Good Morning: Isaac Newton: Who gifted YOU, F=ma

An interview with Newton on ……….

Who GIFTED to Sir Isaac Newton F=ma (now known as Newton's second law of motion)? Leonhard Eular postulated F=ma after death of Newton.

Why 327 years old Third Laws of Motion generalized ?

Interviewer: Ajay Sharma   Mob.   94184 50899 , Email ajay.pqrs@gmail.com

Website   www.AjayOnLine.us

Part I

Newton was wrongly credited to F=ma, Leonhard Eular speculated F=ma

Q 1 Which is your favorite law?

Isaac Newton: All the three laws of motion and law of gravitation are favorite. But after my death the Second Law Of Motion has been completely distorted. The law as given in the Principia is not taught.

Q2 How your Second law of Motion is distorted?

Isaac Newton: The way the Second Law Of Motion is stated by me at page number 19 of the Principia. The statement of the law is

The alteration of motion is ever proportional to the motive force impressed; and is made in the direction of the right line in which that force is impressed.

$F \ ma=m(v-u)/t$

whereas as my law is taught as

'The rate of change of momentum is proportional to the motive force impressed and takes place along straight line in which force is impressed.'

$F =k(v-u)$

Principia's Link:

http://books.google.co.in/books?id=Tm0FAAAAQAAJ&pg=PA1&redir_esc=y#v=onepage&q&f=false

Q 3 Sir, now law is more comprehensive than given by you in 1687.

Isaac Newton : Well if someone improves the law, I do not object. But do not attach or associate any law with my name which I have not given. The Second Law of Motion as taught right from 9th class, is not given by me. Then why it is it is called Newton's Second law of Motion?

Q4. What should be remedy? In some standard texts e.g. Stanford Encyclopedia of Philosophy maintained by Stanford University USA, also state that current form of Second Law Of Motion (F =ma) was not given by Newton.

Isaac Newton: That is true. The experts of Encyclopedia have studied and understood the Principia thoroughly; it should be quoted in all textbooks. The F=ma should be quoted with name of scientist who actually discovered or speculated it.

Q 5 Who had given the Second Law of Motion F =ma, which is associated with your name ?

Isaac Newton : As long as I was alive till 1727, there was only my law as given in **the Principia.** There are references in the literature that in 1736 Swiss mathematician and scientist Leonhard Eular, gave F=ma/n, 1750 Eular put forth equation F=2ma. In 1765 Eular, arbitrarily divided right hand side of equation by 2 thus obtained F =ma. But it is purely arbitrarily step. It is never justified. Likewise it is not justified F =ma, was given by me (Newton). Who associated it with my name, I don't know , it is wrong, absolutely wrong.

Q6 So you accept that Swiss Leonhard Eular derived F =ma not you (Sir Isaac Newton). Why F =ma is associated with you? When you are associated with this? This equation was derived in 1750 (or 1765) after 23 years of your death?

Isaac Newton : You cannot ask a deceased person that what happened after his death. Nobody can look from the grave. Such questions are replied by living persons. So you have to answer this question why a law (equation, F=ma) which is not given by me (Newton) is associated with my name (Newton)? Why a law (equation, F=ma) given by Leonhard Eular is not associated him? It is strange that scientists are not raising the issues. Science means truth, and scientists are proponents of the truth. But they are teaching incorrect ideas to children (upcoming scientists) in schools /colleges etc. Don't start science in the beginning with untrue note. It is sin, and goddess of knowledge is not happy. Give credit to discoverer, I will be more happy.

Table I   The various stages of equation of force.

Sr. No	Year	Equation of force	Comments
1	1736	$F = ma/n$ or $F = ma/2$: n is a constant /coefficient of proportionality depending on the unity of measure.	Euler used two primary or fundamental units L (length) and F(force), hence value of coefficient is 2.
2	1750	$F = 2ma$	Same as above
3	1765	$F = ma$	From $F = 2ma$, Eular obtained $F = ma$.

		Also, F =ma/4 is also equally possible.	Also from F =ma/n=ma/2. F =ma/4 is also possible (F=ma/2).
4	Current	F=ma	F =ma, it is peculated by Eular. But credited to Newton.
5	1687	F =k(v-u)	F =k(v-u) can be expressed in terms of F=ma if value of k is regarded as m/t.

According to Aristotle force was proportional to velocity NOT change in velocity.

Eular Timeline

1736   …..F =ma/n = ma/2

1750   …. F= 2ma

1765   …..F = ma

Q7 How it can be decided, that when F =ma was associated with your name?
Isaac Newton: Just constitute a committee of scientist who have interest in history of science/physics. Ask them to study the developments of science right from 1730 to 1800, then they will clear the mist.

Q 8. This equation F =ma has serious limitations, that under certain conditions the mass becomes INDETRMINATE (0/0)
Isaac Newton: Tell me about limitations with details. How does it happen?

