

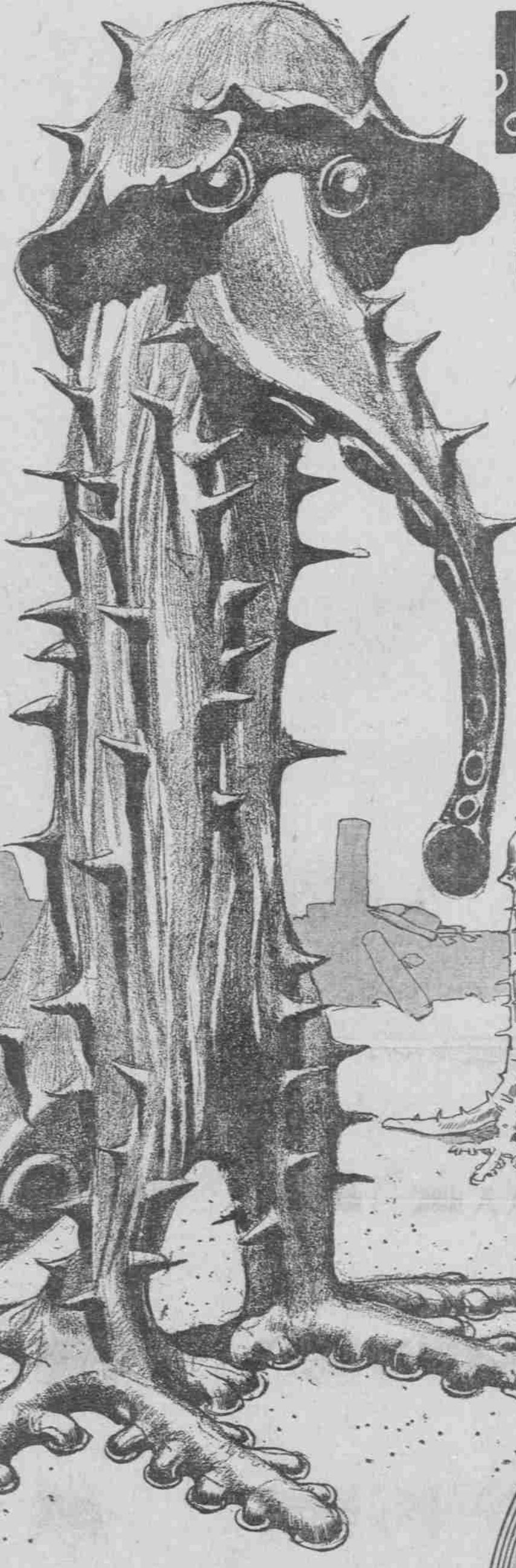
How Civilization's Waste and Energies Are Destroying the Life Giving Element Whose Loss Man Could Survive Only—As Perhaps Have the Martians—By Becoming PLANT-LIKE MONSTERS!

By Prof. Garrett P. Serviss.

Is the atmosphere losing its oxygen? This is a startling question, because oxygen is the breathing element of life. Take it suddenly away and the countless billions of land animals inhabiting the globe would gasp and perish like fish thrown out of water. Take it away gradually, and although life might for a time adjust itself to the diminishing supply, still living creatures would slowly lose their elasticity, and the vital energy

of the world would sink so low that all the advances that have been made in long ages of evolution would be lost, and the earth would become the home of weak, insignificant beings, incapable of more than the languid prolongation of their feeble lives. If Providence wished to put an end to mankind it would not need to set the world on fire, or destroy it with frost—it would only have to alter a little the constitution of the air by abstracting a part of the oxygen which it now contains. Now, it has recently been asserted that there is evidence that just this strange and momentous change in the constitution of the atmosphere of the earth is beginning to become manifest. It has been averred that the proportion of oxygen in the air has already so far diminished that its effects are beginning to be noticeable. If there is any truth in this assertion, it must be said that it escapes the ordinary means of detection. The constitution of the air seems to be always about the same, such changes as can be noted being local, and due to temporary and special causes. Still, if there is a tendency to the withdrawal of oxygen, its physiological effects might become evident before an analysis of the air, not directed to the special end of determining its exact state as a whole, would reveal the fact.

