

TELLING FISH ABOUT WATER

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Abstract. Our present way of viewing the world does not provide a satisfying explanation for the process that brings about the effects of gravitation. This problem is due to the fact that we have totally misconstrued what we see before us. Therefore we must develop a radically different way of seeing the world. One approach is to stipulate that what we call *mass* is, in reality, an *ether sink*. We take as a given that the entire universe is a sea of ether. At points called mass the ether is rushing in and disappearing. Pursuing this approach provides a new way of understanding gravitation; gives a new insight into why gravitation and acceleration are identical; and suggests an alternative explanation for the redshift.

Introduction

The problem we face is that current models of the world are not able to explain the process at work behind gravitation -- or behind the operation of any field, for that matter. Of course, we take as a starting point that action at a distance is total nonsense. If something moves, it is because something else was right there and pushed it. To say that a distant object moved due to the field of another object makes exactly as much sense as saying that the angels moved it. We just have to face this. Anyone who is satisfied with the idea that a field causes action at a distance has abdicated rational thought at some deep intellectual level. We must be able to do better than that.

The two main models we have to work with are the Newtonian model and the Einsteinian model. Keep in mind that Isaac Newton never claimed to have explained gravitation. He was entirely open about this. He simply developed empirical equations that could be used to correctly predict the motions of objects. But he made it clear that the field should in no way be regarded as the *cause* of gravitation. Albert Einstein took the position that a massive body causes the local space-time continuum to be warped in a way that gives rise to gravitational effects. But what does that *mean*? Can anyone really visualize this? *How* does the massive body cause space-time to be curved? Curved relative to *what*?

The reason that we seem unable to grasp the process behind gravitation has everything to do with the way we perceive the world. What we must try to do is

develop a new way of seeing the reality before us. We need a model that makes gravitation transparently obvious. And in the word "transparent" lies the key to unlocking the mystery.

We are very much like fish that live in a flowing stream yet cannot see the water. They exist in it all the time and feel the push of the current, but for some reason they cannot *perceive* it. So they develop myths and folktales to explain the force they must constantly fight against.

Caveats

Now I will talk about a way of looking at the world that is radically different from the way we have all been trained to see it. But first I must make something clear. What follows is simply one example of the type of thinking needed to solve the puzzle. I do not claim that this model is perfect or that it answers all the questions. In fact I am quite certain that it is at best incomplete, and at worst simply wrong in some regards. This is of little importance. The point I am making is that even with its flaws, this approach provides some very interesting insights into what actually might be going on. And that should tell us something. It may not be right, but it is better than anything else out there. Of course, that is not saying much; the other models are utterly worthless for explaining gravitation. It is my hope that what I am presenting here will create interest in this general approach, and perhaps encourage others, more talented than I, to extend and complete this model.

In what follows I will be making unqualified statements such as "This is what is happening" and "Such and such is true." In all cases please understand that I am really saying, "*In my view*, this is what is happening" and "*It is my opinion* that such and such is true." I omit these qualifying phrases for editorial reasons.

A Preliminary Exercise

Before launching into the details of Neoetherics [1], let me lead you through a brief mental exercise. The following thought experiment is not perfect, but it illustrates the nature of our perceptual problem, and the type of thinking that is necessary to see beyond current notions of reality.

Imagine you are standing in clear, still water that comes up to your shoulders. You hold your arms out at waist level, separated by a couple of feet. With your right hand you make a short pushing motion toward your left hand. After a moment you feel a swirl of water push against your left hand. So something came into existence, moved, and caused an effect. But you are looking directly at it and you cannot see it. It is all clear water: top, bottom, inside, outside -- nothing but water. It has an identity, yet it is in no way different or separate from the stuff of which it is formed. It is an *action* of the water.

Now imagine that your perceptions work differently -- something like Doppler radar, for instance. With this enhanced perception you can see action but you cannot see stillness. So you *see* the swirl as it moves between your hands. And it seems to be unsupported. It appears to be a separate entity, moving and acting alone. Yet we also know that it is nothing other than water, and that it is not separate from the surrounding medium.

So it is with the perceptual situation in which we all find ourselves. We perceive objects as being separate things. The intellectual leap we must make is to see that, in truth, all material objects are manifestations of, and totally immersed in, the single substance of the universe: the ether. This is by no means a new idea. Around one hundred years ago many people suspected something like this to be the case -- take note of this comment.

