observed individually because of their unique nuclear properties. As noted earlier, the role of carbon dioxide in photosynthesis (a chemical process) can be observed by injecting a known quantity of carbon-14 as carbon dioxide and tracing its path. This is made possible by measuring the radioactivity of carbon-14, which takes part in the process in the same way as its natural stable sister isotope, carbon-12. The measurement of radioactivity is also a measure of the quantity of carbon-14 present at any stage of the process; but the *ratio* of carbon-12 to carbon-14 tells us the *total* amount of carbon involved.

After its use in radiocarbon tracing in the early 1950's, the technique of isotope ratios found many applications in environmental geology. In quick succession it yielded histories of lake and marine sediments, knowledge of the movements of the atmosphere and underground waters, information on biological processes—in short, vital information on the paths taken by pollutants throughout the environment, the rates at which they are purged, and the extent to which they can accumulate to pose risks.