Scientific Museum.

For the Scientific American.

Hydrogen a Metal.

That hydrogen can be rendered more brilliant than is usually exhibited in its combustion, is now a fact beyond dispute. He, who doubts this, can very easily satisfy himself, by transmitting a stream of the gas through pure turpentine-camphene, and burning it as it is evolved by means of a jet. Nor is there any greater pressure needed than that afforded by the bottle or vessel, through which it passes, containing the camphene. Nor does the brightness of the flame at last diminish to the bluish paleness, ordinarily seen when the gas is burned without the intervention of a second body, or when passing through impure turpentine.

I use three of Woolf's bottles for the experiment, generating the gas in two of them, whilst the third holds the camphene and jet-tube. I believe the opinion is entertained that the brilliancy is due to a supply of carbon received from the turpentine—an opinion at once contradicted by the fact, that the turpentine loses nothing of its weight, notwithstanding it has given passage to a large quantity of gas consumed. And yet, if it be not carbon which gives the illuminating property to the flame,—what is it? I hold that it is the metal of the gas. Hydrogen is now regarded as an exceeding volatile metal. It is true we have not yet reached that power of science, by which to cause its reduction to a solid or fluid. But its mode of combination with certain other bodies so closely resembles that of metals; in other words, its taking the place of metals in combination, is proof too stubborn to deny it a metallic character, and it is this metallic character which makes the brightness of the flame. The metal-vapor, like the carbon-vapor of the candle or lamp, has been rendered incandescent, and hence the brightness.

And here another question presents itself, whence arises this development of metallic energy? My answer is, that it is caused by catalysis. Sometimes the simple presence of one body will cause others to display energies otherwise concealed, or, rather, lying dormant. It is thus with hydrogen—the camphene so catalyzes it as to super-induce the development of its metallic energies. The hydrogen then burns with brilliancy, because the metal-vapor of which it consists is then undergoing unwonted ignition.

This, in my opinion, is the only legitimate doctrine which can be urged, explanatory of the phenomenon observed in the brilliant combustion of hydrogen—a doctrine which, by-the-bye, goes far to substantiate the general admission, that hydrogen is, in nature, a metal. It is, moreover, a doctrine substantiated by the experiments which have been made with a circular cage of fine platina wire, placed immediately above and at a short distance from the perforations of a hydrogen burner. The flame, I understand, becomes intensely bright, and of which I have satisfied myself by simply using the spongy platinum, furnished by Mr. Kent, of New York, with his hydrogen-generator. The platinum catalyzes the hydrogen so as to exhibit more vividly its metallic property in giving a brighter light than when burned without such influence.

The theory, which I have thus advanced, has not obtained publicity further than what my lectures in the Medical College, of this place, have given to it. Thinking it worthy of the attention of scientific minds I send it for a place in your invaluable paper. It is a theory which, doubtless, will be assailed; but that is no reason why it should be withheld, but rather a reason for its promulgation, because the collision may strike out a few more of the scintillations of science, and add a little to the dazzling wonders of the age.

C. A. Foster, M. D.

Evansville, Ind, Dec. 18, 1850.

Imported Maderia Wines.

Maderia wine imported in 1850, 303,125 gallons; in 1850, 193,971 gallons; in no previous year, since 1843, did the quantity exceed 117,000 gallons, and in 1844 it was only 16,000 gallons. In 1843 the average cost was $2,29 per gallon; in 1850 it was less than 50 cents. Sherry wine imported in 1850 212,092 gallons; in 1848, 215,935; and in no previous year since 1843 did it exceed 76,000 gallons. The cost in 1843 was $1,38 per gallon; in 1850 it was 50 cents.

Hydraulics.

(Continued from page 128.)

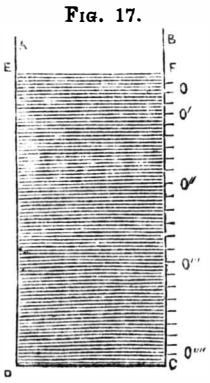
When any of the limits or boundaries which confine a liquid are removed, the force which before was expanded in exciting pressure on such boundary or limit, will now put the liquid in motion, and cause it to escape through the space from which the opposing limit has been removed. The phenomena exhibited under such circumstances, form the subject of a branch of the mechanical theory of liquids usually called hydraulics. It embraces, therefore, the effects attending liquids issuing from orifices made in the reservoirs which contain them; water forced in any direction through tubes or apertures, so as to form ornamental jets; the motion of liquids through pipes and in channels; the motion of rivers and canals; and the resistance produced by the mutual impact of liquids and solids in motion.

