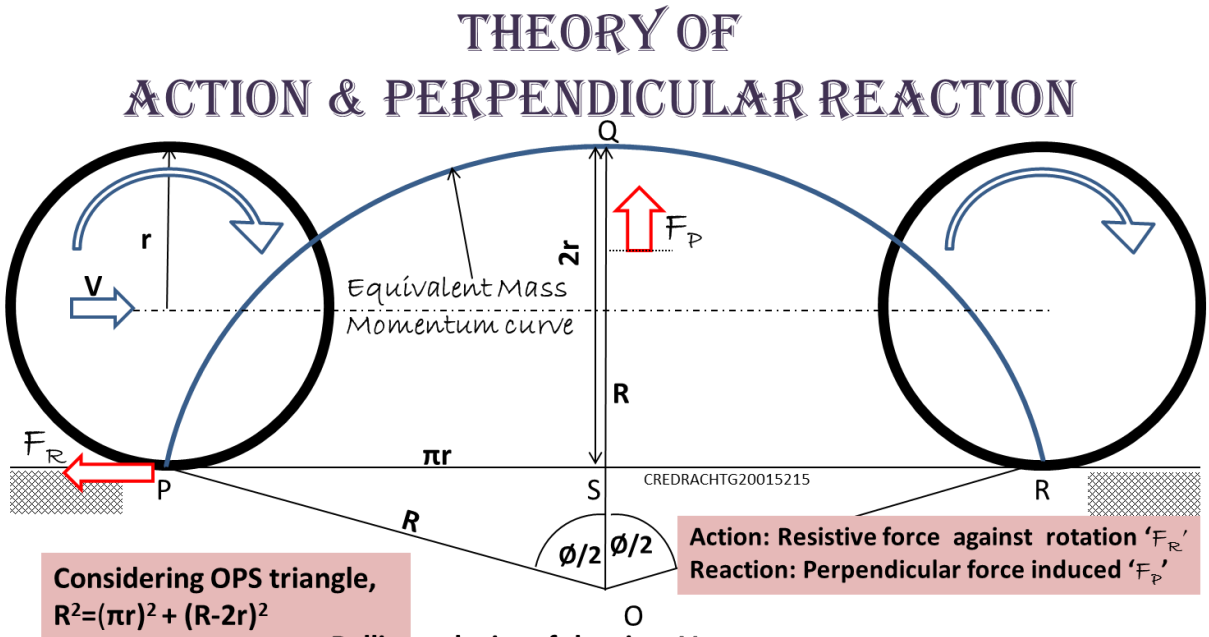
A brief of

Theory of Action & Perpendicular Reaction



Considering OPS triangle,
$R^2=(\pi r)^2 + (R-2r)^2$
R=3.46r

Rolling velocity of the ring=V
Mean velocity of the ring mass ≈ ½ (0+2V) =V
Centrifugal force (mainly upward)≈M V^2/R

At any instant the entire ring 'mass momentum' is equivalent to PQR ring segment . Then a bigger weight of the segment is above the center line of the rolling ring. Therefore the up lifting force is acting from above the center of gravity of the ring wheel. That's why a rolling ring or any kind of a rolling wheel is erected vertical without falling.

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FIGURE-01

Theory of Action & Perpendicular Reaction:-

Whence a rotary system is subjected to the 'Action' of any external buffering force, a perpendicular force is induced within the system as the 'Reaction'.

Background of the finding:-

The subject area of 'Angular Momentum' seemed to me, filled with lots of miss understandings and miss interpretations. The Rotary Motion as a whole in the world, starting from the child's Top, bicycle and to end up with solar systems and galaxies, have not been explained acceptably enough. Many different demonstrations are there to be observed but the phenomenon is not explained well. However teachers got used to defend themselves by referring of the matter to the gloomy theorem of "*Conservation of Angular Momentum*" which cannot be understood by human beings.

I am not afraid to challenge this theory of 'Conservation of Angular Momentum' because it doesn't have any provable mathematical, practical or logical basis behind.

