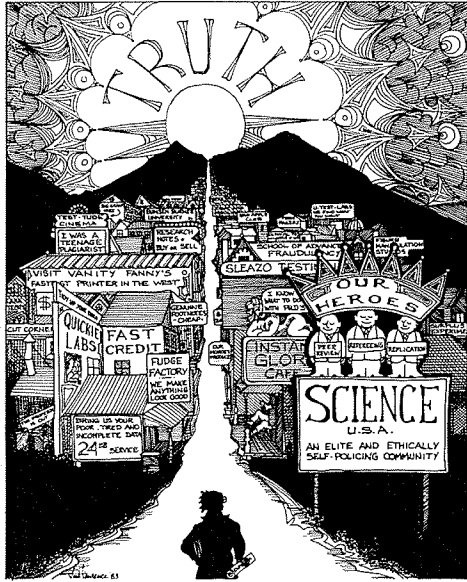


SCIENCE & TECHNOLOGY



Scientific fraud has a long history: Ptolemy, who argued 1,800 years ago that the Earth was the center of the universe, cribbed observations from others. Yet public confidence in science is strong.

formed so that true collaboration (and oversight) is a prerequisite for co-authorship of scientific books and articles, argues Wade.

Journals so obscure that not even specialists read them also contribute to the problem. Otherwise, how could medical researcher Elias Al-Sabti have published 43 plagiarized articles over a six-year period before he was finally exposed in 1980?

It is hard to say how widespread scientific dishonesty is. But fraud is more than a problem of "a few bad apples," Wade concludes. "Fraud in science has a lot to do with the barrel."

A Challenge to Continental Drift

"Faulting Continental Drift" by Paul D. Lowman, Jr., in *The Sciences* (July-Aug. 1983), P.O. Box 356, Martinsville, N.J. 08836.

The theory of "continental drift" has settled comfortably into the minds of most geologists. But Lowman, a National Aeronautics and Space Administration geologist, believes that while portions of the Earth's crust move, whole continents do not.

Geologist Alfred Wegener first propounded continental drift in 1912. He argued that the seven continents began as one "supercontinent," which he called Pangaea, that fragmented 200 million years ago. Its descendants, according to the theory, are still drifting apart.

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Wegener's idea received a big boost in 1960, when Princeton's Harry Hess introduced modern "plate tectonic theory." Hess theorized that the continents sit above seven major "plates," which in turn rest on the Earth's mantle, a plastic base of hot and molten rock that Lowman likens to Silly Putty. The mantle pushes to the surface along mountainous ridges in the ocean floor that separate the plates, and in a process called "sea-floor spreading," forces them (and the continents above them) apart.

The congruent coastlines separated by the Atlantic Ocean are the strongest evidence for continental drift. Yet Lowman points out that when the east coast of North and South America is fitted together with the west coast of Eurasia and Africa, there is no room for a large chunk of southern Mexico. Similarly, the Arctic Ocean coastlines of Canada and the Soviet Union should mesh, but do not. And if all the continents have been moving away from one another, the Earth should have expanded over the last few hundred million years. In fact, it has, but not by enough to accommodate the movements in "drift" theory.

How, then, can the continents remain stationary if the sea floor spreads? Lowman asserts that shifting oceanic plates are pushed *under* the continents rather than against them. The continents appear to mesh, he adds, because sediment from the Earth's mid-Atlantic up-thrusting mantle is distributed symmetrically on the coastlines by ocean tides.

Lowman concedes that few of his fellow geologists share his views. But soon there will be nothing to debate at all. Within the next ten years, sophisticated NASA telescopes now in orbit around the Earth will determine whether the continents really are moving, foreclosing any incipient rift in the community of geologists.

RESOURCES & ENVIRONMENT

Questions on Nuclear Wastes

"U.S. Charts Plans for Nuclear Waste Disposal" by Pamela S. Zurer, in *Chemical & Engineering News* (July 18, 1983), ACS, P.O. Box 3337, Columbus, Ohio 43210.

Members of Congress heaved a sigh of relief when, after years of acrimonious debates, they passed the Nuclear Waste Policy Act (NWPA) late in 1982. However, another round of controversy can be expected before the new federal law is implemented.

The 1982 legislation calls for the U.S. Department of Energy (DOE) to open by 1998 the first of a series of underground repositories for the permanent safekeeping of radioactive wastes from civilian nuclear power plants. Yet key technical questions remain unresolved: What kind of repositories? Where should they be located? Meanwhile, used