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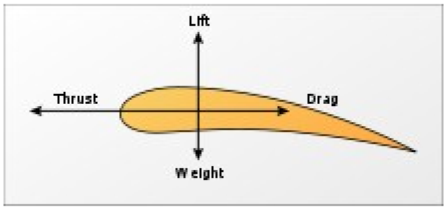
LIFT ON A WING



**plus a discussion of buoyancy
and the raindrop question**

by Miles Mathis

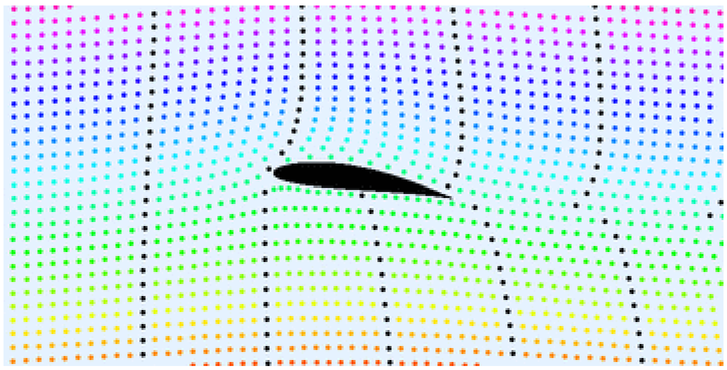
Almost no question has caused such incredible piles of nonsense-answers over the centuries as the question of lift on a wing. It has puzzled scientists for millennia. Aristotle and other Greek philosophers theorized on the subject in the 4th century BC, and Leonardo did famous work on the problem in the 15th century. In many ways, their explanations were more coherent than what we have today. You can see this by going to Wikipedia. I encourage you to read the entire page closely, scanning for sense. You won't find *any*. I will be told that this is because the science pages at Wikipedia are written by pimply-faced highschool boys who can't get dates, but they aren't. They are written by the universities and other institutions, which means they are written mainly by pimply-faced guys in their 30's who can't get dates.

For most of the 20th century—and the 19th and 18th centuries as well—the primary answer to this question included Bernoulli's Principle, and the old lift, drag, thrust, and weight vectors. Unfortunately, that lift vector has always been a hanger, and when it comes time to explain it, the hemming and hawing crescendoes, the math takes over, and everything possible is done to deflect you from noticing that the question is not being answered. It is also unfortunate for those selling this theory that it basically crashed in the 20th century, when it became possible to photograph smoke traveling past an airfoil in a wind tunnel. We had been told that the air above traveled faster than the air below, due to the fact that there was more curvature above, and that this created lift. It was not clear how this created so much lift in the first place, but even that has turned out to be false. Or, the air does travel faster above, but it appears to have nothing to do with the shape of the wing. From the photos, we know that the air above travels so much faster than the air below that they don't even come close to meeting at the back of the wing, which destroys all the old assumptions and equations.

We see this immediately in a recent "One-minute Physics" segment at *New Scientist TV*. The scientist, Holger Babinsky, admits that the old explanation has been falsified in wind tunnels, but he continues,

> Babinsky explains that, although lift is caused by a pressure change between the top and bottom surfaces, it's due to the change in the shape of the air flow, rather than its speed. "This is why a flat surface like a sail is able to cause lift," he says. "In this case, the distance on each side is the same but it is slightly curved when it's rigged, acting like an aerofoil."

You see that he has deflected into curvature rather than different lengths top and bottom, but this explains nothing. First, notice that Babinsky completely overturns more than 200 years of bedrock theory and no one blinks an eye. *New Scientist* sells it as a One-Minute soundbite, and we are supposed to go on with our business, thinking that the old physics has just been given a minor update. No problem! It is still a pressure change, so who cares? But also notice that Babinsky hasn't shown us exactly how the shape of the airflow causes lift. He just states it as a fact. One of the commenters does the same thing. James says, "air above the wing moves faster on the top and the pressure is lower over the top because of that." But neither the speed nor the shape can cause more or less pressure without a mechanism. We have never seen a mechanism.