The adjustments of life are so delicate that a very slight change in this respect could produce incalculable consequences. The air is like wine mingled with water. Of its two principal constituents, one—oxygen—is life-giving and life-supporting; it is the wine of life. The other—nitrogen—is inert, incapable of supporting life, and, in fact, inimical to it; it is the water in the wine, tempering its strength. If the oxygen were unduly increased in quantity the air would become intoxicating, the fiery blood would race through the arteries and veins, dissolving the delicate structure of the body like a raging inundation. All mankind would go mad; the body and the brain would become runaway engines speeding to hasty destruction. We would have Poe's famous story of "Dr. Ox's Experiment" realized on a world-wide scale. The earth would become a universal madhouse. Everything would be accelerated—the body and the brain would move and act like lightning. The dolt would become a momentary genius. The outburst of energy would be



Is the Air Losing Its Oxygen?

SOME European scientists have recently made the startling assertion that our stock of oxygen has been materially lessened within the last fifty years. Stripping of forests from thousands of square miles of country and the outpouring into the air of enormous volumes of carbonic gases are, perhaps, the two great causes of its diminution—for both of which civilization is responsible. When our oxygen is gone in considerable quantities and its place is taken by carbonic gases, what will become of mankind?

Man is very adaptable; his present form is only the result of this adaptation to changing conditions. One may try to reconstruct man under such circumstances. It is probable that he would first sink on all fours to breathe the oxygen still remaining near the earth's surface. His skin subjected to constant heat—for there would be little moisture in the air—would grow thick and bark-like. The pores of the skin, acted upon more and more to help in the breathing process, would enlarge enormously into octopus-like suckers. The ears would, perhaps, form a hood-like covering to the head; the nose become more and more like a tendril or the suckers which certain vigorous plants send forth. As man became more and more a crawling thing his legs would become useless and would probably form themselves into a long root-like appendage. Finally to protect himself, he would grow spines—just as the cactus did—and these would be the last form of hair that once covered his body.

Here Artist Kerr shows what his idea of plant-man would look like in that distant time. For if such changes ever did come about, it is not likely that they could occur for another million years at least.

Enormous quantities of both oxygen and carbonic di-oxide have been withdrawn from the air in past time, and a balance has been reached which enables both animals and plants to flourish; but if those who think that the disappearance of one of these two gases is being accelerated are right, then the time may be almost at hand when the even balance will be so far upset that the constitution of the air will become inimical to the animal kingdom. There is no doubt that the operations of man, while they may tend to withdraw the atmospheric oxygen, act in the opposite way with regard to the carbon di-oxide. Every chimney that pours its clouds of smoke and gases into the air adds to the quantity of carbonic compounds in the atmosphere. Immense quantities are also

rocks of the crust. This process has already been going on for ages, and it has always been an insoluble problem to account for the fact, until recently unchallenged, that analyses of the air show no perceptible diminution of the relative quantity of oxygen. It has been supposed that oxygen may come to the earth from outer space, but the fact has not been proved, and it is

is an ominous fact which should be duly considered. In addition to this, it has been claimed that a change in the constitution of the air is proved by a falling off in the total energy of human life. Notwithstanding the immense advances which have recently been made in certain directions, it is averred that the vast majority of mankind, especially in cities, show less vitality than their ancestors. Improved hygiene, it is asserted, partially masks this effect. Men have learned to take better care of themselves, ways have been found for guarding the heedless against the consequences of their own neglect, immense advances have been made in the art and science of medicine; but, say the pessimists, take away these adventitious aids and you would find that mankind in the present day possesses far less vital energy than it formerly had.

