mathematical concept whereby if the force on one body at a given point is known, the force on other bodies at that point can be quickly and easily calculated. But a field is not a physical object, and to attempt to attribute some kind of reality to it, as to inertia, creates confusion and puts obstacles in the way of understanding.

These and many other misconceptions over the past two centuries have caused such confusion that there is now no way forward. We must go back to basic and build up physics again, with minds free of 20th century metaphysics and myths. By succumbing to the force of myth, Graneau has put yet one more obstacle on the path to truth.

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The article The Riddle of Inertia written by Peter Graneau in the January edition has prompted me to give a dynamicist's view of the question of inertia.

Firstly, I would like to make a few observations regarding any physical laws. Two major tests of the acceptability of a law are: do predictions made by the law agree with measured data to within the accuracy of the best measuring equipment? And does the theory give a simpler appreciation of a phenomenon than any other theory?

The first is a question of sound experimental practice but the second is often a matter of opinion.

In the realm of mechanics the classical methods satisfy the first test, provided that relative speeds do not approach the speed of light and that the concepts of mass length and times are axiomatic. That is that mass is conserved, space is Euclidian and time (based on some periodic system) is independent of the motion of the observer. From these premises the structure of mechanics is developed in accord with experience.

The three most commonly used classical methods are Newton's Laws, Lagrange's Equations and Hamilton's Principle. These are mutually compatible approaches where the definition of force is proportional to the time rate of change of the moment of momentum.

Force is regarded as a defined quantity because it is possible to set up a system of mechanics without the use of force. However, this is rather like running an economy without cash and relying on barter. So we have the definition of force as being that agency which produces a rate of change of momentum, or in more detail: A force is the action of one body upon another which, if acting alone, would produce an acceleration (relative to an inertial frame of reference). Now that the definition of force is that which produces acceleration there is no need to postulate an inertia force to balance the applied "real" forces. Indeed this is contrary to the original definition, Since inertial force does not fit into the classical scheme it is not surprising that it does not obey Newton's third law.

Inventing a fictitious inertia force is a useful device because it enables theorems in statics, such as those relating to virtual work as in D'Alembert's principle, to be used. Also in cases where it is convenient to use non-inertial frames of reference these ficticious forces are useful, as seen in the application of the Coriolis theorem.

The association of force with matter means that the body responsible for the force must be identifiable. Force is to matter as a hole is to a doughnut: No doughnut, no hole.

An example of difficulties which can be generated was given by a series of letters in a learned journal on the question "What keeps the moon up?" Here the proposition that centrifugal force (an example of inertia force) balanced the force of gravity was one solution offered but this leads to the problem of the origin and nature of this centrifugal force. A simpler answer is found by first restating the question as "What keeps the moon *down*?" The answer to this question is quite simply gravity since, if gravity were suddenly switched off, the moon would continue on a straight line, its distance from the Earth increasing. In this case gravity is providing the centripetal force to produce the centripetal acceleration. Regarding the anecdote of the jerking subway train, if the passenger had been wearing roller skates and had had his eyes closed he would not have been aware that the train had jerked; at least not until he made contact with the end of the carriage. This shows that it is the friction force between the soles of his shoes and the floor which gave rise to his imbalance.

The views which I have expressed here are, I believe, the generally accepted views of the majority of contemporary dynamicists and is not a statement of right or wrong. I refer the interested reader to Mechanics, 3rd Ed. by Keith R. Symon, Pub. Addison-Wesley 1972 and to references 10, 12 and 21 quoted therein.

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De Sitter and the aether

Apropos the recent remarks on this topic by Busby and Busby[1] and by Aspden[2], de Sitter's suggestion about binary stars has been stated to be the best evidence that there is for the correctness of Einstein's invariance postulate. If de Sitter is shown to be wrong, therefore, the special theory would be shown to be false. It has been shown that the distances of binary stars, their orbital geometries, and other factors are extremely unlikely, in the case of visual binaries, to be such that de Sitter ghosting effects would be observed. Spectroscopic binaries, however, are sufficiently far away, and in some cases the ghosting effects have been observed. For further discussion see references[3] and[4]. Thus de Sitter *is* contradicted, and Einstein's theory becomes untenable.

However, it should not be necessary to disprove the special theory experimentally, for Einstein's two basic propositions, the invariance postulate (as if a physical theory could ever be based on a postulate!) and the principle of relativity, are incompatible with each other. The invariance postulate contradicts the principle of relativity, and it is this fact which leads to other contradictions such as the notorious clock paradox, so-called. This contradiction at the very core of Einsteins's theory does not merely disprove the theory; it renders it unworthy of any consideration whatsoever as a possible physical theory[5].

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3. V. I. Sekerin, "Gnosiological Pecularities in the Interpretation of Observations (For Example the Observation of Double Stars)", in Contemporary Science and regularity, its development, No IV, University of Tomsk (1987).
4. R. A. Waldron, pp. 98-103 of "The Wave and Ballistic Theories of Light – a Critical Review" (Muller, 1977).
5. R. A. Waldron, pp. 70-73 of reference 4.