

# The symbiotic planet by Lynn Margulis

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Although Russian scientists such as Wallin and Merezhkovsky had formulated the symbiotic theory in the early twentieth century, their work was based on paleontological and zoological observations. Margulis relied on direct microbiological observations for her endosymbiotic theory. Rejected at first, her paper was finally published by the Yale University Press in 1970. and was highly acclaimed as one of the great achievements of twentieth-century evolutionary biology.

Margulis has done significant work concerning the evolutionary origin of mitochondria in eukaryotic cells. Mitochondria are a small part found in most cells, in which the energy of the food is released. Mitochondria contain DNA and ribozymes of their own which are independent of the ribosomal processes of the cell. " It has been proposed that one type of aerobic prokaryote invaded or infected another and that through time, the infective prokaryote evolved morphologically and physiologically into the mitochondrion"(Sheeler and Bianchi 9) This shows that the cells that we are made of were formed by the symbiotic union of different kinds of prokaryotes. " Our remote ancestors quickly learned to live with these invaders and benefit from them" (Willis p 183). When some of these bacteria merged after trying to eat each other, sex arose, and from sex, it is opposite death.

Margulis' description of the Daisyworld makes the idea of Gaia clear. Black daisies absorb heat and white daisies reflect heat. Black daisies grow faster in cold climates, and white daisies produce more offspring. As the sun's luminosity increases, black daisies which absorb heat, heat up their surroundings, resulting in more population growth. This goes on until the crowd of white daisies begins to eliminate the black ones. The white daisies,  
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absorbing less heat, cool the planet. The result is, according to Margulis, "to heat the planetary surface when it is cooler during the early evolution of the sun and then keep the planet relatively cool as solar luminosity increases. Despite the ever hotter sun, the planet maintains a long plateau of stable temperature." According to Christopher Uhl, "the daisies act like a thermostat," (Uhl p. 39) keeping the earth habitable. Gaia, the largest ecosystem of the earth's surface, is symbiotic.

All inhabitants of the earth use the same water and atmosphere, making them partners in a symbiotic relationship with each other. Cells, the building blocks of living organisms have been formed as a result of symbiosis. The earth itself is kept habitable due to symbiosis. Evolution owes a great deal to symbiosis. The book "The Symbiotic Planet" is contemporary and thought-provoking.