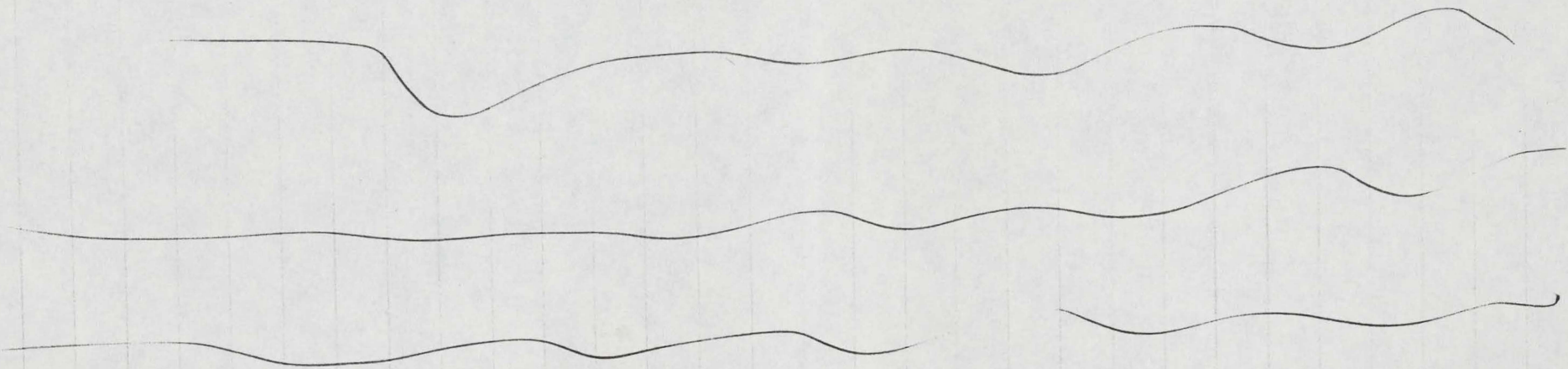


Conceptual Spiral

For Parents

Let's reexamine our abstract

2 - Great to me find - 2



Key Passage

XII

3 - Why is this passage key - ?

- Because it suggests a general way by which we can deal with the world around us

More specifically we shall show that:

- By repeating the theme contained within this passage and by examining the practice of science/engineering and the pursuit of Technology we can create a conceptual model for comprehending, adapting, and adopting to that world.

Now

at the practice of research engineering and the pursuit of Technology,
are going to be the key for removing the conceptual aspects;

...we should ask ourselves;

in speaking of science, engineering, and Technology,
what do we mean?

Sample-Model Message

• Science can be viewed as a self-correcting process of observation, hypothesis, and text.

abstract

• Engineering can be viewed as a self-correcting process of observation, design, and text.

active

• Technology can be viewed as the intermediate state of the art produced by the practice of science and engineering.

~~III~~ IV

? - Point Question - ?

What has the practice of research, engineering and
the pursuit of technology given us or done for us?

Examples from Scores

Some Outstanding Contributions

- Isaac Newton (1687) —
- Adam Smith (1776) —
- A.M. Ampere/C.F. Gauss (1820-1830's) —
- Carnot/Clausius/Boltzmann (1824/1825/1870's) —
- Faraday/Heydahl/Hertz (1831/1865/1888) —
- Darwin/Wallace (1838/1858) —
- Hart / Engels (1848-1895) —
- Gregory Mendel (1866) —
- Henry Poincare (1880's) —
- Ray Planck (1900) —
- Albert Einstein (1905/1916) —
- Spectral/predictability within special/general relativity —
- Discreteness/quantization within quantum theory —
- Quantum/predictability within quantum physics —
- Gödel/Turing/Church/Turing (1930's) —
- Claude Shannon (1948) —
- Crick/Watson (1953) —
- Turing/Symposium/Hallmark/Epstein/Hallmark (1943/1970's) —
- Chaikin/Bennett (1965/1985) —
- Isomorphisms/incompressibility in information theory —

