



FIGURE 7.5
The oxygen cycle at present.

Part of the answer lies in the fact that as the blue-greens died, some of their remains would have been oxidized -- converted back into carbon dioxide. Dead organic matter is oxidized in this manner today (see figure 7.5). But where the organic matter was quickly buried by sediments, its carbon would not have had a chance to combine with oxygen. The oxygen that escaped combination with dead organic matter would have continued to increase the oxygen level in the ocean and thence the atmosphere. Remember that we suspect the blue-greens were alive and well 3.5 billion years ago and that the ozone screen was not erected until 2 billion years ago. What happened to 1.5 billion years of oxygen?

THE GREAT IRON AGE

Many would associate iron with our industrial society, for iron is smelted with coal and made into steel, the structural backbone of the industrial age. In terms of structural metals, it could be said that we presently live in the Iron Age.

Students of ancient history may remember that another Iron Age began about 1200 B.C. It was during this period of history that the terrible Hittites swarmed out of what is now eastern Turkey to battle the armies of ancient Mesopotamia and Egypt. The Hittites were such successful conquerors because they had weapons of iron. Armed with iron swords and spears, they cut to pieces armies with the softer weapons of bronze. From mines in Tarsus and the hinterland they had extracted iron ore and learned the secret of smelting and forging it into weapons. The Philistines also learned this secret process and became formidable warriors.

For the geologist, there is another "Great Iron Age" that took place between 2.5 and 2 billion years ago. This geologic age of iron formation answers the riddle of what happened to the excess oxygen produced by the blue-green algae (that missing 1.5 billion years of oxygen). It also explains why geologists conclude that the first accumulation of oxygen in the atmosphere and the erection of the ozone screen occurred 2 billion years ago.

To learn about the great age of iron formation we must travel from the iron mines of Michigan and Minnesota to the Preston Cloud Laboratory at the University of California at Santa Barbara. Preston Cloud, the dean of ancient earth geologists, has been studying particular rock formations known as BIFs (banded iron formations) for