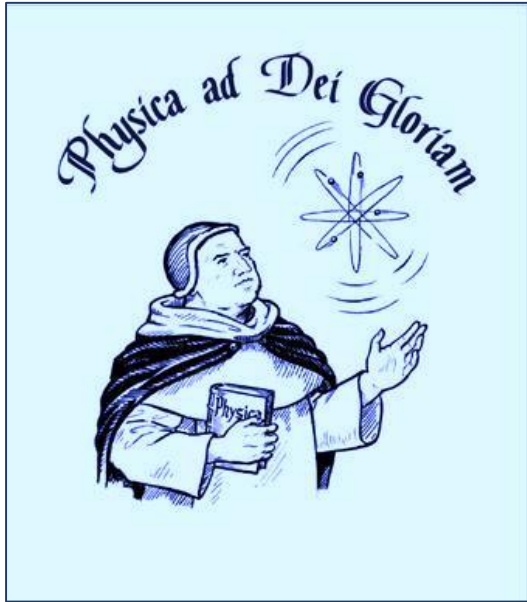


Science before Science Study Group

Week Eleven



*St. Thomas Aquinas,
Pray for us.*

*St. Albert the Great,
Pray for us.*

Prayer before Study

Almighty God, You who are the creator of all things and our loving Father, send us Your Holy Spirit to illuminate our minds so that we can understand how You have revealed Yourself to us through the world around us.

Grant to us
keenness of mind
capacity to remember,
skill in learning,
subtlety to interpret,
and eloquence in speech.

May You guide the beginning of our work, direct its progress, and bring it to completion.

We ask this through Thy Son, Jesus Christ, Our Lord.

Amen



Chapter 5: On Animals, Men and Robots

- What is an animal?
- What is man?
- Will a robot ever be able to think?
- What is a robot?
- Are there other thinking beings besides man and God?

Summary for this week's session

- Do animals have an intellect? Koko the gorilla. Dolphins. Cats. Clever Hans.
- Common senses tells us that no. Is it being blocked?
- Some animals have advanced sensorial knowledge – seem to play back videos – capable of man activities
- Look at language which manifests ideas – can animals transfer meaning?
- Animals have sensorial knowledge and not intellects
- Qualitative difference between having and not having intellect – not a difference of degree
- Animal is an organism with capacity for sensorial powers
- Plant is a organism with nutritive powers
- Plant to animal is a qualitative jump
- Organism is an organized unity – all power are subsumed by higher powers

Summary for this week's session (continued)

- What about man and the physical laws we have from modern science?
- Can we do an experiment to prove the effects of the immaterial?
- Man's substantial form – immortal soul
- The beginnings of an animal and man
- Can we make animals?
- Can we make a man? Case of duplicate self.
- Can a robot think? Imitators of immanent order
- Are there other forms of intelligence? Extraterrestrials? Angels?

Can Animals Think?

- Some evidence that is put forward
 - Koko's sign language
 - Doorbell ringing by a cat
- Need to make proper distinctions – What do we mean by think?
 - Have intellect?
 - Apprehending the form of the thing? In general?
 - Should be able to do science
 - Ask simple questions relative to essence of things
 - Why is sky blue? Why are there bad men?
- We do not find this among animal in the wild

Can Animals Think? (2)

- Let's assume animals have an intellect
 - Since we do not see the evidence – there must be a block or impediment (physical or non)
- If there is a physical block
 - Still should see some rudimentary evidence
 - Steven Hawking had severe physical impediments
 - Stoke victims – Koko's trainer suggested the intellect of a gorilla is hindered
 - Chief power would be most ineffective power?
- Non-physical block
 - A universal decision by all animals not to use the intellect?
 - Absurd not to use prime power

Can Animals Think? (3)

- Common sense – animals lack intellect
- Animals do not perform actions associated with intellect
 - Engineers, artist, musicians, teachers, comedians, etc.
 - A bird's nest 500 years ago is the same as it is today!
- Let's us look at particular evidence before closing the book!
 - Orangutans – Dr. Anne Russon – imitating human being:
 - Chopping firewood, washing laundry and dishes; sawing logs; sharpening axes; one even tried to start a fire!
 - She said they never rehearsed these thing and it was as if “they were playing back mental videos”
 - They were supposed to have learns over 1000 signs!