Contributions

Examples from Engineering

Some Outstanding Contributions

- Savory/Newtonman/Wall (1698/1705/1769)
- George Stephenson (1825)
- H. Phipps/M.H. van Jaarsveldt (1832/1838)
- Thomas Davenport (1834)
- Samuel Morse (1837)
- J.W. Veege/J.M. Doyenne (1839)
- Galton Plant (1859)
- Z. Gramme/H. Fontaine (1869/1873)
- Nikola Tesla (1876)
- Alexander G. Bell (1876)
- Thomas A. Edison (1877)
- Thomas W. Edison (1879)
- Walter von Siemens (1879)
- Germany (1881)
- Charles Parsons (1884)
- Berg/Demeler (1885/1886)
- N. Tesla/G. Harrison (1893/1895)
- Thomas A. Edison (1894)
- Rudolf Diesel (1897)
- Wally (1902)
- Wright Brothers (1903)

- Steam engine
- Steam railway
- magnetoelectric generator/motor (ac)
- battery powered electric motor
- telegraph
- photography
- rechargeable battery
- DC generator/DC motor
- 4 cycle gasoline engine
- telegraph
- phonograph
- electric power transmission
- electric locomotive
- electric motor/generator railway
- steam locomotive
- gasoline automobile
- wireless telegraph
- motor picture projection
- diesel locomotive
- electric railway
- gasoline powered automobile

Examples from Engineering

Some Outstanding Contributions

- Christian Hölmer (1904)
- V Paulsen / R F Fritzsche (1904/1906)
- John A Fleming / Lee De Forest (1904/1907)
- Em Eyring / Lee De Forest (1919/1923)
- USA - Pillsbury - KDRH (1920)
- American or locomotive (1923)
- J. L. Baird (1926)
- Warner Brothers (1927)
- Germany / USA (1932/1934)
- Britain / USA / Germany (1935-1939)
- Hans van Oort / ~~Germany~~ (1939/1939)
- Germany / Britain / USA (1935/1936/1944)
- Eduard / Mauchly (1946)
- ~~Computer~~ (1955)
- J Kelly / R Kaye (1958/1959)
- T H Haurman (1960)
- Philips (1970)
- Sony (1980)
- Borden / Borden / Sordley (1947)

- contributions
- radar
- vacuum tube
- sound motion pictures
- public radio broadcasting
- developed electronic locomotive
- television
- Sony / Sings / sound motion picture
- developed electronic railway
- operational radar
- J Turing / J Thompson
- television broadcasting
- electronic computer
- radio records
- integrated circuit
- laser
- radio-cassette recorder
- radio camera / video
- television

~~XX~~ X

? - Raised Question - ?

Looking at the past, with the controversy those people
have provided the world: What can we say about
our efforts for now and for the future?

~~XL~~

Critical Examination

Grand Message

- Any coherent intellectual system we create to represent large portions of reality will at best represent that reality incompletely.

- However, we neither have nor can we create beforehand a supposition that can forecast or predict the kind of system we will create in the future to represent that reality ~~completely~~.

- Furthermore, such a supposition can neither forecast nor predict the consequences that flow from that system we create later on.
- Going even further, we cannot determine or discern the character or nature of such systems (suppositions) within themselves.

which imply that

~~which may be~~

People among themselves a system evolved from a variety of
information will find it increasingly difficult and ultimately
impossible, to interest with and comprehend phenomena or systems
with more increasing beyond and away from that variety
-- that is, they will become more and more isolated from that
which they are trying to share a deal with -- unless they
spend the new forces to modify their theoretical systems
or create new theoretical systems!

XIV

? - Pair Question - ?

What does all this suggest?

Impression

I think we can comprehend and predict some portions of
 the ever-changing world that nature's report is other
 portions seem forever undelivered and unpredictable.



2 - Review Questions -

Very nice, but what does all this have to do with
our ability to think and grow in such a world
that is seemingly noisy and predictable yet
disorderly and unpredictable?

Comment

- To get at this question let's take a closer and more general look at what science, engineering and pursuit of technology produce and how this is accomplished.
- Furthermore, suspecting that their practices and pursuit are not wholly accidental, nor obvious, and that they seem to change in some ways, let's also examine what keeps the whole enterprise going and how this enterprise objects as personally.

