Notes de cours de mme Oesterle (1)
automne 1961
Université Notre Dame.

9/22/61 (1)

Contemporary Physicists on the nature of their science

Not spheres of science but physicists themselves

Ways to Physical Knowl.

1) Max Planck - Wege zur physikalischen Erkenn.
Has shown in effect Fashion how
Sc. of Physics Sec. unified
Thermodynamics
Mechanics
acoustics
Optics
(Lectures at Columbia at beginning of 20th Cent.)

All know in physics not based on sensation but on measure numbers
when speak of time - how do we measure etc.

2) Sir Arthur Eddington - Space, Time, + Gravitation
(Franco Rosetti -) Nature of Physical World
New Pathways in Science
(Science + the Unseen World / Mathematical Theory of Relativity)
1st to propogate relativity in English Speaking world
1st to find experimental verification of Einsteins relativity theory

Experience in math physics is extremely active - outcome of constructive activity in mind

Nat. of Phys. World has influence on analysts

3)
iv) James Jeans - The Universe Around Us (popular work)
The Mysterious Universe — not recommended
Py of Physical Science
Physics + Music

Number theory hasn't changed ∴ application of numbers to sound is still best example of scientia media - i.e., scientia musica; geometry (modern) accounts of some things better than Euclid's ∴ Optics not good example of scientia media any more

4) Louis de Broglie
Important contribution to mechanics

Matière et lumière

Pierre Duhem - physicist.
history + philosophy
contributed to rationalization of thermodynam

La théorie physique

pointed out: Natl. diff in physics
English satisfied w/ explanat. by mechanical models
French. - more formal - mathematical representation

5) Erwin Schödinger: Nature + the Greeks
(Author of Schodinger theory
Contribution to quantum dynamics)
What is Life

Human body is most unspecialized in nature
In purely intellectual field will reach dead end like animals who have specialized operations

Matter + Spirit

6)
Werner Heisenberg - found relation of uncertainty
Gifford Lectures - Physics and Philosophy
and another book

Distinctive view on way to bridge knowl + language from modern physics to common or familiar language
world of familiar experience + world of science

Natural language (ordinary language) which expresses concepts of ordinary experience

notions which allow us to ask questions
pre-existent knowl acc to Aristotle

Aristotle's Preexistent knowl.

Sound but confused knowl.
"What is man" signifies something,
∴ already know what man is
Know confusedly what man is
bec. we name it
i.e. Know enough about man to ask what is a man

Explanation of concrete data becomes less + less certain as gap betw experiment + explanation becomes wider

Weizsäcker

Niels Bohr — biologist as well as physicist
Max Born — On Nature of theoretical Physics

Natural phy of Causality + Chance

David Bohm — Causality + Chance

Robert Oppenheimer:

Milligan: 1st measured electron
The electron
best view of how we know about physical things

Bridgeman:

9) Da Costa de Andrade:

9/27/61 (3)

Widespread opinion
Epp. sciences replace nat. phy
Physics
Chemistry
Biology
Psychology
Type of consideration in phsical i.e. natural sc.
not asked

If tradition in phy. to be carried on must take this quantitatively common opinion

Modern Thomistic opinion
only metaphysics left
Symbolic logic replaces logic too
Left with metaphy that can be studied w/o logic or any previous training
Have discovered Meta of St. T. as distinguished from Arist is not scientific as Arist's was

1) Try to find out what they mean by science?
narrow meaning
distinguished from strict meaning (Aristotle's
2) What do they mean by experience + experiment?
3) what is status of their knowl?
In what measure does it explain reality
What part does mind play in their knowl.

Einstein says: w/o math. construction [which goes on in our heads] epp. sc [physics] could not go on; if doesn't start from experience + return to experience. Science is empty

Eddington: can only find in sense verification what we have put there from our mind;

Max Born: accuses Eddington of over idealization

4) What they have to say on evolution of physics + what they believe to be destination of physics

Schroedinger: More esp. physics progresses discovers, theoretical physics becomes less + less certain

Great physicists → no such thing ~~that~~ as proper pple Bohr that is definitive - only greatest physicists

5) Observe whether physicists distinguish Symbols and words?
Do they distinguish betw math. Symbols + symbols in physical scien
no such thing as time and temperature in math

6) Way these authors relate what they know as physicists to familiar world of experience?

Eddington: doesn't relate two
Heisenberg bridges by ordinary language

Schroedinger: as physicist I deliberately cut out my personality out of my physical study.
no room for human being in world of physics
no diff. betw elephant + man in
if physicist is to communicate w/ se
should be able talk to se as man

Heisenberg: physicist knowl. is measured by degree to which he can speak of physics in ordinary language - unless he can, doesn't know degree of his understanding of physics

Broglie: says something same

7.) What mean by familiar world of experience?

8.) Meaning of "cause" when scientist is talking about his science

pple of causality has limited application in macroscopic phenomena - in this area seem to obey pple of causality; raindrop is macroscopic to physicist

Hold: all future is predeterminately contained in past

La Place: If one knew complete state of universe at given time could foretell every thing, future or past

Russell: "cause" - is now only efficient cause

De K. "cause" = only formal causality
formula of temp, pressure of gas
don't know whether temp changes pressure or pressure temp
formula doesn't express causality

many use word "because" - where they reject "cause"; refuse to use word "cause"

progress in knowl. impels us to impose new meanings

Sometimes said that when Eddington wrote his books; Heisenberg & Schaeding also in their books are popularizing bec. they use no symbols; what they doing is talking to 3rd about kind of knowl they have in physics; or talking to 3rd about particular point; when he does so he is philosophizing

9/28/61 (5)

"Because" as conjunction has many meanings "causally" as narrow as "cause nowadays

Rel; betw Φ y and sciences
Distinction betw by writers nowadays

What does scientist want to know and why?
problems that arise when want to know
wonder

Problema - original in Greek
anything thrown forward, projection
hindrance, obstacle

Sees things happen - difficulties arise
Why do bodies fall at rate they do
Why do trees grow
Wonder arises from this
desire to know - attempt to dispel ignorance
Whenever seek to know to dispel ignorance
you are philosophizing
In Arist - ancients began wondering
and about sun & moon, eclipses etc
so he considered this philosophizing;
Today say this is science
Why not call math-physicist } philosophers?
zoologist

Subject: what we want to know, of science relatively simple
Object: proposition, something complex
what are properties of things we
know
why do bodies fall at rate they do
why does earth fall into sun
why, [illegible] mass & attracts

When find answers causes of problems you have philosophized
St. Albert much more of natural scientist
Natural sciences are branches of Phy

Whence the distinction of Phy of Science

In middle ages
Difficulties that can be settled once + for all
separated from difficulties that could not
we can define time"
no. of motion of before + after
this definition is virtually a true proposition
that is in motion"

this def. leaves wide open where time is to be found
one of corollaries of def. of time
must be most regular + most rapid
motion in universe + ∴
measure of all other motions
Aristot. identifies this motion
w/ outer sphere - this should
be dropped

In modern science time identified with
(1) pulsations of cadmium
(2) speed of light

practically now use → motion of fixed stars
but this is not constant

Identification of time w/ particular measure
in time of John of St. Thomas

Motion: act of what is in potency qua in potency
analyze motion into quantitative parts
sun into problems
some people chopped whole thing

Some things can be settled once + for all - but still confined to known!
but particular reality time is cannot be solved.

Do we have to identify Phy w/ settled things
Science w/ unsettled problems
(what Aristot. calls the greater problems)

Still in confusion w/ respect further knowl.

Of what is confined
we have more certitude
Know difference
betw horse + man
w/ certainty

more exact knowl
has less certitude
Do not know
w/ certainty
how his brain
differs from horse's brain

intellect is not + function of tool
brain is tool of internal + external senses
+ in some sense of intellect imagination, e.g. is function of brain

in De Caelo → explain all things
in terms of motion (local)
quantitative aspect

Very few things outside of Math in which we
know what things are, perhaps
only man

Sciences distinguished by mode of defining
not by diff. in method

In Physics - place - inner immobile surface of surrounding body
in mathematical terms
i.e. geometrical terms

quantitative analysis of motion in Bk VII is also mathematical

motion acc to place :
motion acc to quality : differentiate parts of science by this
motion acc to quantity : in material sense

considers here even man animals } as bodies

10/4/61 (7)

Whence tendency to distinguish φy + Sc.
Not in Arist
Not in St. Thomas

1st in Renaissance
had to distinguish { problems that can be settled
problems that remain provisional

2nd in φy
certain problems must be settled
{ will there not be ultimate judge - God
immortality of soul
these "domain of φy

3) Possibility of high specialization
which is almost incompatible w/ general viewpt

or attempt at general view by specialist

view that science will give solutions
to all problems
"Scientism" - all human knowledge
should be settled by the
most exact science

Can be eminent scientist w/o losing
any sense of limitations
skilled but unwise scientists
is scientist but not φper;
does not care about anything else
like some animals; e.g. birds
are a dead end - too highly
specialized
this turns against science in the end
become blind about what
is obvious - to our everyday experience

Shows lack of paideia - of education of general culture

can make judgment w/o being an expert

well know when man is good orator
good mathematician

wouldn't expect orator to demonstrate or math. to move by poetic representation

1957 Laval Theologique - pp. 248-260 on [Paideia]

question { Φy of nature - study of; is wider
Math. Physics - ; narrower
application of math to nature
this does not exhaust nature

9) Try to find distinction of paideia or lack of in author you read

10) What does physicist mean by Φy?

