

letters

speed of light, it is certainly correct that future experimentation could lead to the result that the speed of light is not a universal constant. Nevertheless, the theory of relativity, which has so far been quite accurate in describing a large class of data, contains the assertion that *in any local frame of reference*—where any measurement is actually performed—this speed, which must be inserted to correctly describe the data, has been shown to be constant and independent of the motion of the source of light. To my knowledge, the theory of relativity has not been refuted in this regard. I believe that in Loiseau's comments about various experiments that entail the speed of light, he was confusing the global entity, dx_μ/ds —which is generally a function of the space and time coordinates—and the universal constant c , which involves the measured speed of light in any local frame of reference.

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Refereeing versus censorship

With respect to the "refereeing" controversy, it has always been my belief (or perhaps misunderstanding) that the professional journals such as those represented within the AIP exist to allow workers in the various fields to be heard via publication of their results regardless of the opinions of others, the only constraint being that the writer bear the cost of publication.

Hence the question of refereeing is inane except as a limited monitoring function to ensure that the journals, no matter how large a particular edition might become, are not clogged with papers by writers who are irrelevant or obviously incompetent. Any other action on the part of a "referee" is censorship and is to be eschewed.

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Bicycles again

In "The Stability Of The Bicycle" (April, page 34) David Jones considers various aspects of this problem, but all in connection with fixed-geometry machines propelled by pedalling. I would like to add one or two comments:

If one examines (perhaps subjectively) the steering of a bicycle whilst pedalling and whilst gliding one finds that there appear to be different forces involved in steering. There is in fact one school of racing cyclist who prefers a fixed-wheel machine because he considers this to be inherently more stable. Furthermore, if the tracks of a cyclist

pedalling on a wet road are followed, a regular precession of the front wheel will be noticed, whereas, a free-wheeling track will be seen to have irregular corrections at random intervals.

Now, if we add the complications of the high gyroscopic forces from the heavy wheels of a motorcycle, we find that many early machines, which had steering geometry identical with that of a pedal cycle, were quite stable at lower speeds but became virtually unridable at speeds above say 40 mph due to steering wobble, unless the freedom of movement of the steering head was restricted by friction damping. (It is interesting to note that modern machines with a steering geometry that varies in quite a complex fashion due to the springing of frame and forks have none of these problems.)

As a final comment I would like to mention bicycles with a geometry that varies in the horizontal plane. Several makes of motorcycle and at least one pedal cycle have been produced in which the front wheel as well as turning moves to bring the center of gravity of the system in towards the center of the arc traversed by the machine. In this case no lean is involved and the center of gravity of the system remains at the same level. I have ridden only one such machine (a motorcycle of 1920's vintage called a "Neracar"). My general impression of this was of frightening stability, because it gave no impression of the speed at which one was cornering and it travelled straight, as if it were on rails, with quite strong self-centering characteristics.

I trust this may give Jones some additional factors to add to his BICYC routine.

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THE AUTHOR COMMENTS: I doubt whether there is a real difference in stability between a pedalled and free-wheeling bicycle: the regular steering-wobble during pedalling is surely a muscular reflex of the rider? Several correspondents have commented on the motorcycle's steering layout and its heavy front wheel, and I agree that it raises problems not fully covered by my simple analysis, though I do not believe that the springing system is deliberately designed to aid stability. I am very intrigued to learn of the "Neracar" and the other lean-compensating bicycles. They sound fearsome creations that merit completely separate mathematical study. Can any reader supply geometrical details of such a machine?

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