Can Animals Think? (4)

- Let's determine if animals have ideas
 - Language manifests ideas; words are associated with things or ideas
- Two ways of learning words
 - Direct association – e.g. a mother points to a dog
 - Dictionary method – e.g. the point where axis of rotation comes out in the northern hemisphere
 - Example: my 3 year old son did not know what a wallet was. I defined it, then pulled the wallet out and he properly identified it.
- Dictionary method is key!
 - An instrumental sign is given meaning by an instrumental sign (i.e. one word defines by other words)
 - Remember ideas are pure signs, pure referential value, pure meanings
 - If animals can *transfer meaning from one sign to another* then they have ideas
 - This is not *transfer of meaning* – e.g. I bring my son his bike and tell him it is a vehicle and then say a vehicle is “a device for anthropoid locomotion” he could identify the set of words without knowing what they meant (using signal ability only or sensorial knowledge)
 - But using abstract ideas (the idea of an idea and the idea of God or of justice) would make the case that animals can think
 - Despite immense research there is no evidence of *transfer of meaning* capability in animals.

Signs – Pure and Instrumental Signs

- Instrumental Sign – A ‘construction ahead’ sign
 - Primarily the sign is *that which we know*
 - Secondly represents that there is likely men ahead working on the road
 - We do not properly know the second one!
- Pure Sign – Something that brings us into contact with something else
 - It is something *by which we know* something else
- Phantasms and Ideas are Pure Signs

Can Animals Think? (5)

- If not intellectual knowledge, can we explain using sensorial knowledge?
 - Is awareness of particulars by phantasms
 - Some behavior can be accounted for by stimulus response type (mechanical) behavior
 - Apes ape human activity – as Dr. Russon – running back the sensorial images. They don't need to understand
 - Cat ringing doorbell, associated with getting food or getting inside for warmth.
 - These things could be done mechanically but it's clear that cats and apes are aware
 - Koko shows what advanced sensorial knowledge can do – i.e. more sensorial ability than a cat.
 - Reported dolphin ability to identify circles of different colors but only comparing particular things
 - Clever Hans – a horse – fooled even renowned psychologists – but taking cues from audience and others
- Animals are living things with sensorial knowledge but not intellectual

Can Animals Think (6)? Self-Aware?

- In its primary sense – *is an animal aware of its ability to know?* **NO**
 - Animals only know by phantasm and hence only particulars
 - If an animal were to know it knows – it *would not only know* this cat, this grass, this tree, etc but it *would know all of these as diverse particulars as instances of a general thing*. It would be able to form the idea of sensorial knowledge as particular.
- In secondary sense – of being aware of their body and its particular unified actions. **YES**
- There is a *qualitative difference* between having an intellect and not. It is not a *difference of degree*.

Definition of Animal and Plant

- Aristotle and St. Albert the Great were great biologists
- Aristotle identified four primary abilities of living things
 - Nutritive or vegetative
 - Locomotive
 - Sensorial
 - Intellectual
- Man has them all!
- Plants have nutritive
- Animals have sensorial but not intellectual abilities
 - Also has vegetative since sensorial cannot occur with nutritive life (to maintain itself)
 - Animal is an organism (i.e. Heterogeneous parts organized immanently for the action of the whole)– has real unity – vegetative and sensorial must work together in some way
 - Vegetative is subordinated to the sensorial
 - Sensorial is higher being than the vegetative; and subsumes it into its sensorial
- Animals have locomotion
 - why? To preserve its life – to flee from danger; to get food; to communicate with other animals
- An animal is a organism with capacity for sensorial powers
- A plant is a organism with nutritive powers only

Sensorial Knowledge – More or less developed

- Monkeys can make rudimentary “tools” like “umbrellas” and “chairs”
- Even more advanced animals could make fire or spears – without understanding what a spear is or what fire is
- Plant to animal is a qualitative jump
 - From not having to having sensorial powers
 - From purely physical to partly immaterial power
- Animal to man is another qualitative jump
 - To intellectual power that is completely immaterial
 - The intellectual power includes the sensorial powers and both include the nutritive powers

Recap of Man and Animals

- Substantial form of Man called soul is immaterial (non-physical) because man's intellect is
- Intellect is because we have ideas which are general not particular – whereas a material (physical) thing is always particular
- Recall material things are form-matter composites
- Animal substantial form has sensorial and vegetative powers.
 - The vegetative powers make use of physical laws and do not violate them
 - The sensorial powers make use of the vegetative

Man and Physical Laws

- Recall because man is a being, a unity, there must be order between his various powers or he would not be.
 - The more order the more he is
- There must be one power that regulates or orchestrates the others
 - The less in order his powers the less he is
- Intellect is the chief power of man; it is more because it is immaterial
- How does the being of man subsume the physical laws?
 - Like gravity, electrical/magnetic, etc?