11) How does physicist distinguish his dept of natural science from biology, psychology

all best scientists like poetry
identify poetry w/ outlook on life

How physicist compares his science to engineering

12) What does physicist mean by the humanities in Canada: classics & all social sciences

Relevance of classics -
knowl. of languages is nec. because never expressed so succinctly or as well as in Greek & Latin writers; human thought achieved a summit and it was perfectly expressed

More particular questions:

1) Most will discuss causality & free will
some w/ say it ppl of ✓ held true as in 19th century, there would be no free will
Niels Bohr
Eddington
How face problem & how solve it
N.D. will be discussed in terms of chance & fortune

2) What reasons does physicist give Φy not considering final causality purpose
physicist qua physicist cannot discuss

physicist says there is no color
i.e. only angle of refraction -
this is what color is, blue
for instance

What does he have to say about regularity as a condition of science
Does it have to be absolute
relative
Is it enough to have relative
for macroscopic
What about microscopic

or read
Philip Frank: Phy of Science
Braithwaite: Scientific Explanation
E. Nagel: on Scientific method

universal laws of nature – physics (modern) } taken together – cosmology
_ astronomy }

nat. science – embraces all natural sciences

Belongs to general sc. judge other sciences
Is it different from nat. science

To some it appears, in view of
we must distinguish 2 modes of knowing [nature]

Study of nature is formally one
inasmuch as, in whatever branch,
it still defines of sensible matter

Degrees of generality brought up as reason:
sensible subst

living / non-living

various degrees :: different sciences

I Commensia
a) Motion acc. to place
b) ✓ – – quality
c) ✓ ✓ – quantity – growth
(rarest in universe)

But in all these the same mode of defining
Have different methods in each part of scienc
in II Scientific ← dialectical discussion before ✓ definitions
in a) above measurement
in c) begin w/ internal experience
what distinguishes living from non
know I am alive because aware
we have sensations

degrees of generality + diff. of method
may give us material divisions
of Sciences but mode of definition
is same

equivocating on "science" if try to distinguish sciences on any basis except kind of definitions

What we mean by sensible matter
corporeal substance that is subject of what we sense
known by intellect per se, do not sense per se
→ subject of quantity + quality in Christ, St. T., and Eddington
→ what we perceive at same time we sense a thing

sensible matter which we perceive by some power at same time
potentially knowable, not actually knowable
in se, not sensible in act
have such actuality that they can act on our senses
if to be sensed in act
if what is potentially sensible + actually sensible were same - would cease to be when cease to be sensed
if what is potentially knowable were actually knowable, to be would be to be known - Berkeley

things can be actually sensed in the animal

know a posteriori by induction
that all things we know we came to know - i.e., tabula rasa to begin with
can account for how we know w/o having recourse to innate ideas
w/o having all kinds of difficulties

1st know - confused but certain - this related to Plato's theory of knowing

things obscure in se { sensible in potency, not in act
knowable in potency, not in act

continuum } defined in Meta
number }

if math tries to define these gets into labyrinth - must get outside system

definitions intrinsic to science - defined in science
definitions preceded by definiendum
definitum posited by the definition

mode of defining leads us back to sensible things
only by abstraction from individual
pass from individual to universal but must retain sensible matter, not Socrates' matter, but man's
In math, w/o sensible matter
w/ intelligible matter
parts of which the quantity is the order
multitude of homogeneous parts
In meta, w/o sensible matter
∴ can only have negative knowl. of
our universal is impoverished - leave individual aside

modes of defining - snub - nose
sensible matter essential to nose
but can define w/o sensible matter - concave

circle: surface bounded by single line

Can have essential definitions of triangle
can – descriptive – – – :
closed 3 sided figure

nat. sc. abstract from singular
math abstract from common sensible matter –
i.e. from bone, flesh, bronze, etc
mind constructing in defining in Math.

add a unit to a previous number is to construct.

Can considers line as infinity of points
from viewpoint of calculation
but then substituting something else –
i.e. no longer have line in same sense

3 as one 3 is only potentially 3 ones
put three ones you no longer have one 3.

$(1 + \frac{1}{2})(1 + \frac{1}{4}) \ldots\ldots = 2$
fractions increasing but in decreasing ratio
if considers you reach 2 this is a fiction

from viewpoint of calculation – can
geometrize arithmetic & arithmetize geometry
do not define 2, circle
say, because you can perform these
operation on this, it is a number

World of Experience - Sensible in patency
from Eddington in, Nature of Phys. World

some correspondence between temperature we sense and temperature we do not (e.g. of Sun)
see, trace left by electrons, not electrons
can have no sensation of – some physicists'
[illegible] these are fictions

We bring something to world when we sense
or know; there is activity in
sensation; senses contribute
share that knower contributes;
things rendered actually intelligible
by our own agent intellect
(relate to Kant's position) ↗
i.e. Kant right

1st imposition - intelligible - potentially knowable
later – intelligible in act - i.e. intelligible

common conceptions – come from reality
1st notions confused - need to divide

essential condition of sensation - mixed up w/ things
sensation does not consist in this
physical activity btw myself &
thing we sense when we sense
↗ this so, even in seeing; eye less mixed
up w/ things; quality of sensation
not determined purely by object;
limitation of intellect - depends
on sensation, altho not mixed
up w/ object

In Kant - Space & time are conditions of sensation
motion & time when taken as a whole are in
our heads; only the indivisible
is out there

In us - things we know must be prior to our knowing
Or separated Subst - means of knowing are prior to things

Agent intellect presents us w/ things confusedly known - to know them better, have to construct

In math, all known things are constructed, even point

Communia in not. sc. are 1st known + confused ~~as long as we don't synopsize too much~~ extremely certain, but difficult to define

- motion - evident to senses
- hard to define motion
- quantitative analysis of not yet resolved

Obvious difficulties are hard to resolve
difficult matters (sun, moon) easy to resolve

Nat. Sc. acc. to Scientists 10/11/61 12

Communia - have notions of prior to investigation

- motion
- nature
- man
- vaguely

These notions extremely difficult to analyze
Most known but { difficult to analyze
much disagreement

Exp. Scientist's satisfied w/ nominal def's
↳ Know time, place, but do not know definitions

Difficulties of paradoxes of Zeno
In Bk VI arguments are ad hominem
Solutions to in Bk VIII

Obvious difficulties are most diff. to resolve
What is motion?
Historical separation based on this, of Ph and Exp. Sc.

Today begin w/ Study of Universe as whole 1st Arist. wanted to analyze notions above

Social Sc. - Observation of community + people of human community
New people wonder about what time is.
This is what makes man a philosopher - but he must not rest in definition

Things from viewpt of measurability - become easy

Proper sensibles are very obscure
cannot convey to blind, or deaf, what? color or sound
From viewpt of quantity can communicate

Quantity is easy to know - measurable in to parts; parts are same; can communicate about proper sensibles in this order

Special intelligibility of quantity - use standard of measure along thing to be measured either once or twice depending on length of thing measured

Realm of measurability - are we still in ϕ of nature - definitions are of sensible matter

Math phys - formally math. Proper genl is from math - reason you give is geometrical applied to nature Used for purpose of manifesting q math; No, nature Math. is a means, takes on character of an organon

Reason you can apply math to nature is bec. of its remote foundation on reality

- Nature is product of reason
- Math is product of our reason

definitions are physico-math. - applies definitions to nature use math to measure distance betw sun and earth

Taken from math to be applied to physics Proper genl taken from math

Approximate nature more + more - never arrive at science in strict sense - but true science is aim - and approximate knowl is also knowl.

One who does not desire to go from Knowl of Generalities → knowl of things in their connection reveals an unphilosophical temperament

Investigation of nature has to become cooperative today because of vastness of knowl.

Some Catholic + non-Cath. Epistemologies ↓S

Scientist wants to know nature of things
ϕpher concerned with existence
Moral sc concerned w individual + individual circumstances remotely
Prudence directly concerned w ↑

Speculative sc. - not interested in this as this but in kind, in the universal

Esse has many meanings
Most perfect esse we know is ~~sensing~~ & knowing (and sensing as animal)

Omne is intelligere is esse
For man to think is to be; actuality of thinking is highest, but it is with sensing

Esse substantial or esse simpliciter
I am, + I am a human being
Together w all properties that flow from this

Esse Accidentale or sec. genl
Covers anything that is separable predicable accidents
most of our knowl.

No creature is good simply by reason of esse substantial

bonum { simpliciter – good man – is good simpliciter
sec. quid – as Socrates is man – is good sec. quid

good simpliciter is ashered by esse
sec. quid

Where is ultimate actuality } of man?
esse } of God?

Not enough to insist on esse simpliciter
Hell is paired w/ esse simpliciter

Cf St. J. I, 105, a 6

If things deprived of operation, would be in vain; in their operation find their ultimate esse; operation is its intrinsic end – operation in conformity it – for man to think, brute to sense

Meta IX, 11, 1908

Esse simpliciter does not give creature it ultimate actuality

Aust. – To live for living things is to be
De Anima Denominate whole from part
part from whole

What is diff betw esse of man & dog;
no difference betw as far as
esse simpliciter is concerned
We are interested in what man is
as diff. from dog – this found in

God is qui est is proper name of God

I, 13, a 11 ad 1. This is a proper name as id a quo
esse is most common – well known to us
this is good way for us to denominate God

God – name to signify God himself – God

we reflect the imperfection of our knowl.
by this names; correct way of naming
God as maximum ens –
God as intelligere se ipsum –

I-II, 2, 5. ad 2

Say esse say all
But what is esse proper to man

Beings that understand are better than
those that merely live, & those
that live better than that
Thus esse is least you can say about a thing

Man does not exist ff/sake of existing

Not More profound to say this man exists
than this man thinks, for this
elephant too exists; what is
more perfect, that elephant exists,
or that man think

esse subst. not ultimate actuality;
ult. actuality – is the actual consideration of knowl
one asleep is half dead; ~~could~~ there
beatific vision & asleep thru it – to what
avail

If take away what things are, what have you
Sheer existence is utterly empty

1) esse – 2) vivere – 3) intelligere

I, 13, a 11 ad 1

esse acc. perfection
exclude all potentiality
God is ratio formalissima entis
esse as participated – not esse simpliciter
esse imperfect

all action + passion are in singulars – existential
pure thought has greatest actuality in singulars
existential order

role of good in nature
good has to be existential
no sphere accorded such role to good
good is cause of all causes
prior to efficient cause

If study nature from pt. of view of math. physics
resort to formal causality
no question of good here

De Ver 21, a. 2 Whether God knows Sc
thing understood as good in 2 ways
in se ?
acc. to its own species – physical essence

specific perfections – degrees
horse imperf. in re mas
man imperf in sc horse or dog
total perfection in universe as whole

another mode
perfection of one thing that
exists in another
this perfection of knower
qua knowing

In one thing, perfection of whole universe can be in one of its parts after this: order of whole universe inscribed [in him]

Good that divides being is { bonum simpliciter / esse sec. quid

We are not what we should be by esse simpliciter what is perfection of which we exist;

matter / form } what it is

form + matter / composite + existence } that it is

If not this distinction what it is would be existence good is existent

Eternity of world - probable opinion

Everything depends on God as final cause and final implies efficient cause

Intuition - no middle term — This is not that
This is, This is not;
De Pot IX, a. 7, c. + ad 15
I, 85, 5

most intuition — 1° falls in grasp most common predicate

"Being" must embrace everything + cannot be determined by anything from outside -

Things that are, are intrinsically diversified

Only when know ens analogically, can you

When distinguish ens as name applying analogically - in Meta. materially, but still in sc. of nature until prove — there is being beyond changeable beings

Intuition of 1° prples; intuition is of the universal

Is substance convertible of sensible substance or not; Have to prove that it is not.

To know being is to know God acc. to some Thomists

Maritain holds subject of nat. sc. is ens sensible } Ens sensible refers to mode of knowing / Ens mobile refers to thing absolutely

esse rerum in mente / reality } Plato confused these

common as subject of science distinct from math;

When distinguish ens as name applying analogically - in Meta. materially, but still in sc. of nature until prove there is being beyond changeable things

Intention of 1st pples; intention is of the universal

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Ens mobile refers to thing absolutely

esse rerum in mente } Plato confused these
— ✓ — reality

Schroedinger

Science is hollow
Difficult to reconcile this physical sc w/ everyday life

Science vs Phy

Nature & the Greeks: sc. is related to past
basic features in Greeks

science: insight into man & his world
true & adequate statements about reality
beginning is curiosity
adjustment of ideas to facts (step by step)
Science is not just a description
relations between facts & fundamental knowl.
scientist is looking for reasons why
object of all science - all nature
value - same as that of any other branch of knowl.
no value w/o union of all knowl.

