Student A:

From this week's readings, 'frontiers' in history seems to be a broad yet productive concept, leading to significant insights which can often be generalized across several kinds of frontiers. The readings treated scientific, disciplinary, cultural, social, and geographical frontiers with surprising intellectual payoff. If history in the broadest sense is concerned with how things change, a focus on frontiers makes sense because some sort of change happens at any frontier in two ways. Several of the readings focused on the important role of frontiers in historical changes, as in Turner's insistence that the frontier made America, the northern frontier of China that caused the fiscal crises that brought down the Ming dynasty, or the restructuring of MIT's engineering pedagogy based on intellectual frontiers. But the readings also highlighted that frontiers are always a zone, not a "linear boundary", where change between two ends of some sort of scale happens gradually and the inhabitants identify to some extent with both ends. I was reminded of the Thai conception of space in "Siam Mapped" and how it frustrated the British, who wanted to impose a linear frontier. It is because frontiers exist as more than lines in geographical, cultural, or intellectual space that they can be studied. Several authors discussed the forces that shape different frontiers. Williams cites technology, specifically information technology, that "dissolves the familiar boundaries of engineering" (47), but also notes that new boundaries are formed by the needs of society. Turner, confirmed by Lattimore, cites the pull of free land as driving the expansion of the American frontier, not always continuously West but always expanding. Lattimore repeatedly cites limits on the kinds of power that can be imposed (cultural, military, agricultural) from a center as determining the possible periphery, and seems to claim that the frontier between two societies is an injective function of the exact nature of the societies at a given time, plus geography. Bush notes that the endless possible benefits to society define science's "endless frontier", showing importantly that the frontier concept can be used for emotional effect even when a frontier does not actually exist.

Some reactions to each of the readings:

Readings Williams hits close to home for me because I feel tied to the changes in MIT education she's describing. I found her chapter overall an interesting and currently relevant example of a kind of frontier not traditionally considered as 'historical', but wondered near the end if she took her reasoning too far. Though I'm not an engineering student, the changes Williams describes affect students across all disciplines, especially technical ones, at MIT. And although I agreed with almost every step of Williams' argument, I disagree with statements like "only a hybrid educational environment will prepare engineering students for dealing with technical 'situations' in the real world", because Williams sometimes seems to advocate a purely hybrid education, effectively taking place in the frontier. "Hybrid" education is pervading MIT's undergraduate education in many forms, with mixed results. The education of a future generation of engineers, or any kind of professional, does not necessarily best take place in the zone of engineering practice. Even when frontiers are blurred and merged, as is certainly happening in the case of engineering, a focus on the extremes

that a frontier defines can lead to a better understanding of the frontier itself, while the converse seems less likely. I admit that an undergraduate dean probably knows far better, but I feel that my education here has taught me that to delve only into frontiers is peril, exemplified by mechanical engineering students who tell me that their grade is often based more on frontier concepts than substance. Those qualms aside, I liked William's exposition of what determines engineering's frontiers (society's problems), followed by an argument that the determining factor of those frontiers should be changed: "The new master of engineering should be... democracy." (87)

Although Turner's article was very romanticized, ignored the fate of Native Americans, and may be backwards (Lattimore) in seeing a frontier as acting on society rather than vice versa, the general point that the frontier has been crucial in American history was well-expressed. Given that the article was written around 1895, soon (if at all?) after manifest destiny had been achieved, Turner makes an important case that has held up, as if someone were to write a book now on American post-9/11 domestic policy that turned out to still hold true a century later.

Bush's "The Endless Frontier" was interesting to me because of the word "endless", whereas several of the other readings highlighted the real existence (though blurry) of frontiers. Bush suggested several times that there is no limit to science's progress, for example that "we shall have rapid or slow advance on *any* scientific frontier depending on the number of highly qualified and trained scientists exploring it." (7, my emphasis) This is a policy pitch, and Bush realizes that both "frontier" and "modern" are magic words: "It is in keeping also with basic US policy that the Government should foster the opening of new frontiers and this is the modern way to do it." (8) He offers Roosevelt a Louisiana Purchase of knowledge, almost endless returns for a small investment. Although there would be no reason to point out science's limits in such a document and Bush should be seen as writing in a postwar context, "basic research" does have some frontiers of the sort that Williams sketches. Society's needs determine to some extent what basic research is done, though Bush shows that the opposite holds as well. The amount of productive research that can be done in a field depends on other fields -- Bush cites mental health as a medical problem to be tacked, but 50 years later we are not much further along, partially because the brain is still not well understood. Sometimes, the very laws of nature that Bush sees as having limitless application cause diminishing returns -- the laws of physics are ultimately to blame for the skyrocketing cost of the experiments done by particle physicists.

I (honestly) enjoyed Perdue's paper, especially for the notion of 'fractal' history. Many times this semester (and especially this week), we have seen the establishment of some sort of historical scale in order to compare societies. The fractal concept seems to generalize to a scale in several, progressively larger social dimensions. Just as squares are more interesting than lines, reading about the settled/mobile distinction was more interesting in two dimensions than one.

Lattimore spelled out general notions of frontiers the most clearly of

any of the readings. His explanations one the one hand reminded me greatly of the Annales work we read due to the emphasis on long term, cyclic changes, geographical factors, and the importance of the dynamics of social groups. His treatment of "the interaction of social and physical geography in the history of the unified great wall frontier" reminded me of Bloch's treatment of the watermill as an invention that had to be seen in several layers of historical context. On the other hand, I was disturbed by Lattimore's biases towards simplification, absolutes, and evolution: The Chinese were able to assimilate their southern neighbors because they were at a "later stage" in Chinese-style "evolution", Ch'in fell in part because of efforts to reconcile "mutually exclusive" trends, etc. "Evolution" from one historical form to another is not automatically bad -- Braudel's treatment of mountain and plains people seemed productive. What was disturbing was Lattimore's focus on various "evolutionary" trends as autonomous forces, determining how history unfolds. Lattimore made sweeping classifications which I have no way to verify, and could be oversimplifications. The term "backwards", even in quotes, was certainly a shocking way to describe a certain class of societies. His mentions of Chinese writing (103) and "no race prejudice" in Russia central Asia, two things that I've read about, are oversimplified to make various points. If Lattimore does sometimes oversimplify and tries to see generalizations rather than complicating, perhaps it is because of his policy bent? The generalizations he makes are most productive in suggesting a Western policy towards Central Asia. Maybe this is the price historians would pay for having more of a public voice.

Although this has probably been said before, what kind of frontiers matter in a globalizing world? Globalization has happened before to some extent, but IT and global communications technology are new factors. If technology continues to blur all boundaries, will the frontiers gradually disappear? I wonder if not -- much of the Western world lives in frontier regions where the "extremes" that are needed for the concept of a frontier are imaginary or hardly exist anymore, with nationalism and promotion of native cultures filling the gap. As societies go, the Germans, Austrians, and German Swiss are not so different, yet all have a distinct sense of national identity, fostered by state-sponsored education and the continued existence of liederhosen, cowbells, and yodelers, if only for tourists. When one kind of frontier breaks down, maybe humans just cling more tightly to other ones, even if they are mostly imaginary.