Here is the closest thing we get. The dots stand for air pressure, we have more dots below, therefore more air pressure, therefore lift. Many problems here, though. One, the diagrammers commonly give the wing an angle of attack in these newer animations, which is cheating. The old diagrams didn't do that. Two, we can turn the wing over and get lift, so we know it isn't the the longer distance on top that is causing the faster flow on top. *So what is?* Three, this diagram is pushed in another way, as we see by the rising dots even before the air reaches the wing. What makes those green dots in the second division rise before they reach the wing? Four, if the given mechanism worked as we are told, the back of the wing would be lifted more than the front. This diagram suppresses the fact that a change in speed requires a period of acceleration. If the higher speed above is causing the lift, then lift should increase as the speed increases. Since we must have a period of acceleration, the front of the wing would feel less lift than the back. This problem is never addressed. Five, the front of the wing has more weight, which doubles the problem of four. The back of the wing should have more lift and less weight, therefore we should have a strong torque on this wing, forcing the nose of the airplane down very strongly. We don't. Six, pressure changes like this still wouldn't cause a huge vector up. Some vector up would be created, but we have never been shown any clear math that proves the vector is capable of lifting giant planes into the air. The air density, especially at higher altitudes, isn't that great to start with, and the density differentials across a few feet cannot be that great, no matter the thrust. As usual, the equations are just matched to the data. We know that huge vectors up *are* created, so it must go to air pressure differentials. What else could be causing it?

We should have known that the old equations were compromised long before Babinsky admitted it, since we had known since the early part of the 20th century that planes fly just as well upside down. According to the old math and theory, this shouldn't have been possible. To answer this, current physicists (and others, like Simple Cecil) deflect you into "angle of attack," which is a truly pathetic dodge. As you will see below, they deflect you into angle of attack even when they aren't explaining inverted wings. But it doesn't answer in either case, because we get lift in both cases without any angle of attack. We get lift even with *negative* angles of attack, in both cases; otherwise planes would either climb or drop like rocks. Those would be the only two possibilities. As soon as they leveled out or began a shallow descent, they would lose all lift and plummet. But they don't do that. We know that inverted planes can perform shallow descents, which immediately kills the idea of lift being caused by angle of attack. We know that inverted planes can fly on a level. If it were angle of attack that was causing lift, inverted planes could do nothing but climb.

See, no angle of attack. That top plane should have no lift, according to current theory. No angle of attack, wing not angled, wing with almost no curvature top or bottom, plane itself with more curvature down than up.

The same applies to a wing in the normal position. If you go to AskaMathematician.com, and ask him this question, you are treated like an idiot. He tells you,

Using the engines we have today (jets and whatnot) you could fly a brick, so long as the nose is pointed up.

Dodge. You see that this implies angle of attack is what is important. He wants you to think that, because all the old answers have fallen apart. But if you aren't an idiot, you remember watching planes take off. Planes taking off have no *necessary* angle of attack.

That plane weighs 775,000 lbs, and as you can see for yourself, its nose is not in the air. The tail is higher than the nose. The wings are sweptback, but they are not angled. And the engine placement should also interfere with the given theory of lift, since its exhaust acts to speed up the air on the lower side of the wing. And yet, if you move that plane fast enough *in that position*, it will take off.

No angle of attack is necessary. We know this because very fast cars on the Bonneville salt flats take off if measures aren't taken to keep them from taking off. Not only do they have no angle of attack, they have no wings.

I will be told that this plane's thrust is so high it can overcome any problems, so let us look at a smaller plane:

Again, tail higher than nose, wing not angled.

I will be told that airplanes taking off do have their noses in the air:

Do you see the problem with that argument? It was lift that put the nose in the air, so the nose in the air can't be *causing* the lift! That would be circular, no? We can't have A causing B and B causing A. Do you think the pilot just pulled back on his steering wheel and the nose jumped up into the air, causing an angle of attack? I don't think so. This plane is already taking off, so lift is already happening. To study the cause of lift, we have to study the plane before it is taking off. And in that case, it is level to the ground.

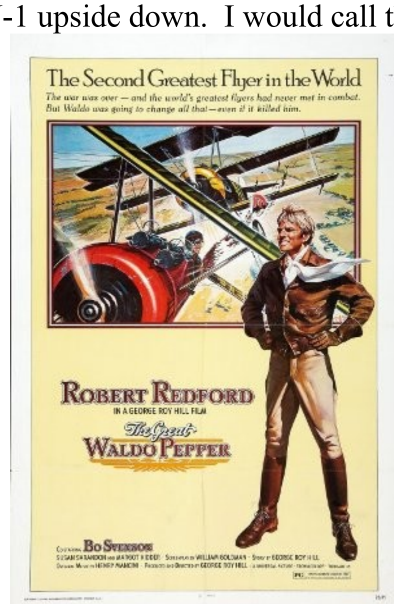
I will be told, "The pilot uses flaps to get the nose in the air, you moron," but that answer misses the point. The flaps simply divert the lift that is already occurring to the front, instead of to all parts of the plane equally. So, again, the lift is the cause, not the effect. Without lift, the pilot couldn't get the nose in the air, so the nose in the air can't cause the lift.

