



Figure 1 Reef-builders: diversity and stability. Over the 500-million-year time frame studied by Kiessling<sup>5</sup>, the diversity of species in coral reefs has fluctuated, and the dominant reef-building organisms have included cyanobacteria, sponges, molluscs, algae and corals. Kiessling used many ecological indicators to show that periods of high biodiversity are followed by periods of lower-than-average ecological change — in other words, biodiversity leads to stability. The red arrowheads represent times when major extinctions occurred. Diagrams drawn by John Sibbick, from ref. 6. Graph from ref. 5, supplementary information. Stromatolites: 1, 5; sponges: 2, 5–7, 12, 13; crinoids: 2–4; cyanobacteria: 2, 3, 6, 7; tabulate corals: 3, 4, 8, 10; rugose corals: 9; foraminifera: 11; bryozoans: 11, 12; rudist bivalves: 16; algae: 11, 12; scleractinian corals: 14, 15, 17, 18, 21, 22; gorgonian coral: 19; giant clam: 20. Organisms not drawn to scale.

productivity. Either evolutionary innovation drives ecological change, and the coupling of biodiversity and stability are ancillary, or the two are so tightly linked that it takes mass extinctions and dramatic evolutionary innovation to decouple them.

These ecological and evolutionary findings<sup>5</sup> are extraordinarily important to the diversity–stability discussion. Those who follow the debate because of its contemporary environmental implications, however, may find this study’s multi-million-year time frame frustrating—but there is an important message. The latest rounds in the biodiversity–stability debate have been fuelled by studies of current rates of species loss and their impacts on current ecosystem function. Kiessling’s finding that, given a few million years, species-rich ecosystems will tend to look the same as they do now, won’t do much to settle this argument. Indeed, given that today’s reefs are relatively diverse, one might inadvertently conclude that they will persist in the face of environmental perturbation.

Kiessling’s data, however, show that only 5–58% of ecological change is predicted by diversity, leaving plenty of scope for environmental impacts to have a dramatic effect. If history provides some basis for predicting the future, coral reefs may show less variability over the next few million years than their

less-diverse predecessors, but they might also collapse relatively easily. Threatened by climate change and coral bleaching, as well as by overfishing, the spread of marine diseases, nutrient pollution and habitat destruction<sup>7</sup>, reefs lie at the threshold of these alternative futures. The diversity of coral reefs may make them productive, and it may sustain their function over time, but these reef paradises can still be lost in the face of environmental change.

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#### 100 YEARS AGO

“Compulsory Greek at Cambridge.” When I decided to go up to Cambridge to study mathematics and philosophy I was living abroad, and I crammed Greek... But on going in for the “Little Go,” though I passed easily in translation, I failed by a few marks in Greek grammar. It was so near a thing that I thought I might pull through in December with a few hours more grind; but unfortunately I ran it too fine, and again failed by a few marks. This meant that I had to get up a complete new set of translation books for the following June, and to prevent further mistakes I went to a coach for the grammar part. I then passed, getting a second class... I can only say my present knowledge of the language is *nil*, although I had a double dose of it... But this may have been due to my resentment at being forced to waste time in an uncongenial study, when I was keen to get on to something else.

Edward T. Dixon

From *Nature* 26 January 1905.

#### 50 YEARS AGO

The declared aim of the Central African Federation is a partnership between the races, European and non-European; and to the attainment of this ideal a university, with the goodwill of the people and the support of the government, can make a tremendous contribution... The Moffat Resolutions adopted by the Legislative Council of Northern Rhodesia on July 29, 1954 (*The Times*, August 14, 1954), began the task of defining partnership in a more precise way than has hitherto been attempted: “(1) The objective of policy in Northern Rhodesia must be to remove from each race the fear that the other might dominate for its own racial benefit and to move forward from the present system of racial representation in the territorial legislature towards a franchise with no separate representation for the races. (2) Until that objective can be fully achieved a period of transition will remain during which special arrangements in the Legislative and Executive Councils must continue to be made so as to ensure that no race can use either the preponderance of its numbers or its more advanced stage of development to dominate the other for its own racial benefit...” The significance of education, and particularly the education of the African, in the working out of such a plan must be clear to all.

From *Nature* 29 January 1955.