Evolution
and
a New Birth of God
Church on Evolution

Humani Generis 1950 para. 36.

Pope John Paul II: “science can purify religion from error and superstition; religion can purify science from idolatry and false absolutes. Each can draw the other into a wider world, a world in which both can flourish.”
“New knowledge has led to the recognition of the theory of evolution as more than a hypothesis.”

Evolution pertains only to the material body; theories of evolution “which consider the spirit as emerging from the forces of living matter or as a mere *epiphenomenon* of this matter, are incompatible with the truth about man. Nor are they able to ground the dignity of the person.”
COSMOS

- Old
- Large
- Dynamic
- Interconnected
The word “cosmos” pertains to the order of physical reality.

Cosmic evolution means that both on the larger scale of Big Bang cosmology and the complex scale of biology, evolution is the way life unfolds.
THE BIG BANG

According to the Big Bang model, the universe developed from an extremely dense and hot state. Space itself has been expanding, carrying galaxies (and all other matter) with it.
Large

• We are one of billions of galaxies

• Our own galaxy, the Milky Way, is a mid-size galaxy consisting of 100 billion stars, and stretching about 100,000 light years in diameter.

• The galaxies are often grouped into clusters—some having as many as 2,000 galaxies together.
Big Bang Expansion
13.7 billion years

1st Stars about 400 million yrs.

Quantum Fluctuations

Inflation

Dark Ages

Development of Galaxies, Planets, etc.

Dark Energy Accelerated Expansion

Afterglow Light Pattern 400,000 yrs.

WMAP
The Expanding Universe

Cosmological redshift

If the universe were contracting instead of expanding, we would see distant galaxies blue shifted by an amount proportional to their distance instead of red-shifted.

A graphical representation of the gravitational redshift due to a neutron star.
A Finely-Tuned Universe

| A trillionth of a trillionth of a trillionth of one percent faster, the cosmic material would have been flung too far apart for anything significant to happen | If gravity had been $10^{33}$ times weaker than electromagnetism, "stars would be a billion times less massive and would burn a million times faster." |
13.7 billion years

“It does not matter what country you Look at. We are all Earth’s children, And we should treat her as our Mother.”

Aleksandr Aleksandrov
We are evolution become conscious of it itself

The human person holds a frontier position in evolution.

With the human, mind reflects on matter
Biological Evolution

Each volume has 450 pages.
Each page = 1 million years

Vol. 1 = Big Bang
Vol. 21 = Earth
Vol. 22 = Life
Vol. 29 = Cambrian period
Vol. 30 = Dinosaurs go extinct on p. 385
Vol. 30 = Mammals appear on p. 390
Vol. 30 = p. 450 last line, human beings
"Humans like mammals have existed on earth for a relatively short time -- only about 0.04% of the earth's existence." (0.04% of 4.5 billion)

"Most anthropologist believe that between about 400,000 & 300,000 years ago, Homo erectus evolved into a new species called Homo sapiens."

The modern human physique first appeared in Africa about 140,000 years ago, and then spread into the rest of the Old World, replacing existing populations of archaic human forms."
Evolution is the human story
Evolution and Consciousness

• Teilhard de Chardin said that consciousness is active at all levels of reality.

• Matter and consciousness -- not two substances or modes of existence. . .but two aspects of the same cosmic stuff.

• The within is the mental aspect and the without is the physical aspect of the same stuff.

• Evolution is toward greater withinness and withoutness
THE PRIMACY OF CONSCIOUSNESS

Evolution is the rise of Consciousness.

Quantum Big Bang
Evolution: The 3 C’s

Convergence

Complexity

Consciousness
Teilhard’s Two Energies

Withinness

Withoutness

Radial

Tangential

Consciousness
Increase in radial energy, the energy of consciousness, led Teilhard to suggest that consciousness is the core of evolution.

Mind no longer appears as an accidental intruder into the realm of matter

Development of consciousness is a transition from a lower to a higher state of centro-complexity”
Wholeness in Nature

• The order of living organisms is internally emergent rather than externally imposed.

