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Bridging the Palk Strait

The NASA shuttle image given below shows a 'bridge' between India and Sri Lanka, named Adam's Bridge. It is made of a chain of shoals, nearly 30 km long, in the Palk Straits between India and Sri Lanka. The bridge is 'mostly submerged approximately 1.2 m below sea level, with only a chain of limestone shoals left showing'.

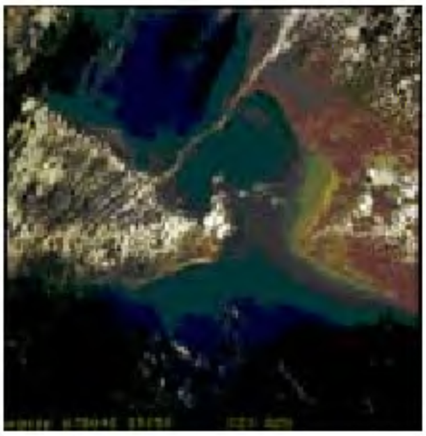

Image courtesy of Earth Sciences and Image Analysis Laboratory, NASA Johnson Space Center. Mission: STS059 Roll: 229 Frame: 25 Mission ID: STS59 Features: PALK STR., ADAM'S BRIDGE website (http://eol.jsc.nasa.gov)

Besides NASA pictures, those taken by Indian Remote Sensing satellites are also said to show the bridge clearly. According to S. M. Ramasamy from the Centre for Remote Sensing (CRS) of Bharathidasan University, Tiruchi, the land/beaches were formed between Ramanathapuram and Pamban because of the long shore drifting currents which moved in an anti-clockwise direction in the north and clockwise direction in the south of Rameswaram and Talaimannar about 3500 years ago and the sand was dumped in a linear pattern along the current shadow zone between Dhanushkodi and Talaimannar. Later, corals may have accumulated over these linear sand bodies.

R. D. Schuiling (**page 1351**) proposes a geochemical engineering solution to elevate the 'island' formations which would enable linking India with Sri Lanka by a land route, 'leaving one or more gaps for shipping and . . . for emplacement of hydro turbines'. The geochemical approach is based on injecting industrial 'waste' acids, especially sulphuric acid in the underground limestone formations.

Radiative effects of aerosols

Determination of the radiative effects of aerosols is currently one of the challenging problems in climate research. Aerosols influence the Earth's radiative balance directly by scattering incoming short-wave radiation back to space and indirectly through their influence on cloud properties. The indirect radiative effect due to aerosol is considered to be one of the largest uncertainties in current global climate models. Several investigations have focused on the determination of indirect effect, but most of them were confined to the anthropogenic (man-made) sulphate aerosols. Studies on the indirect effect of natural aerosols (such as sea-salt) are rather a few. A simple approach has been used to determine the indirect effect of sea-salt aerosols over the Arabian Sea for different seasons using long-term data available from ship-borne and island-based observations. Vinoj and Satheesh (**page 1381**) demonstrate that the indirect radiative effect of sea-salt (natural) aerosols (at the top of the atmosphere) is as large as -7 ± 4 W m^{-2} when compared to the direct radiative effect of -2 ± 1 W m^{-2} and hence cannot be ignored. These values are larger than the anthropogenic aerosol forcing ($\sim 5.0 \pm 2.5$ W m^{-2}) reported over this region. The high variability in indirect effect from -4 W m^{-2} to around -18 W m^{-2} brings out the importance of the natural aerosols in this region. This study also demonstrates the important role of the wind speed on aerosol characteristics and hence its impact on direct and indirect radiative effects. It is important to note that the magnitude of indirect radiative effect (and uncertainty) is several-fold larger than the direct radiative effect of sea-salt aerosols.

Optical traps and red blood cells

Linearly-polarized light has associated with it an electric field whose direction is well defined and easily controlled. Interaction of such light with dielectric particles induces electric dipoles that generate a torque such that energy minimization constraints force alignment of the ensemble of particles along the field direction. Such spatial alignment in gas-phase molecules has been extensively studied by Dharmadhikari and Mathur (**page 1432**) who now draw attention to its possible relevance to micron-scale alignment in experiments on red blood cells (RBCs). A normal RBC is a flattened bi-concave disk. The experimenters place RBCs in an optical trap and show that, after bending and twisting motion, the RBCs assume a rod-like shape with the cellular axis aligned along the light polarization direction. On removal of the light, the RBCs revert to their original shape. The optical trap is simple to implement; it has implications for controlling motion of single cells and opens new vistas for biology at a single-cell level.