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Topics Ch 14

163b9 “Moreover, as contributing to knowledge and to philosophic wisdom the power of discerning and holding in view the results of either of two hypotheses is no mean instrument; for it then only remains to make a right choice of one of them. For a tasks of this kind a certain natural ability is required: in fact real natural ability just is the power rightly to choose the true and shun the false. Men of natural ability can do this; for by a right liking or disliking for whatever is proposed to them they rightly select what is best”

Two parts in “the power of discerning and holding in view the results of either of two hypotheses”
- 1. Drawing out the contradiction
- 2. Being able to judge which hypothesis is true

- This ‘power’ of drawing out the contradiction and being able to judge is dialectic
- interesting to note that this is the way that the man who loves truth will proceed in discovering truth

(why is looking at two sides of a contradiction necessary for discovering truth?)

Sn: there is a likeness between dialectic and wisdom as well sophistry
- the likeness is that all three are universal
- But they differ in strength

The answer is provided by Aristotle in the 3rd book of the Metaphysics
- four reasons why we should proceed dialectically (are look into the contradiction)
    - 1. Untying of the contradiction is the discovery of something that hasn't been seen before
        - Since man’s mind is tied up, examining the knot is necessary for loosening it, and further loosening is necessary for the mind to go forward
        - If one perceives a contradiction, there is actually a new secret of nature which will be discovered if the contradiction is untied
    - 2. Man knows where he is going
    - 3. And when he has arrived
    - 4. One who has herd both sides is better able to judge which side of the contradiction is true
        - Aristotle gives a likeness to the court room.
            - The reason that we have a defendant and a prosecutor is so that the jury can better judge if the defendant is in fact guilty

Dialectic - taking problems *even* to contrary opinions
- ex. From the meno (can virtue to taught)
    - Side 1: what directs us to the good is knowledge

        - But virtue directs us to the good
        - Virtue is knowledge
        - But knowledge can be taught
        - Virtue can be taught
    - Side 2: if virtue was teachable
        - Then there would be teachers of virtue
        - But there are no teachers of virtue
        - Virtue can not be taught
- Ex. 2. debate teams

[why is dialectic (considering contradiction) the road to discovery*?*]

Fist consider these two truths
- Men think about something before they understand.
- Furthermore, we guess before we know
    - We have certain arts of guessing
        - Economists (guesses the motion of the market)
        - Weatherman (guesses the weather)
            - "there is a 60% chance of rain"
            - He is not 100% sure because he does not know, and knowing is being certain
    - Dialectic: a universal art of guessing

- reason seems in large to guess before it knows (though perhaps not in geometry)

Considering opinions on this matter (contradiction) MD #7
- Heraclitus
    - "war is the father of all things"
    - "the hidden harmony is better than the apparent harmony"
        - [how is harmony related to contradiction?]
            - It is what is gotten after the contradiction is resolved
        - When someone has not been exposed to the two sides, he is in a state of *apparent harmony*
        - But when he sees the contradiction and unties it, he has now discovered the hidden harmony
    - "nature loves to hide"
        - Since we know the outside before we know the inside
            - Our senses are a beginning point for man
        - Nature is an internal principle of change and rest
        - Senses of nature in 5th book of Metaphysics
            - 1. Birth
            - 2. Principle of birth
            - 3. Internal principle of all change and rest
    - "if you do not expect the unexpected you will not find it for it is hard to be found and difficult"
        - [how can you expect the unexpected?]