Is it practical? no
aim is to know oneself & world about us

Does scientist require regularity: becomes more exact as gaps become filled but should always be gaps

Limitations of: delusion to think it answers everything
specialization is worthless only in synthesis w/ all rest of knowl

Outlook of scientist should be that of ancient Greeks
no distinction betw φy + sc.
Intrinsic unity

Unprejudiced convictions w/o replacing

Greeks: never before known, highly articulated
w/o specialization
parts of knowl. related to ea. other;
each contributes to each

1) World can be understood – Greeks saw it as complicated mechanism running acc to laws – wanted to find out about.

2) Objectivation: exclusion of knowing subject from nature; cuts himself out
This a fundamental mistake by Greeks

Sc. cannot tell us word about red, blue, etc
We do not belong to world sc. creates for us

Antinomies: 1) world pictures cold + mute.
2) fruitless quest of where mind acts on matter; another way of stating this: reconciling determinism + free will

He is Scientific determinist; compelled by laws of physics to do what we do
Body functions mechanistically
I am one who controls motions

Construct of our sensation, memory etc
Consciousness – related to function – learning of

Importance of ego: self is not surrendered to physics
Refuses to identify ego w/ ~~what~~ physicist would say of him; –
of Eddington + elephant
physicist cannot deal w/ ego

Isn't this like Descartes "Cogito"
For Schroedinger I see this would be enough
Aristotle uses 'man' as example in very beginning of
Descartes brings in what is (physics but confused knowl.)
precise + highest certainty
as 1st pple

Heisenberg: Physicist is open to degree that he as physicist can talk to himself as a man – otherwise have sterile specialization; most Scientists have contempt of man in street
∴ for himself as a man – shut up in world of physics

Rising wall betw sc. + φy?
Doesn't this suppose they are distinct?
Should not have man who is just a biologist
Mathematics is φy; no. theory is φy;
if distinguish them it is because we assume there is a wall

labor { use of energy
w/ some pain

modern view of labor – intrinsic value on its own account

i.e. from drum tasks
i.e. work proletariat does

Schroedinger

Dissatisfaction of Schroedinger w/ physics was because of kind of early education

Distinction betw Physics + the man

(Sept 23, 1961, Nature) — Sermon on same pt.

How understand this distinction:

In math. Physics
- ruled out yourself
- God
- cannot explain emotions
- rule out proper sensibles - blue, etc.

Is distinction definitive - cannot be bridged?

Never be able to bridge gap acc. to Schroedinger

proper per se pples ⟷ common per se pples

blue ⟷ angle of reflection

perception of temperature → kinetic theory of gases

- immediate 1st pples — cannot establish connection betw proper Sensibles - [except in re. sight - i.e. common Sensibles are most perceptible to sight; Sight most detached + perfect of our senses ∴ closest to intellectual knowl.
- basic cleavage
- not talking about 1st pple as to us — kind of discourse here but primitive - i.e. measuring over + over again

proper sense appreh ——— irreducible ——— quantitative modes of sense app

as long as Something different is happening - conscious

Subject + Object are one

Subject is the world - I am the world

Domains of private consciousness overlap - in front of nature

Multiplicity of minds is one mind

Series of diff. aspects of one thing

Questions

Does he suppose order in universe or is it imposed on him by his sc.

Dissatisfied w/ physics as attempt to solve all [problems]

Sense apprehensiveness (common) - or contact w/ reality

Unity of sc. is possible; abstractly all sc's have something in common - i.e. mode of definition

Should all know

{ How physicists / chemists / biologist / psychologist } proceeds - i.e. argues.

If know that all scientists are educated this, would respect his findings in his field

what he means by Determinism? atomistic view of universe
If knew position of everything at any one time, could predict what will happen in future; i.e. Newtonian mechanics universalized; talks about reconciling determinism + free will but does not do so; says he has control of his body to certain extent but doesn't see this contradicts his determinism

Greeks - Something happens by chance - chance meeting
[unintelligible to us]
- give me another chance
- Laws of chance - in lg. numbers are determinate;
i.e. there is intelligibility here
when numbers increase - so can speak of intelligible chance;
at infinity everything is determined

chance better seen in these { Penicillin discovered by accident
Pasteur's process

good Gphers acc. to D.e K.
Whitehead
Bergson
Cassirer

10/25/61

Why can't substances be contraries
If they were there would have to be
something else prior to substances
in which contraries (would be) but substance
is the 1st genus;

Substance
matter unformed | form

Substance
material matter | immaterial form
body

++

Wall arising betw Gy + science
Does this mean they are distinct?
Can distinguish materially several
parts of science w/o distinguishing
them formally; not possible
to distinguish 3 generic modes
of defining

Today's science requires knowl. of Greeks Gy
Present scientific world is produced historically [produced]
comprehensibility } come from Greeks
objectification }
error which comes fr Greeks
Can account for truth + error of Science
by Tracing back to foundations

Some of Greek spheres emphasized
priority of sense knowl. & dependence
of all other knowl. on this sense knowl.
Relevance of sense knowl. in Schroedinger

Basic reason
To discover unity of science - this why
speaks of wisdom in re Greeks

Sc. is nothing but insight into man & his world?

Immediately aware in re speculative problem
is that we want to know - for ourselves
we seek knowl.; objects do not care;
desire to know is only in us + to
embrace whole universe; we are
knowers that are in universe, part of it
whole universe desires to become
known to itself intentionally
which is achieved in man

It is possible to be bent on knowledge
of world & loose relevance of man

Cogito ergo sum - startled world, &c.
brought back ego; ego was
not well taken;
took certitude for distinction
St. Aug. did this long before Descartes

Never lose man; keep man steadily in view;
if man becomes irrelevant - something
wrong w/ universe

No scientist of 20 years ago would write
as Schroedinger & Heisenberg do today;
revolution has happened in science

"Science merely states - this position is not Schroedinger's
states what case is; not mere description
but conveys understanding." Isn't
this contradictory

Science needs description but seeks
reasons why; connections betw phenomena;
don't have scientific grasp unless know
causes; only transition betw phenomena
is not enough

Schroedinger:
know present; predetermined in past i.e., happens because had to happen
reading of present, see future; i.e. description; contra, pure tautology
he finds reason for disintegration
of certain atoms;
but laws seem to be description
constant relation of temp, volume, pressure - this is description
why?
devise Kinetic theory of gases

elephants die at early age why
loose teeth - cannot eat - die - this is reason
incongruity betw animal & his teeth
incongruity in all animals

What scientific explanation is as distinct
from description - not treated in
Schroedinger

Uses word "curiosity" -
Curiositas in Latin is vice - seek to know trivial things; or things not worth knowing
Wonder + desire to know is what curiosity means today

Science begins w/ wonder - Schoed. says
"Scientist must be capable of 'astonishment'"? - off balance of show — what should

---

"Ajustment step by step of ideas to facts."
Are ideas prior to facts?
What does he mean by "idea."
everyone would concede this { Knower must adapt himself to world
Truth is correspondence of thought + thing

But "idea" means in earlier ϕphers practical conceptions
In our time "idea" means concept, i.e. more abstract meaning

Take idea as utterly distinct - does idea correspond to thing + to what extent does it e.g. generalization
like Arist; pples must correspond to reality

There are no pure facts; always changing - adaptation on this level too
Then generalization - which is tentative; therefore subject to verification constantly -
[illegible]

Have many correlated generalizations - form theory; must suggest crucial experiment - insofar as does not suggest further experiment it is at dead end; quantum theory developing more than relativity theory now

practical operation ff speculative end in sc.

So idea as prior - generalization or theory as prior - go ahead of reality ∴ has to be constant adjustment

De Coelo III, ch. 7

"Have certain fundamental notions + these are general - findings are related to these"
have certain notion of matter - e.g. speak of part of matter but not part of water

---

"Science looks ff the reason" - Example given?
Why you can make statements about regular events

Example of "Reason for something"? Struggle for Survival is why trees grow certain kind of bark

If bring intellect into nature it is to account ff good

10/26/61

'Science' applied to all knowl. in Schaedesigen

method } in historical knowl
rules }

Any knowl. arrived at by method + rules

History: what led to given situation; know why
seeing connection between events
philology: laws in development of language;
reasons for exceptions e.g. why
irregular verbs
- in history - want to date manuscript -
there are rules for establishing
e.g. St. T. established that Libri
de Causis was not Aristotle's

Not Science: in rarely + applicable meaning
of science in posteriora

Science: - by reason of what thing is - propter quid
is already analogical - that thing is. - quid

historia - investigation that doesn't reach a term
nearly all knowl. is historical in this
sense
singular event unless significant is not science
in se some wider context could be
scientific

Pirenne - Munsen } great modern historians

Science: body of knowl by rules + methods
about which there is no question

Having knowledge about thing in scientific way - dating manuscript by internals as extrinsic evidence
Do not science of it.

Logic - rules of } universal knowl. by discourse - common logic
Ea. sc. has own method - logic - learned only by practice

What is φy - can't define - so universal, can't define
What have people thought φy is - relative

Science of ultimate causes - ultimate
quoad nos, quoad se; tendency
to resolution to ultimate causes

all sc { φy - why things are as they are
all φy { sc. - how things are

Value of nat. sc; like any other branch of knowl.
Engaged in φy from start; wants to know
for sake of sc - already a φpher

History is scire as much as physics

Unlike religion science prefers to leave gaps
natural causes of natural events
Greeks offered explanation of nat. events
by religion
Rejects religion as explanation
Christian φy - Cannot have φy by religious notions

Schroedinger:
Considered as religious, questions that are ethical
e.g. Who am I, why, what for?
Seeing something scientific in Genesis - filling gaps of religion

Theology is attempt to fill gaps left by revelation

Aim of sc. is not practical
Object of scientist is not to produce things, as engineer does; wants to know for sake of knowing; happiness not measured by amount of commodities made possible
Kind of knowl. - called by Arist, divine - is kind of justification for exist of world that man can know it

What is unique goal: { whence I came / whither I go / Who am I

Doesn't ask this qua physicist?
Talks of man in terms of mass, temperature, even kind of atoms

11/2/61 (19)

{ Comprehensibility - world is intelligible not product chance or god

objectivation: cut out personality

Problem of science - φy; but is a gap filled by religion; should human personality be brought w/in scope of science - φy cannot be studied by math. physics; scientist as man cannot talk to sc.; there must something outside of physics which w/permit man as physicist to talk to man as man; most could be known of man by physics + chemistry is that he would make a good fertilizer all else is f/sake of man - from pt. of view outside of chemistry or physics; he is most refined, least specialized thing in nature; φy has to do w/ wholeness not a part; speculative sc. is about what we can do nothing about;

all sensible qualities have a quasi-static aspect; proper sensibles are lost as proper; proper sensible what we feed on intellectually; atoms in Democritus are intellectual construction problem is to relate intellectual constructions to world we know;

Distinction betw. consciousness + habit

once know how to do a thing
becomes habit + unconscious

when problem is solved it becomes trivial
Have to keep moving forward
Consciousness only when faced w/ novelty
+ can move on; when have grasped
something (newtonian physics or Einstein)
becomes trivial; to rest what is
essentially problematic is perverse;
contemplation is imperfectly realized
in modern science; {less definite / more confused}
contemplation in art; in theology
mind comes to rest but do not rest
in that rest; have to keep moving
on because of negations have to
use to understand things better.
To spare yourself the effort you
acquire habit - i.e. in logic; do
it mechanically in symbolic logic;
not so mechanically in trad. logic;

Consciousness
- awareness
- awareness of awareness
  - awareness of having sensation
  - awareness of sensus communis

Logic {
rules to criticize
helps you to think

Contemplation in strict sense of world
requires rest; conclusions that are
valid but cannot rest indefinitely
St. T. C.G. IV. 56. motives of Incarnation - no need to

Schroedinger
2) {rejection of distinction betw object + subject?
Subject is outside of object?
Self

Should we abolish distinction
tree is subject - lost in its subjectivity
immersed in it
dog - is this dog + all things that it knows
diverse meanings of being
to be simply - to exist
another sense of being: to be other -

immersed in subjectivity - to extent we are
incapable of knowing more

in measure that our faculties are imperfect
are like tree; perfect would be for
subject to object to be identical as in God
always opposite in between is + what we know
(imperfect knower + what it knows)

Kant understood this well
a priori forms: limitations imposed
on us by kind of mind we have
i.e. a measure of subjectivity;
intellectual conception always falls short of object;
qua immaterial knowl. is better

What does 'esse est percipi' mean?