In multiplying the population of the globe, and in upsetting the ways of nature with our inventions and our destruction of natural resources, we have aided in setting up a reaction which now begins to manifest itself by a significant and threatening change in the atmosphere which surrounds us. We are aiding the tendency of the oxygen to disappear by destroying forests, and by continually provoking its withdrawal from the air to form combinations from which it cannot again escape in a gaseous state. How far this may be true it is impossible to say at present, but it should not be forgotten that we have the most convincing evidence that oxygen cannot forever continue to be as abundant as it has hitherto been, even if man does not himself assist in the process of its disappearance. No cooling planet, like the earth, can indefinitely retain an oxygenated atmosphere. The free oxygen in the atmosphere must gradually be withdrawn by entering into stable combination with the cooling

difficult to account for its place of origin or the means by which it arrives upon the earth. On the other hand, if, as seems probable, the main source of supply of free atmospheric oxygen is to be found in the plant life, then it requires no argument to convince anybody that one of the most important things for the prolongation of the life of the earth is the conservation of its vegetation, and more particularly of its disappearing forests. If a certain large proportion of the land area of the globe is not always given up to the production of a vigorous vegetation we may cut off the chief source of supply of that wine of life which the air affords. Then, unless outer space can supply the deficiency, the delicate balance between the chief constituents of the atmosphere must inevitably be upset with the most calamitous consequences. Another thing that is disappearing from the air, though just at what rate we cannot say, is carbonic acid. This, too, is absorbed in the cooling crust, where it enters into mineral combination. These lock it up, just as the oxygen is locked up, and henceforth it can be of no use to the life of the globe. But carbonic acid, or carbon dioxide is for plants what oxygen is for animals—the wine of life. If its relative quantity becomes considerably diminished



Injecting Oxygen Into a Water Jar at the New York Aquarium Preparatory to Sending a Fish for a Couple of Months Journey

plants can no longer flourish, and if the plants perish then the principal source of supply of free oxygen must disappear with them. These are the two horns of the dilemma—the plants are needed to keep up the supply of free oxygen in the air, and the free oxygen is needed to maintain the life of all animals that breathe; and we know that processes are continually at work which withdraw the carbon dioxide on which the plants depend and the oxygen without which the animals cannot exist.