"...we arrive at what may be one of the grandest generalizations of modern science -- of which we are tempted to say that it ought to be true even if it is not -- namely, that all the phenomena of the physical universe are only different manifestations of the various modes of motion of one all-pervading substance -- the ether."

A. A. Michelson, "Light Waves and Their Uses"
University of Chicago Press, 1903

As we all know, Mr. Michelson, along with most scientists, gradually abandoned this idea due to his inability to confirm the hypothesis by experiment. Later in this paper we will come back to this point.

Defining Mass

How do we develop a model of the world that addresses the problem of gravitation directly? To begin, we must see clearly what is before us. The overwhelmingly pervasive experience we have is a constant pushing down toward the earth. The obvious implication is that we are in a flow of some sort that is always going down into the earth. This just must be so. What else could possibly account for our experience?

So this is where we shall begin. We take it as a given that all of space is an endless sea of ether, and that it is the ether which is constantly flowing into the earth. To be more general, we say that ether is always flowing into any massive body. In fact, we can make a great deal of progress if we simply *define mass as an ether sink*. And that is the basic premise of Neoetherics -- the key to all that follows.

We posit that the phenomenon we call mass is a location into which ether is endlessly flowing. This can be represented pictorially as seen in Figure 1a.

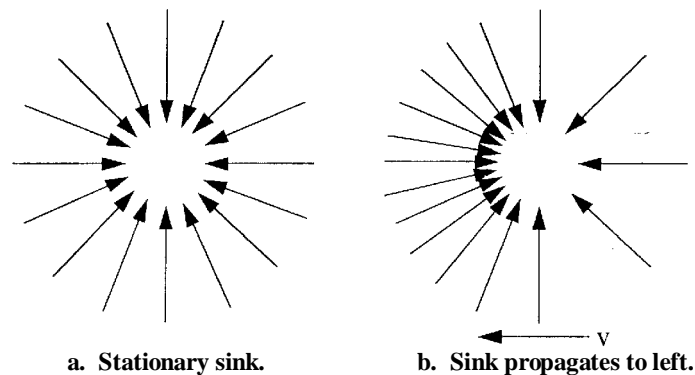


Figure 1.

In Figure 1a the element of mass (ether sink) is at rest relative to the surrounding sea of ether. The inflow rate is equal from all directions – it just sits there swallowing ether. The obvious question is "Where does the ether go?" I have no answer for that. It seems that the ether is draining out of our universe at these points we call mass. It simply goes in and does not come out. Perhaps it is used up or annihilated in some way. In any event, it disappears from the system.

We assume that any body said to have mass can be represented in this way. Massive bodies are actually aggregations of ether sinks, but for all practical purposes they behave as a single sink. This is the most profoundly counterintuitive aspect of this model. But once we are beyond this sticking point the idea turns out to be surprisingly helpful. Let us continue.

Constant Linear Motion

If Figure 1a shows an ether sink at rest, what happens when it moves relative to the stationary ether surrounding it? In Figure 1b we see how this works. We make two stipulations about the nature of an ether sink; (1) the net inflow is fixed – that is, the mass cannot change – and (2) the rate of flow into one side can increase provided the flow into the opposite side decreases by the same amount. That is, the *net inflow* along any axis is fixed. So in Figure 1b the flow into the left side is increased and on the right side it is decreased. Now the sink propagates to the left relative to the medium. How did the flow lines get rearranged? Only through the action of an outside agency – the sink was pushed. When two bodies interact, as in the collision of billiard balls, they experience a

mutual rearrangement of flow lines. After the collision, taking both objects into account, the net inflow along the axis of collision (and along all axes, for that matter) remains unchanged. This stipulation is an expression of conservation of momentum. And here we must deal with the question of inertia.

Why does a body at rest resist being set in motion? Conventional thinking in physics is at a loss to account for the phenomenon of inertia. From the viewpoint of Neoetherics we realize that what appears to be a stationary body is actually a dynamic process -- ether is flowing in from all directions. So inertia has to do with forcing these flow lines into a new configuration. All inertia turns out to be kinetic.

Looking again at Figure 1b we make this further stipulation: once the flow lines are rearranged so that the sink is propagating, this state persists -- there is no tendency for the flow lines to revert to the balanced "stationary" configuration. This stipulation is needed to satisfy Newton's first law. So the sink moves endlessly through the medium with perfect ease -- no bow wave, no wake. This is constant linear motion. Take note that it makes no difference whether we stipulate that the medium is stationary and the sink is moving or that the sink is stationary and the medium is flowing past (through) it.