Sensible in act is sense in act
intelligible in act is intellect in act } right sense

sensible in act is sensed in act?

what it meant historically → when no sensation of sensible thing
thing ceases to exist

Re Anima III, 2, 426a20
Meta III, 5, 1010b30
V, 1021a25

actuality on part of thing which makes it possible to sense
of being sense

if esse depend on percipi, if no esse
no percipe

11/29/61 (21)

Heisenberg

Diff. that has come about bec. of modern sc.
way of thinking
talking
objective
subject

Greek sphers + modern sc concerned w/same problems

Thales all things are water

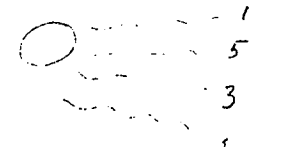
All things come from one thing - unity of world
Ple is rational - not mythical, etc
Material subst.

Newton thought his theory was completely objective
+ ∴ not subject to change

Causality
mechanics
etc
our language based on these ideas of Newton

New Theories have destroyed
Rubens experimentations of black body
as body becomes heated - bec red then white

Planck - heated body emits off in bundles
in multiple integers
actual bundles of determinate size



quantum theory

in Newton Cause of emission of alpha particle?
narrowed to efficient cause

in quantum Strong cause = determinism
weak ✓ - not determinism
non-causal

light strikes photo electric cell
photo electric effect

→ | ≈ particle { theory of light of energy

as opposed to wave theory
Cannot be put together in Newtonian mechanics

Newton: time + space independent of ea. other
Einstein: now combined - new concept

before	now	after	infinitely short time in Newton - can be few seconds
can change effect		can know in some way	

in events that take place simultaneously at distance; cannot have cause
simultaneity at a distance?

Heisenbergs own contribution: p/p of indeterminacy

symbolic construction of time - makes no difference whether effect comes after cause or cause comes after effect

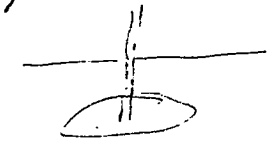
Impossible to reproduce things in microscopic or macroscopic level - our senses not capable (built to) perceive such things

Heisenberg
Atom is not piece of matter of certain shape + size
cannot assert position + velocity of atomic particle at once

light quanta is much larger than proton particle
∴ cannot see particles - destroys it

Use gamma rays - they are smaller;
ray moves it + increase its speed
∴ cannot know position + velocity

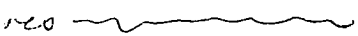
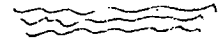
Take diaphram; shoot them thru diaphram
- can get velocity but can't see where they are



Make thick diaphram

Speed of those that go thru but some bounce off + can't know position

Combine 2 thin + thick diaphram

Quanta thought of as waves 
Consider as packet of waves 

Several together give interference pattern
More waves put together, more you can determine position, but can't get velocity; subtract waves until can get a velocity

First

As thing changes place, qua changing place cannot give its position; this would assert it

Heisenberg

No way of determining why some particles are effected by electro-magnetic field

As get more accurate position, lose accuracy of velocity & vice versa inversely

This is a constant - found by Planck; confirmed by Heisenberg

Neutron, proton, electron - 3 elements from 92 of chemistry

↓ Broken these down:

Still looking for indivisible unit of things

Discrepancy betw this world & world we know

Rel. betw biology & physics

difficulty of language: cannot talk in ordinary language about this world

more closely determined by being mathematicized

biology & chemistry drawn closer together

math. relations to express these things know & can describe process but have no concepts to describe

Bohr's complementarity: use quantum theory & wave theory, each when called for

Quantum theory

Will come off at some time but don't know when

Can make prediction - by statistical law

Means of experimentation do not affect thing - thing is large

Quantum - wave

Einstein

Particle

Heisenberg limitation on our knowl.

Process of experimenting effects the sub-atomic particle

Can't know velocity & position at once

Indeterminacy - one goes one way and another

don't know which and undetermined go where

know statistically - in terms of great no's

Relativity: time & space related, not separated

Newton 3 coordinates

Einstein 4 ✓ - must include time

ancient phy & Physics:

Connect acc. Heisenberg

cf p. 21 ff Blake

Causality

Must assume it in atomic event
What we observe - must assume causality
Reasoning or instrument - assume caused by thing
Law of causality does not hold w/ large numbers
We are affected by things in causal way
Fault in ourselves in re Quantum theory
Difficulty in thing i — modern ✓

Change of language

Must fit these new concepts into language; have no ✓ of atoms
Concepts of physics are refinement of our ordinary concepts
Have to talk, explain in ordinary language - multidimensional space; can define mathematically but not in ordinary language;
Science reduces everything to math.;
not like world we experience
Lack language to make Science intelligible
Must change Logic; more possibilities than it is or is not in right side of box
i.e. indeterminate
What happens mixtures both thing + observer + experiment
concepts can only be applied at time of assessment

Physicist does not really understand until he can translate what he knows into ordinary language
Scientific concepts deal w/ idealization
Ordinary language is ~~more~~ nearer to the real

Objectivity + subjectivity

Experiments are not of nature se; but of things changed in process of our experimentation
We influence experiment; must take this into account
"Atom" can no longer be said to be something objective
what we read is objective; thing is not objective, already affected by us

Einstein: Every thing can be described independently of us; dogmatic realism

Physicist's aim

Unified view of world

Rel. betw biology + physics

animals are related to both
man - too involved to be taken

Scientist show Pass on understanding of nature
Indicate man's position in nature

Science + technology

One helps other
... subordinated to Science but Sc., better understanding [illegible]

Study classics

1- { Should know roots of past
We see things from certain viewpt
should know its roots }

2.- Greeks knew how to ask question

3 - Relat. of modern physics w/ views of Greek philos
Democritus, etc

Responsibility of sc.
Responsible whether he is in public life
or not for what he makes +
what is done with

Science - unifies men

Re: K.

What they are made of; how these elements
give rise things we see pples that govern the
stuff i.e. wants to know order of whole
universe.

Have reduced word 'cause' to one meaning -
future is predetermined in past - rigorous
connection betw 2; i.e. Newton physics
has influenced our language as though
there were correspondence betw physical known + ordinary known.

'cause' now: utterly rigorous connection of space-time
phenomena; randomness can produce
regularity providing you bring in
sufficiently large no's of instances

Bohm - On cause + chance - changes his mind
in course of book; i.e. criticizes Copenhagen
school at beginning + retains it in end
i.e. Heisenberg

Ultimate pple of unification of whole cosmos? -
physics? ultimate particle +
laws that govern it; does he think
this w/ explain everything; no, can't
have theory that w/ explain human
behavior

Newtons: Mechanist theory -
means machine; in field of artifact,
assumed that nature is machine
in same way as machines we make

relat. of way of thinking about nature
to way of talking

When scientists talk to ea. other, do they make appointment i.e. to meet at certain time & place

Senses in Heisenberg

Observation on microscopic level

That Our senses affect the observed & observer - is normal; physical interaction even in normal sense experience & physical interaction betw object & observer in all sensation - least of all in Eight; even here photons bounce back - they affect eye, eye affects thing; eye undergoes physical change which affects what it sees; in field of physics & not. ph there was surprise at interference betw observer & observed &c. of Newtonian physics which was on macroscopic level i.e. assumed that if senses only to be objective must not affect or be affected in its sensing; intellect too affected by limitation of senses; pure intellects see thing from w/in; genetic structure was programmed to produce such a nose - they see that & why we will have such a nose.

Indeterminations (in regard to) {velocity / position} due to interference acc. to De Broglie

If we didn't interfere w/ experiment, then things would happen in deterministic fashion

Objective Possibility of interfering & not interfering } objective indetermination i.e. things can be interfered w/ or not

Classical Physics Governed by particles of which made which obeyed absolute laws - determination

But I can stand or sit

Potentia simul contradictions in re my physical structure
If not, I am just a cog in a machine; ~~?~~
physical components must have ~~the~~ potentia;
if I do not need determinism on microscopic scale
to ~~determine~~ explain things on macroscopic level,
why bring it in

Relevance of the unimaginable — Heisenberg: Cannot bring together image of wave + particle

Why does a wave in quantum mechanics have to be conceived as ordinary wave only much smaller; why should microscopic particle be a small body in ordinary sense of body; this is assumption when say we are faced w/ something contradictory; ~~that~~ is a wave & corpuscular; implies we have to imagine these things; do not even have image of prime matter, form, privation, God; if we do, it is totally irrelevant as long as symbols fit + explain

Duhem: Aim + Structure of Physical Theory

1) Aim
2) Structure
3) Characteristics of exp. laws in view of
4) Relat. betw Meta + φy of nature

1) Aim of Phys. Theory
much of what he says is in first
Dist. betw thing + veil of sense exp which hides thing
∴ 2 approaches to phys.
1) penetrate veil of sense exp; this w/ require metaphysics
2) consider sensible characteristics represent + classify symbolically autonomous - this Duhem's

3 pples
1) economy of thought
2) this phys. theory has aesthetic character
3) unity we achieve is reflection of real order of things

2 possibilities
deep - penetrates + judges of appropriation i.e. reason of theory w/ reality
shallow - imagination judges whether mechanical model is adequate

