Carburetted Hydrogen.

Messrs. Editors—I was some years ago led to inquire what was the cause of the blue flame immediately around a gas burner, and at first supposed that it was owing to the impurity of the gas, but experiment led me to a different conclusion. Remembering the well-known phenomenon, that in soldering any article of jewelry, the white flame of a candle was, on the application of the blow-pipe, converted into a blue light similar to the flame of alcohol, it led me to make the following experiments:—I procured a common hog's bladder, and after expelling all the air, I tied the open end over a common gas burner, and inflated it with gas, —carefully removing it, I inserted a burner into the open end, and tied it securely. Putting it under my arm, the results were these: with a moderate pressure of the arm I obtained the usual light, but on increasing the pressure to a certain extent, I was surprised to find that instead of obtaining more light, the gas burned with a perfectly blue flame, and the room which was in the first place illuminated, suddenly became quite dark, although it is evident that with the increase of pressure there was an increased consumption of gas. I also found that the heat was in the first case moderate, and in the second very intense, so much so that it readily melted gold and silver. Inflating the bladder again, as before, with the exception of adding about one-fourth common air, I found it to burn with the blue flame, but I could not produce the white light, however I might vary the pressure, but as before, it produced a very intense heat.

Recently I have made some experiments with what might be called the sieve burner, now frequently met with in restaurants, where it has taken the place of alcohol, heretofore used for keeping dishes hot, for which purpose, as well as many others, it is really a very excellent as well as economical article. I constructed one very cheaply by drawing some fine brass wire gauze over the mouth of a common pint tin cup, and making a hole in the bottom sufficiently large to fit tightly over a gas burner. I placed it over the burner, turned on the gas, and lighted it, when I found it to burn with a blue flame, not distinguishable from that of alcohol. Putting a cup containing a pint of water over it, I found it to boil it 21 minutes, with a consumption of 45 feet of gas. Taking off the water as well as the sieve burner, without touching the stop-cock, I lit the ordinary burner, and placing the same cup, with the same quantity of water as before, I found it to boil in 62 minutes. I subsequently tried the sieve burner over again, but turning on the whole head, the gas first issuing as before through a common four feet burner, and then through the sieve. In this case the water boiled in ten minutes, and I have no doubt that with properly arranged apparatus (mine being very imperfect) the same quantity of water can be made to boil in five or six minutes. This great disparity between the heating qualities of the two burners, I believe to be partly owing to the lamp-black which always forms under the vessel over the usual white light, but which is entirely absent when using the sieve burner. Lamp-black, as is well known, is a bad conductor of heat, and by its presence prevents the heat from penetrating to the fluid; yet I do not think that is the entire cause. It appears to me to be owing to the converting of light into heat, as the sieve burner as well as my other experiments appear to do, and this in spite of the well known law, that light and heat are two separate and distinct elements, yet my experiments with the bladder would appear to warrant the conclusion, that each is convertible into the other, for with a very light mechanical pressure I obtained, what you might call all light, and with a strong pressure, all heat; yet neither the one nor the other were what could be called absolutely disconnected from the other. From my first experiment I was led to very important practical conclusions; they are these, that the gas company can, by increasing the mechanical pressure, force you to consume more gas; although with the increase there is no increase of light, and as it is for the light you want it, it is evident you are paying for a thing for which you get no equivalent—at least not the kind of equivalent you want; and it is to their interest that your bills are large, although they furnish you with the quantity of gas they charge you for, as they can make a large quantity at a much cheaper rate than a small one. This fact is well illustrated in our city. The Northern Liberties Gas Company cannot afford to sell their gas for less than $3 per 1,000 feet, whereas the City Gas Co. charge $2; this company has about four times the consumers that the Northern Liberties has, yet one makes about the same profit as the other, Also they can, if they choose, adulterate their gas with air, which, if added in small quantities, will be very difficult to detect. I also endeavored to catalyze the gas, by passing it through spirits of turpentine, with a view of improving the whiteness of the light, but without success.

Jno. F. Mascher.

Philadelphia, Nov. 21, 1853.

[We request particular attention to the foregoing experiments, and the conclusions deduced from them by Mr. Mascher. This is a subject which concerns all who consume gas, as it relates to the quality of their light and its cost. It is also a question of no little philosophic importance; it is confirmatory of our opinions respecting light and heat. We believe that electricity, light, and heat are convertible into one another, when the proper conditions of developement are present.—[Ed.

More about the Potato Disease.

