heavier atoms of oxygen in the impacting cluster. During the impact of a cluster, Vandenbosch suggests, deuterium atoms might backscatter only to be hit like a baseball by relatively massive oxygen atoms still careening forward. Several whaps like that might boost the deuterium's energy enough to cause fusion with another nearby deuterium nucleus, he adds. That mechanism, Friedman notes, could explain why the all-deuterium clusters in the Lyons experiments, which lacked heavier atoms such as oxygen, yielded no evidence of fusion.

Bae, Yeong Kim of Purdue University, and colleagues at SRI and the Electric Power Research Institute have developed a different scenario, which relies on shock waves to concentrate the collision's energy. They propose that the shock waves heat nanometer-sized regions of the target to temperatures of stellar interiors—hundreds of millions of degrees. Fusion would occur in the tiny compressed pockets of plasma that result, Kim says. "It's like having lots of tiny microsuns," he muses.

Beuhler, Friedman, and Friedlander conjure up another analogy, proposing that the process might be more like the one at work in an ore-blasting explosive charge or an armor-piercing shell. Such "shaped charges" can channel energy so that particles emerge from the explosions in jets traveling many times faster than the detonation wave. Likewise, the tiny cavities chiseled into the target by the impacting clusters might serve to confine atoms under huge compressions while amplifying their energies to fusion-triggering levels.

The Brookhaven trio and their growing ranks of allies freely admit that they're speculating, but they think it won't be long before experiment catches up with them. The ingredients of a bona fide area of fusion research are now in place, after all. Experiments continue at Brookhaven. More are under way, or in the works, at other labs in the United States, France, the Netherlands, and perhaps Japan. Theorists are theorizing. And skeptics are keeping everyone on their toes.

At the moment, most people in the field are pursuing little more than the thrill of basic scientific discovery. But press them a little, and they will admit that somewhere in the back of their minds lurks the possibility that their research could someday harbor payoff to people who have never heard of accelerators, deuterium, and fusion.

In that vein, Friedlander, Beuhler, and Friedman closed their first *Physical Review Letters* paper with a remark as gingerly articulated as it was bold: "The high fusion rates and the sensitivity to projectile energy suggest the possibility of a possible new path to fusion power." ■ IVAN AMATO

Genetic Survey Gains Momentum

Last summer population geneticist Luca Cavalli-Sforza of Stanford University, molecular anthropologist Allan Wilson of the University of California, Berkeley, and others issued a call to action: an urgent plea for help—and money—to collect DNA samples from aboriginal populations around the world before those groups vanish. Now, just a few months later, even the proponents of this bold new plan seem amazed at the response.

As word gets out, numerous anthropologists are offering to help collect samples from the isolated tribes they study. And in an unexpected twist, several federal agencies have approached the scientists—unsolicited—to see how they can help. Indeed, the agencies are already talking about picking up at least part of the tab, which could run to $20 million or more over the next 5 years.

The basic plan is to collect blood samples from members of at least 100 indigenous populations, such as the Bushmen of southern Africa and the Hill People of New Guinea. Such populations, isolated for hundreds or thousands of years, contain in their genes clues to human evolution, migration, and diversity. But the opportunity to analyze those genes is rapidly vanishing as society encroaches upon these once-distinct peoples. Once the samples are collected—probably from about 50 individuals in each group—the researchers would establish permanent cell lines to preserve the DNA in perpetuity, allowing it to be studied even after the tribes have disappeared (*Science*, 21 June, p. 1614).

Walter Bodmer, president of the Human Genome Organization (HUGO), was keen on the idea as soon as he learned of it, setting up a committee headed by Cavalli-Sforza and Marcello Siniscalco of the University of Sassari, Italy, to firm up the scientific strategy and the budget. The group was dealt a tragic blow last July, when Wilson died of leukemia following a bone marrow transplant. Shortly thereafter, Cavalli-Sforza was taken ill. As he recuperates, the dispersed committee has been doing its best to cobble together a proposal for both national and international funding agencies.

But with the proposal still incomplete, Cavalli-Sforza received a letter from Mark Weiss, who runs the physical anthropology program at the National Science Foundation (NSF). Weiss, who had read about the plan in *Science,* said that although his own research budget is too small to make much of a dent in the total cost, he thought his and other NSF programs could provide at least partial support. In late September Weiss brought together representatives from other potential funding sources as well: the genome projects at both the National Institutes of Health and the Department of Energy, and the National Institute of General Medical Sciences. "Everyone is excited," says Weiss. "No one said in stone that they would fund the project, but the general consensus is we are looking forward to receiving a formal proposal."

In response, Cavalli-Sforza and the HUGO committee are furiously revising and fleshing out their proposal into what they call a "grand vision" of the project. As they do so, both scope and cost are growing. The group is now talking about collecting DNA from 200 to 500 populations at a cost of several million dollars a year, double what they were thinking just last summer.

Before they start sampling, though, they'll have to resolve some strategic questions. Cavalli-Sforza and Wilson were deeply divided on the sampling strategy, with Cavalli-Sforza advocating sampling populations that have been isolated in geographic pockets, and Wilson proposing instead setting up a grid and sampling every 50 or 100 miles (*Science,* 21 June, p. 1615). "What is the best way to sample the world? Allan and I had different views," says Cavalli-Sforza. "I have been thinking a lot about a compromise, but I want to hear opinions of theoreticians."

He plans to bring together statisticians, mathematicians, geneticists, and anthropologists to tackle that issue in a workshop, perhaps as early as this winter. A second workshop will bring in physical and cultural anthropologists to help identify which populations to study, and which ones should come first. That's an urgent question, because for some groups, it is almost too late already.

Weiss thinks funding for those workshops is likely to be forthcoming from U.S. agencies. If enough money for the rest of the project materializes from U.S. and international sources, Cavalli-Sforza and his colleagues think they can collect all the samples within 2 to 3 years and establish the cell lines within 5. Then would begin the long-term analysis to tease out the DNA's secrets. ■ LESLIE ROBERTS