But none of this matters. It is all a diversion, as I already proved above. If angle of attack worked as we are told, then airplanes wouldn't be capable of shallow descents. As soon as the angle of attack went negative, the lift would go negative and the plane would plummet. Lift has to remain hugely positive even during a shallow descent, because it is still counteracting *most of* the weight of the plane. If lift goes to zero, we are left with only the down vector, and a fast crash. This argument is doubled with inverted planes, which are also capable of shallow descents. They are supposed to be relying completely on angle of attack for lift, so any negative angle should cause negative lift. The inverted plane put at an initial shallow angle should immediately fall even faster than a rock, since it now has two stacked vectors down (weight and lift).

Modern physicists and mathematicians seem to understand the jig is up, since they don't even pretend to try to make sense anymore. The desperation has become obvious, and you can almost see the sweat poring down their faces as you read their remarks. Our mathematician at AskaMathematician.com is proof of that, since this is his last of four paragraphs:

So to actually answer the question; back in the day planes couldn't fly upside-down. But since then engines have become powerful enough to keep them in the air, despite the fact that by flying upside-down they're being pushed toward the ground. All they have to do is increase their angle of attack by pointing their nose up (or down, if you ask the pilot).

Weird. First, he admits that he hasn't "actually answered the question" in the first three paragraphs, then he misuses a semicolon, then he tells you a lie. "Back in the day," planes couldn't fly upside down. Hmmm. Maybe by "back in the day," he means before airplanes were invented, which is the only way he can be seen to be right. Because according to the old films I have seen, and the old planes I have seen fly recently, the old slow-moving planes were about the easiest to fly upside-down of any of them. Planes have been flying inverted almost from the beginning. Maybe our expert mathematician hasn't seen *The Great Waldo Pepper*, where Robert Redford's character spends half the film flying his 1920's era Standard J-1 upside down. I would call that back in the day.



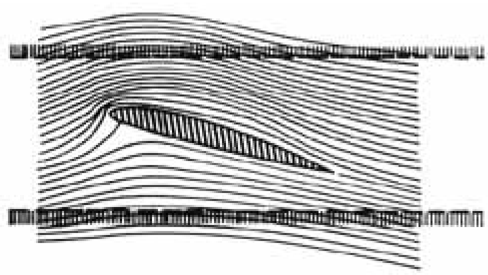
Before you tell me that was a bi-plane, and that bi-planes are different:

The page at Wikipedia is exactly like our AskaMathematician.com page, except that it is longer. Reading the page makes you sad for current science, that it can't come up with something better than this almost 300 years after Bernoulli and 109 years after the Wright Brothers. We actually feel sorry for the poor bastard who had to write the page. He probably said, "Geez, couldn't I write a page where we have a stronger argument, like maybe the page on why Matthew McConaughey stopped going bald?"

The first explanation offered at Wikipedia claims to use Newton's second and third laws:

One way to understand the generation of lift is to observe that the air is deflected as it passes the airfoil. Since the foil must exert a force on the air to change its direction, the air must exert a force of equal magnitude but opposite direction on the foil. In the case of an airplane wing, the wing exerts a downward force on the air and the air exerts an upward force on the wing.

But of course if we use Newton's third law, the force up equals the force down, which equals zero lift. Using Newton, we can get lift only if we tilt the wing, which our author does:



As you see, angle of attack. That is right next to the Newton's laws paragraph. The caption under this diagram reads,

Airstreams around an airfoil in a wind tunnel. Note the curved streamlines above and below the foil, and the overall downward deflection of the air.

But unless the wing is tilted, we get no downward deflection. So this entire explanation is pushed. You should notice that the author has chosen to lead with this explanation, which means he is leading with pushed diagrams and pushed motions. Why would you do that, unless you were writing propaganda.

If science has a real answer to this question, it would lead with the real answer, wouldn't it? How hard would that be?

This is also proof that new science is desperate. When this problem used to be taught, just thirty or forty years ago, you didn't see this sort of transparent misdirection. They didn't feel like they needed to tilt the wing in order to fool you. They didn't need to talk about angle of attack. They just taught you the lift, drag, thrust, and weight vectors, and the Bernoulli equation and so on, and applied it to the unangled wing. They did this, I suppose, because it hadn't become so glaringly obvious to everyone that the old explanations had failed, and that no one would believe them anymore. Our author here at Wiki even admits that the old "equal transit time" explanation is a fallacy. There is a whole section on that. But this is incredible to those of us brought up on this fallacy. That fallacy was bedrock science for decades. To see it thrown into the dustbin with hardly a whimper and replaced with hamhanded misdirection is informative, to say the least.

