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J. Stephen Lansing co-directs the Complexity Institute at Nanyang Technological University in Singapore, and is a professor in the Asian School of the Environment. He is also an external professor at the Santa Fe Institute, birthplace of complexity theory, an emeritus professor of anthropology at the University of Arizona, and a senior research fellow at the Stockholm Resilience Centre.

Previously Lansing held joint appointments at the University of Michigan in the School of Natural Resources & Environment and the Department of Anthropology, and earlier chaired the anthropology department of the University of Southern California. He has been a Fellow at the Institute for Advanced Study at Princeton, the Center for Advanced Study in the Behavioral Sciences at Stanford, the Institute of Advanced Study at Durham University, the Santa Fe Institute, the Stockholm Resilience Center and the Eijkman Institute for Molecular Biology in Jakarta. His recent research has to do with the long-term dynamics of coupled social-ecological systems. Recent publications and films are available at [www.slansing.org](http://www.slansing.org).

**Islands of order**

Not long ago, both ecology and social science were organized around ideas of stability. This view has changed in ecology, where nonlinear change is increasingly seen as normal, but not (yet) in social science. This talk focuses on two surprising discoveries about culture and language in the islands of Indonesia; slow-moving silent transformations that only become apparent in retrospect.

The first discovery is an explanation for the extraordinary productivity of Bali's ancient rice terraces, whose geometric precision has inspired generations of postcard photographers. Viewed from above, a changing mosaic of colors appears: green when the rice is young, yellow as it nears harvest, silver when the paddies are flooded, and brown when they are drained. The evolution of these mosaic patterns duplicates the progression of spin alignments in ferromagnets. In physics, the result is magnetism. But magnetism is not an adaptive process. What is going on in the rice terraces?

The second discovery concerns the evolution of language. Since our species first appeared, every human brain has needed a language. But the connection between specific languages and parental lineages can be lost in a generation, if children learn different languages from their parents. In the Wehali district of

the island of Timor, five languages are spoken in a cluster of a dozen villages, some of which practice matrilocal residence while others are patrilocal. Consequently, marriage often involves moving to a new community. In the first study of its kind, we used finely-resolved co-phylogenies of languages and parental lineages to ask, how long does the connection between languages and lineages persist? And what happens when it breaks?