Math w/ enable to create unified + more adequate phys. theory

2. Structure of Phys. Theory

a) Substitution of symbol; can math represent qualities as well as quantities; qualities are represented on quantitative scale

b) Selection of hypotheses
- Negative { not depend. on Meta; not arrived at by induct; cannot test by crucial exp
- positive { be not contradictory; not ~ to another related theory; that it adequately expresses the laws

good sense & intuition w/ judge which hypoth

c) Mathematical development
Bring to conclusions
Diff betw practical fact & theoretical fact
pract. fact of nerve be correlated exactly w/ theor. fact;
choose one or other theoretical expression of practical fact.;
not necessarily correlated theoretical - i.e. theories

d) Comparison of results of practical fact
do this by experiment
results impossible to test - not good theory
~ possible - - - good theory
results of experiment test whole fusion of theories
can perform crucial experiment to test theory

experiment admits of many interpretations

Experimental laws are neither true or false, are provisional; dependent partly on precision of instruments
good approximation i.e. good theoretical representation

Theory has precision but not necessarily certain
more precise less certain; postulates in math are both certain & precise; in physics not certain at first

Language in physics =

17/7/61

Relat betw phys + ϕy of nature
radically distinct
reality
veil thru which we know it
prove ϕples sufficiently in cosmology
i.e., meta - i.e. illusion
thinks ϕy of nature is meta;
ϕphers give explanation
Eff. sc. description by means of symbolic representation
Both ϕphers + eff. sc. start from laws
stripped of symbolic veil; then
take different path;

Distinction of method
Relation betw kinds of knowl.
theory as symbolic is never in
conflict w/ meta.; do not
have to take theory into account -
i.e. photons, electrons which are
symbolic representations;
empirical elements of laws
must remain same for both
1) ϕphers of nature must know physics
in order to separate about 2
2) To keep physics from getting
↑ metaphysical
3) Physical theory cannot justify
its ϕples; nor can justify
search for unity; physics
as man desires this unity.

goes beyond eff sc. to find this unity
Real order + unity of ϕples in nat. sc;
approach unity in eff. sc;
unified symbolic representation
+ ϕphers penetration of real are parallel
classification is arbitrary? symbol represents real thing
physics is natural classification - can
ask them to predict
phys. theory may suggest to ϕphers -
it would be a sign.

---

law = precise formulation of observable regularity
every generalization is a hypothesis
even law implies faith in all terms
involved that are symbolic
circularity — theory is symbolic representation
law implies theory

There is no such thing as pure fact
anything you observe is observed
w/ jaundiced eye: hypothesis
can be said of law - A proportional to B,
may be beyond evidence.
Get whole set of laws; there is proportion
betw laws; to explain interconnection
use hypotheses
hypotheses { laws { = = =
hypotheses

Divorces φy of Nature from physicist –
e.g. physicist would go wild
if not kept in line by φphes

Modern scholastics deceived by Duhem
into separating 2 radically

sc. – appearances; one hypothesis
saves appearances better
than another

φphr – penetration beyond appearances

mode of definit is same
Duhem wrong in divorcing two

φphes – { sensible substances
as an investigation of nature { measurable aspect in their being & their motion

Duhem divorces them

φy of nature } Divides mode of knowing; doesn't
Exp. sc. } divide the subject or term of
science; part is scientific,
part is provisional

Why use math in investigation of nature?
Duhem – Introduce – to gain precision but
thus lose latitude.
Why do you want precision?
To express precisely or to
know things

Duhem – Know more thru symbol

Two converge · use math to know things
symbolization + knowl. of reality

Theory that is most simple in what Duhem means
aesthetics
but it has to be tested!

both have same object

Maritain — ens sensible

emphasis in philosophy of nature — emphasis in eff SC

whole of science would be destroyed if definitions are of Sensible matter but NOT interested in this SC. "Sensible - this refers to way we know; there is something even if we don't see

Subject of SC. ens mobile

effective subject in absolute way; has 2 aspects ens simpliciter + measurable

substance - subject of absolute taken + as measur

ens sensible cannot be subject of science

where regularity + connection - do not know why - give reason; another reason may be better; empirico deductive

12/13/61

overspecialization leads to a dead end

poets	write nowadays for	other practising poets
painters	paint ✓	✓ painters
musicians	musicians ✓	✓ musicians
dance		

∴ esp. sciences too

over rationalization

at other extreme write of lowest in man

over emphasize the concupiscible novel

must write this in more + more detail

so must have experience of it

∴ must experience evil to write about it

tends to defend se as Iago would defend se

but no person reading about Iago would defend him

both trends: over rational / over animal

art is in the mean

Is traditional logic sufficient for such problems
or do we need a new logic

1) The atom is in left side of box
2) It is true that the atom is in left side of box"
"It is not true that atom is in left side of box"
does not imply that it is in the right side of

1 implies 2, If 1 is true, 2 is true
2 implies 1, If 2 is true, 1 is true

If 1 is true, 2 is true
If 2 is false, 1 may be either true or false

Assume - atom is in either of 2
If in right, it is not in left

Reduces to Prop. which is neither determinately true or
determinately false

Suppose body in motion between

A ⟶ ⟵ B

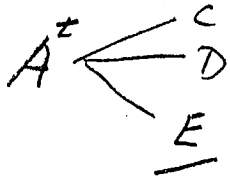
Diff between common place + proper place
Immobile surface of surrounding body
What is its proper place - have to stop mo
As in motion not in proper place or ti

partly in potency, partly in act

What you are asking is to make something completely in

No motion in relativity theory - 3 coordin

cept Indetermination in Theory



with these limits cannot determinately say it will be at one of them, altho can say it w/ probability

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Rel. betw physical theory & epp. physicist
divorces him from nature as if
he had no criterion for coming back to nature ?

criterion is more elegant theory
not so gross
not so complicated

Choose one that more adequately
saves appearances

Theory that comes closer to explaining
reality - simpler; but can never
come back to reality completely;
never achieve theory that is
completely adequate

Physicist comes back to experience himself

Duhem [Opher has to justify his theory
presents him w/ orders which will
justify his accept.

12/14/61 (32)

Vocabulary? metaphy + Cosmology + Phy of nature?

Sympathize w/ Heisenberg's use of words but wrong

Cosmology = discourse on Cosmos ff/ arist on Universe as whole

etomology { linguistic sense - true meaning
psikological
fr. view pt. of verifiability - Phy

logos - spoken word
sign of thing thru thought
thought that word expresses
order - proposition
definition - explains what word + then stand for
enunciation - complete expression of thought

fabricate new words e.g. vocabulary of chemistry

Now, know so many particulars - cannot see connections betw them
forced to use diff. words; if we could see relationships would simplify vocabul
syntax ruins language; absorption of words do not

Heisenberg's use of word "physics"

(differs from cosmology, Phy of Nature..

uses examples to explain word; identifies w/ esp. physics i.e. contracting it to math.? ; why retain "physics" - it refers to nature; physical is starting pt + end + math is inbetween; confusion that math. physics is physics

continuum cannot be composed of pts

time cannot be composed of entities

latter 2 are purely ~~physical~~ but closest to math/physics

purely physical

math/physics

time - number of motion acc to before + after

time - begin by measuring
attain measure not.
body in motion betw A + B takes so much time; regularity

norm of regularity = time must be ~~measure of~~ most regular movt

time can be identified w/ speed of light
is uniform velocity

chemistry - chemist w/o nose cannot operate if apparatus that would replace his nose, no diff betw phys. + chemistry

more purely exploratory

physics would require that disorders in table of elements be explained

c. of living biology

internal epp. ⟶ to external epp

have to return to ↗

investigate eye, parts, parts of brain

political as political. deliberates for means of common good - ethics

David Bohm

He attacks present day physical theory
absolute formulation of system of nature
his process - nature in process of becoming

causal laws: rec. relations ~~betw things~~
at one time + other things at another ti

contingency - could be otherwise

what took place will take place again under sam
conditi
causal laws are inherent in thing
do not have to know all causes to predi

chance contingencies - idealized ---
these factors due to causal
laws in broader contex

theory of probability used in re

nature: object w/ infinite no of facets
new theory doesn't invalidate old
but only corrects it

abstract from nature in our theo

attacks ~~by~~ of mechanism
present interpret. of quantum theo
cannot formulate experiment
which would invalidate it - e
but there always are
such experiments
indi
hyp

object to
find our
theory not
adequate
{ always finding new ideas
always testing theories

His theory — qualitative infinity of nature
same pattern not rec. repeated at all
levels
regards each thing as abstraction + —

Says it is process of becoming
Cannot take into account all natures possibilities
∴ we abstract
can be exhausted only by infinite no. of formulas

laws represent objective content

criticism: world would be unknowable absolutely
like Anaxagoras if have infinity in all directions - could
never know nature, know things
but not their pples

infinite no. of abstractions nec. to know things
bec. of inf — in qualities of things - qualitative
infinite levels of infinity - i.e. both
qualitative + quantitative infinity

Starts w/ contingency in human affairs → contingency in nature
speaks of good + harm

hard to recognize contingency
whenever see struggle f/life + something
cuts this short

contingency = unpredictability to Bohr

falling under predictable laws but does
not prevent ea. event from being contingent

Max Born
wave equation
matrix mechanics - one of ways quantum
theory comes about - due to Born
Science is - sum of observational invariants
eliminate sense qualities

experience of objects is not hallucination
there is objective nature
subjective vs objective interpret of objects
free will; we attribute same thing to other being
use senses for objective knowl.
subjective

{ Sensation communicable by measurement
{ sensation incommunicable to someone if they have not that sense

diff betw quantitative + qualitative

Sc. as he sees it excludes the animal characterized by sensation

objective reality has forced us into present position i.e. of quantum theory; excludes infinity of Born i.e., we are approaching a limit + forced into conceptual frame such as quantum theory

In Born dependence of one event on another thru laws
not mere relation in Born not nec. a cause

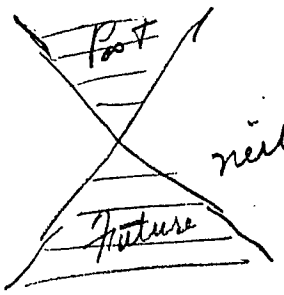
antecedent + contiguity

cause prior to effect

cause + effect in spatial contact or thru others in spatial contact

causation leads to determination

actually no causality in math physics
irreversability requires probability – must pos chance
rel. betw observational error
cannot say cause effect will hold in all ca[ses]
where no chance there is irreversability



neither from receipt of relativity no diff in direction of time
{reversibility
{irreversibility
direction of time bound up
w/ irrationality of nature

in Thermodynamics - time is
irreversible - part of whole
picture of nature but not from this
universal that time is irreversible

chance more fundamental than
causality (in deterministic
sense of word)

on micro level - something seem to
happen at random

on macro. level - see regularities

indeterminism more basic than determinism

Born: awareness that in studying phys. world we are
measured by it.