The Wiki author then explains lift by "pressure differences" and then by "flow on both sides of the wing." But, amazingly, both these explanations also rely on a tilted wing. We are told,

Wherever there is net force there is also a pressure difference, thus deflection/flow turning indicates the presence of a net force and a pressure difference.

As you see, he is still relying on that deflection down to create his lift. He then admits that all this is not very rigorous or precise, and that aerodynamics textbooks rely on more complex models. What he does not admit is that his previous explanations go way beyond imprecision or lack of rigor. They are clearly pushed, since they all rely on a tilted wing. All of them rely on an angle of attack. Just as we saw with the explanation of inverted flying, the angle of attack is now being used to explain everything. This despite the fact that the old theory only used angle of attack to explain actual climbing. The lift page should be explaining level flying, not just climbing. Level flying requires that lift counters weight. These new explanations seem to assume that we only need lift to explain take-off.

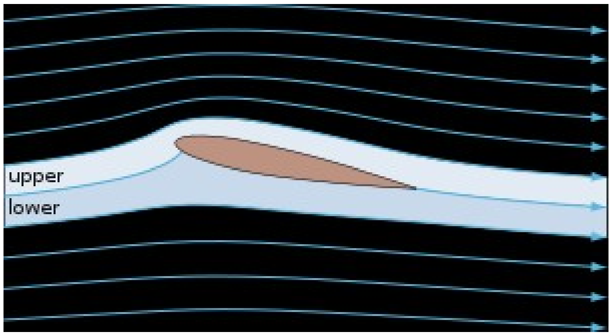
So the author proceeds to the more complex model. Check this out:

Explaining lift while considering all of the principles involved is a complex task and is not easily simplified.[9][26] Lift is generated in accordance with the fundamental principles of physics. The most relevant physics reduce to three principles:

- Newton's laws of motion, especially Newton's second law which relates the net force on an element of air to its rate of momentum change,
- conservation of mass, including the common assumption that the airfoil's surface is impermeable for the air flowing around, and
- an expression relating the fluid stresses (consisting of pressure and shear stress components) to the properties of the flow.

Makes you want to weep. It reads like a sixth grader's term paper, when he has no idea what he is talking about. Lift is generated in accordance with the fundamental principles of physics. We are halfway through an extended treatise, and we need to be told that? Then we are given the three principles. Unfortunately, our author already covered Newton's laws of motion, and wasn't able to do anything with them without a tilted wing. So he adds the very pertinent and poignant information that a wing is "impermeable." How is that 1) a fundamental principle of physics, 2) part of a "more complex model," 3) possibly to the point? Finally, we get mention of not only fluid stresses but shear stresses. I'm sorry, I thought the question was about lift, not about why the wing doesn't break off. If you haven't realized you are being misdirected by this point in the page, you need to knock off the sauce.

This is where the author inserts the fancy diagram above, the one with the density dots. The caption tells us the angle of attack there is 8 degrees. Engineers do still understand that planes can fly level, don't they? Do you think we might get a diagram without an angle of attack? Not here, you won't. That wouldn't suit the propaganda, which relies on it. Wiki has two more diagrams after this, and both include an angle of attack. Here is the last one, representing a NACA 0012 airfoil "at a moderate angle of attack":



That is curious not only for the continued dependence on angle of attack, but for the shape of the wing. Notice the top side is no longer more curved than the bottom. Are we being weaned off that theory?

To show how desperate they now are, we are then told of the Coanda effect, which was once considered pseudo-science.

More broadly, some consider the effect to include the tendency of any fluid boundary layer to adhere to a curved surface, not just the boundary layer accompanying a fluid jet. It is in this broader sense that the Coandă effect is used by some to explain lift.

So now we have layers adhering to one another. By what mechanism? Is it considered unphysical of me to ask for physics? Air is adhering to air or wings how? Wiki actually quotes an experiment by Jef Raskin, who was a human-computer interface expert at Apple computers. Mainstream physics doesn't like outsiders, but they make exceptions for friends from Apple, I guess.

Raskin describes a simple demonstration, using a straw to blow over the upper surface of a wing. The wing deflects upwards, thus supposedly demonstrating that the Coandă effect creates lift. This demonstration correctly demonstrates the Coandă effect as a fluid jet (the exhaust from a straw) adhering to a curved surface (the wing). However, the upper surface in this flow is a complicated, vortex-laden mixing layer, while on the lower surface the flow is quiescent.

