

Open vs Closed Systems: The Growth Needs of Humanity in the 21st Century and Beyond

Comparing Two Systems

Open Systems

- -Non-Zero Sum
- -Whole = More than Sum of Parts
- -Relative limits to growth
- -Win-Win Competition focus
- -Multipolar (multiple centers of gravity)

Closed Systems

- -Zero Sum
- -Whole = Sum of Parts
- -Absolute limits to growth
- -Win-Lose Competition focus
- -Unipolar (one center of gravity)



"Coordinated development is the unity of balanced development and imbalanced development. The process from balance to imbalance and then to rebalance is the basic law of development. Balance is relative while imbalance is absolute. Emphasizing coordinated development is not pursuing equalitarianism, but giving more importance to equal opportunities and balanced resource allocation."

-Xi Jinping, 2016



Figure I- Rather than admit an error in Malthus's axioms, his modern followers have revived and popularized his theory which denies the existence of creative reason, with the Club of Rome's 1972 Limits to Growth (middle), which simply took the old formula (on left) and added more variables (right).



Vernadsky's 3 Phase Spaces

- Lithosphere

• Biosphere



Noosphere/Techosphere







"The biosphere may be regarded as a region of transformers that convert cosmic radiations into active energy in electrical, chemical, mechanical, thermal, and other forms. Radiations from all stars enter the biosphere, but we catch and perceive only an insignificant part of the total. The existence of radiation originating in the most distant regions of the cosmos cannot be doubted. Stars and nebulae are constantly emitting specific radiations, and everything suggests that the penetrating radiation discovered in the upper regions of the atmosphere by Hess originates beyond the limits of the solar system, perhaps in the Milky Way, in nebulae, or in stars ... The importance of this will not be clear for some time, but this penetrating cosmic radiation determines the character and mechanism of the biosphere."

-Vladimir Vernadsky, Biosphere (1928)

Open System Case Study 1: The Arctic





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BUSINESS INSIDER

Soon There May Be A Bering Strait Tunnel Connecting The U.S. To Russia



Tiffany Gabbay, The Blaze Sep 13, 2011, 12:01 PM

The U.S. and Russia have cooperated in space, and now the two countries are adding high seas to the mix, having set their minds on connecting the Eurasian and American continents via an underwater tunnel in the Bering Strait according to Russia Today.



Originally conceived in 1906, during the rule of the last Russian Czar, Nicholas II, the project had been deemed unrealistic by many, and put on hold by world wars and revolutions, but now seems to have recaptured the hearts of businessmen on three continents. The tunnel is expected to be twice the size of the Channel Tunnel connecting Britain and France. The 65 mile giant would be the key component of a 3,700 mile railroad reaching from Yakutsk, Russia to



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Arctic Science Cities







Open System Case Study 2: The Middle East







Five Seas Grand Strategy Revived

Possibilities for the Sinai Peninsula





The Loess plateau, in China 2009 vs 2019





Open System Case study 3: Space Exploration

Peaceful Purposes

International cooperation on Artemis is intended not only to bolster space exploration but to enhance peaceful relationships between nations. Therefore, at the core of the Artemis Accords is the requirement that all activities will be conducted for peaceful purposes, per the tenets of the Outer Space Treaty.

ARTEMIS





SPACENEWS



Russia, China to sign agreement on international lunar research station

by Andrew Jones - February 17, 2021



Russia opts for lunar project with China over continued cooperation with ISS partners beyond LEO

HELSINKI — Russia is preparing to sign a memorandum of understanding with China to cooperate on a vision for an international lunar research station.

"Roscosmos has completed domestic proceedings to harmonize the Memorandum of Understanding between the Government of the Russian Federation and the Government of People's Republic of China