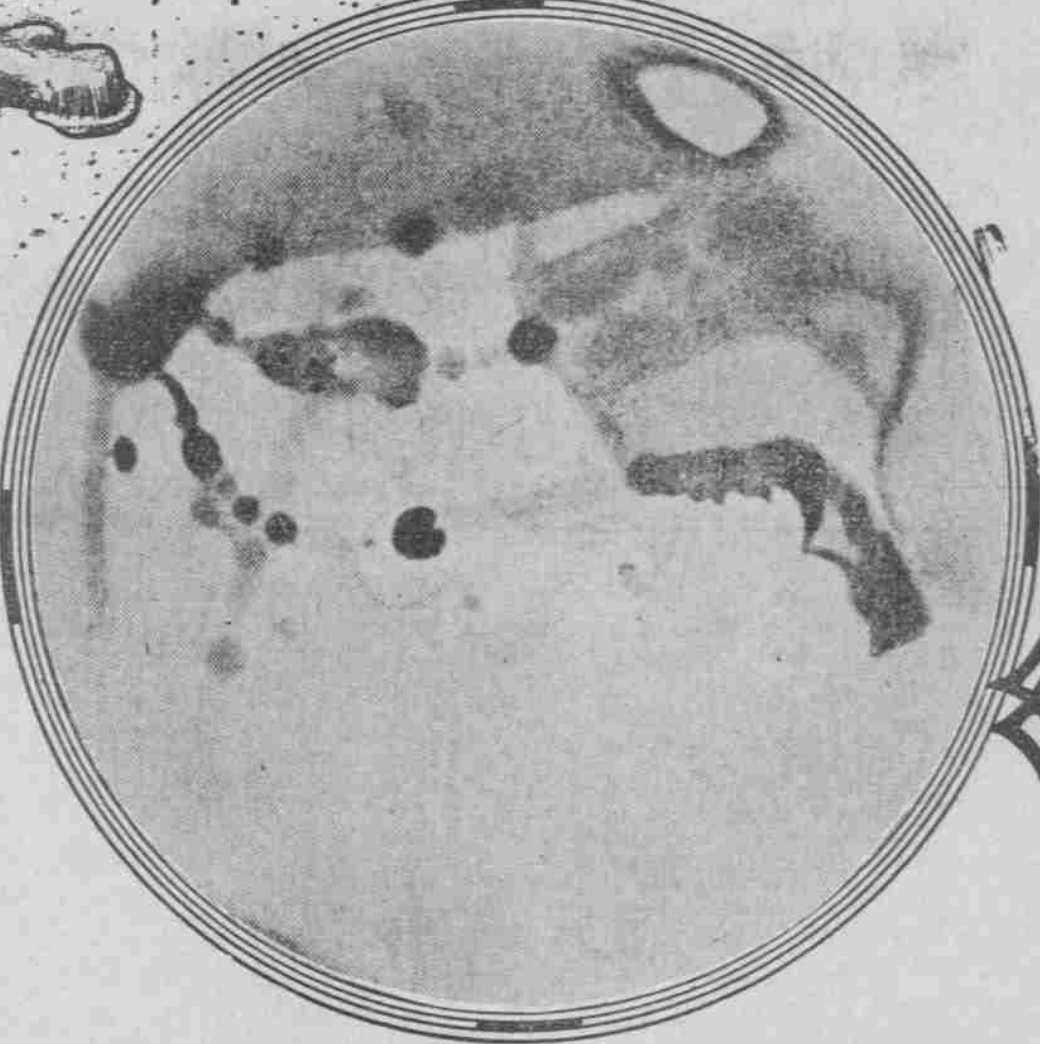
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conclusion that the planet Mars, instead of containing a race of gigantic intelligent animals, as Mr. Percival Lowell supposes, may have no life left upon its surface except enormous and monstrous forms of plants, flourishing in a carbon-laden atmosphere and manifesting their presence and the varying conditions of their life by the appearances of the great dusky lines and patches, waxing and waning with the seasons of that mysterious world. If the oxygen of the air threatens to become sufficiently rare to menace animal life, the question arises whether man can do anything to arrest the process. Recent experiments have shown more clearly than ever the wonderful properties of oxygen as a vital stimulant. A single experiment will suffice to prove this.

One of the practical problems of ichthyologists has been to find a means of transporting live fish across the ocean. Not long ago the authorities of the New York Aquarium made an important discovery. They sent off a jar containing a fish in water, and that jar had been pumped half full of oxygen, after a month's journey at sea the jar was opened and the fish was found flourishing well and happy. It had been kept alive by the oxygen, which had been nearly exhausted during its journey. Since then this method of transporting live fish has been found to work admirably. Another example of the use of an artificial supply of oxygen is afforded by the apparatus which many climbers of high mountains now employ and by which they are enabled to take with them an extra supply of the vital gas for use at the high altitudes where it becomes rare.

Suppose then that the regular proportion of oxygen in the air at ordinary levels should become sufficiently reduced to threaten disaster, might not chemists devise a method of manufacturing the gas in sufficient quantities to counteract the effects of the withdrawal? If we will persist in destroying the forests, the natural suppliers of free oxygen, we must find substitutes for them. In other ways man has shown that if he violates nature he can indemnify her. Perhaps, if the occasion arises, he will be able to show that he can carry out this process of indemnification on a scale never hitherto dreamed of.

Thus the sources of supply for the elixir upon which plants depend are more evident than those from which the oxygen is derived, and it may be that, in the end, the air will become more suitable for plant than for animal life, and in that case the last chapter of the earth's living history will resemble the first, for we know from geologic evidence that plants were the first inhabitants of this world of ours and that animal life was a later development. As the animals came last, may, for similar reasons, go first. This line of reasoning would lead to the



A Photograph of the Strange Markings on Mars Which May Be Due to Intelligent, Monstrous Plant Life.



A Strange Drawing by S. H. Sime, Giving His Ideas of the Last Form of Man on Earth.