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Geodynamic energy and heat transport

Earth-energy has long been, to use Churchill's words, a riddle wrapped in a mystery inside an enigma. Currently popular models rely upon radiogenic heat for geodynamic processes, geomagnetic field generation, and for the Earth's heat loss. The problem is that radionuclides cannot even satisfy just the global heat loss requirements to say nothing of the great geodynamic energy requirements. Moreover, temperature increases with depth within the crust, but the three previously known heat transport processes within the Earth, conduction, convection, and radiation, appear unable to account for heat emplacement at the base of the crust. Herndon (page 1605), as a consequence of whole-Earth decompression dynamics (*Current Science*, 10 December 2005), adds a fourth heat transport process capable of emplacing sufficient heat at the base of the crust to drive crustal dynamics, volcanism and earthquake production and to account for global heat loss and the geothermal gradient.

Burden of haemoglobinopathies in Central East India

The hereditary disorders of haemoglobin may be grouped into two broad categories: haemoglobinopathies and thalassaemias. The haemoglobinopathies are characterized by the production of structurally defective haemoglobin due to abnormalities in the formation of the globin moiety of the molecule. The thalassaemias are characterized by a

reduced rate of production of normal haemoglobin due to absent or decreased synthesis of one or more types of globin polypeptide chains. The thalassaemias are widespread, with maximum prevalence around the Mediterranean littoral and in southeast Asia. Sickle cell haemoglobin is prevalent in Africa and central-southern part of India, whereas, haemoglobin E in southeast Asia and north-eastern India, and haemoglobin D in Punjab and western India. Haemolytic anaemia results from an increase in the rate of red cell destruction.

Breathless on little exertion, excessive fatigue, tiredness or weakness, joint pains, pale nailbeds, eyelids, lips and tongue, and reduced activity in children are the symptoms of anaemia. Anaemia reduces capacity to work, increases the risk of maternal and foetal morbidity and mortality such as premature delivery, low birth weight, etc. and increases the susceptibility to infection.

Several rare types of thalassaemic disorders and haemoglobin variants have sporadically been reported from India. R. S. Balgir (page 1651) has reported the scenario of haemoglobinopathies in the Central Eastern part of India. He highlights a major public health and genetic problem of clinically significant haemoglobinopathies in the state of Orissa. The presence of thalassaemias and haemoglobin E in coastal part of Orissa and that of sickle cell in the central, western and southern Orissa has importance from historical perspective, migrations of people and genetic diversity of ethnic/predatory populations of India. This clearly shows that haemoglobinopathies are not confined only to tribal people but have

penetrated the general and scheduled caste populations of the region unlike other parts of the country.

Wolbachia endosymbiont

The intracellular alpha-proteobacteria of the genus *Wolbachia* has been recently recognized to infect a wide range of arthropods. These were first reported in the reproductive tissues of the culicine mosquito, *Culex pipiens*, causing cytoplasmic incompatibility. Interests in this group increased when it was found that the infection and its effects were not limited to mosquitoes, but were also present in several other insect species. The bacteria manipulates the host biology in many ways, such as parthenogenesis, feminization, fecundity enhancement, male killing, etc. These bacteria are being identified using *Wolbachia*-specific PCR primers, such as 16S rDNA, *ftsZ*, *WSP* protein coding genes and are classified into eight super clades (A to H) based on nucleotide variability.

From the application point of view, *Wolbachia* is of interest as a tool to genetically transform insects for the modification of their disease-transmitting abilities and in controlling pests and predators by interfering with their *Wolbachia* symbionts. Keeping this in view, Prakash and Puttaraju (page 1671) have screened several insects and insect pests of sericulture importance for the presence of *Wolbachia* by using *wsp* primer in PCR technology. The information provided will lead to use of these bacteria as a tool to control insect pests of agriculture in general and sericulture in particular.