Q.9 According to First Law of Motion body continues 'in state of uniform motion' (v=u , a=0) when no force (F=0) acts on it. Under this condition mass becomes
m =F/a =0/0
What is your opinion about it? This issue is discussed in the book
Beyond Newton and Archimedes
Home page   http://www.cisp-publishing.com/acatalog/info_109.html

Isaac Newton : I am not associated with F=ma . It is not my law. So nothing can be said about it. Only Leonhard Eular and its proponents can throw light on the issue.

Q10 What is final reaction about this ? What is your advice?

Isaac Newton : I am known as icon of wisdom in science. I am known as father of science. Please don't blot my name attaching false laws (F =ma) with my name. Let this law be removed from my name and so that I may live in peace in heavens.
I am not fraudulent; I don't need credit for other's laws.

Part II

In the Third Law of Motion……..action and reaction are not ALWAYS equal and opposite.

Q 11 Sir, we have sensitive question about the Third Law of Motion as given in the Principia at page 19. The law states that …….

' To every action there is always an equal and opposite reaction.'
Which physical quantities represent action and reactions, it is not defined.

Isaac Newton: You are right. What do you want to say about it?

Q12 **Did you conduct any test (even at macroscopic level) while stating the third law of motion?**

Isaac Newton: Yes, I have mentioned in the Principia at page 19. Have you any doubt?

Q13 Yes , Sir Isaac Newton , I have doubt , infact my name should be doubt. You have not discussed the striking and rebounding of various balls (rubber, cloth, or wooden) on the wall.

Isaac Newton : Doubt is first step of discover? Explain.

Q 14 Here very simple question is that your Third Law Motion does not take in account the characteristics (or distinctiveness, elasticity or flexibility) of body. It simply states a 'word' action, now action in case of 'rubber ball', 'cloth ball' 'sponge ball' etc can be same. But their reactions on the wall are not the same. So to every action , there is reaction but may not be equal ALWAYS .

Isaac Newton : You are right characteristics of different bodies are different . It appears interesting, I did not discuss it in my law. Can you elaborate it further?

Q.15 Your law does not taken in account the characteristics of body in account. It is its limitation.

Isaac Newton : But it has to supported experimentally.

Q. 16 It can be easily done. Consider three balls of rubber or air filled, cloth and sponge. All the balls have same mass and thrown with same force on the on the wall which is at distance of 10 feet. Now all the balls have same 'action'.

Isaac Newton: OK . What do you want to say further?

Q.17   Experimentally we find that the rubber or air filled ball, returns to original position (traveling back 10 feet) after rebounding the wall. Thus in action (traveling of ball to 10 feet) and reaction, (the rebounding of ball to 10 feet) are equal and opposite in this case.

But in case of   cloth ball it rebounds to distance of 5 feet only, the sponge ball rebounds to distance of 1 foot only. Each should have rebounded to distance of 10 feet (like rubber ball). So in such cases the action and reaction are not equal.
Thus your law is not true in all cases. It needs to be generalized.

Issac Newton: I have broken ice by triggering beginning of physics/science. Before this there was no systematic study of science. I never claimed my laws are absolute, these were the best when I gave them. People accepted them for centuries.. I did not impose my laws of people, they accepted it. If at any time you find new facts, incorporate them in my law logically. It would be the best tribute to me.

After it would be known as Newton's Generalized Third law of motion. Some of my equations (e.g. equation of velocity of sound in media) , theories (Corpuscular theory of light) have been modified. So it science, it is quest for truth. No problem, I am not God who is perfect, I am human being. Science is lighting one lamp from other.

Part III
Water Barometer

Q.18 You have defined acceleration due to gravity, g. It is used in calculations of mass of earth (M =gR^2/2) i.e. 5.98x10^{24} kg. The value of g (9.8m/s^2) can be measured by many methods. The acceleration due to gravity, g is measured with mercury

barometer. The same can be measured with help of water barometer.

Isaac Newton: The water barometer would require a pipe of length about 10.31m , as in mercury barometer it is nearly 1m. If the value of g ($9.8m/s^2$) is found different, then mass of the earth will vary. The mass of earth may be $5.2x10^{24}$ kg depending upon value of g.

Why barometer is not constructed in past 370 years ?

The mercury barometer was constructed by Torricelli in 1644. Even since we talk about mercury barometer only. But in history of barometers in past 370 years, no such experiments (formation of water barometer) are conducted. Thus understanding of barometers is incomplete. We should not draw conclusions only on the basis of observations of mercury barometer. All possible cases must be considered. There are so many liquids such as ethyl alcohol , glycerine etc., these must be included in experiments. These experiments will have scientific significance. It will incite scientific interest as about 40 feet long pipe is required. It is cheaper.

book

Beyond Newton and Archimedes

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