For the Scientific American.

Poisonous Acids.—Hydrocyanic Acid.

(*Concluded.*)

It has been stated that Prussic acid might in some instances be formed by the decomposition of the natural fluids in the human stomach. This opinion is very far from being a frivolous one, when we take into consideration that our Prussian blue is all made from animal products, horns, hoofs,&c. Some have ascribed the rapid deadly effects of Prussic acid to its action upon the nervous system If the odor of this acid makes a person fall down as if struck with apoplexy, and if a few drops make him stagger and die in an instant, no one will mistake the system upon which it operates—it surely must be the nervous.

It is barely possible that any person ever can be poisoned by Prussic acid forming on the stomach. Prussic acid consists of 26 cyanogen plus, 1 hydrogen—or of 14 nitrogen plus, 12 carbon plus, 1 hydrogen Cyanogen is a gas of a strong and peculiar odor, resembling that of rubbed peach leaves. It is highly poisonous and unrespirable, and burns with a rich purple flame. It is composed of carbon and nitrogen, in the proportions of 12 carbon plus, 14 nitrogen, equal to 26 cyanogen. It combines with hydrogen, to produce the hydrocyanic or Prussic acid. The question has arisen, can Prussic acid ever be formed in the stomach ? Or can it be emitted during the decomposition of animal and vegetable substances ? This acid is generated in sensible qualities, by the action of weak nitric acid, on the volatile oils and resins ; and it exists in a great variety of native combinations in the vegetable kingdom. The most familiar of these, are bitter almonds, the cherry laurel, the leaves of the peach tree, the kernels of fruits, pipes of apples, &c. The distilled water and oil of cherry laurel, are the most destructive of all narcotic poisons.

Though like alcohol, Prussic acid is a product of art, yet it will be seen, as above, to exist in some plants. It is now generally considered that this baneful acid does not preexist in those vegetables above named, but results from the re-action of water. It is supposed to have been proved, that it is formed out of a substance of peculiar properties, denominated *amygdalin* which is the characteristic constituent of bitter almonds. To show what probability there may be of Prussic acid being generated in the human stomach, or emitted after death from animal decomposition, it seems to be necessary to give a kind of analysis and synthesis of this poisonous compound.

Prussic acid and water contain the elements of carbonic acid, ammonia, urea, cyanuric acid, cyanillc acid, oxalic acid, formic acid, melam, ammelin, melamin, azulmin, mellon, hydromellic acid, allantoin, &c. All these very different substances can be obtained from Prussic acid, and the elements of water by various chemical transformations.

It is well known by analysis, that Prussic acid and water, when brought into contact with hydrochloric or muriatic acid, are decomposed into formic acid and ammonia. The nitrogen of the Prussic acid, and a certain quantity of hydrogen of the water, unite together and form ammonia—whilst the carbon and hydrogen of the Prussic acid combine with the oxygen of the water, and form formic acid. The ammonia combines with the hydrochloric acid, and forms hydrochlorate of ammonia The formic acid and ammonia, the products of decomposition, contain the elements of Prussic acid and water, although in another form, and arranged in a different order. Thus we may analyze Prussic acid by other agents than muriatic acid, and form all the above named substances, but a desideratum is to ascertain whether any of the above named substances, are ever found in the stomach. Some of them can be detected there, while others cannot. Carbonic acid is frequently there, and so also is ammonia—but urea, cyanuric acid, oxalic acid, formic acid, &c., perhaps never. Thus it may be barely possible for Prussic acid to be generated in the stomach, and emitted during decomposition.

Artificial Light.

In the solar rays, three tints are so combined, that in their transmission through the azure atmosphere, they yield a perfectly colorless light. These rays are red, yellow and blue, and it is to the just and exact balance of these colors, that we owe our pure light In artificial light, however produced, the equipoise is disturbed—the red and yellow tints predominate to a great extent over the third color, the blue, and thus, all light so produced affects the natural and true color of existing objects. To this reason we have to attribute the difficulty of discriminating between delicate tints when viewed by the light of a candle.

