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Biogeochemical Cycles

Many chemical elements are required for life. We can divide these into three groups -

1. The big six that form the ~~major~~ building block of organic compound, i.e. C, H, O, N, P & S.

2. The other macronutrients required in large amount by most forms of life as P, Ca, Fe, Mg.

3. Micronutrients those required in very small amounts by at least some organisms. This group includes Boron, Cu & Molybdenum. These are used by green plants, in some enzyme and nitrogen fixing bacteria respectively.

The absorption and utilization of such elements by organism is compensated by their recycling and regeneration back into the environment. The more or less cyclic paths of these elements from environment to organism and back into the environment are called biogeochemical cycles.

There are two ~~main~~ major kinds of biogeochemical cycles.

I. Gaseous cycle \rightarrow The elements are present ^(Perfect cycle) in the atmosphere and pass through a gaseous phase before completing the cycles. These elements are C, H, O, N & S.

These cycles are characterized by possessing, self regulating feed back mechanisms. Cycle involving a gaseous phase are the most perfect and complete cycles in that, the amount in any one phase tends to remain

fairly constant. The operation of these cycles is elegantly balanced in nature and any reasonable increase in the rate of movement along one path is soon balanced by a suitable adjustment along other paths.

(Imperfect Cycle)

②. Sedimentary Cycles → In the sedimentary cycles, on the other hand, the element concerned is continuously ^{lost} from biological systems through ^{erosion} ~~Erosion~~ and is ultimately deposited in the oceans. The rate of recycling of the element from ocean to land is rather slow and depends upon such processes as biological transfers (eg. through the excretion of marine birds), weathering of rocks, addition from volcanic eruptions. Sedimentary cycles are much less perfect than gaseous cycle in the fact that some of elements may get stuck. In certain phase of life-cycle.