        - When we encounter a contradiction, look for what is unexpected, resolution.
    - So we can see that we are trying to guess at nature (what is internal) by looking first at what is external
        - We say that “we judge a book by its cover” MD #5
- Aristotle
    - Bk III metaphysics “to raise difficulties well is useful for those who wish to resolve them, for the later solution is a loosening of the previous difficulties.”
        - Another translation “To doubt well is necessary for those wishing to discover, for the discovery afterwards is an untying of the difficulties before, and it is impossible for those ignorant of a knot to loosen it”
- Max Plank: discovered the quantum
    - 1900: “Plank went for a walk with his son and he said ‘I think I have discovered something as great as Newton’” -Heisenberg
    - If Plank was not expecting the unexpected then he would not have discovered the quantum
- Einstein:
    - “the first impulse towards the revision and reconstruction of a physical theory is nearly always given by the discovery of more than one fact which can not be fitted into the existing theory”
    - “nothing is more interesting to the true theorist than a fact which directly contradicts the theory generally accepted up to that time, for this is his particular work”
    - (the evolution of physics) “the relativity theory arose from necessity from serious and deep contradictions. The strength of the new theory lies in the consistency and simplicity with which it solves these difficulties using only a few very convincing assumptions” “one of the most fundamental questions raised by recent advances in science is how to reconcile the two contradictory views of matter and waves it is one of those fundamental difficulties which once formulated must lead in the long run to scientific progress”
    - “science forces us to create new ideas and theory, their aim is to break down the walls of contradiction which frequently blocks the way of scientific progress. All the essential ideas in science were born in a dramatic conflict between reality and our attempts of understanding”
- Gamoau (Russian physicist)
    - “staggering contradictions between theoretical expectations on the one side and observational facts and even common sense on the other are the main factors of the development of science”
- Niels Bohr:
    - “Bohr’s hypothesis were only of a provisional character in as much as it presented a mixture of Plank’s idea with the old mechanics. Nobody was aware of the situation more than Bohr himself. Thus in a lecture on a new theory which he gave to the dailies physical society in December 1913, which he himself rightly considered one of his best and clearest lectures, he emphasized this aspect of the problem in the following fine conclusion, ‘before closing I only wish to say that I hope that I have expressed myself sufficiently clearly so that

you have appreciated the extent to which these considerations conflict with the admirably coherent group of conceptions which have been rightly termed the classical theory of electro-dynamics. On the other hand I have y to convey the impression, that just by emphasizing the conflict, it maybe also be possible in the course of time to discover a certain coherence of the new ideas"

- "his (Bohr's) turn of mind was essentially dialectal rather than reflective, although he did, although, spend long hours in solitary thought, often during sleepless nights, he needed the stimulus of dialogue to start off his thinking if the proposer of the dialogue was at hand, the dialogue would be lively enough for as soon Bohr saw his way to the elucidation of the matter, he would make his point with unbounded eagerness and tenacity, not at all to get the better of his opponent, but rather to get him to share his own exhilaration in solving the difficulty. So intensely did he want everyone around him to share it with him, even after many years he would remember every detail of the arguments progress and he would repeatedly tell the story with the same freshness and animation, it was characteristic for these unforgettable conversations, so clearly revealing the essentially dialectical form of thinking that he would never try to outline any picture, but would patiently go through all phases of the development of a problem, starting from some apparent paradox and gradually leading to its elucidation"
- "logical analysis was not for Bohr a mere verification of consistency but a powerful constructive tool orienting the groping mind in the right direction. That he saw the heuristic power of logic in its' dialectical character is illustrated by the striking comment he made in more than one occasion of his own scientific discovery. He says, 'the decisive point about Rutherford's atom model was that it made quite clear that atomic stability could in no way be accounted fro by Newtonian physical laws and there by pointed to the quantum postulate as the the only possible escape from the acute dilemma. Just the sharpness of the contradiction made me absolutely confident of the ruth of the quantum postulate' he was still remembering this lesson when, in one of his last conversations, he observed the reason why no progress was being made in the theory in the transformation of matter occurring at very high energy is that we have not so far found among these processes, any one exhibiting a sufficiently violent contradiction with what could be expected from current ideas to give us a clear and unambiguous indication of how we have to modify these ideas."
- "difficulties were for him (Bohr) merely the external appearance of the knowledge and in an apparently hopeless contradiction he can see the germ of wider and more comprehensive harmony"

- Heisenberg
  - (Gifford lectures) "Bohr's theory had opened up a line of new research the great amount of experimental material collected in spectrosoping through several decades were now available for information about the strange quantum laws governing the motions of the electrons in the atom. The many experiments of chemistry can be used for the same purpose. It was from this time on that the physicist learned to ask the right questions, and asking the right question is frequently more than half way to the solution of the problem."

- continue..."what were these questions? Practically all of them had to do with the strange apparent contradictions between the results of different experiments. Again and again one found that the attempt to describe atomic events in the traditional terms of physics led to contradictions."

