ASSEMBLING CALIFORNIA

"The summit of Mt. Everest is marine limestone."

This, says John McPhee in *Assembling California* (304pp., Farrar, Straus and Giroux, 1993) sums up in one sentence the theme of his geologic history of the U.S.

The earth's shell consists of 20-odd rigid plates, all in motion and colliding with or diving under each other, configuring and re-configuring continents, pushing up mountains and pulling apart seas and valleys – all at the creeping pace of about 2" per year.

The plates rub and grind against each other, creating heat and pressure which produce earthquakes. These cause the plates to "jump." 50,000 major earthquakes (say, the size of the 1906 San Francisco quake) can move plates 100 miles.

Thus was California created. Now it creeps inexorably toward Alaska.

From the 1960's to the 1990's McPhee travelled the U.S. with various geologists, recreating a cross section of its geology at the 40th parallel – following I-80 from New York to San Francisco. *Annals of the Former World,* of which *Assembling California* is the fourth volume, is his report of these travels.

Rocks hold the histories of their origins, telling about long-vanished oceans and continents which have swelled, joined and split, from time immemorial.

In the mind of U.C. Davis geologist Eldridge Moores, McPhee's California guide, is a portfolio of ancient scenes, worlds overprinting previous worlds, landscapes within landscapes.

Southeast Alaska and Vancouver Island were once part of Australia, Peru, and California. The western U.S. is a collection of lithospheric driftwood. Calfornia itself is an assemblage of Pacific islands, pieced together by tens of thousands of major earthquakes.

Yellowstone's Old Faithful originated near Putah Creek. Australia may swallow the Philippines and then Japan. Eventually L.A. will be where San Francisco is now, and San Francisco far to the north.

Geologists map places as real as Mt. Shasta, which no human will ever see – because they lie impossibly deep in the earth and in time.

McPhee focuses on these hidden stories to shed light on the Gold Rush, the Central Valley, the California Wine Country and the 1989 Loma Prieta earthquake in the Bay Area.

As geologic forces create mountains, they push up whatever material happened to be there – including the gold-bearing gravels in the Sierras. 150-200 million years ago, a Pacific island, the Smartville Block, docked east of Sacramento, carrying the Mother Lode – material from an ancient ocean's crust.

In a few years hydraulic mining removed 13,000 million cubic yards of Sierra earth, enough to raise the Sacramento River 7 feet and compromise navigation in San Francisco Bay – yielding 5 billion dollars in gold.

Nothing in spectacular California, says McPhee, is more singular than the Central Valley; with possible exceptions in Chile and Pakistan, it has no counterpart on this planet.

Of the 10 taxonomic groups of soil, the valley has 9, each suited to a different crop, making it the preeminent North

American fruit forest. These soils originated in an ancient sea, and the valley still retains its gentle slope.

Farther west, in the Wine Country, the nutritive soils derived from ancient sulphurous volcanism prepared the geography of wine. Moores identifies the ancient rocks responsible for its bouquet.

The 1989 Loma Prieta quake killed 62 people. To put that in perspective, McPhee lists the tolls of other quakes: Armenia, 1988, 25,000 dead; Mexico City, 1985, 10,000 dead; Iran, 1990, 50,000 dead.

Yet San Franciscans continue to believe in “least astonishment” – the idea that the earth is “normally” stable.

In the 100 miles of the San Andreas Fault nearest San Francisco, the Loma Prieta quake released no energy. So as the plates inch by each other, pressure continues to build.

The Big One will come. The only question is when.

McPhee doesn’t spare technical geological terms, but the book is well worth the effort.