Re: Scientific Errors

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- *From*: "Dennis B" <Utopian@xxxxxxxx>
- *Date*: 30 Jun 2006 07:15:28 −0700

Dennis B wrote:

> blair.houghton@xxxxxxxxx wrote:
>
> > Dennis B wrote:
> >
> > > There exist many errors and misnterpretations which are
> > > perpetuated
> > > within the scientific community which require correction.
> > > The first
> > > error I shall correct concerns "Bernoulli's Principle", with
> > > which it is
> > > erroneously taught that the pressure of an accelerating fluid
> > > decreases
> > > as the velocity of the fluid increases. The indisputable fact is
> > > Newton's laws of motion reveal the exact opposite to be true.
> >
> > No, they don't.
> >
> > At a narrowing of the tube, the flux rate is the same as at any other
> > cross−section of the tube, but the cross−sectional area is smaller,
> > therefore the flow is faster.
> >
> > In order for the flow speed to increase, the average speed of the
> > molecules must increase − they are accelerated into the narrow space.
> >
> > After the narrow space, they are decelerated.
> >
> > An accelerating fluid passes from a region of higher pressure to one of
> > lower pressure. A decelerating fluid passes from a region of lower
> > pressure to one of higher pressure.
> >
> > Since the fluid first accelerates before the constriction, then
> > decelerates after it, the constriction is therefore at a lower pressure
> > than either of the adjacent, wider sections.

This is enough to prove to you that you did something wrong, but I'll deal with your explanation point−by−point so you can see what you did wrong:

> The fluid is comprised of particles with mass. Therefore, in accordance
> with Newton's equation "F = ma", as the fluid accelerates (relative to a

F = ma applies to a rigid mass and an external force. Trying to apply it intrnally to a nonrigid mass − even one comprising a collection of unconnected rigid masses − is fallacious and unscientific.

> reference point)...there is a corresponding increase in the force
> exerted by the fluid in the direction of motion,

False.

If the force were increasing as we travelled along the tube, the molecules would be forced backwards and slowed, not forwards and accelerated.

Since the molecules are accelerating into the constriction, the force is decreasing.

This acceleration is not due to external forces. It is due to internal rearrangement of the velocities of individual molecules. Within the fluid, molecules are colliding and seeing occasional forces from all directions. The density is constant throughout the system, so the probability of a collision is constant, though the momenta transferred by the collisions are not. As the pressure decreases, there is less probability that a molecule moving in that direction will rebound from another in front of it with a rearward momentum higher than its prior forward momentum. The effect is of a higher average impulse behind the molecule and a lower average impulse in front of it, thus a more−probable acceleration of molecules in that direction.

In more simple terms, it is possible for a molecule to collide with molecules before it in such a way as to send it backwards, but the effects of its collisions from the rear will exceed those to the front and it will have a net forward acceleration. As it travels along, its average speed increases, as the pressure around it decreases. Even though the density does not.

Again, the situation is reversed after the constriction, with the faster molecules colliding with the slower ones in front, which provide a back−force and increase the pressure seen from the front.

However, if the tubes are the same size before and after the constriction, the pressure in the latter tube will be lower than the pressure in the former, though still higher than in the constriction. This is why the fluid flows through the constriction at all. Such constrictions are known as throttles. They should not be confused with nozzles, which are open to the outside system, and whose job is to maintain the high speed created by the constriction, so as to eject the fluid, either to dispense it at high speed, or to shed its forward momentum with the result that the tube and nozzle are propelled rearward, which maintains net zero momentum of the universal system.

> and a corresponding
> decrease in force opposite the direction of motion. The
> apparent
> decrease of pressure in an accelerated fluid is the result of
> fluid
> particles moving away from a surface,

This does not apply at all. The statement of the Bernoulli principle requires the density to be a constant at all places within the fluid. If the density is not a constant, you have another problem entirely.

And your tautology about density changes causing pressure changes is fallacious. Density only causes pressure changes when (a) the density is changing due to transient motion of regions of fluid and (b) the density is changing due to phase change (fluids evaporating or condensing, or chemical reactions that change the number of molecules in the fluid, though the endo−/exo−thermic effects of chemical changes are usually more significant).

Normally, it's pressure differentials that cause density changes. But, as I said, that doesn't apply to your problem.

> thus creating a region of negative
> pressure relative to the positive pressure exerted by moving
> particles
> impinging upon the opposite side of the surface (such as the
> underside
> of an airplane wing, for example).

I wouldn't trust you to fold a paper airplane, much less design a real one.

> To Be Continued...

> Why continue? You've already spent this post expositing on something you know to be wrong because the data exist to show that it is wrong. Or you never bothered to look at the data. Which is worse.
>
> At this point, you should question every one of your ideas that attempt to refute any part of basic science. Learn the truths about the simple things first. Then, when you've got that all correct, you might know enough to start challenging the things that science is suggesting but hasn't proved yet. Until then, you're not a scientist, nor an explorer, nor a thinker, nor a reformer, nor a messenger, you're just another nut.
>
> −−Blair

I haven't had the time to truly read your message, yet I did have time to read some of it. I wanted to sare with you something I wrote, which may be of interest to you (hopefully, it will clarify my perspective):