Niels Bohr: Atomic Physics + Human Knowl.
Applying study of atomic problems to other fields
Meaning of c. develop general method
complex to simpler
objective descrip = unambiguous expression
this limits us to classical physics

Chance as Bohr uses it acquires a new meaning
chance - accidental effect ~~of~~ ~~accidental cause that~~ is agent acting ff end

~~to~~ physicist: chiefly have unpredicability in mind
i.e. opposed to determinism

Arist: chance ~~ff~~ event unforseen to agent
what happens ff most part - re. to per se
rarely - re. to per se cau

achieving purpose - end
unintended end

no final cause in math. physics
∴ Chance has new meaning

in individual instance there are equal possib.
not equal probabilities in large numbers -
here one more probable than another

species not predetermined in matter from beginning

Over holiday week end + predict no. of accidents
But each one is an accident

Bohr

He says - he is not dealing w/ vague analogies
when showing rel. betw other fields
+ physics
objective experiment - when we can objectively
explain - this has to be done
in terms of classical physics
Experiments can

Complementarity: have only classical
conceptual frame which is not
sufficient ff mod. physics

Must measure in terms of classical frame

complementary purposes { Fundamental limitation on objective existence in terms of experiment
Limit to way we know things as rel. to experiment

Cannot have simultaneously a complete picture of phenomena
Frame of quantum mechanics is too narrow to comprehend new experiments

Compares this to other knowl.: need wider frame

Causal descrip gives account of behavior only insofar as behavior is indep of means of observation; but behavior is not indep :: indeterminate
probability is not due to choice in nature
" " " " choice of experiments

Freedom of will: corresponds to functions of organism in which there is complementarity

Final Cause: { classical mechanics } eliminate final cause
{ quantum mechanics }
But cannot account for all biological aspects of nature
purpose has field of application in biology
ability to adjust to environment
& includes { means to adjust
most appropriate way

Pure Mathematics
not separate branch of knowl
but is substitute for language
which eliminates the ambiguity

Bohr: is determinism an {abstraction / idealization}?
gives correct result in given system
is working hypothesis
idealization will break down; carried
far enough find something to contradict
it
see what looks like.
determinism in a chosen system
where is indeterminism in observer or
in phenomena? There is objective
indeterminacy, apart from our
observation, the experiment itself

In case of microscopic in math-physics in which no final cause

Is uncertainty in our mind?
— mode of knowing?
objective?

Must see parts in terms of whole
Cannot gather whole from nature
of parts - this is to explain
only in terms of material

In math physics only have equations:
one on left = to one on right;
no causality involved, only
relations

difficulty is to distinguish betw parts
whole in math. physics; do
not know whether substances or no

Bohr (De K) for 1st time formulated in rigorous way 1/11/62 — Descartes too math
Classical physics is foundation — Galileo - reifica
not distinguished from quantum

modern physics - measurement
in re macro physics; apply
to micro physics

Math - physics based on measurement

Complementary of Bohr

Not original idea
new in sense that physicists surprised that there
were bodies of which you could
not get total picture; but
this already in Aristotle

What is diff betw Heisenberg + Bohr

probability in complementarity involves
choice on part of experimental

Is Bohr indeterminacy on part of observer?
Does Bohr believe in objective indeterminacy - no
Contingency in Math - physics is due to
observer + his apparatus
Heisenberg holds ff objective indeterminacy

Psycho in rel.
awareness of feeling warmth
tending to let explicity reflexively
→ cannot have direct + reflex knowl
of same thing at same time

Math - symbols are not a refinement of languge

Oppenheimer

1948 - Lecture - Science + the Common Understang

Little
1957 ——— The Open Mind - collection of talks

1) View of nat sc in re other thought
2) nature + progress of sc.
3) Ethics + Politics of scientist

1) ϕy + science distinct, each is specialized field
Sc. does not produce ϕphilosophers
Sc. will help other kinds of thought
Sc. is limited + non-metaphysical
common exp + refined exp

Rel of biology to physics - separated
have diff. pple — matter + motion

Examine microscopic structure of living being
you disturb it

Laments specialization of knowl.; physics
is narrow and all knowl not subsumed un it

2) Hypoth. constructs are useful but not objective
Reject microscopic causality - no complete
causal prediction here

Intervention to make measurement ∴ indeterm.
is mode of knowing?

Causality on macroscopic scale;
statistical laws lead to probabilities
that are more certain

Teaching + sc. method
Fallacy of lab. situation - student not getting
feeling of disc. Lab. exp is rehash.

Common sense is wrong only if:

Pple of correspondence - had great value as instrument of discovery; old format is ✓ ✓ new;

Sc. is a non-meta activity; takes common sense for granted

3) Moral + political values
Responsibility of scientist for use of his discovery

Observat w/our instruments imposes limitation on kno. & creates disturbance in physical world
Can there be determinism; supposes possibility of being disturbed ∴ indeterminus
Could have disturbance by one part of phys. world on another ∴ indetermin

Contemporary physicist on nature of their science

go to physicist's at age when they begin to philosophize about their kind of knowledge

Works called works of popularization?
Is this true and in what sense
not pejorative
Relate this to analysis of what we know first + obscurely

Schroedinger + Heisenberg
Nature of exp. Science of nature in rel. to knowledge man has
Inadequacy of physicist's point of view cannot explain whole - explains only part of reality - specialists pt of view explains whole in part, but not whole simply
· Mental construction doesn't delve very far into what is important to me (as man)

Eddington
What is known by science is in certain way known a priori

2 meanings of a priori
{ mind built in such way that works in such a way
mind can make constructions + use these constructions to interpret reality; anticipates nature; suggests how nature should behave and then tests it

Duhem –

Bohm – ~~[illegible] [illegible] of causality~~
→ contingency in human affairs to contingency of nature

Neils Bohr –

If want to know nature more + more, must investigate it by special methods – i.e. methods of math. physics + those of biology which are diff. from those math. physics

Not distinct bec. define w/ sensible matter

Theory is never true in exp. sc. – allows you to do things; this shows you are on right track but not that theory is true – only good or bad.

All converge on → Validity of { initial knowl of world ~~common sense knowl.~~ + its certainty

idea [Philosophy is about esse (existence)
ϕy of nature is not ϕy
Exp sc has nothing to do w/ ϕy]

Grows out of epistemological consideration
If begin w/ whether you can know before you can begin to know
Infantile response to stupid question

① De manu et lingua 7 pp + 2 pp.

I S. Grégoire
II Parole et louange
III L'ordre de l'univers au point de vue locution
IV Dégradation de la locution dans la hiérarchie angélique
V Formation de la parole de la coulpe.
VI les organes du gouvernement humain
VII la finalité

1939 parce que au verso de son liv
De la primauté ... , CDK annonce
que De la langue et des
mains doit paraître
prochainement et
que il s'agit de conférences donnée
à l'été 1939.

③ Main et Langue 6 pp.

I. "Au comm. était le Verbe"
II Il y a locution dans les esprits purs
III. La main
IV. la main et la lampe
V. La main, la langue et les beaux-arts
VI ——————— et la théologie

③ Textes sur manus et Vestim. (Vêtement)

④ Albertus Magnus : De Animalibus - 6 pp. miméog.

De manu et lingua

I. S. Grégoire

1. St Grégoire établit rapport entre main et parole, entre la main et la langue. Ce rapport nous fournira le principe d'ordre de toutes nos considérations.

Au chapitre 8 du "de hominis opificio": ~~il énonce~~

(a) la station verticale de l'homme "qua ad cælum tendit, ac sursum spectat."

(b) les mains remplacent les pieds d'avant.

(c) les mains sont nécessaires à la faculté de parler: en sorte que celui qui disait que la main a été faite à cause de la parole ne serait pas loin de la vérité.

(d) Mais S. Grégoire dit qu'il entend cette nécessité d'une autre manière.

(e) ~~Il faut considérer l'ordre de précédence dans la création~~

Et pour s'expliquer, il fait d'abord la considération suivante:

~~Il~~ il nous rappelle d'abord que ~~il nous faut considérer ce qui précède~~ dans l'ordre des choses telles qu'elles ont été établies, il nous faut considérer ce qui précède: Pourquoi

- 1° res e terra nascentes
- 2° animalia rationis expertia
- 3° homo ?

Et, il semble que cet ordre ne doive pas s'expliquer seulement ~~de~~ par ce que tout le monde peut entendre, à savoir que le Créateur a jugé utile de produire les herbes et les végétaux comme nourriture des animaux, et les animaux à l'usage de l'homme: ~~et qu'il a par conséquent produit tout d'abord~~ ~~les~~ ~~avant les hommes, dans la succession des animaux avant les animaux et~~ qu'ainsi existait la nourriture des animaux avant les animaux, de même que tout ce qui servirait à l'homme existait avant lui.

Je suis d'avis dit il ~~que dans ces choses Moïse nous~~ "Mosen in his quiddam tradidisse arcanum", et qu'en paroles voilées il ~~nous~~ fait d'une philosophie de l'âme, ~~et qui~~ dont les philosophes eux-mêmes n'ont jamais parlé que d'une manière obscure. Moïse veut en effet nous montrer ~~la liaison des degrés de vie~~ que l'ordre suivi

dans la production des choses est régi par le principe suivant : "Idcirco natura convenienter quosdam quasi per gradus, qui sunt diversae illae rationes a nobis expositae (plante, animal, homme), a rebus minoribus ad id quod perfectum esset, properat."

Cette considération faite, il l'applique aussitôt : Puisque l'homme est un animal doué de la faculté de parler, il a fallu munir le corps d'un instrument très apte à l'usage de la parole. Et de même que les musiciens ~~ne peuvent tirer le service d'instruments~~ produisent diverses œuvres d'art au moyen d'instruments divers : ils ne peuvent pas tirer le son de luth de la flute, ils ne peuvent pas non plus exprimer le chant de la cithare au moyen de flutes. Pour la même raison il a fallu fabriquer des instruments adaptés à la parole, afin que la parole exprimées par les parties du corps destinées à la formation du discours, rende son éléphant.

Et c'est pour cette raison que les mains ont été ajoutées au corps. Car, quoique soient les multiples usages des mains, "praecipue tamen sermonis causa corpori natura annexuit."

Si l'homme n'avait pas de mains, comme les brutes il devrait exécuter par la bouche tout ce qu'il fait au moyen de ses mains : mais alors, sa bouche, sa langue ne serait pas adaptée à la parole.

Donc, dans la perspective de l'évolution, l'avènement de l'intelligence a nécessité la libération de la bouche pour la parole, par la formation des mains : les mains sont sorties de la bouche : le travail a été divisé, alors que chez les brutes les deux fonctions relevaient d'un même organe. //

"Idcirco recte statuitur, manus esse proprium quoddam naturae loquendi facultate praeditae instrumentum, hunc potissimum ad finem factas, ut earum operâ, expeditior in nobis sermonis usus esset."

Il faut donc chercher l'origine des maux dans la parole.

II Parole et louange

2. Pour saisir toute la profondeur de la parole, il faut lire S. Th., In Joann., lect. 1 & 2

{ "In principio erat verbum, et verbum — — "Verbum divinum est expressivum totius quod in Deo est". "totius esse Patris expressivum". l. 1.
{ "Et omnia per ipsum facta sunt — — (sec. intellectum practicum) quasi locuta.

