

**For the Scientific American,
Flame.**

Flame is volatile matter heated so as to become luminous. The light evolved is in proportion to the quantity of solid matter present in the combustible.

The element called hydrogen, is an example of the purest form of flame.

Hydrogen gas may be evolved in the following manner; place an ounce of small fragments of the metal zinc, in a wide-mouthed pint bottle; dilute two fluid ounces of sulphuric acid, with four ounces of water, in an earthen jug; this must be done by adding the acid very gradually to the water, and stirring them together with a piece of wood or a glass rod: the mixture becomes very hot and must be allowed to cool, and then one half is to be poured into the bottle containing the zinc; a brisk effervescence ensues, which is due to the evolution of hydrogen, the mouth of the bottle is then to be closed with a cork through which passes a brass tube nine inches long and rather more than a quarter of an inch diameter at its lower end, and so small at the other as only to admit of the entrance of a large sewing needle. Permit the effervescence to continue for about three minutes then hold a lighted slip of paper to the small aperture of the brass tube, and the hydrogen which is thence escaping will kindle and burn with a pale flame; until the effervescence ceases.

The pale flame of hydrogen is scarcely visible in broad day-light, and is invisible in bright sun shine: it is a type of pure flame, containing no solid matter producing no solid matter, but only the vapor of water by uniting with the oxygen of the air.

The flame of hydrogen, though exceedingly pale is intensely hot, as may be proved by a simple experiment. Take a platinum wire twelve or fourteen inches long, and as fine as ordinary sewing thread, tangled into a flat knot, leaving only two inches straight; hold this and place the knot in the flame of the hydrogen, the platinum will become white hot, and glow with great brilliancy; but it does not consume, it will be found unaltered after the experiment.

The term *Ignition* and *combustion* are commonly regarded as synonymous, but they denote two perfectly distinct phenomena. *Ignition*, (from the Latin *ignis*, fire,) is the evolution of light from a solid body, at an elevated temperature; it is neither necessarily attended by change of form nor new products. The white hot platinum wire is an example of pure ignition, and it will exhibit the same curious phenomena at any future time.

Combustion, (from the Latin *comburo* to burn,) is the evolution of heat and light from a body necessarily attended by change of form and new products; or, it may be defined, as a manifestation of intense chemical affinity between two or more bodies, attended by the evolution of heat and light, and the production of new compounds. The flame of hydrogen is an example of pure combustion or affinity between the evolving hydrogen, and the oxygen of the air; the two elements combining to produce the compound called water.

It is true that many substances undergo temporary ignition previous to combustion, and upon this fact is founded an explanation of the great light of common flames, for, example, instead of holding the platinum wire in the flame, as above described, let a little fine charcoal dust be shaken through the flame, and light nearly equal to that of a candle is instantly evolved.

The charcoal is solid matter, and also combustible matter, therefore, the intense heat of the hydrogen flame momentarily ignites it, in which heated state it exerts affinity for the oxygen of the air, and then burns. Light is elicited from the ignition and from the combustion, the result of which is carbonic acid gas.

Labor in the United States.

It has been officially stated that there are 3,719,000 persons engaged in agricultural pursuits in the United States; in manufactures, 781,800; in commerce, 119,600; in learned professions, 65,200; in ocean navigation 55,000, and in internal navigation no less than 33,000.

Medical Uses of Salt.

In many cases of disordered stomach, a teaspoonful of salt taken three times a day is a certain cure. In the violent internal aching, termed cholera, add a tablespoonful of salt to a pint of cold water, drink it and go to bed; it is one of the speediest remedies known.—The same will revive a person who seems almost dead from a heavy fall, &c. In an apoplectic fit no time should be lost in pouring salt and water down the throat, if sufficient sensibility remain to allow swallowing; if not, the head must be sponged with cold water until the senses return, when salt and water will completely restore the patient from the lethargy. In the fit the feet should be placed in warm water, with mustard added, and the legs briskly rubbed, all bandages removed from the neck, &c. and a cool apartment procured if possible. In many cases of severe bleeding at the lungs, when other remedies fail, Dr. Rush found two teaspoonsful of salt completely stayed the flow of blood.—In cases of bite from a mad dog, wash the part with strong brine for an hour, then bind on some salt with a rag. In toothache, warm salt and water held to the part and renewed two or three times will relieve in most cases. If the gums be affected, wash the mouth with brine; if the teeth be covered with tartar, wash them twice a day with salt and water.—In swelled neck wash the part with brine, and drink it also, twice a day until cured.—Salt will expel worms if used in the food in moderate degree, and aids digestion, but salt meat is injurious if much used.