Acceleration

Now we must look at what happens if the surrounding medium is accelerating. It is important to realize that an accelerating flow of ether is the general case. Throughout the vast etheric sea that is the universe the ether is always accelerating toward some sink or aggregation of sinks: a proton, a soccer ball, a planet, a sun, a galaxy. Nowhere is it still. Refer to Figure 2.

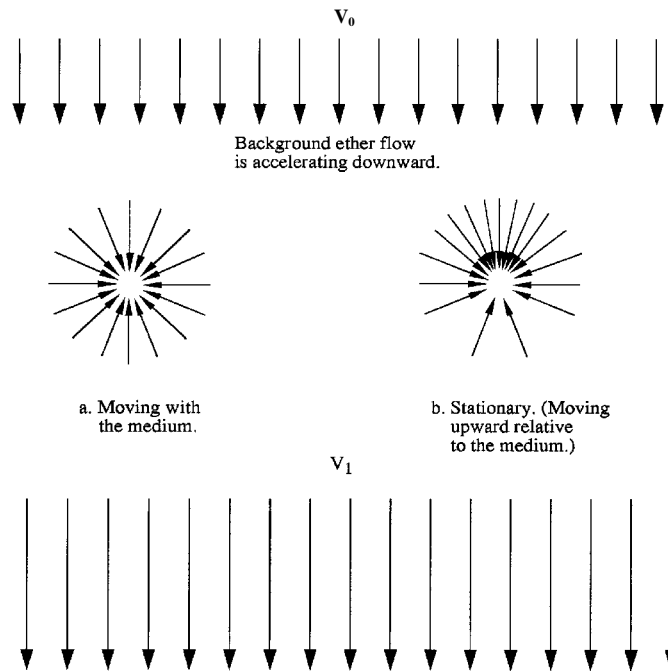


Figure 2.

In Figure 2 the ether flow is accelerating downward. The velocity is V_0 at the top of the figure and V_1 at the bottom of the figure.

Now what happens to the ether sink? The inflow from all directions is still symmetrical, so the sink has no tendency to translate relative to the surrounding medium. It is carried along with the flow of the medium at its location. This situation is depicted in Figure 2a. Since the medium is accelerating, the ether sink is also accelerating. Examining the situation at the leading and trailing edges, we find the following; since no outside agency has acted on the sink, the symmetry of inflow has not been rearranged. Also, since the velocity of the surrounding medium is increasing from point to point, it is clear that the velocity of the medium near the leading (bottom) edge of the sink is greater than at the top edge. There is a "delta v" to deal with that is proportional to the etheric velocity gradient. This sets up stress in the sink; the leading edge wants to go a little faster than the trailing edge. This corresponds to a recognized physical effect, which comes about whenever an object is in free fall in a gravity gradient: the object goes into tension along the axis of the gradient.

Let's see what happens when we reach into this picture and try to stop the sink from moving downward with the flow. Again we encounter the fundamental characteristic of ether sinks: an outside agency must exert force to bring about a rearrangement of flow lines. And rearranging flow lines is the same as changing velocity relative to the surrounding medium. Here we have the connection between force and acceleration. As we slow the sink to a halt, the flow into the top edge will increase and the flow into the bottom edge will decrease by the same amount. This is depicted in Figure 2b. As with the constant-motion case, Figure 1b, the sink can now be viewed as propagating upward relative to the medium.

But remember that the velocity of the medium at the bottom edge of the sink is greater than at the top edge. If we force the flow rate into the sink at the top edge to increase by an amount related to the velocity of the sink relative to the medium, then the flow rate into the bottom edge must decrease by the same amount -- *and that is not quite the right amount to bring the bottom edge into balance*. This irreducible imbalance results in an irremediable force downward. The sink is constantly being sucked (or pushed) down by this inflow imbalance. The magnitude of the downward force is related to the velocity gradient of the ether field and to the size of the sink (net volumetric inflow rate). And net volumetric inflow rate, of course, is identically equivalent to mass.

Thus, depending on one's point of view, the force just described is either the "f" in $f = ma$, or the "w" in $w = mg$. The «g» in $w = mg$ is often called «the acceleration due to gravity.» But what is accelerating? Teachers sometimes say that we can think of the surface of the earth as accelerating upward. Clearly, that makes no sense. From the viewpoint of Neoetherics we see that the opposite is true: the surface of the earth is stationary but *the ether is accelerating downward*. In truth, the latter equation, $w = mg$, is entirely superfluous; all we need is $f = ma$.

