

Outline in 9 pages

Evolution:
On the Nature of Things
Actors

Professors (Departments)	Honor Students (Majors)
1. Dean , Richard Barth,	1. English Literature , Mary
2. Chemistry , Linus Kornberg & Roger Adams	2. Economics , James
3. English Department , Richard Hughes	3. Linguistics , Jerry
4. Physics , Albert Hawking	4. Political Science , Barbara
5. Physics , Rein Watson	5. Theater , Ann
6. Physics Graduate Student, Stewart Perry	6. Art (Painting)
7. Anthropology , Margaret Benedict	7. Philosophy , Alice
8. Literature , William Hopkins	8. Biology , Tom)
9. Philosophy , Immanuel Whitehead	9. Psychology , Derek
10. Sociology , Amitai Parsons	10. Music (Bob)
11. Biology , Stephen Jay Wilson	11. Mathematics , Harry
12. Music , Johannes Britten	
13. Art , Andy Matisse	
14. Religious Scholars: Hinduism-Buddhism -- Ramana Singh, Catholicism --Sister Teresa Merton and Father Thomas Gallagher Burns, S.J.; Protestantism -- Karl Tillich Judaism -- Martin Heschel, Islam -- Jalal al-Ghazzali	

Chapters

1. A Human Perspective-
2. The Fields of Physics and Chemistry
3. The Field of Biology
4. The Field of Anthropology
5. The Field of Sociology
6. The Field of Literature
7. The Field of Art
8. The Field of Music
9. The Fields of Theater, Drama, and Poetry
10. The Field of Philosophy
11. The Field of Psychology
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Chapter 1. A Human Perspective: On the Nature of Things

Dean Richard Barth is upset about the direction taken by liberal arts colleges. Departments have become too isolated and specialized for faculty to discuss subjects in common and issues in the public interest. There is a disappearance of religious studies and a decline in the humanities. He believes the faculty needs to see where they are going and change direction. He calls together the chairs of all his departments for a discussion of evolution. He writes:

The Course of Evolution: Our History

Big Bang ----->>	Earth Life ----->>	Homo sapiens ----->	Civilization
<i>Science</i>	<i>Biology</i>	<i>Anthropology</i>	<i>Social Science</i>
<i>Quantum</i>	<i>Natural Selection</i>	<i>Socialization</i>	<i>Institutions</i>
Particles	Bacteria	Symbols	Societies

Human consciousness

Dean: *Everything we know comes through our consciousness.*

The Anthropic Principle.

An astrophysicist by the name of Brandon Carter proposed that the universe is structured just right to support life here on earth.

The Method of Participant Observation

Benedict: I think the method of “participant observation” is essential to the very construction of knowledge.

Polarities

Dean: Unity/Plurality, Creation/ Destruction, Attraction/Repulsion, Integration/Separation, Symmetry/Asymmetry, Continuity/ Discontinuity, Inner/Outer Complexity/Simplicity, Linearity/ cyclicity, Equality/Hierarchy, Community/Individual, Subject/Object, Freedom/Order, Each new thing is relatively *self-organizing* and *self-directing* while linked to other energies in the universe. These concepts are all substantive, that is to say, found equally in all fields.

“Synthesis” means “combining separate things to form a more coherent whole.”

The Direction of Change

Dean: Evolution is advancing in time with a greater complexity of things but also advancing a greater inner *subject* along with more objectivity. I see an increasing development of the *inner* side of things, a greater interior consciousness inside the brain.

Transcendence

Dean: By “transcendence” I do not mean something religious or supernatural. The word *transcendence* represents something surpassing (or exceeding) the past. It adds a new potential to evolve within itself.

Continuity and Discontinuity

Dean: So there is both continuity and discontinuity in the data. Not all species survive. Is it the same in society?

Freedom and Order

Sociologist: Early social scientists saw a progression toward greater freedom with order.

Community and Individual

Psychologist: Who are we? (Identity: Autonomy and Interdependent.)

Linearity and Cyclicity

Physicist: In *astronomy*, cycles are studied in the orbits of planets, in moon phases, and tides.

Hierarchy and Equality

Biologist: There is a system of ranking in all things.

Chapter 2. Physics and Chemistry

Physicist: Creation proceeds by differentiation and synthesis: *particles to atoms: hydrogen, helium, lithium, beryllium, boron, carbon, nitrogen, oxygen, fluorine, neon...*

Chemist: Molecules differentiate and integrate toward greater complexity: 1. *Monatomic* 2. *Ionic compounds* 3. *Nonfunctional compounds (the paraffin series)*; 4. *Functional compounds* 5. *Nonfunctional polymers* 6. *Functional polymers* 7. *DNA*

Mirror Neurons

Chemist: A mirror neuron is a neuron that fires both when an animal acts and when the animal observes the same action performed by another. Thus, the neuron “mirrors” the behavior of the other, as though the observer were acting.

