terms, have said they are prepared to accept a compromise along the lines of the British proposals. Chief negotiator Yuri Nazarkin, for example, suggested last month a set of "alternative measures" to direct inspection, such as collecting chemical samples outside a suspect facility. At the same time, however, they have continued to insist on a signatory's right to refuse access to certain facilities.

U.S. negotiators, in contrast, while describing the British proposal as a "constructive contribution," are still sticking to their 1984 demand for a mandatory, 48-hour-notice inspection. "Whether the United States is going to move at all from their position is now the $64,000 question," says a European diplomat.

If agreement on verification procedures can be reached, then most participants in the chemical weapons convention are confident that other outstanding issues of disagreement would rapidly fall into place. These include the voting procedures to be adopted by the international committee established to oversee the operation of the convention.

The feeling in Geneva is that much now depends on a variety of external factors. One is the possibility that the Reagan Administration may come to believe that a chemical weapons convention would be a politically useful arms control agreement to have secured during an election year.

A second factor, according to some diplomats, is whether the West perceives a "window of opportunity" in its negotiations with the Soviet Union, which could close if the military establishment there feels that Gorbachev has been giving too much away in his arms control negotiations for insufficient return.

Third, there is the potential impact of the start-up of binary weapons production in the United States, currently scheduled for October. Kenneth Adelman, the head of the Arms Control and Disarmament Agency, has recently reiterated the Administration's argument that the production of binaries should go ahead, even with a ban in prospect, "to ensure that our negotiators' hands are not empty." Some feel that the initiation of production could lead the Soviets to withdraw from the Geneva negotiations.

Finally—and perhaps least predictably—there is the impact of the new talks designed to eliminate medium-range nuclear missiles in Europe, a move that has focused attention on the East-West balance of conventional forces and chemical armaments. Already France has announced that, in the light of what it considers to be a growing chemical threat from the Soviet Union, it intends to start the production of chemical weapons as a "dissuasive force." ■ DAVID DICKSON

Politics of the Genome

Since the initiative to sequence the human genome first became exposed to public discussion, which effectively began at last summer's Cold Spring Harbor Symposium, enthusiasm for embarking in the near future on a full-scale sequencing effort has waned in favor of the more modest short-term goal of genetic and physical mapping of the genome. In the public domain at least, that trend continues, as evidenced by the discussions at the second meeting of the National Academy of Sciences (NAS) committee on the genome project. However, one notable absence from the gathering was Walter Gilbert, who recently resigned from the committee in order to pursue his plans to establish a private company, Genome Corporation, that would push ahead rapidly with both mapping and sequencing. Gilbert, who is at Harvard and was for a time chairman of Biogen, hopes to combine this joint experience in a venture that would, he said, be selling genetic information.

Gilbert's departure from the NAS committee has, for many people involved, produced a more balanced approach to the committee's stated objectives, in which a complete sequence of the genome's 3 billion bases is described as "a subsidiary goal." For more than a year Gilbert has been attempting to raise private funds to establish what he termed the "Human Genome Institute," whose activities would include development of new technologies but would be aimed at both mapping and sequencing in the short term. He plans to have a physical map within a year of start-up and major regions sequenced within 3 years.

These figures caused raised eyebrows at the Academy's gathering, being considered to be rather optimistic. By contrast, the committee was talking in terms of a genetic map (which is related to the physical map) being produced over a period of 5 years, and at a cost of $100 million. And major forays into sequencing are thought best delayed until faster and cheaper methods have been developed.

As the technical debate is being honed, so too is political sensitivity, both in terms of potential congressional response to the project and the interagency tensions that are developing over how funding for the various components of the project might be organized. James Wyngaarden, director of the National Institutes of Health (NIH), told the NAS committee that during hearings on the institute's current budget proposals, positive comments are already being made about the scope of the human genome project, both in terms of benefits and costs. And Robert Cook-Deegan, who is heading an Office of Technology Assessment report on the genome project, said that some congressmen are interested in the project as a potential boost to American competitiveness in biotechnology.

Biologists can be encouraged by these sentiments, said Cook-Deegan, but, he warned, the process of going to Congress with major initiatives in science is extremely unpredictable, no matter how meritorious the project may be. A great fear, repeatedly expressed, is that Congress will warmly embrace the proposal but will not appropriate sufficient new funds to cover it: funding agencies, particularly NIH, might then be left with no political option but to squeeze existing projects to pay for genome mapping and sequencing. Nevertheless, it is not at all clear that sufficient enthusiasm has yet been engendered in Congress to ensure successful passage for a human genome proposal, quite apart from the vagaries of the system.

A second fear, expressed strongly by David Botstein of the Massachusetts Institute of Technology, and James Watson of Cold Spring Harbor Laboratory, concerns the quality of the work that might be funded. Specifically, although participants said that they were comfortable with the peer-review system that operates for NIH research grants, they were less sanguine about quality control for work funded by the Department of Energy (DOE) and carried out in its laboratories. The DOE, although it is the chief instigator of the current genome project and has already committed considerable funds to it, is seen by some members of the biological community as having strayed into their territory. Tensions over academic standards will therefore add to the already established turf battles between the two major agencies. If, as seems likely, the genome project does proceed as some kind of coordinated, interagency venture, then the disparity in the different systems that are in place at NIH and DOE for assessing research proposals and research contracts will probably be modified. ■ ROGER LEWIN