Demonstrating *that* the air causes lift is not the same as demonstrating *how* the air causes lift. We already know it does, and we are seeking a physical explanation. Naming it "the Coanda effect" is not a physical explanation. The demonstration certainly does *not* show that the air adheres to the upper surface of the wing, pulling it up. That would either require the demonstration of some magnetic effect, or of some other effect that can cause attraction or adhering. As it is, we have no such known force, and the demonstration is not a demonstration of such a force. What we see is not a force, it is a motion.

This is beyond incredible, because it means that mainstream physics is no longer explaining lift as a push. It is prepared to consider lift as a pull from above. The old skyhook. The wing is adhering to the air above it.

How did physics reach this pass, where it would allow such nonsense into print? And this is not nonsense hidden away in peer-reviewed journals, this in nonsense being promoted in public, on the number 5 website in the US. It reached this pass because it has never understood its fundamental field. Physics has been blind to charge at the macro-level from the beginning, and none of the conspicuous data in the past half-century has opened anyones eyes. The success of Einstein confirmed to them that the field must be gravity only, and they have stuck to that. But Einstein never told anyone the field was gravity only. He simply provided some new equations for the field. It never occurred to him that the field might be unified already. He didn't ask that question, so of course he couldn't answer it. And no one since then has asked that question. Until I came along, no one thought to wonder if both Newton's and Einstein's fields were already unified. No one thought to ask if there might be two fields under the field equations.

But I have shown that there are. The charge field was hidden in Newton's constant G over 300 years ago. It was hidden in Coulomb's constant as well, and then in the Lagrangian. I have only recently dug it out and used it to solve literally dozens of big, seemingly intractable problems. It solves this one as well. Charge is always arrayed against gravity in the vector equations, which means that it is moving straight up out of the Earth. The Earth is receiving charge from the Sun and recycling it throughout its entire body. This means that everything is being partially lifted by charge all the time. Charge is .1% of gravity, which means that if the charge were turned off, you would weigh .1% more. I have shown that this charge field is what keeps the atmosphere up. In this sense, the lift pre-exists. We don't explain it from the flight equations, we explain it from the unified field equations.

Of course, in most cases it isn't powerful enough to lift anything. We have seen it lifting air and some smaller ions in my paper on the atmosphere, and in my paper on plant physiology we saw it lifting substances in the xylem and phloem, but it can't lift anything bigger than that without thrust. Why does thrust help? Simply because it increases the amount of charge under the object during each second. The only way to increase the charge lift is to increase the charge, but since the charge is constant in each area during each interval, the only way to increase charge is to go into as many different areas during the same interval as you can. In other words, you have to move fast, and you have to move perpendicular to the field.

This is why it requires much less thrust to get lift moving sideways than to move straight up. If you want to launch a rocket straight up, charge lift won't help you. You were already receiving charge in that area, so moving up won't give you any more charge. But moving sideways will.

My smartest readers may say, “But isn't charge moving at c? In order to capture more of it, you would have to be going near c, wouldn't you?” Good question, but no, you wouldn't. The speed of the medium doesn't matter, or not in that way. All that matters is how much of that medium you can impact in each time interval. The faster you are moving sideways to the field, the more charge you feel.

Other smart readers will say, “Isn't this a variation of the old raindrops question, you know: do you get wetter by running or walking in the rain? It doesn't matter, because whether you are walking for 1s or running for 1s, you still get 1s worth of rain. If the rain is the same density in area one and area two, it doesn't matter if you move from one area to the other, or how fast. You are going to get the same number of drops.” Yes, the question is like that, but that isn't the right answer, even with rain. Sideways motion in the field does imply more impacts, either with raindrops or charge photons.

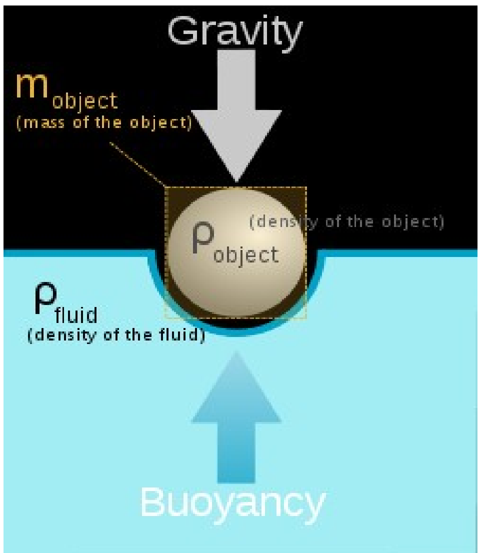
Adjacent areas may have equal densities, but that doesn't determine the answer. Think of it this way: say we have a long line of boys, and the spacing between boys is equal. You are at one end of that line. You are given ten seconds to tag as many boys as possible, with all the other boys remaining stationary. Are you telling me that running faster won't help you tag more boys? The given field density is like the line of boys, but with three dimensions instead of one. At any instant, there will be a certain number of photons in the line you are moving along. The photons are not stationary, of course, but if the density is equal and given, then the average *number* of photons in that line will be nearly stationary. Therefore, the faster you go, the more photons you can tag in the same amount of time. If you tag them, they tag you. If they tag you, you get pushed up, because they are going up already. You get lift. The more of them you tag in one second, the more lift per second you get.