On page 72, this volume, "Scientific American," we published some remarks of Herapath, the eminent English chemist on the potato disease. Since that time he has sent another communication on the subject to the "London Chemical Gazette," which describes the modes of treating potatoes for planting in order to carry out the recommendation presented in the article referred to, for preventing the disease. This disease he attributes to the methods of cultivation long persisted in, in rearing and propagating this excellent esculent. He chiefly blamed the indiscriminate use of organic manure, instead of mineral fertilizers, which latter, were chiefly used when the potato was first introduced.—The changes which he proposed in treating this root were; 1st, in carefully drying the seed potatoes. 2nd, in steeping them in a solution of the sulphate of copper; 3rd, in planting them in *poor* well-drained land; 4th in substituting mineral for barn yard manure. The following information he now presents for carrying out these recommendations; and since potatoes are selling at one dollar per bushel in this city, it is certainly worth the attention of our farmers to try by every means to improve their potato crops both in quantity and quality:

Dessication of Tubers.—The apparatus employed to effect this object should consist of a large heated chamber, similar in character to the so-called "stoving room" of a sugar refinery, or of a long room fitted up with shelves for the reception of the roots, and heated by means of steam pipes, or stoves placed at intervals, and so arranged that a current of air can be made to pass over the tubers, which can be thus rapidly and effectually dried. The same end may be attained on a small scale by exposing the potatoes in layers on the floor of a warm room, or on a malster's kiln; precautions being taken to turn them over occasionally until they have become sufficiently desiccated, and thus promote free circulation of the air; but in practice it will be doubtless found preferable for some enterprizing parties to undertake the drying of the roots, which may be afterwards retailed to the agriculturists, &c. Great care, however, I find, must be taken in performing the operation; otherwise the vitality of the tubers is destroyed. A long-continued exposure in a dry atmosphere, at a moderate temperature, appears to afford the best results. The latter, under any circumstances, should never much exceed 110° or 112°. If the process has been well carried out, the dried roots, when rolled up in a damp cloth, or buried in the ground for a few days, will again be plump and fresh in appearance; whereas, on the other hand, if too high a temperature has been employed, they will, when thus treated, still remain comparatively hard and dry.

Steeping or Pickling Process.—Into a gallon of boiling water put a quarter of a pound of blue vitriol or blue stone (sulphate of copper) and stir the solution well from time to time with a piece of stick until the salt is completely dissolved. When the temperature of the mixture has been so lowered by evaporation and exposure that the hand of the operator can be immersed without any inconvenience, the dried tubers should be thrown into the vessel containing the "pickle," in which they should be kept for one or two hours, care being taken to stir them well two or three times during that interval. After they have been removed from the cupreous solution and well drained, they should be dusted over with a little air-slacked or mild lime, and planted in the usual way.—When, however, the drying process before described has not been resorted to, the tubers should be allowed to remain in the copper solution for thirty or thirty-six hours, and the pickle should be made of double strength.

Preparation of the Mineral Manures.—Mix intimately—

30 lbs. of wood ashes,
15 lbs. of calcined bones, in fine powder,
10 lbs. of gypsum,
20 lbs. of common salt,
30 lbs. of air-slacked lime, and
7 lbs. of nitrate of soda.

Whilst planting the potatoes, into every hole put about half an ounce of the above compost; cover the latter over with some earth, and then plant the tubers in the ordinary way. This manure may be easily prepared by any one at a very trifling cost, and may be measured out by means of a small tin cup, which, for convenience sake, should be suspended to the waist of the dibbler. On large farms, where the roots are set in drill-furrows, the compost may be more readily distributed by the manure-drill, or by hand in the usual manner. On most soils, however, a simple top-dressing of lime and salt, in the proportion of two bushels of lime to one of salt, will be doubtless found sufficient; the manure being employed at the rate of 50 or 60 bushels per acre. Where the land is rich, the admixture of cinders, coal ashes, or shell-sand with the soil will be found decidedly beneficial.

Alleged New Motive Power.