- Matthew
  - "While the Pharisees were gathered around Jesus put to them this question, 'what is your opinion about the Christ, who's son is he?' 'david's' they told him. 'then how is it' he said 'that david moved by the spirit calls him lord when he says 'the lord said to my lord sit at my right hand and I will put your enemies at your feet' if david can call him Lord how can he be his son' no one could think of anything to say in reply, and from that day, no one dared to ask him any further questions"
    - Here is an apparent contradiction which leads to the truth that the Christ is both God and man.
- St. Augustine
  - (city of God) "even the heretics yield an advantage to those who make proficiency according to the Apostle's saying, 'there must also be heresies that they which are approved may be made manifest among you,' whence elsewhere it is said that the son who receives instruction will be wise and he uses the foolish as his servant for while the hot restlessness of heretics stirs up many articles of the catholic faith, the necessity of defending them forces us both the investigate them more accurately, to understand them more clearly, and to proclaim them more earnestly. And the question rooted by an adversary becomes the occasion of instruction

Descartes vs. Dialectic

- Descartes claims that dialectic is useless because one is proceeding from something probable, but not necessary
  - But since knowledge is certain, then you can't get to the beginnings of a science (which must be certain) through probable premises
- Counter-example 1: suppose we are outside and I ask you 'do you see that girl over there?
    - And you say that you don't see her
    - So in order to point her out to you, I ask if you see the big bluff
    - You say yes
    - And to the left, do you see a tree
    - Yes, and finally you come to see the girl
  - So I cam to see the girl by seeing the bluff the then the tree, BUT did you didn't see her *through* the bluff
- Counter-example 2: do I depend upon Euclid and Aristotle for knowing what I know?
    - No, but I do depend upon them in *coming to know* but not for knowing
  - Similarly dialectic leads you to see something that you wouldn't see otherwise, but it is not *through* the probable premises that you are certain of the principles of a science, but rather it is *by* the probable premises that you come to see something you otherwise would not have seen

Composed whole vs. Universal whole

- Composed/ integral whole: put together from its parts, but not said of its parts
- Universal whole: said of its parts, but not put together from its parts

Examples of how contradictions lead to hidden harmony in philosophy

- Example 1: two kinds of whole and part
    - Contradiction: animal is a part of man
        - But animal is man and dog and cat and ect.
        - But man and dog and cat is greater than just man
        - Therefore the part animal is greater than the whole of man
- Example 2: three principles of change (the two contraries and the underlying
    - Contradiction: something is what it becomes
        - Therefore if the dry becomes wet
        - Then the dry is wet (but this is a contradiction)
- Example 3: per accident vs. Per se
    - Contradiction: the good is what all desire
        - Then nobody want's anything bad (contrary to experience)

Therefore we has shown how looking to the contradiction is helpful for progress made in science, theology and philosophy

Duane's definition of reason

- reason: ability to think out
    - In order to understand this fully, let us look to the 8 senses of 'in' which Aristotle gives in the Bk 4 of the Physics (since reason is an ability to thinking out what is 'in') (listen around 1.30 for the likeness of all the 8)
        - 1. As in a place
        - 2. As whole is in part
            - The composite whole
        - 3. As genus in species
            - Since the genus is in the definition of the species
        - 4. As species in genus
            - Universal whole, the species are potentially in the genus
        - 5. As form in matter
            - Form in matter in ability, but the species is more like a subject part than the form is a part
        - 6. As part is in whole
            - In some way the whole is in all of its part.
        - 7. As in one's power
            - "I've got you in my power" "it's out of my hands"
            - The moved is in the mover in this sense
        - 8. As lover in loved
            - "I left my heart in San Francisco" "where your treasure is there your heart shall be"
    - Therefore reason has the ability to think out Parts from some whole, 2. & 3. The definition of some species (genus in species, parts in whole), 4. Species

from genus, 5. Think out order of things (form in matter), 6. Axioms from their parts (if I know what a whole is and a part is, then I can think out that ‘the whole is greater than the parts), 7. The conclusion from the premises (since the conclusion is in the power of the premises) 8. Means to some end (the end is loved, and how to get there … (not sure about this one)