Watson Floats a Plan to Carve Up the Genome

The head of the U.S. genome project suggests giving individual countries responsibility for specific chromosomes

IF JAMES WATSON has his way, scientists committed to mapping and sequencing the 3 billion base pairs that make up the human genome may soon be adding an atlas to their clone libraries. It's not that the maps would help them locate any base pairs, but they might prove useful in looking up the cities around the world where information on individual chromosomes would be assembled.

The director of the National Institutes of Health's human genome program caused a stir when he said last week that the most effective way of mounting a mapping and sequencing effort might be to parcel out responsibility for collecting and collating information on specific chromosomes to different countries. "The French might take several chromosomes and the Italians might take several others," said Watson. The Soviet Union, whose Academy of Sciences has recently announced a 40-million-ruble mapping program, could become involved in a similar way, he adds. "They might take a big chromosome."

Watson's argument, articulated during a meeting in Washington jointly organized by the Alliance on Aging and the American Medical Association, was that there could be financial and political, as well as scientific, advantages to this approach. "For example, the Canadian government might be more likely to put in money if they thought that there was a particular Canadian chromosome, and so on."

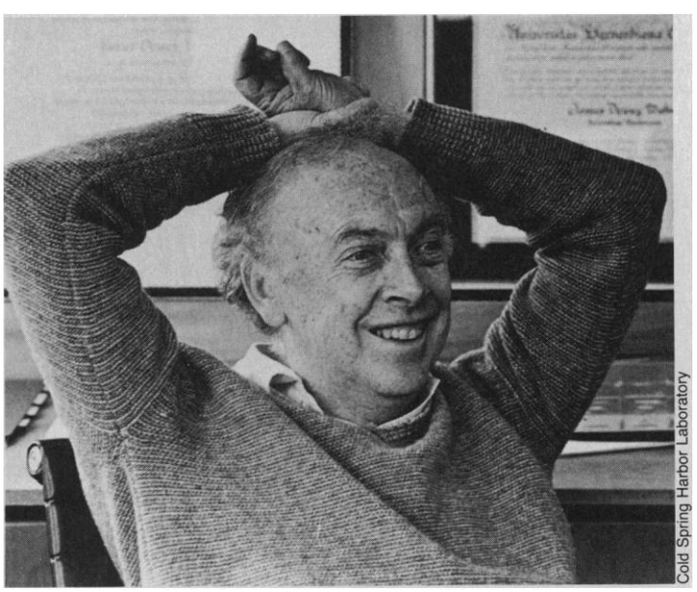
And he emphasized that the purpose of such a division of tasks would not be to prevent scientists in a given country from working on any chromosome they chose. Rather, it would be to foster the kind of international collaboration already existing in several cases. Groups in several countries working on chromosome 11, for example, came together in March at a meeting sponsored by the NIH and organized jointly by U.S. and French scientists. Indeed, as Watson sees it, such a scheme would simply provide efficient leadership: identified institutions in different countries responsible for drawing together information from across the world and then filling in the gaps. Their main work would be in "finishing the job, not starting it," he says.

While Watson's proposal was music to some ears—particularly representatives of the transnational pharmaceutical industry as well as some internationally known researchers already working collaboratively—not everyone is convinced about the desirability of such an approach. For instance, Sydney Brenner, director of the U.K. Medical Research Council's Molecular Genetics Unit, warns of the danger that without a limited number of "hubs" to focus and direct sequencing efforts, there is a risk that "we will Balkanize" the human genome—a reference to the 19th-century fragmentation of Eastern Europe into mutually antagonistic states.

And there was also considerable skepticism expressed when Watson presented his plan for a global division of responsibilities to a meeting last Thursday of the executive committee of HUGO—the Human Genome Mapping Organization that is trying to chart a global strategy for the sequencing project—held at Cold Spring Harbor.

Watson admitted at a press conference after the HUGO meeting that "a lot of people don't like [the idea]." But he added that he would "like to find something else that will work," and that he was "totally open to anything that will [work]."

How Watson's scheme would play on Capitol Hill is uncertain. Although Congress has called for significant participation by foreign scientists in the program (and contributions from foreign governments), much of the political rhetoric remains fiercely chauvinistic. Senator Pete V. Domenici (R–NM) warned in a taped message to the Washington meeting that while genome research was "one area in which we remain significantly ahead" of other countries, "our competitors are dancing a very fast tune in this field."



James Watson. *"The French might take several chromosomes and the Italians might take several others." The Soviets might get a big one.*

Representative Michael Andrews (D–TX) pointed out that many large U.S. research programs, from the Manhattan Project to the Apollo moon landings, had been triggered by external threats, adding that "international competition will shore up a commitment to the human genome program more than any other single factor."