Bisociation₊₊

Arthur Koestler, *The Act of Creation* in 1964 concludes that all inventions and discoveries share “bisociation,” a blending of elements drawn from of two previously unrelated matrices of thought into a new matrix of meaning by way of a process of

comparison, abstraction and categorization with analogies and metaphors.

Conscious/Unconscious

Biologist: Pasteur said his discovery of immunology took place in a sudden flash of intuition, without his thinking through the problem. W. B. Cannon's theory of the "fight-flight syndrome" occurred to him in a sleepless night.

The Tension of Opposites

Dean: The universe cannot be explained by a root metaphor, like Mind or Matter, not just a Mechanism or an Organism. *Root metaphors* do not work here.

Science/Religion

Dean: Science and religion separated as institutions of society. Chemistry separated from alchemy, which was rooted in religion. The psychoanalyst Carl Jung looked at Newton's break with religion. He felt that science had forgotten its original values.

Self-Organization

Dean: Physicists say that the self-organization of atoms also applies to the self-organization of society. Chemistry associations are self-organizing in society, like chemicals in a laboratory test tube.

Reflectaphors

Literature Professor: Reflectaphors are similarities that occur in the interactions of elements of something. Reflectaphors are the *hidden order* in a work of art.

Dean: The ants in the colony, the neurons in the brain, and the investors in a market are all self-organizing systems, all self-directing.

3. The Field of Biology

Wilson: Evolution is *the way* inheritable favorable traits become more common in successive generations of a population while unfavorable traits become less common. Is this "unit" a *gene*, an *organism*, a *species*, a *group*, a *cell*, and *population*, a *climate*?

Co-evolution

Certain types of flowers have a nectar chemistry associated with a hummingbird's diet.

Their color and their morphology coincide with the bird's morphology and vision.

Human Body

Wilson: One quadrillion cells exist in the human body and 90 percent of them are bacteria, yeasts, and other microbes that keep us alive.

Pheromones and Morphic Fields

Tom: A pheromone is a chemical that triggers a response within the same species.

The Brain

Prof. Wilson: The brain is *the most complex object in the universe* containing over 11 billion specialized nerve cells called neurons through electrochemical pulses.

4. The Field of Anthropology

Benedict: The *Paleolithic Age*, The *Mesolithic Age*, and The *Neolithic Age*.

The Evolution of Language

Benedict: Animals invented signs and signals, and then humans transformed them into symbols that have "meaning." Meaning transcends a time or place.

The Evolution of Writing

Stages of writing go from *pictograms*, to *ideographs*, to *hieroglyphs*, to an *alphabet*.

Human Consciousness

Benedict: The psychologist Julian Jaynes says the human brain in this early stage was “bicameral.” The left and right sides of the brain were physically “not integrated.”

Physical Anthropology

Benedict: In 100,000 years, anatomical trends toward smaller molars and less bone mass

Junk DNA

Prof. Kornberg: Human evolution may have been driven by parts of the genome called “junk DNA”(95%) for which there is no function.

5. The Field of Sociology

Parsons: Sociology is a field of knowledge that stands between science and the humanities. It has data that is both subjective and objective. It’s a synthesis.

The Evolution of Society

Parsons: Comte saw society evolving in what he called the “Law of Three Stages.” he called 1. Theological (*fetishism, polytheism, monotheism*) 2. Metaphysical (*stages of abstraction*) and 3, Positive. (scientific method).

A Social Universe

Wilson: Bacteria live in self-organizing societies with trillions of members and their own identity and systems of communication.

Verstehen

For Max Weber it means an accurate interpretation of a *subjective* fact.

6. The Field of Literature

Literary Theory

Prof. Hughes: Leaders in critical theory movements reject the idea that science can claim any *absolute truth* about nature. A “Theory of Everything” in physics is nonsense.

Binaries

Prof. Hughes: Derrida says we privilege one side of a binary over another, like *presence* over *absence*, *identity* over *difference*, *fullness* over *emptiness*, *meaning* over *meaninglessness*, *mastery* over *submission*, *light* over *dark*, *immediacy* over *delay*, *origin* over *supplement*, *correspondence* over *arbitrariness*, *truth* over *untruth*, *reason* over *unreason*.

Frequencies

Dean: Matter and Mind are working at different frequencies. We need to research them. It would help us resolve this difference.

The Tension of Differences

Hughes: Everything is evolving in the strain and stress of differences seeking to become one. We cannot let one side trap us as if it were The Truth – as in Ideal versus Real, or Subjectivity versus Objectivity.

