Good Morning Archimedes:
An interview with Archimedes whose 2265 years old principle is being taught all over the world.
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Part I General

Q1. What is your principle Dr Archimedes?

Archimedes: Don't call me Dr Archimedes, as 2265 years before there was no PhD degree. According to my principle

"when body is immersed in fluid (water) , its weight decreases . The decrease in weight is equal to weight of the water   displaced by body from the pot."

Many people knew before me that weight of body decreases in water but I went a step a higher. I determined decrease in weight of body in medium. In universe it is my principle which is existing in science as such i.e. uncut or unmodified. It is the oldest established principle of science i.e. 2265 years old.

Q2. When mathematical equations were derived on the basis of your principle?

Archimedes: In 1687 in the Principia Newton defined acceleration due to gravity, g. Thus after 1937 (1687+250) years mathematical equations became feasible on my principle. Then equations were written for weight and upthrust. The equations which are discussed now became feasible after 327 years (2014-1687). None of the scientists discussed it completely, as it should have done. In the equations the VOLUME of body is considered, not SHAPE of body. For same volume body may have any shape.

 Q3. Can a principle be justified without mathematical equation?

Archimedes: No never. Theoretical predictions are made on the basis of mathematical equations, these are experimentally tested. If theoretical predictions are found to be correct, then law is regarded as correct. The principle cannot be justified without mathematical equations.

Part II Limitations of Archimedes principle.

Q 4. What is condition of floatation according to your principle?

Archimedes: The body floats when downward weight, becomes equal to upward thrust. For simplicity density of body must be equal to density of medium (water). The SHAPE of body has no role to play, only volume of body is considered in the principle.

Q5. Does the SHAPE of body has any role to play in floating bodies according to your principle?

Archimedes: According to mathematical equations in case of floating bodies, only density of body and density of medium are significant. Thus the SHAPE of body (spherical, umbrella shaped, flat, twisted, long pipe shaped etc.) has no role to play at all, it is prediction of my principle. My principle does not account for the SHAPE of body, it is the BIGGEST limitation. The principle only takes in account VOLUME of body which can have different shapes, it is significant in application of the principle.

Q 6 Your principle does not take in account SHAPE of floating bodies. So it is limitation of the principle. Why did you not confirm it?

Archimedes: There are two reasons for this.

(i) Firstly in my days there were no mathematical equations as Newton defined the law of gravitation after 1937 years (1687+250). Thus principle was understood qualitatively only.

(ii) Also experimental facilities to conduct experiments were cipher in my days. So the effect of SHAPE of body must be checked now. Why don't scientists check it (in case of independently floating bodies) . Now scientists claim we are going to land on mars soon and develop new civilizations. I , Archimedes also want to know the ultimate truth. There are countries like USA, ENGLAND, FRANCE, INDIA; they have excellent facilities to conduct such experiments. The effect of SHAPE of body on dynamics and statics can be checked. According to mathematical equations based on the principle only VOLUME of body is significant not SHAPE of body.

Q 7 Your principle does not take in account the SHAPE of rising and falling bodies. So it is limitation of the principle. Why did you not confirm it?

Archimedes: Well, initially I gave the principle for finding out decrease in mass (when body is immersed in fluid). It was just intuition. On the basis of mathematical equations of my principle, the SHAPE of body has no role to play, in case of rising and falling bodies. On the other hand a spherical particle of 1 gm falls quickly than a flat or distorted body. Similar is true for rising cork in water. The shape of body is insignificant in floating bodies mathematically, but experimentally it is significant. I did not develop mathematical equations for the principle. I did not have facilities to conduct experiments.

Q 8 Under some feasible conditions your principle, predicts that volume of material filled in balloon becomes indeterminate (0/0), which is MEANINGLESS.

Archimedes: As I told you that I had given the principle as a statement in 250 BC. Then Newton published the Principia in 1685 and defined acceleration due to gravity (g), then gave my principle a mathematical basis.

Thus my principle remained without mathematical equations for 1937 years of its enunciation. Now mathematical equations are existing since past 327 years (2014-1687) and interpreted by Ajay Sharma. It was not possible in my time. Now Ajay Sharma has privilege of mathematical equation. So he had drawn correct equations in the research papers and book **Beyond Newton and Archimedes.** The volume can never be UNDEFINED or INDETERMINATE (0/0) i.e. V=V, the limitation is limitation. Science is dynamic not static.

Q 9 According to your principle a steel needle falls down in air as it is denser than air. But an aeroplane rises in air and moves. Both the plane and needle have same densities.

Archimedes : Airplanes were not discovered in my time so I did not think about, the comparative motion of steel needle and aeroplane. My principle implies that heavier (denser) body must fall in lighter medium. So both must fall down.

Q 11 So do you admit limitations of applications of your principle?

Archimedes: I will be the first person to accept limitations of my principle if these are really there. I did not give the theory for explaining rising, falling and floating bodies. I never discussed the effect of

SHAPE, as such equations were not available. These equations do not contain any factor which may account for SHAPE of body. These are its applications. I don't see in any library of the world that my original handwritten works survives. Scientists have interpreted my work as they got it from various sources.

Q 12 in his research papers and 'book beyond Newton and Archimedes', the critic Ajay Sharma has extended your principle and its applications?

Archimedes: Don't call Ajay Sharma my critic, but he is my great admirer, I have seen in past two thousand years. He has fearlessly elaborated my principle to its fullest extent. I could not do so due to lack of mathematical equations. Normally scientists explain the principle at preliminary stage and move ahead. They think my wisdom is infinite but it is not so as I am also human being. He has seen the principle in modern context which was impossible in my time. Why others are not doing so. Had I been alive at this moment I would have done the same. So he is working for me and doing the right thing.

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Part III Generalized principle and future

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Q 13 Thus your principle is modified to get correct results . The principle, applications and related/extended applications are described in book "Beyond Newton and Archimedes" in chapters 4-6 The generalized principle is

............"when body is immersed in fluid (water) , its weight decreases. The decrease in weight is proportional to weight of the water displaced by body from the pot."

This in generalized principle additional factor comes in picture, when sign of proportionality is removed. It accounts for SHAPE of body and other elusive factors.

Archimedes: It is OK. Even after 2265 years old principle is in use and enriched. The generalized principle predicts the volume of medium filled in balloon does not become UNDEFINED or INDETERMINATE (0/0) i.e. V=0/0, we get exact volume V (V=V).

Q14 What is your advice to scientists about you principle?

Archimedes: In my days there were no mathematical equations, no such experimental facilities. So the principle was correct at that time. Earlier we assumed that there were only 5 planets in solar system but now it is 9. So science is not static and absolute, it is relative. Now my principle is translated in terms of mathematical equations, if new predictions are experimentally tested, the generalization will be confirmed. I am eager to see new results. What is use of expensive and sophisticated laboratories if elusive experiments are not conducted. It is not routine but innovative experiments are important.

Q15 So now we will start conducting the experiments which were not possible at your time. If your principle is found true then the principle will exist in original form till the civilization /humankind exists or will be modified as Ajay Sharma suggested.

Archimedes: It is right, we will meet when the innovative experiments are over. I was interviewed for first time by someone, it is so nice. Thank you

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