

## Scientific Museum.

### The Spanish Fly and the Cockroach.

Although the cockroaches abounded inconveniently at the Mauritius, it was not without pity that I saw them consigned, as they frequently were, to a living grave by a wicked looking insect much resembling a Spanish fly. It was impossible to witness his proceedings, combined with his glittering blue and green dress, without imagining the elfish demon of a pantomime leading an innocent victim to perpetual entombment in some haunted cavern. Let the cockroach be moving never so briskly across the wall, he has no sooner caught sight of the fatal insect—not a quarter of his size—than all energy leaves him, and he stands stupidly resigned. The fly then walks up to him, looks him hard in the face, and presently putting forth some apparatus which stands him in place of a finger and thumb, gently takes the cockroach by the nose and leads him daintily along for a foot or two. Leaving him there, he commences a thorough examination of the neighborhood, beating the ground up and down like a well-trained setter, and, not finding what he wants, returns to the cockroach and leads him on a little further, when the same process is gone through, sometimes for hours, till the whole wall has been examined. Chinks there are in plenty, but they do not suit him; he has taken the measure of his victim's bulk, and means to lodge him commodiously. Presently a suitable hole is found, and the fly, moving backward, gently pulls the cockroach after him into his last home. What horrors are perpetrated in this dark recess cannot be more than surmised. The object undoubtedly is to engage him as a wet-nurse. No doubt the poor cockroach is bored in some part not vital, and eggs laid in him; a purpose, indeed, for which his succulent motherly frame seems peculiarly adapted. And not improbably, during this vicarious incubation, he is supplied with food, until the young, of whom he is pregnant, being hatched, commence, in return for his services, to "gnaw his bowels, their repast." It is in vain that during the scene above described you urge the cockroach to seek safety in flight. The poke of a stick is disregarded; he seems dead to all hints; nay, move him to another part of the wall, he waits there with the same stolid indifference the return of his tormentor. Probably a sly thrust is given him in the first meeting of noses, or some "leprous distilment" dropped in his ear; for he has entirely the air of being hocussed.—[Voyage to the Mauritius.

### Destruction of Ships by Spontaneous Combustion.

Capt. Bates, of ship *Nanantum*, from Baltimore for California, which was destroyed by fire from spontaneous combustion of her cargo of coal, took passage at the Falkland Islands in the Scotch ship *Hermagoon*, Capt. M'Kenzie, for Valparaiso, with coal, but when twelve days out, west of Cape Horn, this ship also took fire from spontaneous combustion, and every exertion to smother it proved unavailing. They took to their boats and were picked up soon after by the British ship *Symmetry*, Capt. John Thompson, of Liverpool, for Acapulco, with coal. Capt. T. would not deviate from his course to land Capt. Bates and wife, or the other ship's company; but Dec. 15, in latitude 47 S., longitude 79 W., they fell in with ship *Fanchon*, of Newburyport, from Baltimore for San Francisco, with coal, which also took fire and was destroyed, as before reported, making the third ship burnt by that means within a few months, while Capt. B. and wife were on board.

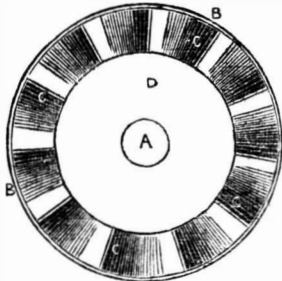
Capt. Thompson, of the *Symmetry*, had the cruelty to demand and receive of Capt. Bates, for the thirteen days he and his wife were on board his ship thirty pounds sterling, taking an advantage unexampled in meanness, of persons who had suffered a double shipwreck, and had no means of redressing themselves. Capt. Bates and wife were at Payta, Jan. 26th, on their way to San Francisco.

### A Sofa Made of Coal.

The *Fife Advertiser*, Scotland, says, speak-

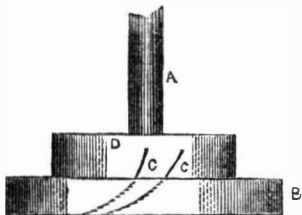
ing of the West Wemyss Coal-field:—"Mr. Williamson is making a sofa wholly composed of coal: it is nine feet long with three compartments or divisions, and is sufficient to contain seven people sitting on it. The front standards are beautifully carved, displaying three mongrel animals, which forcibly remind the spectator of the richly-carved figures that appear so frequently in Dr. Layard's remains of ancient Babylon. This rare geological curiosity was ordered by General Wemyss, and it is highly probable that it will appear at the Great Exhibition, as it ordered to be finished previous to that time.