The Unending Synthesis of Things

Hughes: Derrida sees the *unending combination of contexts*, assembled by our nature in ways that require something to be hidden.

Transcendence

Dean: Transcendence means something exceeds its past in complexity. This new thing has incorporated key elements from its earlier period and shows greater involvedness.

Rhetoric

Mary: Tropes are “figurative” like metaphor, *alliteration*, *synecdoche*, *metonymy*, *onomatopoeia*, *irony*, and *allegory*. *Evolution is based on them*. Metaphor is a device that puts together very different images to create a new image.

The Novel

Prof. Hughes: Thomas Mann’s *The Magic Mountain* is an allegory for our time. It is a *bildungsroman*, “a novel of personal development.”

7. The Field of Art

Chart: Evolution of Art

Benedict: The oldest known paintings could have begun anywhere from 35,000 to 100,000 years ago. Look at the *sureness* and *refinement* in horses painted on the wall.

The Elements of Art

Matisse: The elements of art are like atoms, "building blocks" of a painting -- *line*, *shape*, *form*, *space*, *texture*, *value* and *color*. Green has at least 84,000 *tints* and *tones*.

Chart on Art Principles

Dean: This principle of “interconnectedness ” is applicable from the Big Bang.

Aesthetics

Jane: The field of aesthetics began as a theory of beauty in the eighteenth century. Philosophers saw art as an expression of both beauty and the sublime. This was a synthesis of all fine arts; a higher level of understanding.

Future

Matisse: The next stage will combine science with art. There are new studies on how science is seeking integrative frameworks.

8. The Field of Music

Dean: The oldest song was recorded in cuneiform around 4,000 years ago in Ur, a coastal city in ancient Sumer.

Bach and the Principles

Dean: The astrophysicist Carl Sagan has said that the UNIVERSE IS LIKE A FUGUE. Each voice plays variations on a key theme.

The Evolution of Music

Benedict: The oldest song was recorded in cuneiform around 4,000 years ago in Ur, a coastal city in ancient Sumer. **Table I: Evolution of Music**

The Evolution of Harmony

From the 6th to 9th centuries A. D., a dozen scale patterns of tones and semi-tones were invented but only the simplest "perfect" harmonic ratios were accepted

Differentiation

Britten: Societies in Europe developed different musical traditions. Look at Spain, Germany, and France.

Cycles

Derek: There is the “song cycle.” The sequence is given some *unity* by having something in common, like a narrative or a person.

Evolution in the Classical and Romantic Period

Britten: So many instruments are *invented* that their combination overpowers the human voice; the symphony evolves from sonatas. **Dean:** The “Romantic Period” came with an evolution in complex (“high”) culture”— in literature, philosophy, and the arts. I say the Romantic Period deepened *interiority*. Synthesis continues as a principle.

The Principle of Freedom

In physics that involves counting the number of parameters within which something can operate: greater choices.

Music Theory: Invention and Synthesis

Tom: Composers thought Beethoven was noise at first. John Cage’ guide was *I Ching*.

Vibrations

Britten: Pythagoras discovered that the *pitch* of a musical note depends upon the length of the string that produces it; it is part of the “harmony of the spheres.”

Chords and String Theory

Britten: Dmitri Tymoczko found a way to represent the universe of all musical chords in graphic form. He says the cosmos is filled with chord spaces, known as *orbifolds*.

Math and Music

Perry: The Golden Ratio exists in molecules. The DNA is based on the Golden Ratio. Stradivarius used the Golden Ratio to make his violin. And then there are symphonies.

9. The Field of Theater, Drama, and Poetry

Bertolt Simon says: Greek playwrights put abstract ideas into their stories, developing a greater “*interiority*” in the process.

Chart: The Evolution of Theater

Simon: The *Ramayana* and *Mahabharata* became the first plays in India.

The Evolution of Poetry

Professor Burns: Consider the *Iliad* and *Beowulf*, at first, oral. I died as a mineral and became a plant, I died as plant and rose to animal, I died as animal and I was Man.

10. The Field of Philosophy

When one side of a polarity is exaggerated or overemphasized, there will be a distortion about the true nature of things.

Postmodern Philosophy: Culture

Structuralists search for polar oppositions in culture. *Logos* is the union of all opposites. It cannot be deconstructed without losing Reason itself.

The Evolution of Philosophy

Prof. Benedict: Tell us about reincarnation. Does that have something to do with early philosophy?

Modern Philosophy

James: Hobbes, Descartes, and Newton, Locke, Berkeley, Hume, Rousseau, and Kant. None of them knew about biological evolution, but their ideas all bear on it.

Polarities and Evolution

Kornberg: A voltage has polarity. A magnet also has polarity.

The Origins of Justice in Nature

James: Poetic justice evolved from nature. Justice is affiliated with Order by its principled mutuality with Freedom.