3. Mais pourquoi les choses sont-elles faites ? Pour la gloire de Dieu : clara notitia cum laude. Or la louange est une locution suscitée par l'appréhension, par la contemplation d'une vérité qui dépasse l'intelligence, par l'étonnement, par l'admiration : "angeli loquuntur Deo, cum per hoc quod super semetipsos aspiciunt, in motum admirationis surgunt." Ia 107, a. 3, c.
Dans cette gloire est accomplie la fin de la création. ~~Produit par~~ Faite par la parole ~~et retourne~~ la créature raisonnable effectue le retour à son principe dans une parole : la créature procède de Dieu "secundum artem", la louange, comme toute locution est un art.

4. La louange a quelque chose de paradoxal qui est d'ailleurs de l'essence même de ~~l'admiration~~ l'étonnement en tant que "admiratio est consequens apprehensionem alicujus excedentis nostram facultatem". Et à cause de cet "excédent" "contemplatio in affectum terminatur" : IIa IIae 180/3/3m : l'esprit se réfugie dans les affectus de la volonté, qu'il exprime pratiquement.

III L'ordre de l'univers au point de vue locution

5. Où S. Th. traite-il de la locution ? Dans le traité du gouvernement divin médiat : Ia qq. 106-7. / cf. prolog. 106 : quomodo una creatura moveat aliam : et primo de angelorum illuminatione."

La locution est de deux sortes :

pratique { (a) illuminative : manifestative de la vérité : et celle-ci est gubernatrice.
pratique { (b) affective (simplex locutio) : communicative de ce qui procède de volonté.

L'unité d'ordre constituée par les species angéliques envisagées au point de vue de l'opération est par conséquent suspendue à leur locution.

6. Qu'est ce que la locution ? "nihil est enim aliud loqui ad alterum quam conceptum mentis alteri manifestare." cf. Ia 107, 1, c.

7. Qu'est que l'illumination ? cf. Ia 106, a. 1, c. "cum autem ad id.....
Notez que l'illumination se fait par division et particularisation.

8. Que faut-il entendre par la langue des Anges ? "lingua angelorum metaphorice dicitur ipsa virtus angeli, qua conceptum suum manifestat." 107, a. 1, ad 2. / de Ver., q. 9, a. 4, ad 12, (p. 219)

IV Dégradation de la locution dans la hiérarchie angélique.

Q Sth. C. Th. Ysagoge p. 160-162

9. La hiérarchie est constitué par les degrés d'universalité de la conn. angélique et qui est aussi le principe d'ordre dans leur gouvernement:

- Les premiers considèrent les choses et les ordonnent selon qu'elles procèdent du premier principe, Dieu. (Les premiers ministres du roi)
  - Cherubim : illustrant intellectum.
  - Seraphim : incendunt voluntatem.
  - Throni : judicia Dei et decreta ostendunt et exercent.
- Les autres considèrent et ordonnent les choses en tant qu'elles procèdent de causes universelles créées : (les gouverneurs de provinces)
  - Dominations : etiam bonis angelis praesident et dominantur.
  - Potestates : malos angelos coercent.
  - Virtutes : quae coelos movent. (coelum adhuc causa universalis)
- Les derniers considèrent les choses en tant qu'elles procèdent de leurs causes propres et particulières quant à leur dernière exécution : ils exécutent les choses que Dieu commande dans notre univers.
  - Principatus
  - Archangeli
  - Angeli : simpliciter nuncupantur.

10. L'action gubernatrice des anges dans notre univers est par conséquent une sorte de continuation de la locution : c'est une action qui se rapproche de plus en plus du particulier, du singulier, et qui devient mouvement local du particulier. A parler dialectiquement : la division de la lumière est poussée à sa limite : à la diffusion sur le singulier matériel, et elle prend la forme d'une impulsion motrice. Ce n'est plus de la parole qui s'adresse directement à l'intelligence : il n'agit plus par sa "lingua qua conceptum suum manifestat" : il pousse les choses comme de la main. Ia q. 110.

Rappelons-nous le texte de CG III 24 : "Quod formae quae sunt sine in materia venerunt a formis quae sunt sine materia ; et quantum ad hoc, verificatur dictum Platonis, quod formae separatae sunt principia formarum quae sunt in materia, licet ponerit eas per se subsistentes et causantes immediate formas sensibilium ; nos vero ponimus eas in intellectu praeexistentes et causantes formas inferiores per modum artis."

11. Mais, gouvernement divin même les choses corporelles se gouvernent les unes les autres : les corps célestes par le mouvement local dérivé des intelligences séparées ; les corps inférieurs par leur inclination naturelle pour une fin.

Or, nous avons vu que "si natura operetur propter finem, necesse est quod ab aliquo intelligente dirigatur." Phys. II, l. 12, n. 1

Si la nature agit pour une fin, c'est qu'elle a une aptitude naturelle pour une fin : "et hoc est naturam appetere finem." ib. 13, n.

Et enfin : "natura nihil aliud est quam ratio cujusdam artis, scil. divinae, indita rebus, qua ipsae res moventur ad finem determinatum : sicut si artifex factae navis ponet lignis ferre, quod ex seipsis moverentur ad navis formam inducendam." ib. 14, n. 8.

Cette ratio : λόγος, ce verbe ou parole est comme un principe et une semence pour les choses à produire : ratio seminalis : logos spermatikos.

cf. Ia q. 115, a. 2, c. & ad 1.

X { "Ipsa creatura liberabitur a servitute corruptionis in libertatem gloriae
filiorum dei. Scimus enim quod
"Omnis creatura ingemiscit et parturit usque adhuc"

Ad Romanos VIII 21-22

CABINET DU DOYEN

UNIVERSITÉ LAVAL
FACULTÉ DE PHILOSOPHIE

Et la génération ici bas est une sorte de continuation de la locution gubernatrice.

12. Parce que les choses corporelles ne gouvernent pas ex proposito, mais ex necessitate naturae: "inquantum omnia quae hic aguntur, divinae Providentiae subduntur, tamquam per eam praeordinata, et quasi praelocuta, fatum ponere possumus. Ia 116, a. 1, c.

V. Formation de la parole dans le cosmos.

13. Quel est le terme de cette action gubernatrice? Les choses corporelles ~~sont~~ considérées en elles-même sont muettes. Mais quand on les considère dans la perspective de leur fin, elles sont ordonnées par et à l'intelligence, à l'animal raisonnable, au ζῶον λογικόν: à l'animal qui forme des verbes. Tant qu'il n'existe dans le monde que l'animal ἄλογον, le monde ne peut effectuer un retour explicite à son principe: ~~il est muet~~ il appelle ce retour par son inclination pour la fin. Les choses corporelles demandent la parole: ~~"caeli enarrant gloriam Dei". Mais, comme dit S. Thomas: "caeli dicuntur enarrare gloriam Dei, laudare et exultare, materialiter, in quantum sunt hominibus materia laudandi vel enarrandi vel exultandi." de Spe. [illegible]~~ — L'action gubernatrice des intelligences séparées et des choses corporelles ~~elle n'est pas elle-même une locution; mais~~ elle est ordonnée à la locution: à l'évocation d'une parole proprement dite. Les logoi spermatikoi sont ordonnés au logos qui procédera de la bouche de l'homme.

X

logos, au verbe vital que nous mons, et →

L'homme poursuivra cette locution qui unifie l'univers de deux manières:
- par la locution proprement dite: docendo et illuminando
  - langue
  - sens large: mouvement local: art: mains.
- par sa verbe séminale

L'action gubernatrice des anges sur les choses corporelles, et celle des choses corporelles elles-même n'est pas ~~illumination~~, locution, mais elle est ordonnée à la locution: ~~à la formation d'une parole vitale~~ à l'évocation d'une parole vitale.* Le logos, la ratio seminalis est ordonnée ~~à la~~ au logos qui procédera de la bouche de l'homme.

14. C'est ici qu'il faut placer l'évolution décrite par S. Grégoire de Nysse. Elle consistera dans une progressive émancipation de la langue. ~~Les fonctions que nous exécutons par les mains, auraient été exécutées par la bouche, en sorte que dans la bouche la main a été précédée par la langue a été précédée~~ Ce qui remplace la main dans les animaux, est antérieur à la langue: ~~les cornes, les ongles, les sabots, le dard vénéneux, la fourrure, les pattes de lièvre, les etc. cf Greg. N.~~

- cornua
- unguium acumen (ongles)
- ungulae (sabots)
- aculeus venenatus (dard vénéneux)
- l'égide des poils
- leporis celeritas (lièvre)
- capreae vis saltandi (le chevreuil)
- oculorum praestantia (telescope)
- proboscis (trompe)
- chelae (les pinces de l'écrevisse)
- ~~squamea cutis et~~
- crocodilis squamea cutis (sa peau écaillée)

La raison remplace tout cela avec avantage

15. Libération de la langue chez Aristote :
de Partit. animal. II c.16, 659 b 30
c.17, o.

16. La formation des mains chez Aristote : IV c. 10.

17. Darwin, The Descent of Man, c. II § Natural Selection. p. 431

VI Les Organes du gouvernement humain. IQ. 117. =

18. a. 1 : Utrum unus homo possit alium docere.
(a. 2 : " homines possint videre angelos)

19. a. 3 : Utrum homo per virtutem animae possit corporalem materiam immutare.

VII La finalité : cf. Aristote : § Anaxagore
§ Albert le grand

Mais pourrait vaincre space et temps.
Remarq. Distinction pas absolue.

Note sur Art
§ Relig.

15.o Nécessité de langue pour vie la plus noble de l'homme.
Pour vie purement humaine
Pour art

---

1. Pr vie noble:
(a) - indigence: nécessité d'enseignement. Car l'homme dépend des autres pr conn. même; dépend de l'illumination par autrui.
- surabondance: docteur → bien commun de la spéculation.

(b) Or, les conception de l'intell sont infiniment variée.
L'homme dépend du corps pr communication de ce qui est au dedans.
Donc, faut instrument corporel —
Mais, ce qui est communiqué infiniment varié.
Donc instrument infiniment flexible...
La langue [illegible] — Sorte d'infinité physique et instrumentale. Instrument de "manifestation".

Cf. Arist. de Part. anim. II 16 & 17.
Notez identité de l'instrument de la locution & instrument du goût.
(a) "bouche" du corps pour le corps. ← ;
(b) "bouche" du corps pour l'âme → ; corresp. "oreille": comparables à bouche corp. pour corps,
(1) Le corps a certaine universalité.
Nutrition aussi doit avoir universalité: aliments très divers.
{ et aliments naturels
{ et " artificiels: hic intell.: mode "goût" aussi intelligent. Goût en certain bouches, et touche sens de l'intellig.

Notez aussi que chez brutes la langue à la fois instrument du goût et "main". Et, ici, la langue comme "main" et pour le "goût" seulement. Bouche pour corps slt.
Identité de la main et de l'organe du goût.
Hic certaine convenance: car brute opère pour l'homme, pr l'intell p., a mangeant.

Notez aussi que l'art qui se rattache à langue, l'art le plus universel: poésie.
Poésie inséparable de locution physique. Tend vers parole à la fois naturelle et spirituelle.
Mais, poésie déjà semblable à œuvre de la main, car "opus" — i.e. pas communication pur et simple d'un objet — sic science enseignée, mais communication d'un objet fabriqué au moyen du langage.

16. Les mains.

Arist. de Part. Anim. Lib. IV, c. 10.