Cyril H Thalpe Gamage

From my childhood I was against of the 'direction of angular momentum'. Why hand rules if the mechanism behind the phenomenon is clear to the founder?

Just for an argument's sake, you can imagine a child who is rotating a mass tied by a thread around his finger. It is clear that the rotating object possesses a certain **angular momentum**. At once the thread is broken and the mass is thrown away in a **straight line**. Then what is the 'Conservation of Angular Momentum' there?

But 'Energy' is conserved there, after and before the incident as well. Therefore Albert Einstein's '**Conservation of Energy**' is adequate to explain every energy based dynamics in the universe and other kinds of conservations are not logically acceptable.

The fault is with the society for accepting the entire package produced by the great scientist Sir Isaac Newton without testing or challenging over centuries. There is no argument that Newton is the greatest among all the practical scientists ever lived upon Earth. But a certain part of a theory could be erroneous and it is the fault of other scientists who lived ever since without testing the contents to identify erroneous sections.

Therefore the scientists of the 21st century have the soul responsibility to challenge and test the Himalayan stock of unfiltered knowledge base ever accumulated through centuries in the field of Physical Science or unless our prospective kids will certainly go mad by mental pollution.

Theories must be frequently challenged or unless 'Physics' too would become a conservative subject such as 'History' or 'Archeology'.

Paradoxes are always manmade and products by wrong theorizations.
'Reality' itself is simple enough to understand by a man, or unless it cannot be the 'Reality'

The theory of 'Action & Perpendicular Reaction' can explain all the complicated cases related to rotary systems. (*The theory is first published as 'The Alternative Dimension in Angular Momentum' /Space Dynamics-V4/2012 and this can be considered as the second edition of the previous publication*.)

Case studies as a proof of the new theory:- (1-Erecting of riding wheels)

It is your balancing skill to keep the bicycle erect at slow speed. But it is automatically erected with growing speed due to the perpendicular force induced in the upper region of the wheels as shown by the figure-01.

As a proof of the theory, too small wheels could not effectively erect the bicycle because the wheels ought to be adequately big and heavy.