• relation between parts and whole is thoroughly interactive

• The whole is an integrative relational structure

• the whole provides a certain stability; it is not a fixed form but a dynamic pattern that changes constantly
• **Mechanism** – a functional unity in which the parts exist in relation to one another in the performance of a particular function.

• **Organism** - a functional and structural unity in which the parts exist *for and by means of* one another in the expression of a particular nature.
Organism

The parts of an organism—leaves, roots, flowers, limbs, eyes, heart, brain—are not made independently and assembled, as in a machine, but arise as a result of interactions with the developing organism.
Nature is an interlocking network of systems, an “unbearable wholeness of beings”

In living systems, “the product of its operation is its own organization.”
Wholeness in Nature

- Implicate Order
- Quantum entanglement
- Autopoiesis
- Morphogenetic Fields
- Systems biology – open systems
• being is intrinsically relational and exists as unbroken wholeness in a system.

• Rather than starting with the parts and explaining the whole in terms of the parts, Bohm starts with a notion of undivided wholeness and derives the parts as abstractions from the whole.

• because reality is marked by relationality and movement, it has endless depth.
The essence of nonlocality is unmediated action at a distance... a nonlocal interaction links up one location with another without crossing space, without decay, and without delay.

“Non local action at a distance”
Ludwig von Bertalanffy credited with theory of “open systems.”

Open systems – feed on a continual flux of matter and energy from their environment. Remain far from equilibrium.

Self-regulation became key property of open systems.
The structure of a living system is constituted by the actual relations among the physical components; structure is the physical embodiment of its organizations.

Structure = Relationships
Chaos Theory

- **Sensitivity to initial conditions** - an arbitrarily small perturbation of the current trajectory may lead to significantly different future behaviour ➔ “Butterfly Effect”

- **Strange attractors** – basins of attraction within system that can lure the system into a new pattern of order over time.

- **Fractals** – geometric shape that is similar to itself at different scales
Rupert Sheldrake postulates a field of habitual patterns that links all people, which influences and is influenced by the habits of all people.

The more people have a habit pattern -- whether of knowledge, perception or behavior -- the stronger it is in the field, and the more easily it replicates in a new person (or entity).

May describe how the human consciousness is shared.
Holons and Holarchy

View of living systems as networks provides a novel perspective on the so-called hierarchies of nature.

The interconnected levels of networks constitute a web of life wherein systems interact with other systems or networks within networks.
Whole
Whole-part
Whole-part
Whole-part
A holon is something that is simultaneously a whole and part.

Evolution produces greater depth and less span; as the individual holon acquires greater depth, the span or the collective gets smaller and smaller.

Ex. a whole atom is part of a whole molecule; a whole molecule of part of a whole cell; a whole cell is part of a whole organism.
Holarchy -- a hierarchy of self-regulating holons that functions:

1) as autonomous wholes in supra-ordination to their parts,
2) as dependent parts in sub-ordination to controls on higher levels
3) in coordination with their local environment.
“In a *hierarchy* participants can be compared and evaluated on the basis of position, rank, relative power, seniority and the like. (distinct levels of being)

In a *holarchy* each person’s value comes from his or her individuality and uniqueness and the capacity to engage and interact with others to make the fruits of that uniqueness available.” (one order of being)
As holons emerge in greater complexity, consciousness increases.
We are no longer parts in a world machine but wholes within wholes.
Matter is not a thing in itself but a concentrated form of energy which has mass or weight.

What is striking about the physical world of mass-energy is the inherent *force of attraction* within all dimensions of cosmic life.

*Attraction* is a fundamental force that yields more than the sum of entities themselves.
Love as a Cosmological Force

Physical reality:

Attraction
Union
Emergence

“The force of love-energy is present from the Big Bang onwards, though indistinguishable from molecular forces.”
Evolution = Process \rightarrow Future

the infinite possibilities for more life.

