he would have prevented all this trouble about etherization now, all this lobbying at Washington, this great expense to our country, by taking up the time of Congress and committees; and last not least, the proposal of taking \$100,000 out of the treasury of the United States to pay one for a discovery made by another. Dr. Jackson has not been well treated, we believe, but we suppose he sees now how his own long silence—in the proper quarter—has been the means of causing so much trouble and expense and heart-burnings in our country, and as we have reason to believe, expense, trouble, and suffering to himself.

Critical Dissertation on Steam, Air, and Gas Engines.

After the successful application of steam to propel machinery, ether, alcohol, and various vapors were proposed as substitutes, because it was supposed that liquids which boiled at a lower heat than water—gave off their vapor then—would economize fuel. This opinion was entertained by both scientific and unscientific men, and although Mr. Ainger pointed out this error in an article read before the Royal Society in 1830, the very last number of the Franklin Journal copies an article from the London Chemical Gazette, by J. Apjohn, Professor of Chemistry, Trinity College, Dublin, in which he proves to his own satisfaction that all fluids which boil at a lower temperature than water must necessarily economize fuel if applied as substitutes for steam in propelling machinery. We will point out his error, and in doing so establish the principle that although water does not boil at such a low temperature as many other fluids, its vapor possesses a greater elastic force just in proportion to the heat applied to it.

The principle which Mr. Apjohn lays down to prove that alcohol and ether which boil at a lower temperature than water, are more economical in fuel, to exert a force in propelling machinery is this:—"The specific and latent heat of water combined, is 1129°00, that of alcohol 875°50, that of ether 534°70." "The mere inspection of these figures," he says, "is sufficient to show that with alcohol about three-fourths, and with ether somewhat less than one-half the caloric required for water will suffice to produce the same mechani-

cal effect." What reason does he adduce? Here it is, "the vapors of different liquids have at their respective boiling points the same elastic force, equal volumes of them will produce equal mechanical effects." This is a grave error to be propagated by a professor of chemistry; it is not the basis upon which to found any proposition for proving the economy of one liquid over another to produce mechanical effect and we will show why. The mechanical effects of vapors are inversely in proportion to their densities; thus although alcohol floats on water, and ether on alcohol, yet the vapor of water (steam) floats above the vapor of alcohol, and the vapor of alcohol above that of ether. The density of water is 10, alcohol 8, ether 7; the density of their vapors is water 6, alcohol 10, ether 25. M. Cagniard de la Tour put some water into one glass tube, ether into another, and alcohol into another, and hermetically sealed them. By applying heat ether became gaseous in a space scarcely double its volume, at a temperature of 320°, and exerted a pressure of no more than 38 atmospheres; alcohol became gaseous at a temperature of 404½ in a space of thrice its volume with a pressure of 139 atmospheres; water acted on the glass chemically, but by adding some carbonate of soda to it, it becomes gaseous at a temperature of 648° in a space four times its volume, consequently, as an increase of a double volume in alcohol vapor increased the pressure nearly four times, from 38 to 139 atmospheres, the pressure of the vapor of water would be in the same proportion 556 atmospheres; less elastic, according to the pressure to be sure, but under the same pressure there can be no doubt, that according to its latent and specific heat, it would exert a force in proportion over alcohol and ether. Water vapor has 25 times more latent heat than alcohol vapor, but the specific gravity of the latter is 25 times greater, this shows that the same bulk of vapor will be produced from them both—alcohol and water—with the same expenditure of heat; hence there can be no advantage—no economy in substituting alcohol for water as a source of vapor in the steam engine. The error of Mr. Apjohn lies in taking his deductions from the product—vapor—of heat and a fluid, not from the heat and fluid first. It is the case with too many people, they do not go to the root of the matter, hence their deductions, from laying down a false proposition, may look very plausible, but at the same time be very erroneous. Alcohol, ether, carbonic acid gas, &c., are more expensive and troublesome to obtain than the vapor of water. Some of them would act chemically on the machinery also. They do not possess the quality of being so easily and suddenly condensed as steam, and thus they have not the same qualities to recommend them as substitutes for it. This is the reason why volatile fluids which boil at a lower temperature than water, when applied in engines (and there have been many of such engines,) have always failed to compete with steam. We intended to produce some reasons why hot air engines have also failed to compete with steam, but this we must leave till next week.

To Subscribers.

We have a number of subscribers whose subscription term will expire with our next number (16.) If all subscribers would send in their subscriptions a week or two before they expire, it would save us from sending notices to them of the same, but many, no doubt, forget their dates and numbers, and it is the attention of such which we wish to arrest.—This volume of the Scientific American, so far has been distinguished above the past, and its future numbers, will, we assure all our readers, fulfill what we have heretofore said of it, of being "the cheapest and best mechanical paper in the world."

Stitching Shoes by Machinery.

The introduction of sewing machines for stitching shoes is becoming quite common. One establishment in Abington, Mass., uses no less than six. It is said that an operator, with the machine, will stitch in a day more than ten times the amount usually accomplished by a "stitcher," and that the cost is very materially reduced. Who, a few years ago, would have thought that our coats and shoes would ever have been stitched by iron fingers?