wealth, however, lay not in the new technologies, but in applying them to practical uses. There would doubtless be a spate of new instruments and reagents that could be sold, but this would be a relatively small research market in comparison to medical diagnostics, and smaller still in comparison to therapeutic pharmaceuticals or agriculture. In the medical arena, the most compelling rationale for corporate investment was not in technologies being pursued, but in the terrain being mapped, that is, genes embedded in the human genome. Private investments presumed a means to stake claims on that territory. Those claims would necessarily change the complexion of research, altering the rules by which materials and data were exchanged. The claims being staked were in the form of patents or trade secrets.

Each national government had thus been encouraged a genome research program not only to expedite biomedical research, but also to promote national economic development. These goals could not both be pursued to their logical ends without conflict, as national economic development would by definition mean winning an international economic competition, which was not entirely compatible with unfettered international sharing of data, information, and technology.

The seriousness of the conflict was brought to the surface by an international controversy provoked by a US patent application filed by NIH in June 1991. This patent application will be discussed at greater length and with greater authority by others in this conference, but several points should be made clear here. First, much of the public controversy was poorly framed in ethical terms. Sanctimonious claims were made about direct links between human genes and human dignity. DNA is a universal genetic code, and it will be difficult if not impossible to distinguish human genes from those derived from other organisms. This argument cannot be taken too far, as it is obvious that the human genome in aggregate contains the plans for a human instead of a monkey or nematode or yeast, but it is equally clear that very few, if any, genes will be exclusively human in origin. A classic 1975 paper by King and Wilson showed that the average protein sequence differed only one percent between humans and pygmy chimps, and the