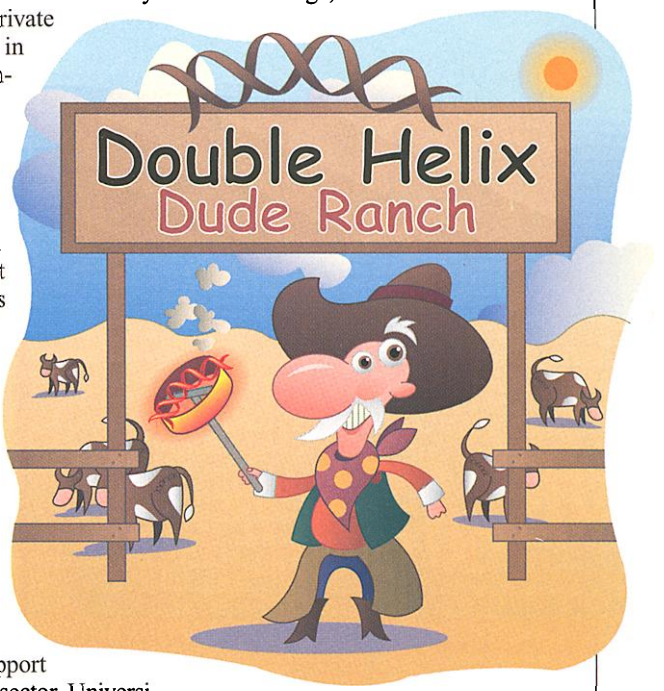
# Enclosing the Research Commons

It is approaching 60 years since Vannevar Bush and others persuaded the U.S. government to do a remarkable thing: take resources that had been at the disposal of the war effort and allocate them to the support of basic research, most of it in academic institutions. It came to be called the "Endless Frontier," a metaphor adroitly chosen to link the promising unknowns of 20th-century science with the promising unclaimed spaces of the 19th-century American West. The Endless Frontier changed fundamental science from a venture dependent on small privileged elites into a vast publicly owned enterprise.

That was the first revolution. The second, under way now, is a surge of basic biomedical science toward the private sector, driven by the mobilization of philanthropy and corporate risk capital. Continuing the frontier motif, it could be called the Great Enclosure. Just as the 19th-century frontier was transformed from public land into a checkerboard of individually owned holdings, the largely public domain of basic research is now moving into private hands. Interestingly, these enclosure revolutions came about in the same way: Both were implemented by purposeful government intervention, accomplished through statute.




After the Civil War, the federal government, lacking the capacity to develop the vast public lands west of the Mississippi, developed a strategy for delivering that frontier to private settlers. The Homestead Act of 1862 allocated 160-acre lots virtually free to those who would promise to live on and improve them. The railroad land grants, established in that same year, provided huge holdings to the railroad companies that would provide transportation links to the new territory.

In the Bayh-Dole Amendments of 1980—the "Homestead Act" of the Endless Frontier—Congress gave up federal rights to the intellectual property resulting from work supported by government funds. Instead, those rights could be claimed by the institutions themselves or by individual scientists where institutional rules permitted it. Bayh-Dole thus did for intellectual property what the Homestead Act had done for real property. Just as happened in the 19th century, further statutory changes extended the incentives for privatization, including modifications in the tax laws that reduced the tax on capital gains and allowed more generous deductions. The resulting flood of venture capital brought huge private investments to support the kind of research that had previously lived only in the public sector. Universities set up offices of technology licensing, and faculty hurried to participate in new start-ups.

All this has brought some major benefits along with significant costs. Hundreds of companies are now contributing important nonproprietary research findings at no cost to the taxpayer. We have two human genome projects, years sooner than we would have had either one, thanks to a $300 million private investment. Industry job growth has helped many of our students and colleagues survive a discouraging academic employment sector. On the cost side, new problems of conflict of interest, licensing policy, royalty distribution, and the propriety of commercial relationships have arisen for faculty members and university administrators alike.

As the debate over the "corporatization" of science proceeds, there may be some lessons in the history of the 19th-century effort at public land enclosure. The Homestead Act did not envision the vast differences among Western lands in terms of water availability, nor did it contemplate until too late that other uses of the land (such as logging, livestock raising, and mining) might rank higher than farming. Abandonment, conflicting claims, and range wars dissolved many of the Homestead Act's hopes. In the end, the government had to retain much of the real estate it had hoped to turn over, leaving us the splendid public lands that make the American West such an attractive destination.

The contemporary enclosure of the Endless Frontier is replicating that history, yielding patent disputes, hostile encounters between public and private ventures, and faculty distress over corporate deals with their universities. Many observers, counting these costs, advocate policies for reversing privatization. Others argue for an acceleration, as discretionary resources in the federal budget promise to dwindle. Recent decisions may hint at a resolution: August's Executive Order on stem cell research promises to transfer a major public program into the proprietary sector. That's where things may be headed; stay tuned.

**Donald Kennedy**

CREDIT: TERRY E. SMITH