of a potential threat to politically sensitive systems," says Melvyn Goldstein of Case Western Reserve University. "Unlike geologists, who can often accomplish their work in the space of a few weeks and can be kept under the watchful eye of guides and away from the people, anthropologists need to stay in one place for a long time, they speak the language, and get to know the people very well."

Partly for this general reason of caution toward the social probing of anthropologists, and partly because of the inflammatory case of Steven Mosher, a Stanford anthropology graduate student who in 1981 was accused of "unethical conduct" while researching rural family planning practices in China, it took Goldstein 3 years of persistent effort finally to get permission to do a linguistic study in Tibet. Goldstein, a specialist in Tibetan language and culture, says "I decided to do a linguistic study initially, because it is less political." The 5-month project, which started in May 1985, involved collecting "a very large corpus of new lexical terms . . . and two social-linguistic surveys" and was carried out in conjunction with the Tibet Academy of Social Sciences.

A year later Goldstein returned, together with Cynthia Beall, also of Case Western Reserve, to embark on a much more ambitious project, this time an anthropological and physiological study of the Phala Shang nomads of Western Tibet. "These people live at altitudes of between 4800 and 5400 meters and are the highest natural populations ever studied," says Goldstein. "They live in a unique ecosystem, which is dominated by grassland, where they herd yaks, sheep, and goats. We are taking a grassland ecologist with us on our next trip, because we are very interested in studying the cultural ecology of these people."

The anthropological literature has a somewhat romantic view of nomads, says Goldstein, portraying them as free spirits roaming a landscape that is regarded as theirs by right if not in fact. "It is different with the Phala," says Goldstein. "Until 1959, when the Chinese took over, they were serfs of Tashilhunpo, the seat of Tibet's second great incarnation, the Panchen Lama. Soon after that the commune period was instigated under the Cultural Revolution. Then, in 1981, the commune property—the sheep, goats, and yaks—was equally divided among the individuals."

This unusual background gives the anthropologist an opportunity, in studying the nomadic system of the Phala, "to try to understand what is intrinsic nomad, what derives from Tibetan culture, and what comes from the Chinese system." One thing

Making the World's Roof

On average, India creeps 5 centimeters closer to central Asia every year. This collision between continents has been going on for about 45 million years, so something had to give—the northern edge of India to form the Himalaya, Tibet to form a huge, towering plateau, and perhaps much of Southeast Asia to form a patchwork of displaced crustal blocks.

Until recent years geophysicists wondering exactly how these processes work—and which of them predominate in the world's premier example of an active continent-continent collision—had to ponder the problem from afar. But, as highlighted at the recent National Academy of Sciences symposium, researchers can now stand on the rocks and the faults that are crucial to unraveling the problem.

Peter Molnar of the Massachusetts Institute of Technology pointed out the grand scale on which the 45-million-year-long collision between India and Eurasia has elevated the crust. With Mount Everest to its credit, the Himalaya has a deserved reputation for extreme altitude. But more than half of the Tibetan Plateau, which is the size of Alaska, stands higher than 5 kilometers. Nothing at all in the conterminous United States is that high, and only a few small areas in all of North America reach that height. Mountains as high as 7 kilometers dot the plateau, Molnar noted, but in his recent 500-kilometer traverse out of Lhasa he encountered no incline steeper than the hill he lives on in Boston. The plateau is surprisingly flat.

Explanations of how so much of Tibet got so high have been around for 60 years. They run the gamut from a relatively buoyant India sliding all the way under Tibet and floating it to its present height, to India ramming Eurasia and squashing it upward. Molnar prefers squashing to explain the elevation of at least the plateau's northern half, but he concedes that the data are as yet too few to prove it.

Thickening of the Tibetan crust is not the only way that Eurasia has accommodated the intruding India, as Paul Tapponnier of the Earth Physics Institute in Paris emphasized in his segment of the symposium. Northern Tibet, for instance, is apparently being extruded to the east out of India's path at a rate of roughly 2 centimeters per year, according to Tapponnier, which is almost as fast as India is slipping beneath southern Tibet. Extrusion of crustal blocks has probably played a significant role in this collision and in mountain building in general, said Tapponnier. Many of the particulars are speculative at this point, he noted, but India may have pushed aside Indochina, the Sunda Islands, and Malaysia.

Understanding how the India-Eurasia collision builds mountains that may resemble the early Appalachians would have more than purely intellectual rewards. Clarence Allen of the California Institute of Technology told the symposium of his trip with colleagues into southwestern China (the former Kam region of Eastern Tibet) to study the Xianshuihe fault system, which seems to form one of the boundaries between Tapponnier's extruded blocks. The system has generated four earthquakes larger than magnitude 6.8 in this century.

On the basis of geological analyses made during Allen's trip, the fault is slipping about 15 millimeters per year, which is slower than but in the same range as slippage on the San Andreas. In fact, says Allen, the Xianshuihe fault is a fine analog for the San Andreas. In particular, the geologic products of the Xianshuihe fault's motion that are used to reconstruct its behavior are well preserved—erosion is slow at high altitude and, unlike the situation on the San Andreas, no shopping malls are built across the fault. All in all, the Xianshuihe fault presents promising opportunities for research on earthquake prediction and hazard evaluation, he said.

In a discussion period at the end of the morning's talks, these geophysicists agreed that although the new access to Tibet is heartening, work there is still more difficult than they would like. But, they quickly noted, fieldwork can be complicated by bureaucratic obstacles and delays in any number of other countries. In addition, the logistics of working in remote, high-altitude regions puts a strain on the hosts of visiting scientists that would be a burden anywhere.

Not too surprisingly, the interests of host and visitor in Tibet are somewhat divergent, Molnar and Tapponnier noted. Although they want to know how crustal motions lead to mountain building, their hosts are primarily interested in what rocks are there and what resources they might contain. The prospects for mutually beneficial cooperation would appear to be good. ■ RICHARD A. KERR