icebergs float in the oceans of the world. It is also the reason why aquatic wildlife can continue to live in water under the winter ice.

Water is also very stable as a liquid. It has unexpectedly low freezing (0°C) and high boiling points (100°C). Without water, the Earth would have no climate, only arid desolation. The Earth's oceans serve as vast heat sinks, storing the heat from sunlight and releasing it at night. In the Northern Hemisphere, the oceans accumulate heat in summer and release it in winter. The oceans are huge reservoirs that moderate the climate throughout the globe.

The molecules of water have an unusual capacity for sticking together, whether into raindrops or snowflakes. Water also has curious electrical properties in its solid state. Most electrical currents in solids are conducted by means of electron flow. Not so in ice. In ice, electricity is conducted by means of the positively charged protons of its atoms.

FIGURE 4.6.

Mount Saint Helens, May 18, 1980. Through such eruptions the earth outgasses its hot primitive atmosphere of noxious gases and water vapor from sources deep within its rocks.

Water is the primary constituent of protoplasm and comprises 80% to 90% of all living matter. More than 70% of our physical bodies consists of molecules of water. Water is also the universal solvent. Practically everything we make is either mixed with or cleaned with water. Bread may be the staff of life, but it would not exist without water. It takes 136 gallons of water to grow the wheat for a single loaf of bread.

Water is the most common substance on Earth. To obtain our water, we turn a faucet. Water is so common, so much a part of our everyday lives, that we take it for granted.

American astronauts returning from their space mission to the Moon must have thought of water as the source of new life and hope. One has only to contemplate the dry, lifeless surface of the Moon, the frozen ice of Mars, or the inferno of Venus to view the waters of the Earth with reverence.

It was the astronauts who gave the Earth a new nickname -- "The Blue Planet" -- because two-thirds of the planet is presently covered by our blue oceans. This was not always so. In the Earth's early history it had no water or atmosphere at all. It looked like the Moon, a naked and lifeless body of rock. But, by 3.5 billion years ago, the Earth was completely covered by water.

OUTGASSING OF THE ATMOSPHERE

How did the Earth produce the atmosphere and water that are so vitally necessary for life to exist on any planet?