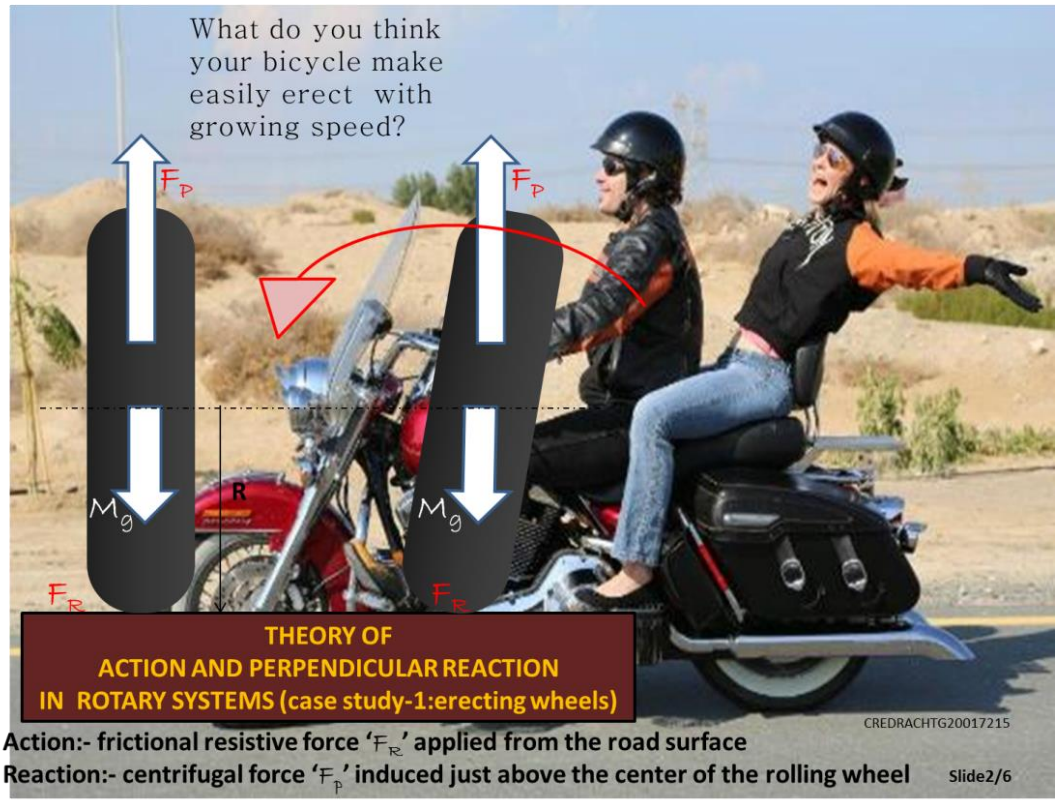
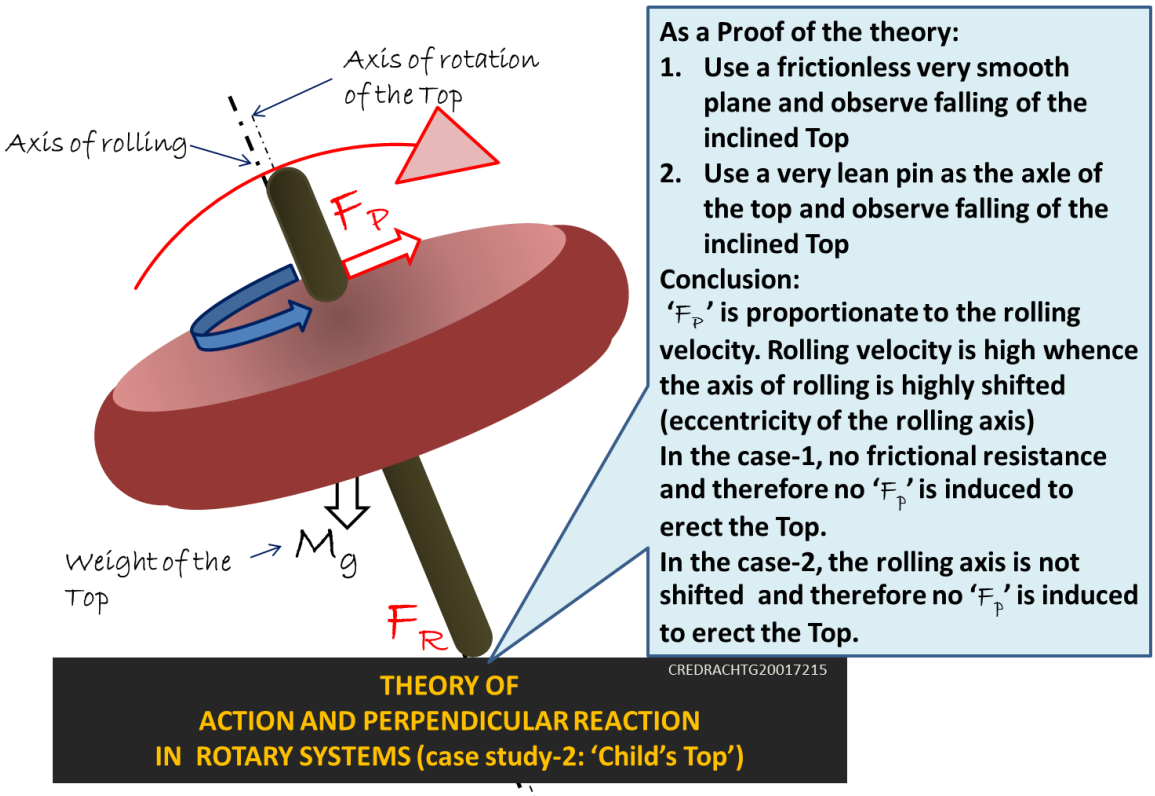


FIGURE-02

Besides that, the erecting force is not developed if the road is frictionless. You would experience the difficulty to balance the bicycle when the roads are slippery and muddy. In that case the 'Action-the resistive force from the road' is less and as a result the 'Reaction-perpendicular force induced in wheels' is also not adequate to erect the bicycle.