For the Scientific American.  
Hydraulics.  
(Continued from page 208.)  
FIG. 35.



There are a great variety of Re-action Water Motors in use, one claiming one form, and another claiming a different form or arrangement, as being the best. By some it is said the horizontal shaft is just as good as the vertical, while another asserts the perpendicular is the only one adapted to the nature of the action of the wheel. One claims the centre vent as the best mode of employing the water wheels, another sees nothing but what is objectionable in thus using the water. The facts of superiority and inferiority of one and the other form have yet to be collected. Fair and full trials have not yet been conducted upon such a scale as will warrant dogmatic conclusions. Many patents have been granted in our country on such kinds of water wheels, and to tell the essential difference between them and the principle involved in the patents, the most acute lawyers would find their learning sadly out of joint, even if they were to require an explanation from the Bureau at Washington. Almost every form of this kind of wheel may now be used as public property by any one who may choose to do so. A few, showing

FIG. 36.



some variety of form, will be presented, one of which is shown by the top view, fig. 37, and its side section, fig. 38. A is the shaft, B is the side circular band or flange of the buckets; D is the cylindrical block on which the buckets, C, are cast. The whole of these parts may be cast in one piece—this is the cheapest way to do it. The wheel is placed in a water-tight case and a shield above, like that of the French Turbine, may conduct the water to the buckets. The lower gudgeon of the shaft, A, should be set in an oil box fixed in a step below. The upper gudgeon should also be set to run in a bearing box above, and on the top should be a bevel wheel to gear into any pinion upon a cross shaft, or if it is desired to use the wheel for grinding, the lower stone may be secured to a block or bed, and held stationary near the top of the shaft, (the shaft passing through it), while the upper stone may be secured on the top of the shaft, to move with the speed of the wheel. For farmers who have small streams on their farms, such a wheel is very cheap, either for grinding or for working other machines. Instead of a bevel wheel on the top, a large pulley with a groove in it may be used on top of the shaft, and a band from it, may drive various machines. A wheel of three feet in diameter, large enough, with plenty of water to drive a threshing mill, circular saw, and other machinery, should not cost over \$100.

### New Jersey Zinc and Franklinite.

In Sussex County, N. J., midway between Sparta and Hamburg, there are immense quantities of zinc ore and franklinite. The zinc ore is and is mixed with franklinite, (an oxide of red iron) and some manganese; itself is a volatile metal when heated up to a certain temperature, but neither of the other two are. To reduce the zinc from the ore, the flux is either charcoal, coke, or the purest anthracite, and the result is a metal, obtained of chemical purity, well adapted, as chemists now generally understand, for the most delicate chemical tests. The white is also a pure substance of zinc and oxygen.

The operations of the company owning the mines, are at present confined to the manufacture of white and brown paints from the zinc ore. For this purpose they have erected furnace buildings, mills, machine shops, &c., at Newark, where they own a valuable property of forty acres, between the Passaic river and the Morris Canal. About fifty tons of ore are mined and hauled to the feeder of the Morris Canal daily. This is transported by the canal to the works in Newark. The present furnaces and machinery are equal to the manufacture of about 2,000 tons each of the white and brown paint annually. White zinc paint has heretofore been imported from France, where it is manufactured of zinc metal, and sold at 13½ cents per lb. Its superiority in color and durability over white lead, becoming in fact whiter by age, is proved by the high price it bears. The New Jersey company can manufacture this paint cheaper than white lead can be made, and thus monopolize the sale. The brown paint is much used for painting outside work, iron, brick, &c. It possesses galvanic properties, and having a strong metallic basis, resists fire when put upon wood. The sale of this paint is only limited by the facilities of the company to produce it. It is made simply by crushing and grinding the zinc ore in oil. It has long been a desideratum among the scientific men of the world to find some mineral substance which would possess all the qualities of a superior paint, and yet be free from any ingredients which might have a tendency to impair the health of the workmen.