In other words in order to gain a richer image of science, engineering, and technology we will address the following questions:

- What does science, engineering, and technology produce?
- How is this accomplished?
- What is the driving mechanism that keeps the process alive and ongoing? or put another way, what phenomena sustain or motivate the whole enterprise?
- Finally, how does the interplay of science, engineering and technology affect us personally as individuals, as groups, as societies?

First of all

3 — What does Science, Engineering and Technology produce — ?

If we examine the contributions from the practice of science and engineering and generate from these individual contributions what do we see? We see new ideas, new materials, new systems, new etc.

In other words

Science, Engineering and Technology produce change over time.

~~XX~~ ~~XX~~ ~~XX~~ ~~XX~~ ~~XX~~

How is it really produced?

To start with, we speak of it in terms of these features that seem to be a part of that really. In other words we reduce the model pattern down to some features that make up that pattern. Different people in examining such a pattern may see different features that make it up. In other words, there are different ways by which a pattern can be reduced, hence the possibility for differing features or parts or separations of how it comes out we call this process of reduction: analysis.

2. Putting this process even further we can reduce many different patterns to parts that make up each pattern and use these parts, or variations thereof, to make a new pattern, ~~the~~ ^{that} whether it be a new concept, or a new system, new process, new idea, - can be created, we call this process of ~~combining~~ ^{combining} a synthesis.

Now if we test the results of this process with the model we're dealing with, we have an analytical/synthetic feedback loop for comprehending, absorbing, and applying to that world.

Pulling all this together we can
say that

Novelty is produced by a mental/physical feedback process
of analysis and synthesis that permits us to interact
with the world so that we can comprehend, cope with,
and shape that world as well as be shaped by it.

which carries with the question

} — Great is the driving mechanism that keeps the process
 { alive and organizing — a put another way — what
 phenomenon underlies or motivates the whole enterprise?

One thing is clear: If our ideas and thoughts matched
 perfectly with what goes on in the world, and if the
 systems or processes we designed performed perfectly and matched
 with what we wanted them to do, what would be the
 basis for creating new ideas, new systems, new
 processes, new etc.? The answer: There wouldn't be any!

The present and production of mismatches are
 what ~~the SET~~ ~~under~~ and maintain the
 SET enterprise here, keep it alive and organizing
 — otherwise there is no basis for it to
 continue

~~XXI~~

XXIII

Very Nice
but

How do these Scientific, Engineering, Technology dynamics
affect us personally or institutionally, or groups, or societies?

As already shown the practice of science/engineering and the pursuit
of Technology not only change the physical world we interact with
but we also explain, modify, new processes, how etc. -- but they also change
the mental/physical ways by which we think about and act
upon that world

In this sense

The practice of science/engineering and the pursuit of Technology forms
us to continually remodel our mental/physical orientation with
that changing world as that we can continue to thrive and grow in it.

Put simply

Scientific, Engineering, Technology dynamics affect us personally
or institutionally or groups, or societies by changing our orientation
to match with a changing world that we, in fact, help change.

? — Paris Question — ?