Case studies as a proof of the new theory:- (2-Erecting of the child's Top)

It is wonderful to think that, the most complex phenomenon have been hiding in the simplest toy from a child's collection, misguiding the scientists for centuries.



Action :- frictional resistive force 'F_R' from the plane applied upon axle
Reaction:- centrifugal force 'F_P' induced perpendicular to the resistive force and it is in the opposite direction of shift of the axis.

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FIGURE-03

Always Physics Teachers face the difficulty in explaining the phenomenon of the erecting top. The hand rule in the conventional theory says direction of angular momentum of the top is reversed when the rotating direction is changed. But students question 'Why the top is erected all the same even if we change the rotating direction?'

And even if any force is induced upward along the axis, the top should fall by the weight acting vertically downwards from the center of gravity. Hence the vertical stability of the top at dynamic state is not explained at all and Teachers used to defend themselves by referring the matter to the gloomy theorem called "Conservation of Angular Momentum" which is beyond understanding by human beings in this world.

Students keep silent thinking that 'we cannot but teacher must have understood it'. But in reality teachers themselves think 'Students seem to have got something out of that'.

Hand rules are always born whereas the founder himself is not clear of the mechanism behind the phenomenon.

Cyril H Thalpe Gamage

The new theory can explain how the top is erected without use of any hand rules.

Case studies as a proof of the new theory:- (3-Erecting of the hanged wheel)