But in the one sector that might be expected to harbor competitive values, the reverse seems to be true: industry is pushing collaboration, at least at the basic research level. "A fully integrated effort is probably impossible—at least not without a world government—but dividing up the effort is both desirable and achievable," Ralph Christoffersen, vice president for discovery research (and formerly director of biotechnology) for the Upjohn Company, and an adviser to both the Pharmaceutical Manufacturers Association and the Industrial Biotechnology Association, told the Washington meeting.

As to how this international collaboration can be achieved, Christoffersen suggested that the next step should be to bring together representatives of all the funding agencies involved, from the U.S. Department of Energy through Japan's Ministry for International Trade and Industry (MITI) to the Soviet Academy of Sciences.

"Collaboration will not remain effective if it is left to the scientists alone; [sequencing the genome] is too big and complex for that," he says. "The lead agencies in all the countries who want to get involved should

sit down and discuss how to generate the two things they all need: money and political clout."

Brenner of the U.K. Medical Research Council, who is one of the main architects of Britain's recently announced genome program (*Science*, 31 March 1989, p. 1657) and a skeptic of Watson's scheme, is keen that there should remain some form of central coordination and direction. "Somehow we will have to have at least one hub—perhaps three to cover the whole of the world—with the spokes going out to individual laboratories and research groups," he says. One function of such a hub, adds Walter Gilbert of Harvard University, would be quality control.

Gilbert endorses the idea that much of the work should be done on a networked basis. "At the moment, the way that groups are developing the technology in this country and abroad makes it possible to think of breaking up [the mapping and sequencing project] into different chromosomes," he says.

Watson seems keen to play down claims that the United States should exert a strong leadership role in an international sequencing effort, perhaps aware that this could dissuade some countries, such as France, from endorsing the active participation of their scientists. "The thought that we can dominate the genome initiative strikes me as totally unrealistic, and it is also unrealistic to say that there will just be one hub," he says. "It is a perfect program for international cooperation and by having other countries coming in, we can substantially reduce the costs to the U.S."

Given the "tricky question" of how deeply Japanese scientists should be involved, Watson says that the optimal solution might be a judicious mix of collaboration and competition. "Perhaps everyone should be allowed to compete on one chromosome, and we could use this as a test bed for comparing the jungle to the civil approach," he suggests.

Victor McKusick, the president of HUGO, says many of the organization's 220 members are sympathetic to the idea that individual research centers should assume responsibility for bringing together and completing information from other laboratories on particular chromosomes—providing that the choice of such lead centers comes from within the scientific community. However, he emphasizes that "there has not been any policy decision taken yet."

But Watson admits that he is really just raising a trial balloon. "This idea of nations each taking responsibility for chromosomes is something to throw out and see if we can put together in some way," he says.

■ DAVID DICKSON

Wide World

Show and tell. *Martin Fleischmann demonstrating the Utah experiment to Marilyn Lloyd, chairwoman of the subcommittee that authorizes funds for energy research.*

Utah Looks to Congress for Cold Fusion Cash

But even help from a Washington lobbying firm may not be enough to overcome negative results from other labs

THE RUSTY STAND bearing a small glass jar with tubes protruding from its cap made for an unlikely exhibit in the halls of Congress. But there it was: the by-now world famous apparatus employed by the gurus of cold fusion, Stanley Pons of the University of Utah and Martin Fleischmann of the University of Southampton in the United Kingdom, who were in Washington to tell their story to legislators.

The appearance of the two electrochemists before the House Science, Space, and Technology Committee on 26 April was more than just a replay of the roadshow the duo has staged for various groups in recent weeks. This time an entourage of officials from the University of Utah were in tow and they were shopping for $25 to $40 million to help create a $100-million Center for Cold Fusion Research in Utah.

To help orchestrate this effort, the university has enlisted the services of Cassidy & Assòciates, the Washington lobbying firm renowned—or notorious, depending on your point of view—for helping universities secure funds directly from Congress for projects that often have not passed through the usual peer-review process. The firm arranged private meetings with members of Congress; set up interviews with the *Washington Post* and the *New York Times*; and the firm's founder, Gerald S. J. Cassidy, sat alongside university officials at the hearing.

Chase Petersen, the president of the University of Utah, also brought along an unpaid Boston consultant to whip up concern about international competition. "I am here because I am concerned about my three children and the future prosperity of their generation in America," Ira C. Magaziner, president of Telesis, Inc., told legislators. His message was simple—that the Europeans, Japanese, and Koreans will steal America's latest invention, cold fusion, unless the federal government embarks on a crash program to understand the phenomenon and develop marketable technologies.

At least one committee member, Robert S. Walker (R–PA), the ranking Republican, seems receptive to the university's overtures. Walker advised his colleagues at the hearing that "$25 million might be a more realistic" down payment for Congress to provide in