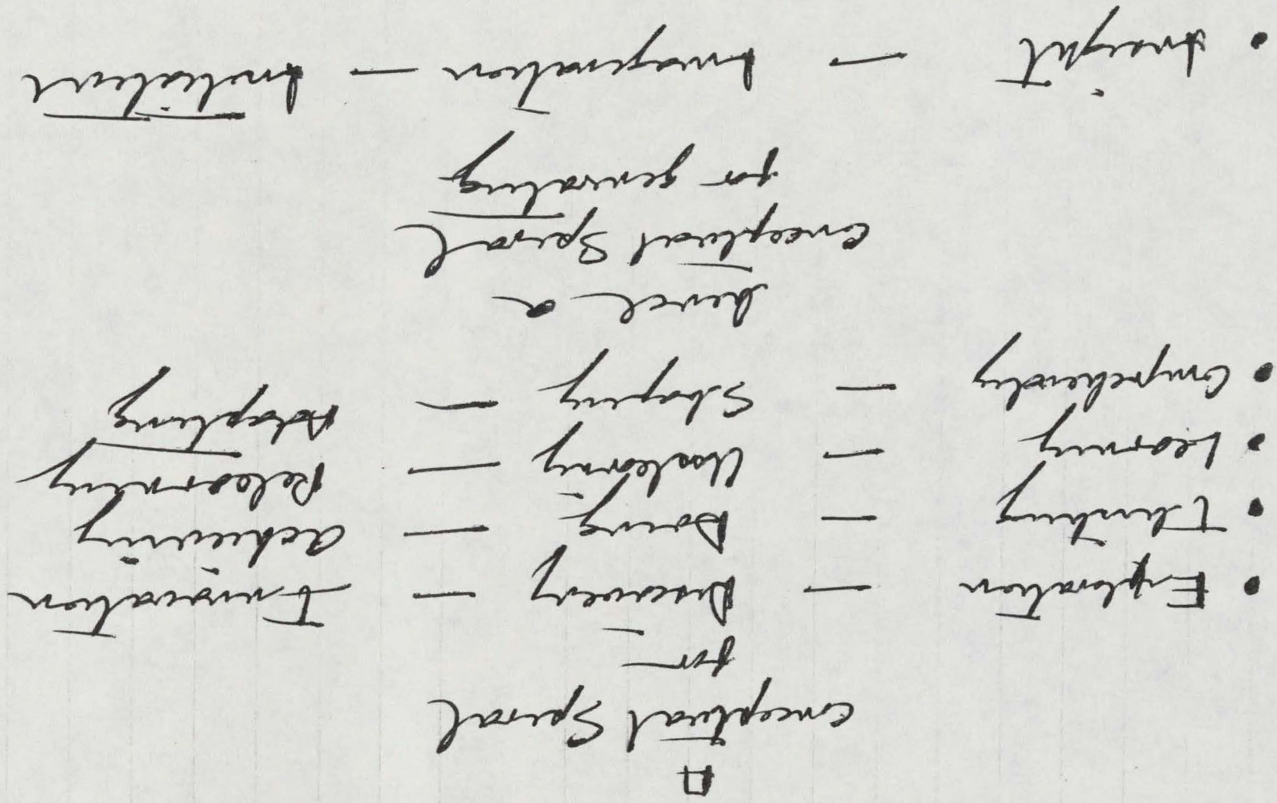
What learning does all this have
on
Worming and Learning ?

Illustration

Novelty is not only produced by the practice of science/engineering and the pursuit of Technology; it is also produced by the force of nature, by our own thinking and doing, as well as by other, and it is produced continuously, at somewhat irregularly or haphazardly. How in order to think and grow, ^{we} need a world we must make out thinking and doing, hence our orientation with that emerging novelty. Yet, any orientation ~~constrained~~ by experience before that novelty changes (as well as by the Grand Storage discussed earlier) ~~introduce~~ mismatches that confuse or disorient us. However, the analytical/synthetic process, previously described, permits us to adjust these mismatches so that we can rematch, thereby reorient our thinking and action with that novelty. Over and over this continuing rethinking of correspondence, mismatches, analysis/synthesis, matters as to correspond, especially, and shape as well as be shaped by novelty that literally leaves around and over us.

Now

If we connect this continuing notion of representation - manipulation - abstraction ~~there is~~ ~~and the~~ ~~novelty~~ that comes out of it with the previous discussion we can see that we have!



~~XXVII~~
XXVII

which
raises the question

? - { Can we survive and grow without
them absolutely? } - ?

IONI

~~XXV~~
XXIX

which suggests

The conceptual spiral also represents:

Paradigm
for
Sustainable and Growth

~~XXXI~~ XXX

Point

Since survival and growth are directly connected with the
acquisition, exchanging words of meaning and bearing are well suited
the thinking (conceptual) aspect of generation, mimicry
analogy/synthesis, mimicry, mimicry, analogy/synthesis...
for comprehending, absorbing, and adapting to that world and
the novelty that ~~drives~~ drives out of it.