

## LETTERS

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## Public participation in China's project plans

THE SUCCESS OF China's government-funded megaprojects, including the South-to-North Water Diversion (SNWD) project (1, 2) and the Three Gorges Dam project (3), is in question. A change in the Chinese government's top-down decision-making process for such projects would help.

Although Chinese laws and regulations require public participation in the decision process (4), it remains limited in practice. State agencies and their leaders should play a much greater role in which projects are selected for implementation. The SNWD project began well before its feasibility report was approved by the state in 2008. Individuals and groups who are positively or negatively affected by a proposed megaproject should also play an important role in project selection. Public participation in the appraisal of government-funded projects would improve the effectiveness of the decision-making process, reduce conflict between the government and the general public, and facilitate project implementation.

A number of proposals for government-funded megaprojects are expected in the near future, with the goal of boosting the economy. Public hearings and surveys have been put in place to register public comments on these projects. However, controversial projects such as Pengze Nuclear Power Station in Jiangxi Province (5) show that conducting the process objectively and engaging all stakeholders must still be improved. The development of such projects has substantial social, environmental, and economic impacts. Therefore, facilitating and implementing public participation would be of great practical value. To be effective, a policy to promote greater public involvement must ensure that project information is transparent and that the public's voice is heard.

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Three Gorges Dam on the Yangtze River.

## Infection and the first eukaryotes

IN THEIR PERSPECTIVE "Pathogen to powerhouse" (12 February, p. 659), S. G. Ball *et al.* argue that the endosymbiotic events that led to the evolution of eukaryotes involved infection of an already complex host. They write that "the first challenges for an endosymbiont are to avoid being digested..." There are, however, issues associated with such a concept.

In the case of plastid endosymbiosis, Ball *et al.* advocate involvement of chlamydial pathogens (the MAT hypothesis), but independent analyses have rejected this idea (1). In the case of mitochondrial endosymbiosis, Ball *et al.* suggest that a relative of the *Rickettsia* pathogen infected an archaeon, with one caveat being that all *Rickettsia* are obligate intracellular pathogens that depend on eukaryotic cells and their mitochondria for survival. Furthermore, Ball *et al.* assume that the interplay of the endosymbiotic partners was not symbiotic. Yet, such symbioses are common, *Paulinella chromatophora* and

all secondary endosymbioses being two examples.

For mitochondrial endosymbiosis, the authors envision an archaeal host that could endocytose (i.e., incorporate large particles including bacteria). Lokiarchaea currently represent the closest relatives of such a host. However, pangenome data (2) show that Lokiarchaea lack critical endocytosis components, including those that mediate membrane curvature toward the cytosol and dynamins responsible for membrane scission; the latter are likely of mitochondrial origin (3). Endocytosis is selective and requires vesicle formation, an acidified lysosome, and a multivesicular body, which also matures through vesicles that mitochondria secrete (4). It

is thus misleading to say "It is likely that endocytosis in Archaea originally evolved..." particularly in the absence of endocytosing prokaryotes.

Ball *et al.* also suggest that autophagy evolved earlier than mitochondria to remove incidentally captured prokaryotes. Yet, the initiation of the phagophore depends on mitochondria-associated endoplasmic reticulum membranes (5). The endomembrane system appears to depend a lot on mitochondria, not vice

versa. Most important, advocating a complex host that was infected by a *Rickettsia* relative fails to explain the universal presence of mitochondria in eukaryotes and offers no rationale for why mitochondria came about in the first place.

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## Response

WE DISAGREE WITH Gould that the phylogenetic analyses of Domman *et al.* (1) reject our hypothesis that plastid endosymbiosis relied on an interaction between cyanobacteria, a chlamydial pathogen, and a single-celled eukaryote (the MAT hypothesis). The phylogenetic trees shown by Domman *et al.* are very similar to ours