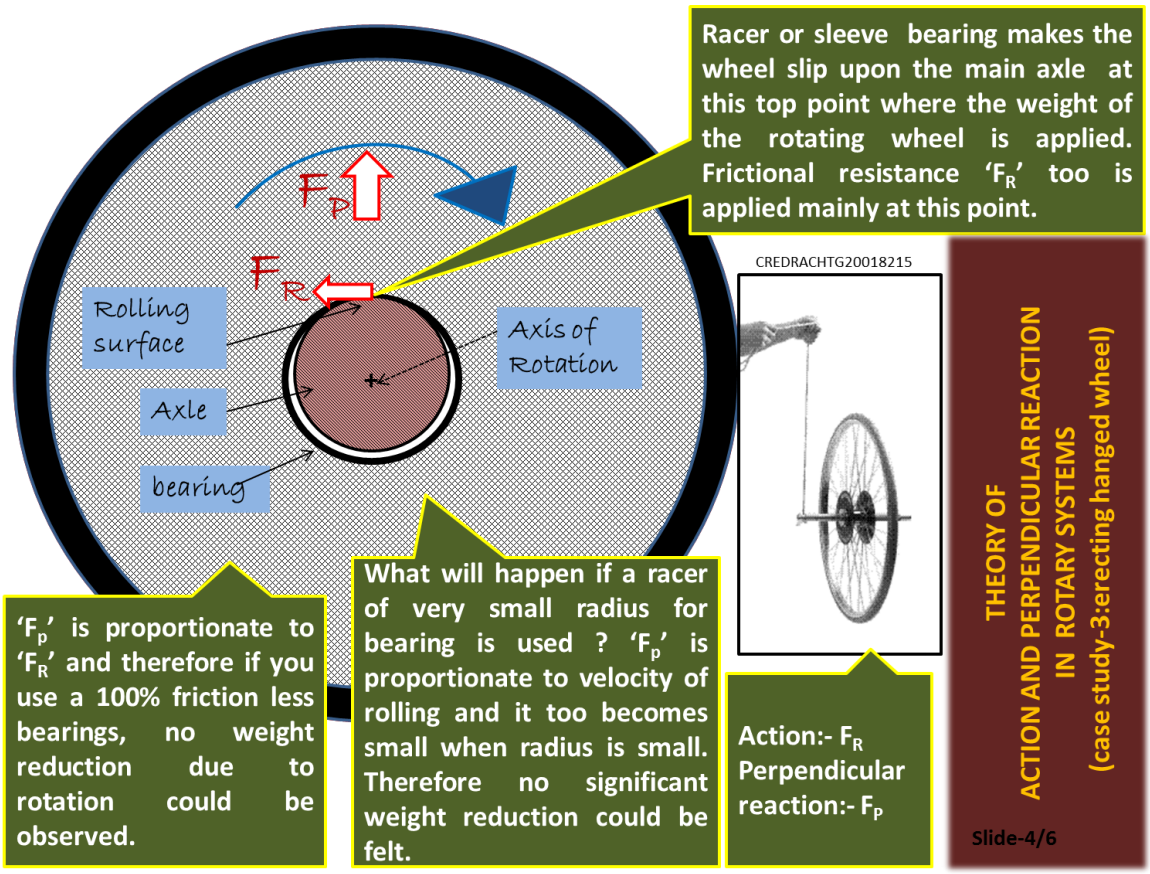

FIGURE-04

What are the main physical parameters which matter the erection of the hanged wheel?

1. Rotating speed
2. Mass of the rotating part of the wheel
3. Radius of the bearing (ball bearing, roller bearing or sleeve bearing etc.)
4. Friction of the bearing
5. Angle of inclination of the axle

You would agree with no arguments on 1st and 2nd parameters because the relation is clear enough. But about the 3rd reason you would argue 'How radius of the bearing does matter' with it?

The perpendicular force 'Fp' is a centrifugal force and it depends on the distance from rotating axis to the frictional surface on which the wheel is rolling. The entire wheel load is shouldered by the axle at the top region of the bearing as shown in the figure-04.

Even if we don't notice it, the wheel is just rolling over that point while rotating. The 'action' is the resistance of the bearing and 'reaction' is the centrifugal force due to

rolling. The force of reaction proportionate to shift of rolling surface from the rotating axis and therefore radius of the racer bearing becomes important.

You can observe it by yourself doing the same experiment by use of a very small bearing fixed to a very lean axle and observe the wheel would not be erected.

Then you may question 'how friction of the bearing affects upon this matter?

Frictional force is the 'action' applied against the rotary system. If the action is weak then the reaction too becomes weak.

Therefore use a 100% frictionless racer (if possible) and observe the wheel would not be erected as a proof of the theory. Also use an old corroded racer bearing and observe how easily the wheel is erected.

"What is the importance of the inclination of the axel?" then you may ask.

I can answer this by a similar question such as, "why don't you hang your apparatus sharply vertical?"
You can weld a hook at the end of the axle and hang the thing sharply vertical and then you would observe no erection at all. And why is that? That is because the wheel weight should be loaded only upon one side of the axle to create a perpendicular reaction. Therefore no erecting force is induced within the wheel whereas the axle is kept sharply vertical.

You can do the experiment in a space laboratory under zero gravity conditions. However much speedy the wheel could be rotated there no erection would be observed because no wheel load is applied upon the axle. Therefore give up those unnecessary hand rules and gloomy theorizations whence things could be clearly explained mechanically.

Case studies as a proof of the new theory: - (4-Mystery of the Boomerang)

Teachers are always helpless in explaining this incident of the boomerang's orbital motion. To defend themselves from student's arguments they got used to forward the same faulty theorization 'Conservation of angular momentum' which cannot be understood by a human being.

It is simply nothing else but air resistance does this job. If you don't believe my word, please throw a boomerang in to the free space out from a space craft where there is no resistance. Then you would observe it is moving on a straight line with no magical orbiting.

(But one thing I have to remark, even though we believe free space has no resistance, it is wrong. It is not resistive as much as in the atmosphere but yet it possesses a medium in which motion is a little resistive. For more of the phenomenon please refer 'Dynamic Stability in Orbital Motion of Planets'/ Space Dynamics-V6/2013).

