JAMES E LOVELOCK 1919-

- Nathan, Heather,
- Deborah and
  ny

Cat Stevens - Morning Has Broken

James E. Lovelock Education

- Born 1919 Letchworth Garden City, UK
- 1941 Manchester University= B.Sc. Chemistry
- 1948 London School of Hygiene and Tropical Medicine= Ph.D. Medicine
- 1959 London University D.Sc. Biophysics

Academic and Professional Activities

- 1941- 61 Medical Research Council, National Institute for Medicine Research, London
- 1954-55 Visiting Scientist, Harvard University Medical School
- 1958-59 Visiting Scientist, Yale University Medical School

- 1961-64 Professor of Chemistry, Baylor College of Medicine, University of Houston
- 1964-74 Visiting Professor, University of Houston
- 1964-89 Visiting Professor, Department of Cybernetics, University of Reading
- 1993-Present Honorary Visiting Fellow of Green College, Oxford University

Major Awards

- 1955 CIBA Foundation Award for Research in Aging
- 1974 Fellow of Royal Society
- 1975 M.S. Tswett Award for Chromatography
- 1980 American Chemical Society's Award for Chromatography

- 1986 Silver Medal and Prize, Plymouth Marine Laboratory
- 1988 Norbert Gerbier Prize, World Meteorological Association
- 1990 Amsterdam Prize for Environment, royal Netherlands Academy of Arts and Science
- 1996 Volvo Environment Prize

1960's

1960

- Kennedy became President of U.S.
- U.S. Launches:
  - Tiros I, first weather satellite
  - Echo I, first communications satellite (experimental)
  - Transit I-B, first navigational satellite
  - Corona, first spy satellite

1961

- Alan Shepard is first American in Space
- Water Pollution Control Act is Amended
- JFK begins the Apollo Program

1962

- First Earth Day
- Rachel Carson's " Silent Spring" was published.
- John Glenn orbits the earth 3 times

1963

- Martin Luther King Jr. "I Have a Dream" speech
- Kennedy was assassinated
- Clean Air Act was passed

1964

- Wilderness Act
- Plans to build the Word Trade Center Announced
- Good Friday Earthquake (Single most powerful earthquake in U.S. History)

1965

- Water Quality Act Passed
- Solid Waste Disposal Acts are passed

1969

- Santa Barbara Oil Spill
- Man lands on the Moon

What is Gaia Hypothesis?

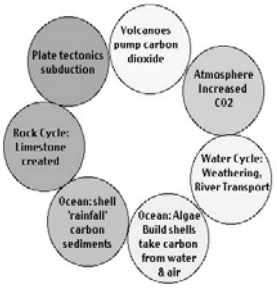
- The Gaia Hypothesis states that the earth is alive and functions as a single organism that maintains conditions necessary for its survival.
- Lovelock defines Gaia (named for Greek goddess *Gaia*, earth's mother) "as a complex entity involving the Earth's biosphere, atmosphere, oceans, and soil; the totality constituting a feedback or cybernetic system which seeks optimal physical and chemical environment for life on this planet."

How does Gaia work?

- Lovelock explains, "Life, or the biosphere, regulates or maintains the climate and the atmosphere composition at an optimum for itself."
- In other words, the atmosphere, oceans, land, and the life in them, is a closely connected system that responds to one another as if they were all part of one body.
- It does this in a unconscious homeostatic state, (Homeostasis can be defined as the maintenance of physiological conditions required to maintain the life of the organism).
- If Gaia is a self-regulating organism, then it will adjust to the impact of man, however it could act to exclude man.

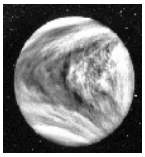
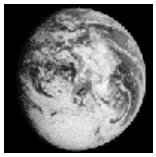
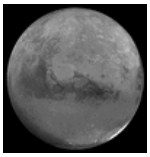
Some of the major processes that Gaia regulates:

- The amount of salt in ocean water.
- The amount of carbon dioxide in the air.
- The temperature of the Biosphere.
- The amount of oxygen in the air.
- Graph with other examples.



Example of a dead planet

- In 1965 Lovelock, as part of a NASA team, was asked to propose hypotheses that would demonstrate whether life existed on other planets, such as Mars and Venus.
- The team stated that a "dead" planet is at a chemical equilibrium.
- Venus: N(<2%), CO2(98%), Trace of Oxygen
- Earth: N(78%), CO2(0.03%), 21% Oxygen
- Mars: N(<3%), CO2(95%), (0.13%) Oxygen

Question 1

What is Gaia?

Answer:

- A complex entity involving the earth's biosphere, atmosphere, oceans, and soil.

Question 2

- Lovelock asserts that, "if Gaia exists, the relationship between her and man, a dominant animal species in the complex living system, and the possible shifting balance of power between them, are questions of obvious importance." What are the questions of importance?

Answer:

- The questions of obvious importance are those that make us wonder about the earth and the life it bears, and the speculations about the consequences of our own presence here.

Question 3

- What is the difference between the Gaia hypothesis and the Gaia Theory?

Answer:

- The Gaia hypothesis, is that the totality of life on earth constitutes, a self-regulating system able to keep it's climate and chemical composition comfortable for the organisms that inhabit it.
- The Gaia theory is, "regulation, at a state fit for life, is a property of the whole evolving system of life, air, oceans, and rocks."

BEAUTIFUL DAY