A world opened to the future makes the present rich in possibilities to create something new.
“But even among the molecules, love was the building power that worked against entropy, and under its attraction the elements groped their way towards union.”

Teilhard de Chardin
Imagine a vast dark cloud of hydrogen atoms stretching through millions of miles of space. Each of these trillions upon trillions of atoms is involved in an attracting activity for all the rest, and slowly begins to move. A common center emerges, and the hydrogen atoms begin to clump together. The growing pressure from the gravitational attraction enables the hydrogen atoms to fuse into helium atoms, thus releasing their hidden energy in a vast profusion of light emanating in all directions: the core of the star ignites. All of this activity is the result of the cosmic allurement of gravitation.

Brian Swimme
The Power of Love Energy

Love is the power of attraction, one to another. The primacy of energy and the power of attraction.

- Union is prior to Being; Union ➔ Being

This is a radical shift from what we know:

being ➔ union

- In evolution, union is always towards more being.
• The fundamental energy of love: “What comes first in the world for our thought is not “being” but “the union which produces this being.”

• Love is the affinity of being with being in a personal, centered way; a unity toward greater wholeness of being that marks all cosmic life
Love is Relational

- “To be” is “to be with.”

- Reality is “being with another” or “interbeing.”

- I do not exist in order that I may possess; rather I exist in order that I may give of myself, for it is in giving that I attain myself.

- Being must first be a “we” before it can become in “I.”
• The universe, in the framework of love, is intrinsically relational.

• The whole of reality from the lowest to the highest is covenanted, that is, united in a bond of love.
Teilhard uses the word *hyperphysics*

the principle of life is toward *more being*,

not perfect being (!)

as we find with *metaphysics*. 
The foundation of things is not so much a ground of being sustaining existence from beneath, as it is a power of attraction toward what lies up ahead.

“The universe is organically resting on the future as its sole support.” (Teilhard)
Cosmic Personalization

- love is attractive
- Attractive being unites
- Union gives rise to more being
- Unitive being is emergent (new)
- Emergent being complexifies (more relatedness)
• evolution is the movement toward greater wholeness and consciousness.

• This center to center process of development is both personal and universal. “True unity does not fuse the elements it brings together

• it is not *something* but *someone* who is forming in evolution.
Love, Sex and the Cosmos

• Sexuality presumes that we are part of a whole and have been separated from the whole.
• Our incompleteness makes us long for wholeness and union
• We are wholes longing for more wholeness and being.
• Sexuality and the flowering of personality
• Teilhard saw a deep energy at the heart of cosmic life that is evident in the human person. Sexual energy, he said, is the energy of centricity and unification.

• Any explanation of the world (biological, philosophical or religious) that does not succeed in finding an essential place for sexuality in its system “is virtually condemned.”
• Through the passion of union, the individual emerges from isolation of being alone and enters into union with another in a way that is more spiritualized from the start than the individual personality.

• Teilhard speaks of the “creative role of erotic attraction” not only on the level of the individual but the universe itself is erotic.

• Passion is the true stuff of the universe; “the whole creation is groaning in the pains of new birth” (cf Rm 8:22)
Omega

- Principle of centeredness
- Omega = ultimate divine energy
- Love = concentrating energy at the heart of cosmic evolution.

“The physical structure of the universe is love.”
• As life becomes more complex and conscious, it becomes more integrally whole.

• Teilhard called this unitive principle undergirding wholeness, Omega. Omega is the most intensely personal center that makes beings personal and centered.

• As the principle of centration that is both within and ahead, Omega emerges from the organic totality of evolution.
“I am the magnetic and unitive force that brings the disparate matter together and urges each newly created form to multiply, to beautify, and to bear fruit. I nurture and release spirit from among the crude and complex elements. Each step towards union moves my creation towards greater spontaneity and freedom.”

Teilhard de Chardin

“The Eternal Feminine”
Reflection

Attend to your inner energies.
What is the place of: love?
    desire?
    attraction?

Are you an open system or a closed system?

Center yourself in prayer and attend to the strange attractors within. What are they?