It is reasonable to suppose that what is most plentiful on earth, is most essential to the wants of man. But we in general invert the order of nature, placing the greatest value on those things that are difficult to obtain. We burrow in the earth to obtain gold from its bosom and consider it our all in all, whereas we can neither eat nor drink it. When sickness lays its clammy hand on man, he is not apt to look to simple water as a remedy for his disease, but like the Assyrian general when told by the prophet to bathe in Jordan, and be cured of his leprosy, he scouts the simplicity of the act and the medicine, and turns away. As it was with the Philistine warrior, so it is with men at the present day, with but few to retract wisely like him, their first doubts. Simple salt, is almost a cure for every thing with sailors,—our landsmen would rather seek medicines that come from the Persian Gulf or the wilds of Hindostan.

Rhodium.

Rhodium is a metal discovered by Dr. Wollaston in 1803, in the ore of platinum. It is contained to the amount of three per cent in the platinum ore of Antioquia in Columbia, near Barbacoas; it occurs in the Ural ore, and alloyed with gold in Mexico. The palladium having been precipitated from the muriatic solution of the platinum ore previously saturated with soda, by the cyanide of mercury, muriatic acid is to be poured into the residuary liquid, and the mixture is to be evaporated to dryness, to expel the hydrocyanic acid and convert the metallic salts into chlorides. The dry mass is to be reduced to a very fine powder, and washed with alcohol of specific gravity 0.837. This solvent takes possession of the double chlorides which the sodium forms with the platinum, iridium, copper and mercury, and does not dissolve the double chloride of rhodium and sodium, but leaves it in the form of a powder, of a fine dark red color. This salt being washed with alcohol, and then exposed to a very strong heat, affords the rhodium. But a better mode of reducing the metal upon a small scale, consists in heating the double chloride gently in a glass tube, while a stream of hydrogen passes over it, and then to wash away the chloride of sodium with fresh water.

Rhodium resembles platinum in appearance. Any heat which can be produced in a chemical furnace is incapable of fusing it; and the only way of giving it cohesive solidity, is to calcine the sulphuret or arseniuret of rhodium in an open vessel at a white heat, till all the sulphur or arsenic be expelled. A button may thus be obtained, somewhat spongy, having the color and lustre of silver. According to Wollaston, the specific gravity of rhodium is 11. It is insoluble by itself in any acid;

but when an alloy of it with certain metals, as platinum, copper, bismuth or lead, is treated with aqua regia, the rhodium dissolves along with the other metals, but when alloyed with gold or silver it will not dissolve along with them. It may, however, be rendered very soluble by mixing it in the state of a fine powder with chloride of potassium or sodium, and heating the mixture to a dull red heat in a stream of chlorine gas. It thus forms a triple salt, very soluble in water. The solutions of rhodium are of a beautiful rose color, whence its name. In the dry way, it dissolves by heat in bisulphate of potassa; and disengages sulphurous acid gas in the act of solution. There are two oxides of rhodium. It combines with almost all the metals; and, in small quantity melted with steel, it has been supposed to improve the hardness, closeness and toughness of this metal. Its chief use at present is for making the inalterable nibs of the so-named rhodium pens.

Roman Artificial Pearls.

The nucleus of these pearls is formed of small pieces of fine grained alabaster. Holes are drilled through small blocks of this substance, and they are then shaped with the knife. These little blocks are afterwards coated. For this purpose the pearly and shining parts of oyster and other shells, is carefully separated from the white, opaque and rough parts, and is reduced to fine powder, which is mixed with a solution of isinglass in proof spirit, or with white transparent size of proper consistency. The beads are stuck on the points of slender pieces of bamboo, and dipped into the solution above mentioned; and then the other end of the pieces of bamboo are stuck in earth contained in pots, so as to stand upright, and at such a distance as to keep the beads from touching each other.—This is performed in a warm room, and as soon as the coat is dry, the beads are again dipped in the pearly composition, and the operation is repeated until the beads are sufficiently coated. Beads so made, are extremely durable, and not so liable to injury as those made of glass bulbs, coated interiorly with the powder of the scales of the bleak, fixed with isinglass, and afterwards filled up with wax.

Families of Literary Men.