It is the peculiarity of this branch of hydrostatics, that, from various causes, the phenomena actually exhibited in nature or in the processes of art deviate considerably from the results of theory, and among millwrights and hydraulic engineers there are a great variety of opinions.

If a small hole be made in the side of a vessel which is filled with a liquid, the liquid will issue forth with a certain velocity. The force which thus puts the liquid in motion is that which before the orifice was made, exerted a pressure on the surface of the matter which stopped the orifice. It is obvious, that the moving force of the water which thus issues from the orifice must be adequate and proportional to the power which produces it. But this power, being the same which produced the pressure upon the surface of the vessel, will be proportional to the depth of the orifice below the level of the liquid in the vessel. Hence we may at once infer, that water will issue with more violence from an orifice at a greater depth below the surface, than from one at a less depth; but it still remains to be determined what the exact proportion is between the rapidity of efflux and the depth of the orifice.

In whatever proportion the velocity of efflux is increased, the quantity of liquid discharged in a given time must be also increased; and, therefore, the pressure or the depth must not only be increased in proportion to the velocity, but also as many times more in proportion to the quantity discharged. Thus the depth of the orifice, below the surface, will always be in proportion to the square of the velocity of discharge.

Fig. 17.



If in a vessel, A B C D, fig. 17, filled with a liquid, a small hole, O, be made at one inch below the surface, E F; and another, O′, at 4 inches below it; a third, O″, at 9 inches; a fourth, O‴, at sixteen inches; and a fifth, O⁗, at 25 inches; the velocities of discharge at these several holes will be in the proportion of 1, 2, 3, 4, and 5. If the upper line in the following table express the several velocities of discharge, the lower one will express the corresponding depths of the orifices:—

Velocity.	1	2	3	4	5	6	7	8	9	10
Depth.	1	4	9	16	25	36	49	64	81	100

It is impossible to contemplate the relation exhibited in this table without being struck by the remarkable coincidence which it exhibits with the relation between the height from which a body falls and the velocity acquired at the end of the fall. To produce a two fold velocity, a four fold height is necessary. To produce a three fold velocity, a ninefold height is required. For a fourfold velocity, a sixteenfold height is required; and so on. Thus it appears, that if a body were allowed to fall from the surface, F, of the water in a vessel downwards towards, C, and obstructed by the water in the fluid, it would on, arriving at each of the orifices above described, have velocities proportional to those of the water discharged at the orifices respectively. Thus, whatever velocity it would have acquired on arriving at O, the first orifice, it would have double that velocity on arriving at O′, the second orifice, three times that velocity on arriving at the third O″, and so on. Now, it is evident that if the velocity of efflux at any one of the orifices be equal to the velocity acquired by the body in falling from the surface, F, to that orifice, then the velocities acquired at each of the orifices will be equal to the velocities of discharge respectively. Thus, if the velocity acquired in falling from F to O be equal to the velocity of discharge at O, then the velocity acquired in falling from F to O′ being double the former, will be equal to the velocity of discharge at O′; and in like manner the velocity acquired at O″ being three times the velocity at O, will be equal to the velocity of discharge at O″. In order, to establish the fact that the velocity with which a liquid spouts from an orifice in a vessel, is equal to the velocity which a body would acquire in falling unobstructed from the surface of the liquid to the depth of the orifice, it is only necessary to prove the truth of this principle in any one particular case. Now it is manifestely true, if the orifice be presented downwards, and the column of fluid over it be of very small height; for then this indefinitely small column will drop out of the orifice by the mere effect of its own weight, and therefore with the same velocity as any other falling body; but as fluids transmit pressure equally in all directions, the same effect will be produced whatever may be the direction of the orifice.

Bear Hunting in Sweden.