The "Paris Presse" says that a certain Dr. Carosio, of Piedmont, has invented an electro-magnetic apparatus, called the hydrodynamic pile, which, he asserts, will create a new motive power, and effect a revolution in the production of light and heat. The apparatus is based on the theory of electro chemical equivalents, and on what is called Faraday's law—namely, that the electric current is equal to the chemical action, and that, consequently, the electricity which serves to decompose water into oxygen and hydrogen gas, is equal to that resulting from the combination of two gases in forming water. The apparatus consists—1. Of an electric battery formed of several cells on the prinple of Grove's pile, in which the electric current is produced. 2. Of a series of cells in which water becomes decomposed, and produces oxygen and hydrogen. 3. Of two reservoirs in which the two gases accumulate under a pressure of several atmospheres. 4. Of two cylinders in which movement is produced by the elastic force of two gases, after having produced the movement, are reconducted anew, to be afterwards distributed in the cells of the battery to produce the electric current; and of some other machinery seeming to regulate the equilibrium of the pressure of the two gases to distribute acidulated water, &c. By this apparatus, Dr. Carosio obtains—1, the formation of water by the combination of oxygen and hydrogen gases. 2, an electric current always in proportion to the said combination. 3, the decomposition of the water in oxygen and hydrogen gas proportionate to the electric current, and equal to the quantity of water recomposed; and 4, the separation of the gases at the very point at which they begin to develope themselves. The gases, in passing into two reservoirs, in which they are retained under the pressure of a given number of atmospheres by the augmentation of their elasticity, produce movement by means of a mechanism similar to that of ordinary steam engines. 5, finally, after having produced the mechanical effect, the two gases are separately re-conducted into the apparatus, in which the recomposition of the water takes place, to repeat the same series of phenomena—the electric current, the decomposition of water, and movement."

This learned doctor is certainly a very ignorant man as it respects the application of forces to propel machinery. His plan is like the employment of a steam engine to pump water to the top of a fall, to run down again and drive a water wheel. He employs the electric current to decompose water, and then uses the force of the gases so produced to drive machinery. This force is said to be equal to that of the electric current which decomposes the water. Why then does he not employ that force first by an electro-magnet, instead of employing it second-hand. He is great upon effects, but blind to causes. The re-conducting of the gases back to the battery, is something altogether too vast for our comprehension. If the description had stated that he employed the electric current as a motive power through electro-magnets, and used the pressure of the hydrogen gas generated in the battery for mechanical purposes, then we would have concluded that he understood something of the matter, but no more than others.

Hydrochlorate of Soda in Bread.

Will you allow me just room enough to warn your readers against a very plausible recipe for making bread with muriatic acid and soda? It would be a nice recipe if the muriatic acid were pure. But I have found, from six years' experience in using it in cooking, (confirmed now by an assay of Dr. A. A. Hayes) that it contains, as ordinarily made, lead enough to give a man very severe dyspepsia, accompanied with pain in the bowels, weariness and low spirits. Three years ago, my physician told me I must be taking lead in some form; but I did not then suspect my muriatic acid of containing it. Dr. Hayes' assay has, however, shown me how difficult it is, sometimes, for us to detect the exact source of an admitted evil.

[The above is from the "Boston Traveller," and should be a caution to all housekeepers.—It was supposed by many that as the combination of muriatic acid (hydro-chloric acid) with soda formed common salt, liberating carbonic acid gas in the act of union, that these were the best substances which could be employed in making bread by instantaneous *raisings*.—It is difficult, however, to obtain pure acid, and the impure cannot be used with safety. After much consideration of the subject, we believe that raised bread made by any other process than vinous fermentation—not effervescence—is neither sweet nor healthy.

The Pacific Railroad.

We are glad to see that the Wall Street plan for swindling the public, by bribing Congress, meets with no favor from the public press. There is not now a single journal of respectability that dares openly to advocate it, while there are very few but what are energetic in their opposition to it. We are glad to see this: it speaks well for the trustworthiness of the press in general, as guardians of the public welfare. The "N. O. Bulletin" is very much astoned at the magnificent subscription of the ex-Secretary, rather broadly hinting that if his debts were paid, very little would be left for any sort of subscription. It even goes so far as to assert that one of the stockholders expressly declared that there was no intention on their part to pay a cent upon their subscriptions. An instalment of one mill (!) on the dollar has, however, been called for. We do not wonder that the Tribune calls this the "Moonshine Railroad Scheme."

New Heating Apparatus.

We have several times seen in our exchanges reference to an invention, by means of which, in the language of one of them, "the flame of an ordinary gas burner may be made to give off any desired amount of heat." Our readers will scarcely need to be told that this is an unmitigated humbug. No means whatever can be adopted that will cause the flame of an ordinary gas burner to give off a degree of heat sufficient to warm a room of ordinary size on a cold evening, still less to drive a steam engine. Perhaps, however, at second thought, the plan might do to propel a "caloric engine."