

man nature, but was sometimes deceived by designing men around him, like all other great men have been.

How he traveled among the people and built cities, in my next.

H. J. FAUST.

AIR WE BREATHE.

The following is a synopsis of a lecture delivered by Professor Kingsbury before a meeting of Salt Lake County school teachers:

The air we breathe envelops the earth and extends upwards from its surface fifty miles—probably five hundred. It consists mainly of oxygen and nitrogen, in small quantities carbonic acid gas and watery vapor, and in very minute quantities ozone, hydrogen, peroxide, nitrous acid, organic matter, etc. The oxygen is the great supporter of combustion; through its presence animal life is enabled to exist. In the bottle before you, has been collected some of this gas. You will observe on inserting a glowing taper into the bottle that the spark bursts out into a flame. The nitrogen which acts as a diluent has just the opposite properties to oxygen. It is a non-supporter of combustion and is incapable of maintaining life. You observe that as the flame on the end of this stick is brought into the bottle before you containing nitrogen it is extinguished.

Carbonic acid gas is found in the atmosphere generally, in the proportion of four parts to ten thousand parts of air. When it is increased to seven parts or more it then becomes detrimental to health. This gas is the product of animal respiration. As we inhale, the air enters our lungs and the oxygen coming in contact with certain organic matter oxidizes it, and produces carbonic acid gas and water, which are then expelled from the lungs as we exhale. Carbonic acid gas is the principle food of vegetation. Vegetation absorbs this gas, decomposes it, and liberates oxygen. Animal life supplies food for the vegetable kingdom and vegetation provides oxygen for the animal kingdom. Carbonic acid gas is a non-supporter of combustion and hence cannot maintain animal life. By breathing into this glass jar thus and inserting a lighted taper into it, you observe that the light is instantly extinguished. This gas is not poisonous yet it is detrimental to health when found in considerable quantities in the air, as well as an indicator of the presence usually of injurious substances.

Watery vapor, always in larger or smaller quantities in the air, should be present in amounts equal to about seventy to seventy-five percent of saturation for health. Ozone, a different form of oxygen, is one of the very active oxidizing constituents of the air. It readily destroys organic matter in its presence. It is found in the largest proportions in the "country" air, and in the smallest amounts in and about large dirty cities. This is necessarily so from the fact that the organic matter in cities being quite abundant uses up the ozone. This important gas is produced during electrical storms. The electricity passing through the air changes some of the oxygen into ozone.

Hydrogen peroxide is another very active ingredient. It oxidizes organic matter, tending therefore to destroy any vegetable or animal germs present. It

is the product of the oxidation of ammonia in the atmosphere by ozone. Nitrous acid is another substance destructive of organic germs and the product of a chemical action between oxygen and nitrogen brought about by electrical discharges during electrical storms or during any electrical discharges through oxygen.

Organic matter is found in larger or smaller quantities in the air, depending upon the conditions present. In cities where there are streets containing considerable dust, much organic matter may be hurled into the air during wind storms if not kept down by sprinkling.

This may include disease germs along with other matter. For instance, in Naples Doctor Manfredi found in one gram of dust on one of the streets 761,521,000 microbes, on one of the best streets 10,000,000 per gram, and in one of the most filthy streets 5,000,000,000 microbes per gram. In this dust there were several different disease germs. It is quite important to have the streets sprinkled to allay the dust and thus to prevent as much as possible organic matter from rising in the air.

In and about our homes it is necessary to look well to the surrounding conditions. In cellars underneath our dwelling houses, no decaying organic matter should be allowed to remain; for gases produced by its decay may either promote the growth of other organic matter, animal or vegetable, or through their presence deteriorate the air in our living rooms and render it unhealthful. Such cellars should have cemented floors and walls, and these walls and the ceilings should be whitewashed with lime to disinfect them. It is best to keep in the cellars cupboards and boxes in which to put away foods of different kinds and to occasionally take these from the cellars and wash them thoroughly.

Great care should be bestowed upon our cellars, especially when they are underneath our houses, for whatever the air of those cellars is may determine more or less the kind of air pervading our living rooms above. Floors should be hardwood if possible and the joints between the boards should be close so that dirt could find no lodging place where it might remain year after year. The dirt which might thus accumulate is partly organic matter and might even be disease germs. If not disease germs it might be such as would supply on decomposition the kind of food necessary for the growth of these germs. Floors should be painted and oiled, the latter being the better, to thus prevent them from absorbing organic matter.

Walls whitewashed are much more productive of health than those calcimined or papered. Neither calcimine nor paper is permeable to air, but the ordinary plaster is. You will observe as I blow through the stem of this pipe against the flame of the lamp that the air passes through the plaster contained in the bowl and throws the flame to one side. Moreover, the glue paste used both in the calcimine and for papering might undergo decomposition and thus become obnoxious.

Besides this, paper very frequently contains arsenic, and sometimes in quite large quantities. Most all the green shades used in coloring the paper are made by arsenic compounds. Even in the white enameled paper arsenic to the amount of from fifteen to twenty

five grains to the square foot has been found. Sometimes sickness of a long lingering undeterminable character is due to the arsenic dust coming from the wall paper. If the walls are calcimined the ceilings should not be in order that the air might pass through them. In laying up walls water used in making the mortar contains more or less organic matter which may become oxidized and destroyed in a short time provided the free passage of air through them is not impeded by calcimine or paper that otherwise might long remain and give rise to disease.

Our houses should be well ventilated and especially our living and sleeping rooms. Our chimney flues should be well constructed, have good strong draughts, and the stoves used be free from cracks that the carbon monoxide which is such a deadly poison could not escape into our rooms. Carbon monoxide is that seen burning just above the surface of the hard coal with a pale blue flame. Minute quantities of the gas in the air we inhale will produce headache, and additional quantities death. It acts directly upon the haemoglobin, the coloring matter, of the red corpuscles of the blood.

In our yards organic matter accumulated should be constantly collected, burned or hauled away. Ashes usually should be kept dry while about our premises, as moisture coming in contact with them produce sulphuretted hydrogen, which is a food to low and destructive organic growths. The air of our cities should be tested to ascertain its condition with respect to gases and also organic matter. Sometimes in the vicinities of smelters where obnoxious fumes are given off arsenic, copper, lead, etc., are found in quantities entirely too large.

Manufactories whose chemicals are either being made or used should be carefully looked into by health officers, because in some cases the air through these is found to become impregnated with sulphuric and hydrochloric acid fumes, etc., highly detrimental to health. Health officers should know enough to appreciate the importance of having all these things productive of sickness carefully considered by thorough physicians and chemists.

Written for this Paper.

BISSELLS' BIG JOB.

WASHINGTON, D. C., Nov. 26, 1893. The most overworked men in Washington today are President Cleveland's cabinet ministers. Every one of them has his hands full. Carlisle has been boiling his brains for months over bonds and bullion. Gresham is almost distracted by the situation in the Sandwich Islands. Hoke Smith is wondering how the soldiers' vote can be gotten back to the Democratic party by new pension legislation, and Wilson Shannon Bissell is worried to know how to make the small postal appropriations meet the immense deficit which the lack of business and the hard times is creating in our postal revenues. I have devoted this week to a study of our new Postmaster General. He is by no means an ordinary man. He is not only a hard worker himself, but he understands how to get work out of others. His experience as a railroad president and a railroad lawyer stands him in good stead in the Post Office Department, and