

lungs of mammals, their blood is aerated by it combining with carbon, and then it is expelled in carbonic acid—a gas composed of two equivalents of oxygen and one of carbon. If the oxygen were suddenly extracted from the atmosphere, every living being would die within the space of five minutes. The air most conducive to health contains only oxygen and nitrogen in the proportions given above; all mixtures of other gases with the atmosphere are injurious in proportion to their quantity and nature. Carbonic acid gas, which is expelled from the lungs and also produced by combustion and fermentation, escapes into the atmosphere and acts as a poison when inhaled in large quantities. The quantity of carbonic acid gas thrown into the atmosphere is continually increasing with the increase of human beings, and the vast quantities of fuel which they consume for manufacturing and commercial purposes. It has been calculated that a thousand millions of human beings annually consume 2,000,000,000,000 pounds of carbon, which multiplied by three will give about the quantity of carbonic acid thrown into the air from this source alone. Still all the carbonic acid which now flows into the atmosphere, forms but a small portion of the great aerial ocean. On the tops of mountains and on the ocean it only constitutes about one-fortieth per cent. in weight of the whole atmosphere. Thus diluted, it does no injury to any person, but in cities and in apartments where there is not a free circulation of air it exists in much greater quantities. The only remedy for this evil is a greater supply of fresh air. What are called disinfectants and deodorizers have no effect upon carbonic acid.

Besides carbonic acid, other organic emanations from putrescent bodies—animal and vegetable—pass into the atmosphere. That the entire atmosphere does not become corrupt is a subject of wonder. The Creator has endowed it with the property of purifying itself, and recent chemical discoveries have thrown much light upon the subject. About twenty years ago, it was discovered by Professor Schonbein that when electric sparks were passed silently through air, the oxygen was changed in nature but not in essence. It received the name of ozone from its peculiar odor, and much was then said and written upon the subject to no profit. Its character is now better understood, and it possesses such intensely oxidizing and bleaching powers that substances upon which common oxygen produces no effect are rapidly oxidized in contact with air which contains only a small portion of it. It unites with putrescent substances, and it has been called "one of the great scavengers of nature." Permanganate of potash contains ozone, and when dissolved, it is called ozonized water, which has of late been much used in medical practice as a deodorizer. Ozone in the atmosphere is said to be promotive of health, and it is therefore a most important condition of oxygen. The explanation given by chemists of the change which oxygen undergoes in becoming ozone, is that it is polarized and broken up into two states, called ozone for the negative and antozone for the positive. Dry ozone will not dissolve in water, but when a certain quantity of oxygen is converted into ozone, another portion is changed into antozone, which is soluble in water and forms the peroxide of hydrogen. There are several antozonides, but much has yet to be learned respecting this polar condition of oxygen. It is remarkable that ozone is changed into common oxygen by simply submitting it for a short period of time to a temperature of 500° Fah.; and it is further remarkable that ozone and antozone have the power of neutralizing each other in contact and evolving ordinary oxygen in a pure state. According to Faraday, oxygen is the most magnetic of all the gases, and its various changes of character may be due to its electric or magnetic condition.

#### RECUPERATION OF THE GLOBE.

The skill and cunning of man is continually busy in turning out machinery whereby the labor of the world is accomplished speedily and successfully. It seems at the present time that there is hardly a trade, or a branch of one, that is not in some way furthered by silent and skillful tools. Amid all this material cause and effect are we in any danger of overlooking the processes nature carries on in the

bosom of the earth, and upon its surface, for the rejuvenation of its exhausted forces, and for the sustenance of man as well? The achievements of mind are great, and the ingenuity of our countrymen is of world-wide celebrity; the subtle efforts put forth by Nature are not only interesting, but also inspiring in many senses.

When the thoughtlessness of man would exhaust the generous soil that feeds him, the trees shed their leaves, the trunks fall to the ground and decay, brooks trickle in and moisten the earth, birds drop seeds in their flight, and lo! in a little while the herbage springs rank and luxuriant, coarse grass grows heavily, and the soil fattens and waxes mellow under its rich food. Forests may in time wave over acres of such places, only to be cut down by the axe of the invading settler and turned to account in the economy of the world. Damp, mold, and mildew, convert the acid bark and the fatty woods into a manure or muck that makes the earth throb with renewed vigor.

Are there not new mines also forming? In the dark and silent laboratory of nature, fathoms below the surface of the earth, who shall say what wonders are now transpiring for the future benefit of mankind? It is not wholly idle speculation to dwell upon these subjects, for we read daily of the discovery of silver, of gold, of antimony, coal, oil, and a long list of innumerable other substances, all useful to man. These nature has been slowly gathering in for ages, until the adventurous foot of man roaming through the wilderness strikes upon the hidden treasure and forthwith distributes it to the world. By what mysterious affinity or construction some soils bear gold, others diamonds, and yet others silver or rubies, no man can say; for neither gold nor diamonds have as yet been made artificially, and although the component parts of these minerals and gems are well known, there is wanting Nature's own process of amalgamation to make their production at will a matter of no mystery.

