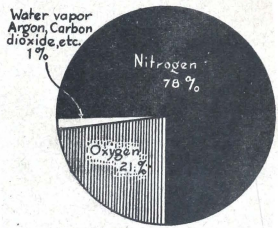
ELEMENTARY SCIENCE SECTION

THE INVISIBLE OCEAN IN WHICH WE LIVE

MAN can live three weeks without food, three days without water, but only three minutes without air, says an old proverb. Though these figures may not be exactly correct, they help us to understand how important is air to all life. Air is the commonest and most valuable thing in the world. It takes part in every activity, large or small, on the surface of the earth.

We live at the bottom of an ocean of gas which is the air covering the earth. Without air neither plants nor animals can live.

The climate of a country depends upon the air and its movements. The cold winds from the polar regions lower the temperature of a country and the hot winds from the torrid zone raise it. The winds also bring the clouds of water vapor over the land where it falls as rain. Without this moisture the plants from which we get food could not grow.



What is this marvellous substance, this air? Chemists tell us that it is a mixture of gases, principally three gases: oxygen, nitrogen, and argon. There is about 21 per cent of oxygen, about 78 per cent of nitrogen, and nearly one per cent of argon. Besides these three gases, air contains small quantities of carbon dioxide and hydrogen, and very small traces of other gases.

When a room is poorly ventilated, we say the air is "impure." This means that the air contains larger amounts of carbon dioxide than at other times.

Oxygen is the life-giving gas in the air. The nitrogen serves to keep the oxygen from getting too strong. If the air were pure oxygen, every living thing would burn out too fast.

The carbon dioxide in the air is produced by the action of the oxygen on the carbon, which is an important part of everything alive. Every breath we draw forms carbon dioxide; every fire produces it. That is why air in cities where people are crowded together is less pure and healthful than air outside of the cities.

If it were not for plants, after a while the air would not be fit to breathe. Plants take carbon dioxide from the air, take out the carbon for the use of plants, and turn the oxygen back into the air.

How High Is There Air Above the Earth?

Probably air stops 40 or 50 miles above the earth. But at very high levels the air does not contain enough oxygen to support human life. Men who rise to great heights in airplanes have to take tanks of oxygen for breathing.

Another important thing about air is that it is compressible; that is, it can be pressed together or condensed. Air is also elastic, that is, it can be expanded or made larger. Thus, by means of a pump we blow up the tires of our automobiles and our bicycles. The air is compressed

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MAKING A TERRARIUM

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A leafy loam makes good soil. This you can find around almost any shrub. Dry out this soil by heating it in your oven for an hour at a temperature of about 250 degrees. This kills certain bacteria that might be present. Screen the soil next and sun it.

An inch or two of soil will do for your purpose. With the earth placed, add the rocks, being sure to have them of a size in proportion to your garden scheme.

Select thrifty plants. They must be dainty. It is not always necessary that they be rooted, for many plant slips thrive well under glass. But artistry and imagination must be used in the planting. Ferns are especially effective. Variegated *Wandering Jew* is good, and colorful coleus is attractive. Begonias are particularly suitable. Various species of both of these are found in all parts of the Philippines.

Your garden should be planted so that it is attractive from all sides, as you will want to turn it around to catch the light from time to time. Experiment with different types of plants, and, although it is more interesting to gather lovely things in the woods, any garden will afford you many suitable subjects.

After the garden is planted, sprinkle it lightly with water. Remember that too much water is worse than not enough. These glass gardens literally take care of themselves, once they are properly planted. Moisture collecting on the sides of the container seeps into the soil, and it is seldom necessary to water more than once in six weeks or two months.

At first your garden may have a steamy effect. Remove the top cover for a little while and then replace it.

After the plants have been under the glass for some time, a few of them may look moldy. This indicates too much moisture, and they should be aired again. If they seem to wither, a bit more dampness may be necessary. If they mildew or show a very dejected droop, it is best to remove them.

Once the garden is well established, however, it will thrive with tropical luxuriance, and almost without attention, for months at a time.

A word of warning: Never leave your terrarium in strong sunlight. It needs air occasionally to keep it fresh, and once in a long time it requires the lightest kind of sprinkling, but not too much water, not too much air, and not too much sunlight.

The terrarium prefers to be let alone most of the time. And in this it has the advantage over other gardens. It thrives best where it is reached by filtered light.

If planted artistically, a terrarium will be an endless source of delight to everyone who sees it. And it will last for two or three years.

INVISIBLE OCEAN

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inside.

We can store compressed air in tanks, and use it for many purposes. In the air-gun, the bullets are shot by compressed air instead of gun powder. In a suction-pump, the air is compressed. It exhausts the air pressure in the pipe above the water, and the pressure of the air on the water outside the pipe forces it up inside.

QUESTIONS

1. What is the commonest but at the same time the most valuable thing in the world?
2. To what extent is air used in the world's activities?
3. What must all plants and animals have?