More Depth is Needed...

- Knowledge comes with correlative power
- Sensorial knowledge with (internal sense) evaluative power and appetitive power which causes the organism to feel revulsion or attraction
- Intellectual knowledge comes with the appetitive power called the will
 - The will perceives what the intellect learns (it utilizes the ideas of the intellect so must be immaterial)
 - Something good attracts and something bad repels
 - The will is drawn by what appears good only
 - No particular good binds the will to choose it
 - The will can choose another – free will (undeniable datum of experience)

Physical versus Will?

- Physical law demands material causality
- Some of the problem comes from incorrect placement of the science
- Questions about man's soul
 - How will it regulate physical powers?
 - How can it do it without violating strict causality
- Regulation of the powers
 - The will controls the lower powers by immanent action
 - E.g. fireman saving life of a woman doesn't change nature of his instinctive revulsion of fire, uses it to keep from getting burnt
- Immanent versus External action
 - Form-matter composite – the immaterial form acts from the inside
 - Not as one body acts on another as in physical interactions
 - Before discovery of magnetic field a chip of iron veers from its path – violation of the known physical laws – but we later find the magnetic field and include it in the physical law
 - Metaphorically one can say that the intellect becomes a new law of the behavior of man's physical parts

Will and Material Causality

- The action of the will violates causality *only if one confines causality to causes proceeding from material (physical) things*
- The will does not obviate the need for the lower powers
 - The sensitive, vegetative, material powers
 - The higher powers work through the lower
 - The immaterial laws augment the physical and they don't work without them
 - *The material works externally; the immaterial works from within*
- Correction of cultural belief
 - Immaterial is part of the working of the universe
 - Incorporate new phenomenon when necessary into laws of physics (magnetic example)
 - We must learn to do a similar thing with the immaterial
 - Immaterial is not supernatural - only God is supernatural – everything else is part of nature
- The will and modern science
 - Scientist fixes the material conditions of his experiment; excludes immaterial
 - E.g. electrons minimally “violating” physical laws (p. 118 – 120)

Specialize Experiment to Detect Immaterial?

- Trying to see action of immaterial soul in an atom or group of atoms
 - More silly than trying to see vegetative life there
- Life is an organism
 - “a complex immanent organization of heterogeneous parts”
 - It is a *relation among parts* not found in isolated parts
 - It is *ordered* toward the *immanent* action of the whole
- We know intellect is immaterial from its effects
 - To demand it be forced into a part is like straining an elephant and expecting it to still remain an elephant.

Man's Substantial Form

- Normally for physical things (form-matter composites)
 - When the form is taken out of the matter, the form is lost
 - Recall: eating apple; death of an animal
- The act of being is the form (recall *primacy of the act of being – esse*)
 - The form is what makes a thing to be what it is!
- Forms are only incidentally destructible
 - *Forms of themselves are immaterial* – have no parts and thus no way to take them apart
 - First accident of material things is extension (quantity).
 - E.g. A cat is spread out and so it can come apart
 - An immaterial thing is simple
- *A substantial form that is tied in all ways to the material will cease to exist when separated from the material*
 - It has no proper act outside of the material
 - Such forms will only exist in one's and God's mind – a referential existence in one's mind and not outside the mind

Man's Substantial Form (2)

- However, man's substantial form
 - Has *acts* that are not bound up with matter (the body)
 - One *can* destroy *the part* of the man that is *bound up with matter*
 - *One cannot destroy the immaterial substantial form itself!*
 - *The human soul is immortal. It cannot die.*
- Hence: at death
 - The body loses its substantial form
 - But the form remains because unlike the body it cannot be ripped apart
 - It is a whole without parts

Back to the Metaphor of the Man in the Car

- Didn't we say that man could not think without his body?
 - No! he couldn't think with a damaged body
 - He is only completely himself with a body
- When soul is separated from matter
 - Mode of being is different
 - No longer has access to phantasms – so no new ideas (knowledge)
 - No contact with material world
 - Level of being is lowered
 - It must work in a purely immaterial mode
- Driver-Car metaphor
 - Car completely broken down – driver could get out and walk
 - Will be inhibited but have freedom from not having the car
 - Can think (without access to phantasms); will know general things by its ideas; will not know particular things