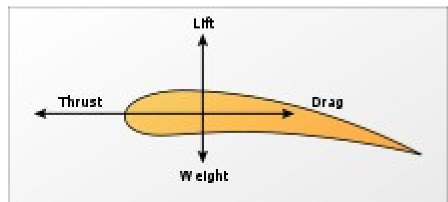
A few current physicists or mathematicians actually get this rain question right, although I have seen more get it wrong. Amazing there isn't consensus on something so simple, this late in history. One who gets it right is Nick Allen at the BBC, and he even uses pretty much the right math, though as usual it is too complex for normal people to understand. My explanation above is much clearer than his. He solves with a short integral equation. You can solve it with integrals, but you don't need integrals. The answer concerns a velocity, as I just showed, not an acceleration, so using integrals mucks up the math for no good reason. With a constant velocity, you can solve just with a velocity and a density, as I just did.

As for others who have visited this problem recently, Mythbusters ran two poorly controlled tests that were inconclusive, since one contradicted the other. Simple Cecil got it wrong as usual, and he even included a "confirming" link to a curious experiment run by Thomas Peterson and Trevor Wallis of the National Climatic Data Center, writing for the meteorological journal *Weather*. These guys tested the theory by having one of them run a hundred yard course in the rain, while the other one walked. I hope you see the problem there: it takes a lot longer to walk a hundred yards than to run it! They needed to spend equal *times* in the rain, in order to test the theory. In fact, their experiment is strong proof of my explanation, since the walker in their experiment only got 1.67 times wetter, despite spending 3-4 times as long in the rain.* This means the runner got about twice as wet each second as the walker. *The New York Times* also got this wrong in 2006, as did theNakedScientists.com, Yahoo answers, Wiki answers, Physlink.com, Wisegeek, Mathforum.org, dctech.com, physicsforums.com, and scienceworld.ca. However, Lucas at answerbag got it right.

The lack of a scientific method in approaching the raindrops question is almost as sad as the approach to the lift question, and it might even be sadder since the question is easier. As we have seen with the guys from NCDC, few "scientists" have bothered to even whittle the question down to a single variable, in order to test it. Unless we match the times of running and walking, the question isn't even interesting. Of course you want to run if a shelter is near, but why include that? We don't need to include wind, either, or headdrops versus chestdrops, or the variable shape of the human body. The question is interesting as a matter of velocity, not a matter of secondary variables. The reason these secondary variables are included is as a diversion, as we have seen. The people answering the question can't answer it, so they load it down with secondary variables. Then they get it wrong anyway. My fiancee (who is a massage therapist and yoga teacher) said, "Well of course if you limit it to velocity, you will get wetter running," but the majority of professional physicists and mathematicians have failed to see that. She is right, but they are not. Not only do they fail to see that they need to limit the variables to answer the question, but once we throw out all their secondary variables for them they get the central question wrong. They tell us it doesn't matter how fast you move, or they tell us you hit fewer raindrops by running. Both flat wrong. By running you hit more raindrops per unit time, which by itself answers the question.

If most physicists can't get simple math like this right, we shouldn't be surprised to find them making a mess of lift, which is a bit harder. Physics was always weak in the foundations, but it has crashed in the past few decades. To see this, we can study the *old* answer to lift. If we do, we find it is much closer to correct than the current one. To start with, the old answer didn't feel the need to divert you into angle of attack every second, because the old equations included the idea of buoyancy (even though they weren't able to fully explain buoyancy). The old equations, including the Bernoulli equations, *read correctly*, expressed lift more by the buoyancy of air than by speeds top and bottom of wing. If we read the old equations correctly, we find that the speeds are an *outcome* of the equations, not the cause of them (see below). Bernoulli's equations are equations of fluid mechanics, and all fluids have buoyancy, so Bernoulli's equations should always have been read as an extension of Archimedes' equations, with transverse motion in the buoyant medium.