When the sink is released its acceleration is related to the velocity gradient (not the velocity) of the surrounding medium. The rearranged flow lines have canceled the velocity of the medium at that point.

Notice how this model helps clarify certain observable phenomena. First, whether we say that we are applying a force to make the sink accelerate relative to a fixed medium, or that we are applying a force to stop the movement of the sink in an accelerating medium, the situation is identical. The whole business about gravity being the same as acceleration becomes transparently obvious.

Second, when the sink is released in an accelerating ether flow, it takes on acceleration related to the velocity gradient of the flow -- irrespective of the size (mass) of the sink or its initial velocity. More correctly, the size of the sink automatically causes the force to adjust so that, when released, its acceleration

will be dependent only on the velocity gradient of the surrounding medium, not the size of the sink.

The Redshift

In the preceding sections we have laid out the basic ideas of Neoetherics: (1) the universe is a continuous sea of ether, and (2) there are certain points where the ether is draining away – the points we call mass. Now we must look at the implications that follow from this line of reasoning. The most intriguing of these implications is an alternative way of understanding the redshift.

We can regard the universe as being made up of ether which exists at some pressure – much like an ideal gas in a closed vessel. At the points called mass the ether is draining away and disappearing from the system. The implication is that the overall etheric pressure in the universe is decreasing very slowly. One can also imagine that light waves propagate through the ether in a way analogous to the propagation of sound in air. Think of light waves as being imbedded in the structure of the ether. If the etheric pressure is decreasing, the wavelength of the light is gradually being stretched out. This means that light reaching us from a distant source would be shifted to a lower frequency. The more distant the object, the longer it takes for the light to reach us, and the more pronounced would be this drop in frequency. This frequency drop is indistinguishable from the Doppler shift that would occur if the distant source were receding from us at some velocity.

Thus the redshift may be caused by the velocity of the source, or by decreasing etheric pressure, or by some combination of these effects. Of course, this has an enormous impact on the way we understand the size of the universe. It should also be noted that the reduction in etheric pressure might not be constant through all space. It is possible to imagine a region where the etheric pressure is particularly high, and the reduction of pressure occurs more rapidly. This implies that objects in the same general vicinity could have different redshifts.

Time Dilation

The argument in the preceding section not only applies to light, but to *all events* we observe in the heavens. This is equivalent to saying that distant events we observe are actually taking place more rapidly than it appears to us here. This calls into question the validity of using the period of a Cepheid variable as an indication of its absolute magnitude.

Shape Distortion

This final speculation is quite bizarre, yet it seems to follow from the model we are developing here. If all material objects are manifestations of the omnipresent ether, then these objects will change shape as the ether of which they

are formed changes shape. For instance, imagine that an object is fabricated in deep space, where etheric movement is minimal. If this object is then released and falls toward a massive body the ether in which it is embedded will elongate in the direction of travel and contract along the axes normal to the direction of travel. The shape of the object itself will be distorted in the same way. I find this an extremely difficult concept to think about. The most disturbing aspect of this is that even if it is true, there may be no way of detecting this change. The reason is that all instrumentation also partakes of the same distortion, thus nullifying any attempt to measure it. And this, finally, brings us back to the Michaelson-Morley experiments.

Michaelson-Morley

The original experiments designed to detect the ether were laid out on a flat horizontal platform. From the viewpoint of Neoetherics we can see that this arrangement totally misses the point. The main direction of ether flow is straight down into the earth. While it is possible that a horizontal component may be present, it would only be a secondary effect, and it would not represent the orbital velocity of the earth. If the same experiment is set up in the vertical plane a variation in the speed of light *is* detected. But current theoreticians attribute this to the effect of the local gravitational field. And of course that is the same thing as saying that the variation is caused by the ether flow.

The preceding section suggests another problem with experiments of this sort. The instrumentation itself may be distorted by the local etheric flow in a way that cancels out the effect one is trying to measure.

Conclusion

The principles of Neoetherics lead to a different way of understanding the underlying nature of the world. The challenge for the scientific community is to pursue this line of reasoning and attempt to construct a mathematical depiction of this model. This is fraught with difficulty due to the possibility that physical bodies may have a bizarre plasticity – not heretofore suspected and perhaps impossible to measure. Nevertheless, if this model can be supported by a convincing mathematical analysis, then we will have made a major step toward an intuitively satisfying solution to the ancient problem of gravitation.

REFERENCES

1. J.C. Shifman. Neoetherics – Visualizing Gravity. 1985. (Available at <http://www.river.org/~jerry>)