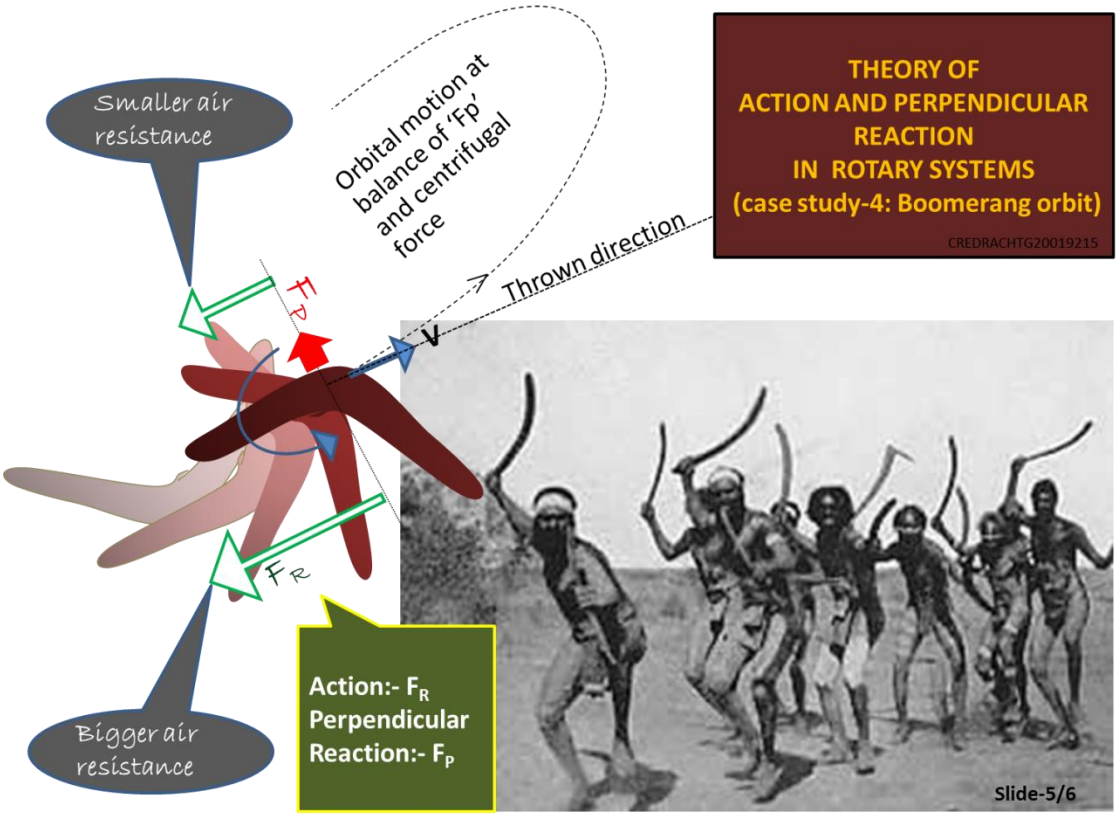

FIGURE-05

As you throw the rotated thing, one side of the boomerang faces a bigger air resistance than that of the other end. Then the rotating system tends to roll upon the resultant resistive plane. Rolling always creates a perpendicular centrifugal force and the system is entered in to an orbit.

Case studies as a proof of the new theory:- (5-Mystery with the Dentist's Chair)

The apparatus in the picture is more suggestive for unbiased demonstration than the Dentist's chair. That is because a man in a rotating chair can give a small turn to it in any direction by a slight moving of his body accordingly. Therefore the teachers who believe in some hand rules in mind, gives a slight turn to the chair moreover in support of their teaching.

Cyril H Thalpe Gamage

But this mechanical demonstrator as shown in the figure has no theories in mind and it does the demonstration unbiased.