That is the diagram from the buoyancy page at Wiki. Notice how similar it is to the lift diagram under my title. We just add thrust and drag vectors to the two sides, and buoyancy becomes lift. Then, with a correct understanding of the raindrop problem, we apply that here, getting more buoyancy because we get more lift per unit time. If we go back to the line of boys playing tag, we just assign a certain amount of buoyancy to each boy. The more boys you tag in the same amount of time, the more buoyancy you collect. This is why speed is important, which is why thrust is important. Thrust produces speed and speed multiplies buoyancy.

Some readers will say, "Good lord, you wasted ten pages telling us current theory was garbage, only to come back and admit that the old theory was mostly correct. Why would you do that?" Because I am not finished. The fluid mechanics/Bernoulli principle answer was fair, since given fluid buoyancy, you can calculate the right answer. They do calculate pretty near the right answer most of the time, since if they didn't our planes wouldn't fly as well as they do. But that still leaves the buoyancy to explain. Bernoulli and all the rest of the old guys just took certain fluid properties as given, and then wrote equations to express those properties. But what we have wanted all along—and not had—is a mechanical explanation of buoyancy. Exactly why are fluids and gasses buoyant, why do they resist compression, and so on. In short, why do they act as they do? Current theory is written backwards from data, and so it expresses the data fairly well, as you would expect. But as usual it doesn't explain the data.

For instance, we can study the first sentence at the Wiki page for buoyancy.

In physics, **buoyancy** is a force exerted by a liquid, gas or other fluid, that opposes an object's weight. In a column of fluid, pressure increases with depth as a result of the weight of the overlying fluid. Thus a column of fluid, or an object submerged in the fluid, experiences greater pressure at the bottom of the column than at the top. This difference in pressure results in a net force that tends to accelerate an object upwards.

As usual that is garbled, and as usual it contradicts other pages and other current theory. It contradicts the page on atmospheric pressure, for instance. There we are told that a column of air one square meter in cross section weighs 10.2 metric tonnes. That means that the force vector is not in all directions, it is down. Only a vector down creates weight. If we apply that reasoning to this problem of buoyancy, we would read the last quote above to mean that the pressure at the bottom of a column of fluid would keep an object down. If "pressure increases with depth as a result of the weight of the overlying fluid," then that fluid on top should be keeping the submerged object down. Therefore we should *not* expect it to rise. The deeper we sink it, the less likely it should be to rise. But that is not what follows. What follows is "the difference in pressure results in a net force... upwards." How is that? More pressure down low creates a force upwards? How can more weight above and more force down create a net force upwards? That would be true only if the fluid pressure was the same in all directions. In that case, yes, the net force would be up. But that isn't what we are told. We are explicitly told that the overlying liquid has weight down, which must be a net force down, not up. If that isn't clear, think of the column of air above your head, which is said to weigh several hundred pounds. That weight IS the net force, it is down, and there is no way to juggle the equations to give you a net force up.

Yes, if you were less dense than air, you would rise, but not by this explanation. If there were really a ten tonne column of air above every square meter, nothing would rise no matter the density of it. There is a lot of air above you, but it doesn't weigh anything, as I have shown. It has *no* net vector down. It has mass, but that mass is resisted by charge.

This must mean that buoyancy, like lift, is not really understood. The old equations aren't too bad, but the explanations are and always have been pathetic. This is because they are trying to explain buoyancy without charge, so they are forced into these bald contradictions.

What is really happening is that the air has buoyancy. More velocity sideways in the field gives you more buoyancy per unit time, and this creates lift. The old equations are then written to match this, and so far so good. But we still need to explain the buoyancy of the air. The air keeps the airplane up, but what keeps the air up? Why doesn't the air compress and collapse? Why doesn't it fall? We are told it is the kinetic energy of the air molecules, but that doesn't serve. Where does the kinetic energy come from? Is the heat from the Sun falling on the atmosphere enough to create the pressure we see? It isn't even close. If heat from the Sun or the temperature were the main factors, we would see the sky literally fall with a large drop in temperature, and we don't see that. We don't see the ionosphere collapsing in on the lower levels at the poles or in winter. We get a bit of that, but nothing like what we would expect if the pressure of fluids and gasses was determined by heat from the Sun. Same thing with the deep oceans, which are cold and dark. The water remains incompressible down there, thank goodness. But why? Can't be kinetic energy of the fluid caused by heat or temperature. I will be told it is pressure from above, but that is circular. The resistance to pressure is then explained by the pressure. We know how fluids act, but we don't know why they act that way.

