Peter Auster, editor of the Marine Technology Society's latest journal issue, which was devoted to "ROVs for science" and the dialogue over manned versus unmanned research. Such skepticism infuriates Ballard. "The point is they haven't used an ROV system. What's their credibility? I've used both," he says.

What's more, he argues, manned research is simply not cost-effective, and he points out that ROVs can literally work 24 hours a day since the ships they're tethered to can provide continuous power through the cables in its tether. Beyond that, he says, the amount of data gathered from a manned mission cannot compare to that from an ROV like Jason, since the ROVs' link to the surface ship also includes fiber optic cables that provide scientists with an unending flow of numbers and images.

But while manned research supporters concede that ROVs offer more bang for the buck, they question whether ROVs actually save much money. Alvin's costs are relatively well established, operating on an annual budget of around $2 million, but since Jason hasn't operated as a research vehicle full-time, its overall costs are more murky. WHOI's Walden points out, for instance, that Jason requires more manpower to operate—12 people compared to Alvin's eight—and manpower represents a significant fraction of operating costs. "There's really no great savings. I think the financial argument is a lot of smoke," he says. "It's about a wash [in overall cost]," agrees Dick Pittinger, WHOI's associate director of marine operations and one who monitors the accounts of both vehicles.

A final consideration attached to the debate, and one that researchers suggest cannot be easily dismissed, is the emotional appeal of manned missions. "These scientists just want to go down in subs," says Drew Michel, chairman of the Marine Technology Society's ROV committee. A small number even argue for a new manned vessel, one making use of the incredible advances in composite materials and able to go deeper than current submersibles like Alvin. But does the ocean science community really need manned submersibles, a growing fleet of ROVs, and the oncoming autonomous vehicles, and is there enough good research projects to keep them all busy? Some oceanographers think so. "In the future, I can't see anything except widespread use of all three," says MBARI's Robison, who recently called the whole debate a "bogus issue." He and others argue that the goal-oriented research capabilities of subs like Alvin are the perfect complement to the superior surveying powers of AUVs and ROVs like Jason. Says URI's Lynne Carter Hanson, a member of NRC's marine board, "We are dividing the community unnecessarily when we look at ROVs or AUVs versus submersibles." Those concerned about the fates of Alvin and Jason, at least most of them, certainly agree with that opinion.

–John Travis

SWEDISH SCIENCE

Funding Bonanza Splits Biologists

Every so often, some section of the scientific community gets an unexpected windfall that banishes—for a while, at least—the usual complaints about underfunding. Last year, British biomedical researchers struck it lucky when the charitable Wellcome Trust sold billions of dollars worth of drug company shares and doubled its annual budget (*Science*, 22 May 1992, p. 1132). Now it's the turn of the Swedish research community.

Late last month, the Swedish government set aside some $1.3 billion to launch three new research foundations, which should mean a boost of up to $125 million a year for Swedish research over the foundations' intended 15-year life. That's almost as much as the total amount now spent by Sweden's three main government research councils. Most of the money is destined for projects that could eventually help Swedish industry, but academic researchers will get the lion's share of the sudden cash injection. Gustav Rickerts, a senior official in the Swedish Education and Science Ministry, expects university-based "directed basic research" in biotechnology, computing, and materials science to dominate the new investment.

Three new research foundations will spend almost as much as Sweden's three leading research councils.

The euphoria hasn't lasted long, however: Swedish biomedical researchers are already engaged in a bitter dispute over the division of the spoils, and the research community is holding its collective breath, hoping that the planned foundations will not be torpedoed by a dispute between the country's major political parties over the source of the funds.

Both the ruling center-right coalition and the left-leaning Social Democrats—who held power until 1991—claim to be strong supporters of research. But the Social Democrats are incensed that Science Minister Per Unckel intends to finance the new foundations from the so-called wage earner fund—money levied from industry that the Social Democrats had intended to use to buy shares in companies on behalf of the public. Although the Social Democrats have reluctantly accepted that their fund is to be dismantled, some researchers are worried that they may try to convince minority parties that more of the money should be used on schemes that would directly help ordinary workers, and that this will cut into the allocations for the three foundations.

But the looming parliamentary debate may be tame compared with the spat that has already split the biomedical community—pitting the Swedish Medical Research Council (MRC) against such elder statesmen of Swedish science as tumor biologist George Klein of Stockholm's Karolinska Institute and University of Gothenberg pharmacologist Arvid Carlsson. The problem? A proposal the MRC sent to the government last summer, after it was asked for advice on how to spend the money.

"The whole issue was dealt with by a dozen people on the MRC itself," says Carlsson, who contends that the council should have first consulted its network of peer-review committees. When the contents of the proposal leaked out, says Carlsson, many researchers thought it was slanted toward the research interests of council members. Worse, he says, it included an addendum with more than 30 names of scientists suggested as possible candidates to perform the work—at least five of whom were close colleagues of members of the MRC. "That was rather shocking," says Carlsson, who has since collected 550 signatures for a petition denouncing the MRC's behavior.

MRC secretary Tore Scherstén responds that the council's traditional peer-review committees were not well equipped to draw up the interdisciplinary research proposals that the government was looking for. And although Scherstén now regrets that the controversial addendum was attached to the proposal, he says the point was simply to show that Sweden had competent researchers in the priority areas identified by the MRC. The critics have now taken the issue to the Swedish government's judicial chancellor, however, who will rule in the spring on whether the council fell afoul of a conflict of interest.

A big fear among biomedical scientists is that the affair has so badly damaged the public image of Swedish biomedicine that medical research could end up getting less than its fair share of the wage earner fund money. "Maybe we will get nothing," laments brain researcher David Ingvar, of the University of Lund, an outspoken critic of the MRC's handling of the issue. "The whole thing is tragic."

–Peter Aldhous