The franklinite which is in great abundance in New Jersey is, however, beginning to attract a great deal of attention. This ore of iron, makes excellent iron. It becomes magnetic by calcining, and is therefore a magnetic iron ore, in which state it can easily be separated from the zinc ore by revolving magnets, when a very pure metal is produced from the same by the ordinary methods.

### New Discovery of Daguerreotype.

In our article, page 189, on Actinism, we stated that we had been informed that one of our artists had discovered a process of taking pictures, showing all the colors as well as the lights and shadows.

The discoverer is a Mr. L. L. Hill, of Westkill, Greene Co., N. Y. In a recent article in the *Photographic Art Journal*, he says "the discovery is due to some chemical compound, a nondescript to me, though I have made the science of chemistry my study for years. That it is a new substance, or combination of substances, I am positive; and this is all I know concerning it. It is simply and easily produced, but not by any law stated in the large number of chemical works with which I am familiar. Doubtless however a correct and thorough analysis will determine its nature."

He had 40 specimens of pictures taken by his discovery at the date of his letter to the *Journal* spoken of. Three of these are thus described:

1. A view, containing a red house, green grass and foliage, the wood color of the trees, several cows of different shades of red and brindle, colored garments on a clothes-line, blue sky and the faint blue of the atmosphere; intervening between the camera and the distant mountains, very delicately spread over the picture as if by the hand of a fairy artist.
2. A sunset scene, in which the play of colors upon the clouds is impressed with a truthfulness and gorgeous beauty which I cannot describe.
3. Several portraits, in which I have the true complexion of the skin, the rosy cheeks

and lips, blue and hazel eyes, auburn, brown, and sandy hair, and every color of the drapery. Changeable silk is given in all its fine blendings of colors, and delicate richness of hues. I not only get red, blue, orange, violet, &c., but their various tints. The whole impression, including the lights and shades, is far more brilliant, round, and mellow than the most superb daguerrean image I have ever seen."

He adds:

"I have a most exquisite type of my little girl, (one year old,) taken in the act of crying, the plate not having been exposed a full second. At the same time, my light required fifteen seconds for a daguerreotype. This picture has caught the expression perfectly both of the eye and whole face. On one cheek is seen a bright tear drop, and the color showing through it much deeper than the surrounding parts; which latter, I suppose, is owing to the refractive action of the fluid."

The discovery is named Hillotype. The only difficulty now experienced is in taking yellow colors. We hope this discovery is all that it is stated to be.

### LITERARY NOTICES.

AMERICAN RAILWAY GUIDE, for March, is issued and for sale by Curran Dinamore, the publisher, 138 Fulton street. It embraces all the information a person can desire about the different routes, starting time of trains, etc. It is a valuable work, and should be in the possession of every one intending to travel. We have found it exceedingly useful, as oftentimes the patience of ticket masters is so completely exhausted by questions that the "reply courteous," is forgotten. This Guide saves the mortification of a sharp shot from an insolent ticket clerk. Price 12½ cents.

STANFIELD HALL, an Historical Romance, by I. P. Smith, Esq., author of "The Jesuit," "Robin Goodfellow," etc.; published by W. F. Burgess, No. 22 Ann street, at 50 cts. per volume, pp. 224 each. This is said to be one of the most powerfully written romances since the days of Sir Walter Scott. It possesses high dramatic interest, and embraces the exciting period of English history during the reign of Henry VIII. It is a work of no ordinary brilliancy and stamps the author as a man of genius.

We have received from Messrs. Dewitt & Davenport, Agents, Tribune Buildings, No. 34 Shakespeare's Dramatic Works; published by Messrs. Phillips, Sampson & Co., Boston, Mass.; it contains "Pericles, Prince of Tyre," embellished with a beautiful engraving of "Thasia." This number closes the sixth volume. Price 25 cents per number.

"The U. S. Railroad Guide and Steamboat Journal," March number. This comprehensive and useful guide to travellers, is published every month, revised and corrected, by G. R. Holbrook & Co., 114 Nassau st. For sale by Dexter & Bro., Ann st.

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