When luminous rays are transmitted through tinted glass, it is known that those colors which are complementary to that of the glass are in part neutralized, and the transmitted light is modified according to the colour of the medium employed. Experience tells us that the excess of colour in artificial light exists in the red and yellow tints ; the corrective medium, then, must be blue, in order to cause the transmitted light to become achromatic. The depth of colour (which is to be obtained from cobalt) of the glass, must depend materially on its form and thickness, and the nature of the uncorrected light ; this point must rest for its complete elucidation upon the manufacturer's experience.

Artificial light to be tested, should be enclosed in a fitting box or lantern, let a direct ray fall on a white substance, as paper, side by side with a direct ray of a warm sunlight in a room to which no other ray of light has access. So long as the ray of corrected artificial light is of a warmer or ruddier quality than the ray of solar light, the achromatic power is short of its highest intensity, and therefore within the range of true achromatic powers, or further and more perfect correction. If the artificial light appears colder or bluer, the medium is too deeply tinged, and is not an achromatic but a coloured medium, applicable in no way to the improvement of artificial light by the correction of the excess of coloured rays emanating therefrom. If the qualities of the respective rays be the same, then it will be evident that the highest point has been reached, and the medium is at its highest available power or state.

Paraffine.

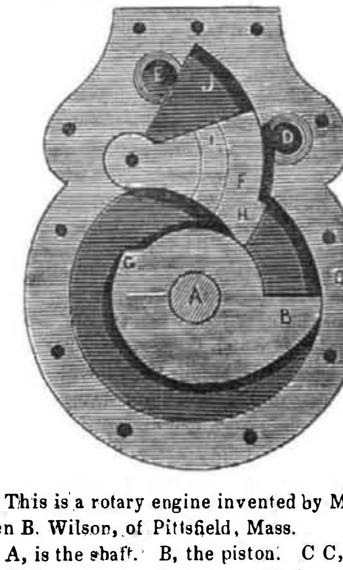
Distil beach tar to dryness, rectify the heavy oil which collects at the bottom of the receiver, and when a thick matter begins to rise, set aside what is distilled, and urge the heat moderately as anything more distills. Pyretaine passes over, containing crystalline scales of paraffine. This mixture being digested with its own volume of alcohol of 0.833, forms a limpid solution, which is to be gradually diluted with more alcohol, till its bulk becomes 6 or 8 times greater. The alcohol, which at first dissolves the whole, lets the paraffine gradually fall. The precipitate being washed with cold alcohol till it becomes nearly colorless, and then dissolved in boiling alcohol, is deposited on cooling in minute spangles and needles of paraffine. Or the above mixture may be mixed with from one quarter to one half its weight of concentrated sulphuric acid and subjected for 12 hours to digestion, at a heat of 150° F. till, on cooling, crystals of paraffine appear upon the surface. These are to be washed with water, dissolved in alcohol and crystallized. Paraffine is a white substance, void of taste and smell, feels soft between the fingers, has a specific gravity of 0.87, melts at 112° F., boils at a higher temperature with the exhalation of white fumes, is not decomposed by dry distillation, burns with a clear white flame without smoke or residuum, does not stain paper and consists of 85.22 carbon, and 14.78 hydrogen ; having the same composition as olefiant gas. It is decomposed neither by chlorine, strong acids, alkalies, nor potassium ; and unites by fusion with sluphur, phosphorus, wax and rosin. It dissolves readily in warm fat oils, in cold essential oils, in ether, but sparingly in boiling absolute alcohol. Paraffine is a singular solid bicarburet of hydrogen ; it has not hitherto been applied to any use, but it would form admirable candles.

History of the Rotary Engine.

Prepared expressly for the Scientific American.

WILSON'S ROTARY ENGINE.

FIG. 59



This is a rotary engine invented by Mr. Allen B. Wilson, of Pittsfield, Mass.

A, is the shaft. B, the piston. C C, is the cylinder. D, the steam pipe. E, the exhaust. F, is a valve thrown into the socket I, by the piston passing under it. G, is a projection which raises the valve at H, when one third round, thus cutting off to receive the benefit of the expansion of the steam. L, is a mortice through the valve indicated by the dotted lines for the steam to exhaust through E.

