

invites both pure scientists (see page 247) and conservationists in the field (see page 250) to change their ways of working.

The classical world in which Linnaeus worked may seem, at first glance, to contrast with our present age of change. Linnaeus believed in fixed species of knowable number created by God and observable by men, in a world more like the lawns and flowerbeds of a formal garden than Darwin's dynamic "tangled bank".

Yet Linnaeus's classification was itself a response to a changing world — a world in which Europe's growing hegemony was bringing new species into the realm at headlong speed. Linnaeus's own experience of it was bounded by France to the south and Lapland to the north, but the 'apostles' who carried forth his words and sent back samples and descriptions sailed out from Sweden to Arabia, the Americas north and south, China, Japan and the Pacific. Two sailed with Captain Cook, sending back samples from the parts of the Pacific now being sieved for genes.

The various inventories that Linnaeus produced grew ever longer. But while today's world continues to expand in many ways, in some, including those most important to taxonomy, it is shrinking. The

creationist Linnaeus was able to assert that "we can count as many species now as were created at the beginning," but today's taxonomists suspect with near certainty that species are being irretrievably lost to science at an ever-quickening rate.

This whittling away of the bark and marrow of life is not necessarily, in itself, catastrophic. Not every lost species represents a depletion of ecosystem services or other human amenity, and although that is not the only yardstick by which to measure such things, it is in some ways the most important.

Linnaeus would no doubt find much to admire in today's scientific world: its scholarship; its ability to assemble data from around the world in minutes; its tools for examining essences. He would hopefully come round to evolutionary theory — and see the error of the racial categorizations he applied to humans.

The fact that so much of life can be seen in a few buckets of sea water might reconcile him to the fact that swallows do not, as he insisted, wait out the winter in lake-bottom mud. But the realization that the second edition of his dreamed-of universal catalogue would be slimmer than its first would surely strike him as a melancholy one. ■

Open for business

California's stem-cell institute is already transparent enough.

Twenty-eight months after California's electorate voted to spend \$3 billion on an institute dedicated to stem-cell research, the California Institute for Regenerative Medicine (CIRM) is finally up and running.

Last month, it gave 72 labs SEED (Scientific Excellence through Exploration and Development) grants for innovative approaches to stem-cell work. Tomorrow they will be joined by up to 25 more, under the institute's first tranche of mainstream investigator grants.

Details of how these grants will be executed — often in the same labs as other research funded by the federal government, and therefore subject to the Bush administration's tight constraints on stem-cell research — have yet to be fully worked out (see page 238).

However, it is already clear that the CIRM has established a robust grant-review mechanism that should satisfy the critics who said the institute would be secretive, biased towards particular organizations that had lobbied for its creation, or overly deferential to scientists. Indeed, the scrutiny to which the CIRM was initially subjected has resulted in a system for grant evaluation that is in some respects more transparent than that of any other research agency.

For example, the CIRM publishes a large amount of information about every grant application on its website (www.cirm.ca.gov), including anonymous reviewers' comments, review scores and the reviewers' recommendations to grant or withhold funding. Successful grant applicants are named on the site, but those who fail remain thankfully anonymous.

The reviewers' comments are frank and potentially embarrassing. One review summary opined that a successful applicant's proposal "lacks focus" and "is not well put together", and some reviewers said

they were sceptical about the rigour of another successful applicant's prior publication record.

This openness derives from the CIRM's unusual beginnings. In its short existence, the agency has engaged in constant and often productive dialogue with watchdog groups such as the Foundation for Taxpayer and Consumer Rights, based in Santa Monica, and members of the California legislature in Sacramento. The CIRM's oversight procedures and structure have come under close scrutiny through lawsuits in the California courts.

But as the first grants are awarded, the CIRM is under pressure to open up its review processes still further. The taxpayer-rights group now wants the agency to identify not only those who win awards, but also those who lose out. That would be akin to the state of California publicly releasing information on all the job applications it receives, complete with adverse comments made during the hiring process.

It is impossible to see how such a move will benefit California's taxpayers. Publicly identifying, and sometimes humiliating, those who fail to win awards serves no useful purpose. On the contrary, it is likely to deter scientists from submitting risky proposals that might draw flak from reviewers, and may well curtail reviewers' honesty.

Watchdog groups have also suggested that more financial information should be disclosed about members of the grant-review working group itself. The group is recruited from outside California, and is already screened for potential professional and financial conflicts of interest. The proposal for yet more disclosure, if implemented, would make the CIRM's external review process more onerous, without adding useful information on potential conflicts.

The CIRM is now functioning well, and its dialogue with the public has played a significant role in its progress. Calls for yet more openness may be well intentioned, but they threaten to override the element of confidentiality that is inherent to fair peer review, and to undercut the agency's mission of supporting cutting-edge research from the best Californian scientists. There comes a point at which yet more sunshine leads to sunburn. ■