

## Local data are vital to worldwide conservation

*Sir*—Red Data Books and Red Lists of threatened species have drawn attention to species at risk of extinction worldwide<sup>1,2</sup>. As the number of national Red Lists increases, more information becomes available to assess the global status of species. Unfortunately, global assessments coordinated by the World Conservation Union (IUCN) are not making full use of this wealth of local data, often giving a misleading picture of the status of a taxon.

In our study of this problem, we excluded widely distributed threatened species, whose risk of extinction may vary from country to country, and focused on nationally endemic taxa, where national and global Red Lists should be identical. We found that national assessments tend to incorporate data from global assessments, but the reverse is much less frequent. This decreases the efficiency of conservation at the national level, where actions are most likely to have an impact; local organizations have difficulty raising international funds because donors believe, wrongly, that international lists are more accurate.

We compared global and national lists of threatened endemic species for Argentina<sup>3</sup>, Bolivia<sup>4</sup>, Ecuador<sup>5</sup> and Venezuela<sup>6</sup>. Although most South American countries have national Red Lists<sup>7</sup>, only these four use the new IUCN Red List categories used for global assessments<sup>8</sup>. The combined national and global lists cover 173 taxa (Table 1). All taxa should be included in both lists; in fact, only a quarter are. Over half of the taxa listed nationally are not listed globally, while more than three-quarters of the taxa included in the global lists also feature in national lists. Of those taxa included in both lists, the categories they are assigned to in each list are more likely to differ than not ( $\chi^2 = 4.22$ , d.f. = 1,  $P < 0.05$ ). Agreement between national and global lists is best for birds, followed by mammals and reptiles (Table 1).

We suggest that these disparities are due to a lack of communication between

national assessments based on geography and global assessments based on taxonomy. National Red Lists are usually produced by local organizations. In contrast, IUCN compiles global Red Lists through its Species Survival Commission (SSC), a network of more than 5,000 volunteer scientists organized into areas of taxonomic interest.

To improve the flow of information between national and global Red Lists, data from geographically based lists must be compiled, cross-referenced, and made available to global assessors. To this end, the SSC should create an interdisciplinary group to administer a website containing the national Red Lists of the world. By standardizing the process of submitting information to the website, a 'virtual' specialist group would be both cost-effective and relatively easy to manage; it would significantly improve the quality of Red Lists at both levels and would make research and conservation more effective.

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Table 1 Nationally endemic South American animals in national and global Red Lists

Taxon	National lists		Global lists		Both lists	
	Number	(%)	Number	(%)	Number	Taxa simultaneously in both (%)
Mammals	29	69	27	74	36	56
Birds	66	76	58	86	74	68
Reptiles	4	50	3	67	5	40
Amphibians	9	0	0	0	9	0
Bony fishes	8	0	4	0	12	0
Crustaceans	6	0	1	0	6	0
Insects	31	3	1	100	31	3
All taxa combined	152	46	94	78	173	42

## There's a place for the theory of everything

*Sir*—As the originator of the term 'Theory of Everything' (TOE) to represent the ambition of string theory to describe all the elementary particles and their fundamental interactions (*Nature* **323**, 595; 1986), I was dismayed by the tone of a recent review by my old friend George Ellis of *The Quest for Unity* (*Nature* **401**, 527; 1999) by Etienne Klein and Marc Lachièze-Ray.

My definition of a TOE — a theory to "unify all the fundamental interactions" and "explain the number and couplings of all the elementary particles" — is not different from Ellis's "theory unifying all fundamental forces into one", but I take issue with his (and your headline writer's) assertion that this "is ... irrelevant to most physicists".

In addition to the cosmologists cited by Ellis, the TOE ambition of particle physics is relevant to any astrophysicists interested in topics such as black holes, gravitational waves, active galactic nuclei, gamma-ray bursters, dark matter, structure formation, supernovae, high-energy cosmic rays and so on. Moreover, the theoretical tools of quantum field theory, conformal field theory, topological solitons and so on, discovered or developed by particle and string theorists, are central to much of condensed-matter theory, and even of interest to pure mathematicians; witness the Fields medal awarded some years ago to Edward Witten, even before the advent of Seiberg–Witten theory.

Like Ellis, I lament the fact that physics "is becoming ever more fragmented into disparate subjects", but particle physicists are hardly to blame for the richness of the phenomena (relativity, quantum theory and so on) revealed by their predecessors in the quest for unification. Nobody can know what richness may be revealed by the TOE, and the fragmentation it may engender.

And, please, no more citations of the defunct Superconducting Super-Collider: its physics will be covered ably by the Large Hadron Collider (LHC) at a fraction of the cost. Indeed, the LHC, at \$2 billion, is not so much more costly than the Spallation Neutron Source in the United States, at \$1.3 billion, or the Japanese Hadron Facility, just to take two examples of current accelerator projects motivated in large part by condensed-matter physics. Where would these, and synchrotron light sources, be if would-be particle unifiers had not developed the necessary accelerator tools?

Finally, I agree with Ellis that "isolationism is a prerequisite for successful physics", and with the authors of the book that it is a challenge for physics to "resist the temptation to project the false self-image of

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