Men of genius, says a speculative genius in the Quarterly Review, seldom leave more than "a brief progeny behind them. With the exception of Surrey and Spencer, we are not aware of any great English author of at all remote date, from whose body any living person claims to be descended. There is no other real English poet prior to the middle of the eighteenth century, and we believe no great author of any sort, except Clarendon and Shaftsbury, of whose blood we have any inheritance amongst us. Chaucer's only son died childless; Shakspeare's line expired in his daughter's only daughter. The granddaughter of Milton was the last of his blood. Newton, Locke, Pope, Swift, Arbuthnot, Hume, Gibbon, Cowper, Gray, Walpole and Cavendish, never married." Yet for all this, no theory can be formed from the facts set forth, as many great men have transmitted through successive ages a numerous posterity, while many men destitute of either talent or genius have left no family tree behind them.

Ruins of Baal-bek.

Baal-bek, valley of Baal, is the Arabic name. As Constantinople is the Stamboul of the Turks, and Damascus in El Sham. In consequence of the burning of the Alexandrian and other libraries, the ancient history of this place is very much lost. It was doubtless much of the same age with Heliopolis in Egypt, and was established soon after the deluge. Two perennial streams, the Litane and Bourauni, flow into the valley. The goodly Lebanon in its full sublimity extends up and down, ridge beyond ridge, perhaps twenty miles distance in the west, and Anti-Lebanon, its fraternal mountain, ranges up and down in the East, twelve miles distant. Simple, attractive, majestic, awe-inspiring, is the scene. Yet this might have had little or no influence in the selection of the spot, even in a superstitious age. Heliopolis or Baal bek is now a small town of little importance. The soldiers barracks, constructed by Ibrahim Pacha and now vacant, make quite a show. An

ancient wall, skirting the hills, may mark out the boundary of the former city. Pillars and tombs in the vicinity would in a different situation attract some attention; but silence reigns, where busy and joyous multitudes once lived! No sound of hammer or axe is heard, no bell or trumpet, no shout of men or laugh of children, from morning to night—There 3000 years ago were assembled the dense multitude under the open heaven to bow in humble prostration to the sun. A splendid idolatry was long sustained. Human victims were probably often offered in sacrifice. The stones near the foundation on the north side are immense in measurement, and grooved exactly in the style of those in the foundation of Solomon's temple at Jerusalem.

Foes of the Rattlesnake.

The rattlesnake has a superior foe in the deer and blacksnake. Whenever a buck discovers a rattlesnake in a situation which invites attack, he loses no time in preparing for battle. He makes up to within ten or twelve feet of the snake—then leaps forward and aims to sever the body of the snake with his sharp bifurcated hoofs. The first onset is most commonly successful, but if otherwise the buck repeats the trial, until he cuts the snake in twain. The rapidity and fatality of his skillful manœuvre leaves but slight chance for his victim either to escape or eject his poison into his more alert antagonist. The blacksnake is also more than an equal competitor against the rattlesnake. When the black and rattlesnakes are about to meet for battle, the former darts forward at the height of his speed, and strikes at the neck of the latter with unerring certainty, leaving a foot or two of his own body at liberty. In an instant he encircles him within five or six folds, and then stops and looks the strangled and gasping foe in the face, to ascertain the effect produced upon his corseted body. If he shows signs of life, the coils are multiplied and the screws are tightened—the operator all the while narrowly watching the countenance of the helpless victim. Thus the two remain thirty or forty minutes—the executioner then slackens one coil, noticing at the same time whether any signs of life appear, if so, the coil is resumed, and retained, until the incarcerated wretch is completely dead. The moccasit snake is destroyed in the same way.

The Forests of Oregon.

It is more especially in the forest that the grand, the picturesque, the sublime, the beautiful, form the most singular and fantastic combination. From the loftiest giants of the forest, down to the humblest shrubs, all excite the spectators astonishment. The parasites form a characteristic feature of these woodlands. They cling to the tree, climb it to a certain height, and then, letting their tops fall to the earth, again take root—again shoot up—push from branch to branch—from tree to tree in every direction—until tangled, twisted, and knotted in every possible form, they festoon the whole forest with drapery, in which a ground work of the richest verdure is diversified with garlands of the most varied and many colored flowers. In ascending the Columbia, we meet, from time to time, with bays of considerable extent, interspersed with handsome little islands, which, thrown as it were, like groups of flowers and verdure, present the most charming spectacle. Here the painter should go to study his art—here would he find the loveliest scenery the most varied and brilliant coloring.—At every step the scene becomes more ravishing the perspective more noble and majestic. In no other part of the world is nature so great a coquette as here.

Effect of the Spirit Rations in the British Navy.

We learn by recent intelligence from England, that the British Government have issued orders to all its consuls in different parts of the world to institute inquiries into the character and capabilities of British seamen as compared with those of other nations. The result thus far shows that the British seamen are below others in morals, and as seamen are much less efficient than our own. This has been attributed to the spirit rations in the navy.