Step back from the edge

I generally read Howy Jacobs's editorials with both interest and amusement, often enjoying his insight into a diverse range of topics. However, with reference to his June 2012 editorial, *At the cliff's edge*, I think he has allowed himself to be completely misled.

Howy states that, "political leaders are desperately in search of immediate and reliable advice on how best to handle the current financial crisis", but points out that the advice they have received is next-to-useless because it is so diverse. He argues that "economists remain fundamentally divided over the diagnosis, which does not stop some of them from offering unsolicited advice," and concludes that "our colleagues in economics need to be cautious, applying level-headedness and humility in the face of trends that cannot accurately be predicted, let alone shaped by policy."

However, I take issue with his assertion that our political leaders are actively in search of this advice, and that there is no consensus about the course of action needed. In fact, many commentators agree on solutions to the current crisis and the prevention of future ones. The fact that their suggestions have not been acted on suggests a lack of political will or courage, and undue influence on the government of interested parties. These suggestions include: (i) greater regulation of the financial markets, starting with a 'Tobin tax' on financial transactions—this would put a brake on the financial games that are the major cause of the crisis; (ii) a major cut to military spending, which is arguably the worst spent money on Earth; (iii) a higher rate of tax on high salaries—up to 92%, following the example of US President Eisenhower in the 1950s; (iv) the separation of commercial banks and financial banks, with different rules and responsibilities for each, as is being undertaken in the UK; (v) the direct provision of money to people—that is, an increase in salaries, a genuine subsistence salary for the unemployed, expanding the public sector, support for small and medium enterprises, support for the green

economy—rather than the existing style of 'quantitative easing' that passes it to banks who use it to bolster their capital rather than lend it to boost the economy; (vi) a cap on executive pay; and (vii) a cap on the money spent on lobbying governments.

Any one of these policies would help those who are suffering most from the crisis by redistributing wealth or modifying behaviour, rather than increasing the wealth and influence of the few, as is the existing trend.

I wonder how many of us are truly aware of the extent to which our politicians are personal stakeholders in the financial world [1]? Why is it that the richest 1% of nearly every population become richer everyday, whereas the rest stagnate or become poorer [2]?

I am not trying to say that things are simple, or that everything can be solved quickly and inexpensively. However, politicians should act on behalf of the people, not surrender to the will of corporations. Growth forever is simply impossible: this is a lesson that biologists could impart to economists.

In relation to Howy's other point, that academic economists should be more careful in making sweeping proposals on the basis of their own pet theories, it follows from my comment that it does not matter what they say anyway, given that EU politicians seem determined to please the markets, rather than supporting their own people. This mindset is most clearly demonstrated by the fact that the success of political agreements is measured primarily in terms of credit ratings, rather than

welfare or other indicators of a nurtured and successful populace.

The admission by Barclays Bank—probably only the first of a series—that it manipulated interest rates for its own benefit, is yet another indication that banks should be more strictly regulated by politicians. It is intolerable that the existing situation sees corporations controlling the will of governments, and worse still that politicians seem almost complicit in this arrangement.

Walking along the cliff's edge, as Howy suggests, will lead to a serious and probably fatal accident. The question is, who should fall: the financial elite, who caused this crisis and continue to grow wealthier from it, or the common man or woman, whose taxes are being absorbed by banks and whose children have a very bleak outlook indeed? Different economists propose different solutions, based on their opinion: which ones to listen to is the responsibility of politicians, and not a decision that should be left to 'market forces'.

CONFLICT OF INTEREST

The author declares that she has no conflict of interest.

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EMBO reports (2012) 13, 772; published online 17 August 2012; doi:10.1038/embor.2012.123

Plants are intelligent too

Whilst welcoming Ken Richardson's argument that intelligent behaviour is present in all organisms [1], I draw attention to several omissions. First, many researchers have commented on the ubiquity of intelligent behaviour in the animal world.

Commenting on protozoan behaviour, Alfred Binet, the creator of the first IQ test, wrote that "we find manifestations of an intelligence which greatly transcends the phenomenon of cellular irritability" [2]; Romanes stated that "no one can have watched the movements of certain

infusoria without feeling that these little animals are not actuated by some amount of intelligence" [3].

Moving on from protozoa to multicellular organisms, Vertosick described "the intelligence of every living thing" including bacteria [4]. Similarly to Richardson, however, he omitted higher plants that form 99% of the eukaryotic biomass on Earth. Plant behaviour is not strikingly evident because it operates on a totally different timescale to our perception, but its visible aspect is phenotypic plasticity. Higher plants respond to an enormous variety of physical, chemical and biological signals in their environment to maximize foraging for resources in two distinct but unpredictable and variable environments: above and below ground. Optimizing this phenotype probably involves territoriality, self and alien recognition and competition, as described by game theory. Predictive assessments, decisions and trade-offs are all involved, as well as countering the threat of herbivores and disease. Mate selection is elaborate and underpinned by discriminating, complex conversations that precede and follow fertilization.

The goal of any individual plant is the same as that of any animal—the intelligent construction of behaviour to optimize life cycle fitness and maximize selection. To this end, nervous systems are not necessary; complex networks are sufficient to create intelligent behaviour. Higher plant cells are as complex as animal cells, and the individual plant coordinates its millions of cells into overall coherent and intelligent behaviour. Any discussion about the evolution of intelligence therefore has to include the behaviour of plants [5–7].

CONFLICT OF INTEREST

The author declares that he has no conflict of interest.

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EMBO reports (2012) **13**, 772–773; published online 7 August 2012; doi:10.1038/embor.2012.118

Response to Anthony Trewavas

It is always good to acknowledge the surprising insights into simpler forms of intelligence expressed by scholars a century or more ago. What has not been clear, however, is of what these early forms consisted, how they evolved into the vastly more complex systems we have since seen, and what that might tell us about the nature of these newer forms, especially human cognitive abilities. The "missing heritability" problem, reflecting reliance on additive (independent), and linear deterministic gene effects, suggests that we have been on the wrong track as far as explaining causes of

form and variation are concerned. A better answer, I suggested, arises from challenges posed by increasingly changeable environments as more simple niches became filled. In realistically changeable environments, we need to focus on structures, not elements, in niches, to understand what has evolved. In my article [1] and in other work [2], I have tried to describe the abstraction of structure at increasingly complex levels, based on nonlinear dynamic principles. At all levels, these allow much faster, creative responses to environmental challenges, expanding developmental plasticity and altering evolutionary trajectories. I gave examples in cell signalling and gene transcription systems, in physiological and early nervous systems and in brain, cognitive and human socio-cognitive systems. So we can portray evolution as a series of bridges or cascades, responding to the dynamics in the world at increasingly complex levels, and amplifying potential for complexity in living things. The trend culminated in cognitive powers that transcend the old darwinian laws, in adapting the world to themselves, rather than vice versa.

CONFLICT OF INTEREST

The author declares that he has no conflict of interest.

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EMBO reports (2012) **13**, 773; published online 17 August 2012; doi:10.1038/embor.2012.122