The other problem is that our vector with both buoyancy and lift is up. Incompressibility and the old fluid mechanics don't really explain that. I already showed that in my paper on the atmosphere. Since the atmosphere does have mass, there must be a vector up to keep it from falling. Yes, it *would* have a weight of 10 tonnes if that weight vector weren't matched by a vector up, and it *should* have a weight of 10 tonnes, according to the current theory. But it *can't* have an unresisted vector down of 10 tonnes or it would fall. Therefore, we must have a vector up to explain both the buoyant atmosphere and lift. That vector was unknown until now, but it is charge. It is my charge field, the other half of my unified field. The charge field has an acceleration up of $.009545m/s^2$. It will automatically lift anything with an acceleration down that is less than that, which is why smaller ions are lifted into the ionosphere. The charge photons just push them up there, by straight collisions. This is also what keeps the atmosphere up and the clouds up and so on. This is what causes atmospheric pressure, since as the photons keep the air up, they do so by collisions, and those collisions also keep the kinetic energy up. It isn't (mainly) heat or temperature coming down from the Sun that keeps all fluids and gasses energized and resistant to compression, it is charge coming up out of the Earth.

Fluids and gasses resist compression because they are full of charge. Charge resists compression. Charge creates the vector out that balances the pressure vector in. Charge also creates buoyancy and lift, because charge is moving up. There is a real vector up in the field before anything else is computed, which is what confused everyone from the beginning. Without this vector, you have to push your explanations to match data, and that is what we have seen. The explanations of lift were initially pushed with air speed differences, equal transit times, and other blather, and now they are pushed with angles of attack and other misdirection. But once we know of charge, the answer is relatively simple.

Now to tie up some loose ends. I said above that the air speeds above and below were effects of the lift, not the cause of lift. What did I mean? What I meant is that the air speed differential is a by-product of the motion of the object, not the cause of the motion. Take as our object in motion an airplane. Since the charge is lifting the air and the air is lifting the plane, the charge or air must be colliding with the plane. This means the plane is *blocking* uplifting charge or uplifting air. This creates a pocket above the plane of somewhat less charge and somewhat less air. You could say we have a partial vacuum; or at the least, less density above the plane. This creates a pocket of lower resistance or friction, and the air moving sideways can travel faster through that pocket. And, yes, this does create a bit more lift. This is not the primary cause of lift, but it can and does add to it. The old explanation was mostly wrong, but not totally wrong.

Also notice that the old theory was upside down. It tells you that air above moves faster, and that this causes less density above. I just showed you the opposite: there is less density above, and this allows the air to move faster above. The cause and effect are reversed.

This also explains the Coanda effect. Remember the straw blowing air over a bird's wing, causing lift? In this case, the moving air clears the existing air out of the upper pocket, and since the new air is moving sideways where the old air was just sitting there, the new air lowers the density in that pocket. This creates a small amount of lift. So this effect is real, but it isn't the main cause of lift or the cause of a bird's flight. The cause of a bird's flight is the buoyancy of the air, which is caused by the charge vector up. You can't make a bird fly just by blowing on the top of his wings with straws.

This also shows up the current explanation of the Coanda effect, which if you remember had to do with adhering layers. We were told that the bird's wing was being glued to the air above it in some magic way. All bollocks, as you now see. The wing is not being adhered or attracted to anything, it is simply moving in the path of least resistance.

Now perhaps you see why I spent some time on the raindrops problem. It is central to this question of lift, since it explains how motion in the field creates more lift. We have seen a majority of physicists get the raindrops question wrong, which might tell us why they also get the lift question wrong. As I have shown in many many papers, physicists and mathematicians—even the famous ones—can't seem to do simple kinematics or vector math. They have spent a lot of time learning to juggle Hamiltonians and tensors and complex numbers and whatnot, since these things impress the gullible, but they have spent no time learning to apply kinematic equations to real problems. That is how we reached this point—14 years** after Hawking told us physics would be finished—where mainstream physics still cannot answer a simple question about running versus walking. It buttonholes you daily with more airy theorizing about black holes and quantum tunneling and backward causality and borrowing from the vacuum, but it cannot tell you how to keep your shoes dry or how a bird flies.

*Since they don't give us times, we have to estimate based on assumed walking and running speeds. A common walking speed is 3mph, and I hope Wallas could run faster than 5mph (Usain Bolt runs over 23mph in 100 meters). To confirm Cecil's analysis, Peterson would have to walk 3mph while Wallas ran <5mph. Unlikely.

**He told us in 1988 that physics would be over in a decade, which means all the right answers should have been posted by 1998. I have shown that the mainstream still hasn't posted *any* of the right answers as of 2012, so they are 14 years late and counting.