The beginning of life – animals and man

- Animal zygote – a living organism – a living what
 - It is not a living animal but becomes one – needs an efficient cause
- Need principle of causality and what an organism is.
 - Nothing changes itself; can't give itself something it doesn't have
- Efficient cause – is something that causes a change
 - There is no cause – role of mother is passive
 - Maybe zygote provides its own efficient cause – but this is precisely what it cannot do.
- Zygote is an animal right from conception; animal life begins at conception
- It must be the law of its own development
 - It is what it is to become in a hidden way right from conception

Human Zygotes

- Same reasoning goes for human zygotes
- Except – where does the soul come from?
 - Distinction between creation and making
 - Can make material things out of material
 - But can't make an immaterial thing (no parts outside of themselves)
- When the zygote is to be, it calls for the substantial form of a man
 - It is infused at the moment the embryo comes to be
 - Matter being disposed
 - Law imposed by God

Can we make life, animals?

- Do a thought experiment. Can we make animals?
- Animals are completely bound to the material
 - No reason why they cannot be made
 - Man can be the efficient cause if he know the various potentialities of the materials he brings together
 - There may be insurmountable technical issues but in theory it can be done
 - Rizzi says – “considering the present state of science, I think it highly likely that man will make animals at some point”

Can we make man?

- Arguments apply as in the case of making an animal
- But the immaterial form cannot be made (because it is not material)
- But once the matter is disposed
 - It calls for the immaterial form (soul)
 - It is then infused by God – part of the law of nature God made.
- Man can, in principle, by his action (though not by his simply making), cause another man to come to be

Duplicate of Self

- Not an embryo but a full-grown man
- Like cloning
- Make a identical copy of you down to you're atomic 'make up'
 - Put all the atoms together
- What would happen?
 - A new soul would be infused – he would not be you – you are you
 - His intellect would have no ideas (He was just created by God so would not have formed any).
 - He would have memories but would not have accessed then yet
 - He would then start forming phantasms and ideas
 - He would see many sensorial memories
- He would be quite confused – what an awful way to begin life.

Can a robot ever think?

- No, the intellect is immaterial and cannot be made
- Turing came up with test – concerning artificial intelligence
 - Man behind curtain fooled by computer
- Just having a painting look like a face doesn't make it a face
 - Even with 3D and motion
- Robots aren't even life – no immanent activity – only a functional replica (we just talked about exact replicas)
- Appearance is what a robot designer is after
- It's not even an animal – not a organism – heterogeneous
- Heterogeneous parts allow complex relations ordered towards the whole
 - This is what make substantial form of living thing different than inanimate forms

Final Causality

- Each part makes no sense outside the whole because each part has its reason for being that part in that place only in the whole
- Heart – is to pump blood to brain To examine heart in isolation makes no sense
- The parts of an organism have an end, which is the whole. Mysterious but true.
- Final cause in physics – Newton, Maxwell, Einstein
- Final cause is ordination
 - Implies foreordination (ordination is there before reduction of potentiality to act)

Robots are Imitators of Immanent Order

- We start off with the idea of something that has parts ordered to one another to make a whole
 - However we choose to use already made substances rather than activate the internal potentialities of matter
- One does an external ordering to make a robot
- Robots are not living things
 - Cannot have true sensorial knowledge which requires a whole
 - The whole is aware
- Robots are only artificially (imitatively) intelligent

Other forms of Intelligence

- Aliens? Possible, but no evidence of this
- Any other possibilities
 - Man is like an amphibian – one foot in the material world and the other in the immaterial realm
 - What about creatures that are purely immaterial?

Purely Immaterial Beings

- Our intellects are immaterial but tied to matter because of their need for phantasms
- What about creature that has ideas innately?
- Such a creature called angels
- Some well-developed ideas about them
 - Each angel would be its own species
 - Each angel would have various levels of being based on the simplicity of its ideas
- Do they exist? We will see in later chapters
- If Descartes would have thought more about angels, he wouldn't have gone so far astray!

Organism

Life is an organism which is a complex immanent organization of heterogeneous parts; it requires a relation among parts and so is not found in isolated parts. It at least has nutritive and reproductive functions.