While man exerts his ingenuity to tear down the mineral rocks, or open up the bowels of the land and rend from thence the lumps of coal which are built up from the decay and waste of previous centuries, all over the known world, other mines and other fields and forests are springing forth, or being slowly enriched by ceaseless and never-ending natural operations. Whatever waste goes on is renewed again; if this were not a fact, this generation of men would have starved, and future races would find nothing wherewith to build or sustain life.

#### THE LABOR MOVEMENTS.

The universal disturbance in and unsettled condition of all classes of laborers and mechanics is attracting much attention among thoughtful persons. The machinists of this city—as intelligent and orderly a set of men as can be found—have asked an advance of 25 cents per day on the former rate paid them, alleging that the prices of all kinds of provisions, &c., have increased at such a rate that they find it impossible to support their families in respectability and comfort. The car drivers and conductors have also come forward and demanded an increase of 50 cents per day, and at the present writing many of the lines have granted the advance. These men work fifteen hours a day for the paltry sum of \$1 50, or 10 cents an hour, and are obliged to be on duty in all sorts of weather, hot and cold, without cessation, the week round; certainly justice demands that their labor be valued at higher rates.

The sewing girls and workwomen, generally, have also petitioned for an advance, and have been met in some cases with a ready accession to their appeals; in others they have received the cold shoulder. The Shylocks who get rich from the efforts of these hard-worked and poorly-paid females are proverbial for their meanness and want of principle the world over, and with such a record it is not to be wondered at that they refuse to acknowledge the propriety of the pitiful sums asked for by the operatives. That no person of average health and stature can support life on \$2 50 per week, in a fit condition to stand the duty required of them, is a proposition that none will dispute; and we see no reason, except the most despicable avarice, for a non-compliance with the workwomen's appeal. We trust it will not be in vain; and we hope that all the trades at variance

with their employers will find their remedy in an amicable and speedy adjustment of the disputed points. Certainly, the sympathies of the community are much prepossessed in favor of the orderly and quiet manner in which the proceedings, so far, have been conducted. Intimidation and threats are unheard of, and the conduct, generally, of the trades on strike, is in marked contrast with similar movements in former years. It augurs well for the spread of intelligence and correct ideas among mechanics that they have abandoned mob law and violence generally. The laws of supply and demand are one thing, and hunger, cold and nakedness, are others; and it is of no use to tell the needy that the value of their services is regulated by inevitable laws. As we previously remarked, we hope that the delay to the interests of the country and private individuals will be speedily and amicably adjusted. Our working classes should bear in mind that they cannot safely attempt to speculate upon the necessities of the Government. In common with all of us they have a strong interest in its success, and its permanence very much depends upon the fidelity of the working classes. Unless they are willing to bear their share of the national burdens they will very soon find themselves deprived of the necessary means to bear their own.

#### THE COAL QUESTION AGAIN.

The *Herald* of the 13th contains a statement in the form of a letter from a correspondent at Wilkesbarre, Pa., that anthracite coal, which is sold at \$11 per ton in the cities of New York and Philadelphia, is sold at the mines for \$2 50, and charges complicity upon the companies who transport it to market, they having the whole control of the trade. If this statement be susceptible of proof, it is certainly a singular solution of the coal question, and places it on a very plain basis; the authority we quoted further states that the miners are not overpaid, and that in effect collusion and combination of the lines of railroad between the mines and the principal markets is the key to the exorbitant prices demanded. This the public have long suspected, and the statement about the three hundred and fifty steamers is mere haphazard work. The *New Ironsides* is quoted as burning two tons of coal per hour—lying still, we suppose; for in reality she burns more in active duty. She is rated at 1600 horse power, which at 4 pounds of coal per horse per hour (a fair average) would give 6400 pounds, and the three hundred and forty-seven steamers in Government employ are charged with burning a million and a half tons per annum; this is exaggerated, as a little plain figuring will convince anyone. Although there may possibly be the indicated number of steam vessels on the navy register, they are not all in service at once, and it does not seem at all possible that the quantities mentioned are actually required; for these same ships, previous to the war, were engaged in passenger and merchant traffic, and their consumption then, together with that of the foreign trade to Southern ports, would bring the amount of coal used before the war much higher than that now required. Such reckless statements go far toward helping the parties who keep up the price of coal to sustain their demands. The fact that foreign coal cannot be imported at paying rates is well proved by that able and fearless paper, the *Philadelphia Press*, and we hope and look for a speedy reduction in the price of this article of prime necessity. Speculation in the essentials of life is at all times reprehensible, but never more so than when the poor are oppressed beyond measure, and when lives are lost and health injured by reason of the high price of fuel. The paper dealers had to abandon for a time their designs in consequence of the very unfavorable light they were placed in by the *Press* of the country, and we are confident that the same power has only to make itself heard on this question to effect a reform.

The Adriatic Mills in Worcester, Mass., are driven by a Corliss engine, which has a belt on it 30 inches wide, 114 feet long and double throughout.

A SPECIMEN of glass work, turned and finished in a lathe, was lately shown at the Great Exhibition, London.