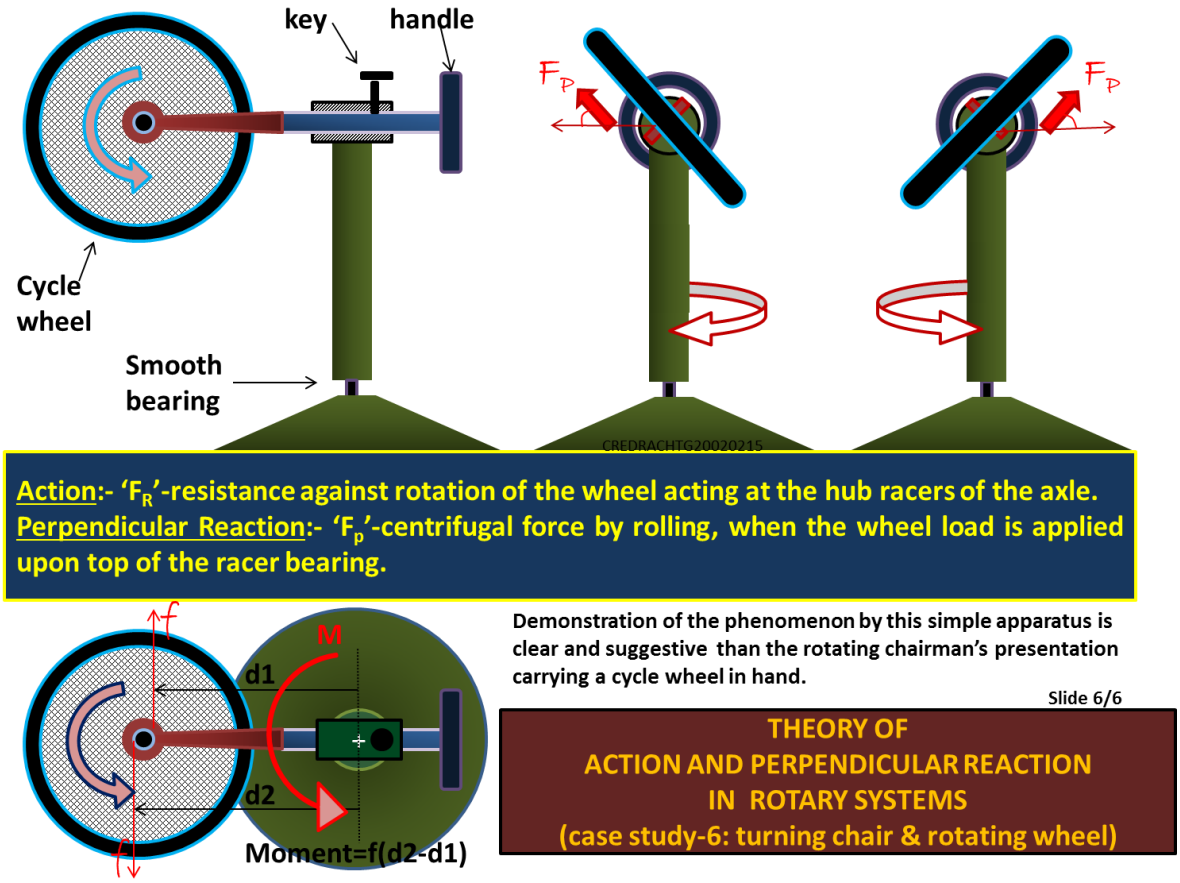

FIGURE-06

First of all we have to understand that there are two causes which could matter upon this phenomenon.

1. Theory of Action & Perpendicular Reaction
2. Resultant resistive moment

The first reason must be clear enough by now for the readers but what is the second reason? Please look at the small figure at the left bottom corner of the figure-06. At this position of the rotated wheel its plane is sharp horizontal. Then the frictional force 'f' upon the axle is uniformly distributed. But an unbalance resistive moment is created about the chair axis because distance to far end of the racer bearing is bigger than that of closer end. This unbalance moment 'f(d2-d1)' tends to give a slow turn to the chair in the same direction of the rotated wheel.

If you don't agree with me, please use a 100% frictionless racer of very small radius to experience no turn about the chair axis. In contrary, use a rusty old big racer to observe a good turning of the Chairman.

Cyril H Thalpe Gamage

When the plane of the rotating wheel is vertical, wheel load is applied mainly upon the upper region of the axle. Then the rotating mass tends to roll about a surface being shifted a bit from the rotating axis. Then a centrifugal force is created in the rolling mass to lift it against gravity. Now if you adjust the rotated wheel a bit inclined then the turn of the chair axis too could be observed as shown in the figure-06.

Ultimate Conclusion:

It is important however the Scientists of the 21st Century have to improve fundamental mechanical aspect of reasoning rather than jumping towards theorization with highly philosophic reasoning tools.

END