Identity

Dean: Kenneth Burke says “identity” is fundamental to being human. It leads us into pre-human times. We said a lion could identify an antelope.

Summary: Priorities

Benedict: Is the Subject more powerful than the Object? Could Life be more powerful than Death -- in the long run? Socrates said the purpose is to gain self-knowledge

11. The Field of Psychology

Evolution Chart

Derek: Is there progress in the study of the mind?

Paranormal Phenomena

Mowrer: Professionals study: *telepathy, precognition, clairvoyance, psychokinesis, reincarnation, ghosts* and other similar phenomena.

Mediums

Mowrer: Mediums translate what William James called “the other side.” I have a level of verification for me. I find confirmation when “communicating” with the deceased.

Reincarnation

Dean: Reincarnation means that a person migrates to a new body on the other side.

Forecasting the Future

Mowrer: We call it “precognition.” We are in a “sea of frequencies.” Electromagnetic waves go through space at 186,000 miles per second from the station to your radio.

Near Death Experiences

Mowrer: They happen after an individual has been pronounced clinically dead -- or close to death. Doctors have been reporting them with the cardiac resuscitation techniques.

The Self in Evolution

Dean: The “self” refers to a person's essential being. It distinguishes one from others. In my field the “self” is the agent responsible for all actions ascribed to an individual.

12. The Field of Religion

In the original Novel the Dean died after the last class, leaving a grieving faculty. The faculty decided to hold a last class session in his honor.

Benedict: We have with us, Professor Ramana Singh, who teaches Eastern religions – such as Buddhism, Jainism, and Hinduism. We have Professor Theresa Merton and Professor Thomas Gallagher Burns, S.J. in the Catholic tradition, Karl Tillich, the Protestant tradition, Martin Herschel, who teaches Judaism and Jalal al-Ghazzali studies Islam.

Kornberg: Let me offer a quick summary of what the Dean has proposed through previous classes. Our new guest-scholars need a “catch-up.”

Evolution of Religion

Prof. Burns: Dr. Michael Behe says there is evidence of biological systems that are “irreducibly complex.” “They could not possibly have evolved by natural selection.” They must have evolved by “intelligent design.”

Tantra

Singh: Tantric practices are thousands of years old, written as a dialogue between the

Hindu god Shiva -- who is "the penetrating power of focused energy" -- and his consort, Shakti, the female creative force. Kundalini is the force behind evolution.

Merton: In Catholicism, nuns and priests practice celibacy.

The Self

Singh: The word "self" is used everyday like what you call the ego. It is the cause of suffering. You are in the great dance of existence. The body participates in subtle energies that are gateways into every part of the universe.

Compassion

Singh: Buddhists have no God, no permanent "self."

Complexity and Simplicity

Singh: Compassion is *simple*, but you would find it *complex* to experience.

Kornberg: Simple and complex is like Einstein's $E=mc^2$. That is a simple formula in mathematics but it is extremely complex to understand.

Merton: Jesus wanted us to live in simplicity, "Be like a child."

The Purpose of Evolution

Merton: The purpose is to bring heaven into the earth. It is, as the Dean said, the final synthesis. We are here to join heaven with earth.

Ghazzali: Bahá'u'lláh taught that the purpose of evolution was the development of the soul. Evolution takes us -- with our help -- towards the Great Communion.

The Evolution of Power

Merton: We are evolving through the power of love. Look at the Berrigan brothers, Dorothy Day, Cesar Chavez and Dolores Huerta, Lanzo del Vasto, Dom Helder Camara, Mairead Corrigan, Danilo Dolci.

Singh: Look at Gandhi, a Hindu. Look at Martin Luther King, a Baptist.

Oppositions in Evolution

Burns: The Jesuit Teilhard de Chardin spoke of how we evolve through a "living earth." God is in and outside human consciousness: Immanent and Transcendent. The Jesuit Bernard Lonergan proposed a cosmic process that develops from stage to stage.

Who Are We?

Merton: We are the Children of God! But Catholic intellectuals debate the work of Søren Kierkegaard who says your *inner life* harbors a secret. The "self" has a secret.

Reincarnation

Singh: Life is a theater where we learn new roles in "self-realization."

Truth

Singh: Mahatma Gandhi *invented* a new word for the synthesis of truth and life: *Satyagraha*, bringing truth into your life, joining love and truth in action.

A World Community

Burns: Wait. Father Drinan was a Jesuit who was a world federalist. He said we must build a world community, develop global law -- construct a "global government."

Herschel: Norman Cousins was a Jew who worked with Drinan on world law.

The Sacrifice

Wilson: Identity and sacrifice could be traced back to the beginning of time. The story is finished.