This rotary engine has a very good principle in it. It is double with a plate between the two pistons, which are placed at right angles to one another in the cylinders.

Marine Glue.

Digests from two to four parts of caoutchouc, cut into small pieces, in thirty-four parts of coal-tar naphtha, promoting solution by the application of heat, and by agitation. The solution, when formed, will have the consistency of thick cream ; to this add 62 to 64 parts of the powdered shellac, and heat the mixture over the fire, constantly stirring it until complete fusion and combination has been effected. Pour the mixture, while still hot, on plates of metal, so that it may cool in thin sheets like leather.

In using the cement, put some of it in an iron vessel, and heat it to about 248° Fah., and apply it with a brush to the surface to be joined. It is said to make a perfect union of pieces of wood, and is recommended for use in ship-building ;—hence its name.

Keene's Marble Cement.

Gypsum is baked in the same way as for making plaster-of-paris ; it is then soaked in a saturated solution of alum ; again baked to the same degree as before, and ground to a fine powder. It is now in a fit state for use. On being worked in the same way as plaster-of-paris, it sets into a very hard composition which is capable of taking a high polish. It may be coloured by mixing the powder with water containing any mineral colours, instead of common water.

To make Sea Water fit for Washing Linens at Sea.

Soda put into sea-water renders it turbid; the lime and magnesia fall to the bottom. To make sea-water fit for washing Linen at sea, as much soda must be put in it, as not only to effect a complete precipitation of these earths, but to render the sea water sufficiently lixivial or alkaline. Soda should always be taken to sea for this purpose.

A Cheap Blacking for Shoes.

In three pints of small beer, put two ounces of ivory black, and one pennyworth of brown sugar. As soon as they boil, put a desert spoonful of sweet oil, and then boil slowly till reduced to a quart. Stir it up with a stick every time it is used ; and put it on the shoe when wanted.

Another :—Ivory black, two ounces; brown sugar, one ounce and a half; sweet oil, half a table spoonful. Mix them, and then gradually add a half a pint of small beer.

LITERARY NOTICES.

Minifie's Drawing Book.

A certain London publisher being asked his opinion about a certain work he had issued, replied, " I have sold 5000 copies in one day." This was a conclusive argument in favor of the book. We cannot say how many copies of Minifie's work have been sold in one day, throughout the country, but its sale with us has been of an extraordinary character and it is a book that deserves it.

Linear Perspective.

This is a new work, by E. Jones, Esq. published by C. M. Saxton, 121 Fulton st. this city. It is to be published in monthly parts, at 25 cents each, and will thus be brought within the reach of all. It is a neat and lucid work, characterized by that perfect acquaintance with the art, which distinguishes the author.

Guide to the Temple of Fame.

This is a neat little volume embracing a Universal History for Schools, by Emma Willard, published by Barnes & Co. No. 51 John street. The style is clear and the thread of the history is a silver cord.

The American Phrenological Journal for April, by its able conductors, the Fowlers, is an interesting number. To those who wish to know about the great Swedenborg we commend this number.

" The Saturday Rambler," published in Boston, by Wm Simmonds & Co. is a very ably conducted, interesting family paper. It is worthy of patronage.

" Scotts Weekly," published at Philadelphia, is also an excellent paper, and we hope it will visit us more regularly. We always look for it, sometimes to our disappointment.

Mr. Ritchie, engraver of our city, has just produced an inimitable likeness of Henry Clay from a Portrait by Jarvis. It is a vigorous and spirited portrait—full of intellect and animation. The great fault which we have found with mezzotints, is their tameness—unsuited to bold display. No fault of this kind can be found in this engraving, it looks like a line engraving, and we have been told that his plates after printing 12,000 impressions exhibit no perceptible change.

Subscribers in want of any of the Mechanical works noticed in the previous numbers of the Scientific American, can order them through this office. We have and shall endeavor to oblige our patrons with any article they may need from this city, and we have only to request them to be as explicit in their communications as possible, which will save us much trouble.