A hydraulic press is supposedly capable of amplifying force. For example, 1 dyne of input force can supposedly be converted into 10 dynes or even 100 dynes of output force. In a hydraulic press the supposed increase of force is offset by a decrease in the distance the output piston travels. The output is dependent upon the (exposed) surface area of the piston (and input force). As the volume or capacity of the output piston chamber increases (and the exposed surface area of the piston as well), the distance which the output piston travels will decrease in response to the input force (presuming the input remains constant). Force is determined by measuring the displacement of a mass (as well as the time involved for the displacement to occur). Since the distance a piston travels is dependent upon the volume or capacity of the piston chamber (as well as input force), the distance travelled by two different (output) pistons as a result of a given input force (1 dyne for example) will not be the same if the volume or capacity of the output piston chambers are different (for example if the exposed piston surface area of one is 10 cm^2 and 100 cm^2 in the other). Yet, the total volume of fluid displaced (1 cm^3) is the same for both pistons. In other words, the amount of mass (i.e., the water) displaced in response to a given input force (1 dyne in this example) is the same. Thus, wouldn't the output force of both pistons be the same, considering that force is measured by the displacement (or acceleration) of a mass (such as the water inside the piston in this case)? Undeniably, the total energy remains the same (ignoring losses due to friction, etc.), although the energy density must decrease at the output for the same reason that the total energy density of a fluid accelerating through a tube of varying diameter changes, while the total energy remains the same (ignoring losses). The definition of force is that which causes acceleration of a body. Force would therefore appear to be synonymous with the definition of "energy". So, how is it that the input force increases while the input energy density

> decreases in the case of a hydraulic press? One may be prone to argue that the energy density does not decrease as the volume/capacity of the output piston chamber (or circumference of the tubing) increases. Yet, the energy density does in fact decrease as the volume (capacity) of the piston chamber or circumference of the tubing decreases, for the energy must expand to occupy a larger volume of space. Thus, I would expect that the force would decrease as well, just as the ram pressure (and velocity) of an accelerating fluid decreases as the circumference of the tube in which it flows increases. To use an example, I would expect that a force of 1 dyne applied to a piston with an exposed surface area of 1 cm^2 would be converted into a force of .1 dyne cm^2 in an output piston with an exposed surface area of 10 cm^2.
>
> −Dennis B

Correction: To use an example, I would expect that a force of 1 dyne applied to a piston with an exposed surface area of 1 cm^2 would be converted into a force of .1 dyne/cm^2 in an output piston with an exposed surface area of 10 cm^2.

To continue...

Force is defined as mass times acceleration. In other words, force is essentially a measure of the total energy it takes to move a certain mass a certain distance within a certain amount of time. Work is defined as force times distance and is essentially the same as force minus the measure of time. In other words, it is a measure of the total energy required to displace the mass a certain distance without regard to the time involved.

If the input piston (having an exposed surface area of 1 cm^2) travels 1 cm as a result of 1 dyne of force, and the output piston (having an exposed surface area of 10 cm^2) travels only .1 cm, then the force involved to displace 1 cm^3 of fluid (or water) is the same for both the input and the output because the same volume of fluid is displaced at either piston. If one takes into consideration the mass of the pistons, this also partially explains why the output piston traverses less distance than the input piston. It would take 10 times the input energy (or 10 dynes) to displace the output piston by 1 cm, using the body of water in between as a mediator of the applied force (wherein the body of water itself is displaced 1 cm^3 by the 1 dyne of input). Therfore, an input force of 1 dyne can only displace the more massive output piston a distance of .1 cm (which is 1/10 the distance). In other words, to reverse the situation, only 1 dyne of force need be applied to the larger "output" piston for it to traverse the same distance of .1 cm, and also displace the smaller "input" piston by 1 cm, not 10 dynes. 10 dynes of force applied to the larger piston, as would be encountered if attempting to use the press to lift a weight of 10 dynes would cause the larger piston to traverse 1 cm in the opposite direction and the smaller piston to traverse 10 cm in the opposite direction as well. Thus, the input and output force must be the same. Because work is a measure of force or energy, determined by the displacement of a mass (albeit without regard for the time involved), the work applied to the input piston must be the same as the work of the output piston.

A weight scale measures weight by the distance the scale's plate traverses as a result of the gravitational force (or acceleration) between the earth and the mass being weighed (presuming the measurement is performed on Earth) according to the following equation:

$F = ma = mg = w$

Key:

F = force

m = mass

a = acceleration

g = gravitional acceleration

w = weight

....The greater the mass being measured, the greater the gravitational force between the mass and the Earth and therefore the greater the distance the scale's plate will traverse. Although weight is a measure of force, and force is defined as essentially an accelerating mass (or energy since energy and mass are equivalent, mass being made of energy)...the fact is that a scale measures the force of weight without measuring the acceleration or time involved to displace the mass. Rather, a weight scale measures only the WORK involved in displacing the scale plate. Yet, it does indeed measure the (total) force (or energy) which is required to displace the scale plate the distance it traverses as a result of the gravitational force between the Earth and the mass being weighed (presuming once again that the measurement is made on Earth), thus implying the following equation:

$F = ma = mg = w = W$

Key:

W = work

Furthermore, if one uses a scale to measure the force at the output of a hydraulic press, the scale will actually measure less force or work as the volume of the output piston chamber increases, because the piston will traverse increasingly less distance if the volumetric capacity of the output piston chamber is increased.

Dennis B

"Do not attempt to adjust your television set..."

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