In some parts of Sweden great depredations are committed by bears, which issue from their haunts and destroy the flocks and herds of the farmhouses and villages. When such depredations fall severely on any particular locality, the peasantry assemble together in large numbers, and, extending themselves in a line, beat through that part of the forest in which the "grisly monsters" are supposed to be. The bears, aroused by the shouts and firing with which these proceedings are accompanied, collect themselves together sometimes to the number of twenty, and the hunters then combine their forces, and make a simultaneous attack on the general enemy. Hunted in this way the bear soon pays the penalty of his misdoings; but when attacked by a single huntsman, he often meets with better fortune, for, should the latter miss his aim, or strike any other part of the bear but the head, the enraged beast rushes on him, and wo betide him if he but get him in his grip. In the northern part of Sweden, however, the peasant issues forth undaunted in pursuit of the bear. Sometimes he takes with him two or three small dogs, which, when the bear is found, divert his attention by barking around him, and the hunter is enabled to obtain an opportunity of having a steady and certain aim at him. In this manner oftentimes a peasant will destroy six or eight of these animals. The peasants of Norway exhibit equal intrepidity, and will single-handed attack a bear with whatever instrument may be at command.

John H. Dunnel got only $17,60 per ounce for the best specimens of gold, from the U. S. Mint, but could have $18 in the West Indies, and $17,75 in Wall street. Strange, this.

Why is a clock the most humble thing in existence? Because it always holds its hands before its face, and however good its works may be, it is always running itself down.

Commissioner of Patents Reports.

Our thanks are due to Senator Thomas Ewing for a copy of the Commissioner of Patents' Reports. The report is a most able and useful one, and has been generally admired.

LITERARY NOTICES.

"Household Words"—A weekly Journal, conducted by Charles Dickens, better known as the notorious Boz, author of the Pickwick Papers. This journal has reached to near the end of its second volume, and has, as we learn, obtained quite a large circulation in this country under the name of a prominent publisher of this city. The editor cannot conceal his inveterate hatred of us and our institutions, notwithstanding the kisses and sugar plums bestowed upon him while on a a visit to this country some 10 years since. If any one needs proof upon this point, it can be found in an article under the caption of "Food for the Factory." published in No. 36. A meaner or more selfish attempt to ruin the interests of our cotton planters cannot be found in print. The author is evidently muling for favor from a class of "lords" into whose society he has hitherto vainly attempted to ingratiate himself. We have no wish to encourage the circulation of such publications in this country. They ought to be bundled up and returned to the miserable source from whence they eminate. We are so short sighted and obtuse in our comprehension, that we can see neither wit nor ability in the contents of the Household Words. It is a silly concern to make the best of it.

The International Magazine, for January appears upon our table through the politeness of Messrs. Stringer & Townsend, the publishers. It contains a portrait of the celebrated Edmund Burke, his residences, and grave. The review of his life and character is from the pen of Mrs. S. C. Hall, and is elegantly written. The illustrations are well done—the typography excellent,—the paper finer than usual, and the contributions are each in themselves gems in literature of the highest order. This magazine is deserving a large circulation and we are happy to learn receives it. 144 pages; price per single number 25 cts. Published at 222 Broadway.

Woman and Her Diseases, from the Cradle to the Grave, adapted exclusively to her instruction in the Physiology of her System, by Dr. E. H. Dixon, Editor of the Scalpel. This is a work of over 300 pages, and has already passed through several editions. It has received the unqualified approbation of the most prominent journals in America. The editor treats each subject with great delicacy and clearness, and we do not hesitate to commend it to the careful attention of those to whom its contents are addressed.

We are indebted to Messrs. Fowler's Wells, 131 Nassau street, for a copy of Dr. Combe's Lectures upon Phrenology. These Lectures were delivered in this country in the years 1838 and '39, and at that time attracted much attention. Several editions have been sold by the publishers, "and the cry is still they come." They are among the most valuable contributions to the science.

Wilsons Great Metropolis, for 1851, has just been issued by H. Wilson, No. 49 Ann street. It contains an almanac for the coming year, besides a valuable collection of important matter connected with the government and institutions of this city, illustrated by several engravings of its most prominent buildings and a map of the streets.