~~N. Thomas~~

S. Albert, de Animalibus, L. 14, Trad. 2, c. 2.

S. Thomas – Ia

Darwin, The descent of man... p. 432 et segg.

Donc, toute matière est ordonnée à l'intelligence :

1° ese
2° consens.
3° connais.

Intellectus hum. avant son exst., selon intention, s'attire toutes choses comme le bien qu'elles désirent.
Cette finalité caractéristique du monde des choses compatibles et generables: Met. XII l.7.
Mais pour que les choses puissent être ordonnées et tendre, il faut en elles cette ratio indita ab intell. Met. XII 12.
Cette ratio, logos, verbe, est inséparable de l' "appetere finem": l'"appetere" est la raison d'être de la ratio.
Elle est comme une parole mise dans les choses, et qui leur fait appeler la forme à laquelle elles sont ordonnées. Cette parole "ratio quaedam" se termine à la véritable parole qui procède immédt de l'intelligence, et dans laquelle le monde spectre les retrouve à son principe.
Donc, les choses naturelles sont suspendues à leur principe et leur fin par un logos.

Considérons donc le rapport entre la finalité dans la nature et la parole dans l'univers.

I

1. Pourquoi les choses sont elles faites ?
2. La parole est un retour à Dieu Réjouissant.

II

Main et Langue

Nous allons traiter de la main pour montrer combien loin on peut pousser la considération d'un organe aussi familier et apparemment ordinaire.

St. Grégoire de Nysse sera notre guide.

Comme les autres auteurs, il établit un rapport entre l'intelligence, la main et la station verticale de l'homme, mais à tout cela il ajoute le rapport étroit qu'il faut voir entre la langue et la main, celle-ci n'étant qu'une extension de la langue.

C'est ce rapport qui ~~commandera~~ sera le principe d'ordre de toutes les considérations que allons faire.

Voir "Formation de l'homme", chap. VII etc.,

I

1° "Au commencement était le Verbe,
Et le Verbe était en Dieu,
Et le Verbe était Dieu.
Il était au commencement en Dieu.
Tout par lui a été fait,
Et sans Lui n'a été fait rien de ce qui existe."

2° Dieu crée pour se manifester au dehors, non pour se manifester à soi-même. — Or, il ne peut y avoir manifestation au dehors que pour un être capable d'atteindre Dieu en tant que manifesté de lui. De là la nécessité d'une intelligence inhérente à l'univers, capable d'apprécier l'excellence de Dieu: ceci dans la louange.
cf. S. Bonaventure.

~~1. Qu'est-ce que la louange?~~
~~"dans le verbe" parole.~~

3° En quoi consiste cette louange?
Cette louange est une locution proférée par l'intelligence créée et dans laquelle elle exprime son admiration pour la grandeur et l'excellence de Dieu qu'elle ne pourra jamais comprendre.
"Angelus laquitur Deo, vel consulendo divinam voluntatem de agendis, vel ejus excellentiam, quam numquam comprehendit, admirando, sicut Gregorius dicit, quod angeli loquuntur Deo, cum per hoc quod super semetipsos respiciunt in motum admirationis surgunt." — "Locutione qua angeli loquuntur Deo, laudantes ipsum, et admirantes, semper angeli loquuntur Deo." (Ia 107/a. 3, c. fin ad 2)

4° Notez donc le rapport: Toutes choses ont été faites par le Verbe divin pour la louange laquelle est aussi une parole dans laquelle l'intelligence créée fait un retour actif à son principe.
Cette louange a ~~99~~ chose de paradoxale: elle est l'expression d'une admiration, i.e. d'un étonnement: l'étonnement est lui-même ~~99~~ chose de paradoxale: ~~admiratio est emotio~~

"admiratio est (species timoris) consequens apprehensionem alicujus rei excedentis nostram facultatem: ~~unde admiratio~~ unde admiratio est actus consequens contemplationem sublimis veritatis. Dictum est enim quod contemplatio in affectum terminatur."
II II 180/3/3m.

5° Voilà la forme la plus parfaite de la locution créée. [Il faudrait peut être dire un mot de cette parole de S Thomas "Laus dei est sacrificium, summe placens deo"... Ps 26 [redacted] 49 [circa med.] ~~et~~ en rapport avec le "Unde et memores" de la messe, où le Verbe incarné, victime immolée, est offert à Dieu en disant les mystères de sa vie.]

6° Notez aussi que la création est une oeuvre d'art — que la locution est elle aussi une oeuvre d'art: un art pratique. La création est un "faire", la locution est un "faire".

II

1° Il y a locution ~~[illegible]~~ dans les esprits purs: c.à.d. communication mentale active: Ia q. 107 a 1, c. [redacted] ad 1m [redacted] (p. 530)

~~Cette locution est de deux sortes:~~

~~illumination~~
~~locution pure~~

~~2° [illegible]~~

2° La locution de deux sortes:

- illumination } locution essentiellement sociale.
- locution pure. } Besoin de l'intelligence créée.

Notez: S. Th. étudie la locution dans le Traité du gouvernement: "quomodo una creatura aliam moveat; et primo de angelorum illuminatione."

Les esprits purs sont vitalement liés les uns aux autres formant ainsi le grand univers des esprits, par la parole.

3° La langue et la toucher.

Ia 107, a 1, ad 3

de Veritate, q. 9, a. 4, ad 12 (p. 219)

III La main.

~~La langue et la main~~

~~A~~ La nécessité de l'art dans la nature.

Il existe entre l'intelligence humaine et la nature une disproportion radicale.

- Les natures sont déterminées "ad unum": elles sont étroites, limitées. La nature répond à des besoins déterminés et limités:

- L'intelligence est infinie, ses besoins sont infinis. Son objet dépasse tous les genres. Elle tend naturellement à vivre de la vie de toutes choses: "anima est quodammodo omnia". – "Anima infunditur".

- Entre l'intell. et le corps proportion réciproque: "anima forma corporis". Ceci entraîne dans son corps un certain dénûment, certains besoins naturels qui ne peuvent être comblés par la nature, mais par l'intelligence seule. Ce dénûment même rend l'homme physiquement et naturellement plastique par rapport à l'intelligence. Exemple de dénûment: la nudité, ses besoins de nourritures artificielles, etc. La pauvreté de son instinct.

(Toucher sens de l'intelligence)

- Mais, cette même proportion entraîne aussi les moyens nécessaires pour combler cette indigence: la main et la langue.

Langue et mains : I 91/3/2m ; 76/5/4m.

~~Arist. de Part. Animal. IV 10~~

Voilà donc la cause des arts utiles qui répondent aux besoins naturels de l'homme, besoins naturels ~~nature~~ qui ne peuvent être comblés par la nature. — L'intelligence elle-même doit y répondre. Elle invente d'instruments dont elle se servira deira participer de son infinité : c'est le cas de la main : grâce à cette infinité la main peut faire des chemises, des fards, des brosses à dents, des mayonnaises, et des parapluies. — Et elle fait des mains, i.e. extension.

Arist. de Part. Anim. IV 10

" Prudentissimus "

J. Charles Darwin
The Descent of man
c. 2, § " Natural Selection.

IV La main et la langue : la conception de S. Grégoire de Nysse.

1° de Hominis opificio, c. 8, col. 147 C usq. ad finem.

Donc, à proprement dire : { les mains sont sorti de la bouche —
il a fallu libérer la bouche de ses mains.

2° La main comme extension de la langue : gestes et écriture.
Extension de la langue à travers la main dans tous les instruments de communication { réseau des postes et tous les instruments la T.S.F. etc —

3° Fournit un rapport sous lequel on peut étudier toute la spère biologique.

4° Si l'on prend la langue au sens spirituel :
Tout les moyens d'expression et de formation dont nous disposons ~~sont~~ peuvent être réunies sous la raison de "lingua". Ses embranchements : compensation dans Expurcation.
En fait c'est ce qui rend possible la substitution.

<u>La langue</u> n'est pas un <u>absolu</u>.

<u>En fait</u> : – On ne parle pas qu'avec la bouche

– on peut s'exprimer par d'autre voies. (Ex. : Helen Keller, The Story of my life, Londres 1923. She is deaf, dumb, and blind).

<u>Ratio st</u> : dirait que l'intell. déborde réct tel moyen dit. insuffisant – analogie avec système "récepteurs" et sa pluralité d'organes et de sens. – L'intellig. dans son extériorisation se diffuse ont potst.
Autre exemple : le toucher répandu

<u>Nota</u> les rapports

Son : | oreille —— speach
| musique | bouche / main / oreille

vue : | peinture – yeux – mains.
| sculpture – toucher – mains

Toucher les yeux avec la main à travers peinture, écriture, etc.

V ..... et les beaux.

1° la langue : { poésie (universalité : langue princ^tr)
2° la main { musique (1° à langue)
{ peinture - sculpture, architect. ---
3° le corps tout entier : danse : sorte de locution.

Nota : comment la locution relie les sens :
la vue et l'oreille à travers la main : { écriture / musique
" " et le toucher à travers mains : Sculpture

VI et la Théologie

1° La langue et la main dans les sacrements. (impression de main
2° { les mains et l'"inexprimable" : prier avec les mains - II II 84, Adoratio: actus corporis
{ la parole et la prière : prier avec l'église : récitation
de prière dans une langue inconnue.
II II 83, a. 12.

Etc —

La tête chez animal espèce de main –
de cou espèce de bras.
(Cas curieux de l'éléphant. Et le serpent)

" Homo vice pedum priorum brachia, et quas manus dicimus habet. Solus enim animalium omnium erectus est, quoniam ejus natura atque substantia divina est. Officium autem divini..... " de Part. An. IV 10 686 a 25.

" quorum igitur anima pondus sustinere non posset, haec quadrupeda facta sunt. ibid. b 1...

unguis : une griffe
ungula : patte
cornu : une corne
hasta : lance
ensis : une épée, ~~une~~ un glaive.

La main aussi une aile.

"Il nous est agréable de parfaire les choses imparfaites ; car dès lors la chose devient notre œuvre." Rhet. I 1371 b 25.
(p. 125)

Prier avec les mains:
qui disent qq chose que la parole directe ne peut exprimer.

L'imposition des mains. (l'Illum. angélique par imposition.

La langue et la main

Notre main menace d'écraser notre parole. (Le machinisme, l'industrie prennent naturellement le mors aux dents : car ils nous donnent avant tout des biens sensibles. Or, ceux-ci sont, pour la plupart des hommes, les plus séduisants, et, par conséq., les plus puissants.) C'est la langue d'action extérieure qui se tourne contre la langue parlée au dedans de nous. L'émanation intérieure qui s'écoule avant d'aboutir au dehors.

Lingua et Manus

Lingua congruit in duo opera naturae, scil. in gustum et locutionem. — in I Pol., L. 2, p. 11 b.
Comme double nutrition — corps, et âme. Pourquoi cette unité d'organe pour deux fonctions?
Langue siège du "sapere" — et "os sapientiae".
Voir aussi S. Thomas in Cant. Canticor. — ou Dissert. et phil. & theol.