

## letters

some to support the old prejudice that the spin-orbit interaction in nuclei has nothing to do with relativity. This misconception is far more serious than the semantical error that was corrected by Hurley and Roman.

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1/85

## APS Instrument Group

A guest editorial in the March 1985 issue of *Review of Scientific Instruments* (56, 3) announced the formation of an Instrument and Measurement Science Group of The American Physical Society. I have a great interest in instrumentation, but I think it is wholly inappropriate for physicists to attempt to annex an area that has been the province of electronics engineers.

The Institute of Electrical and Electronics Engineers has long had an Instrumentation and Measurement Society. This society publishes the quarterly journal *IEEE Transactions on Instrumentation and Measurement*. I recommend that APS members who are interested in instrumentation and measurement join the IEEE. I've been a member of both APS and IEEE for many years, and I recognize their complementary roles. Preemptive maneuvers are out of order.

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4/85

W. W. HAVENS REPLIES: The APS Topical Group on Instrument and Measurement Sciences was formed because a sufficient number of APS members signed a petition to the Council to form such a group. There appear to be a large number of instrument- and measurement-science physicists who are interested in communicating with other physicists interested in the same subject, and APS is attempting to arrange for better communications in this specialty. Forming this group is not a preemptive measure by APS, but the result of a grass-roots request to fulfill a perceived need. The group appears to be very popular: 508 APS members have joined the group as of 30 June 1985.

W. W. HAVENS JR  
The American Physical Society

8/85

## Physics of dance

I greatly enjoyed Kenneth Laws's article, "The physics of dance" (February, page 24). I feel he articulated well

a number of points that a thoughtful dancer or dance observer may intuitively understand. As an ex-professional dancer and current teacher of classical ballet, I'd like to make a few comments:

► **Pirouettes:** Laws described how body placement and compactness are necessary "to achieve a reasonable turn rate." Such placement is also needed for proper balance, which is a prerequisite for speed in a successful pirouette.

► **Grand jeté floating illusion:** Laws analyzed a leap wherein the center of gravity shifts within the dancer's body to effect the gravity-defying illusion of "floating" briefly. An alternative method of leaping is to hold one's center of gravity as stable as possible during the leap. If the dancer attains good elevation, the result is quite dramatic, because the leap is highly arching and the pose is momentarily frozen. The figure is engraved, as it were, into the audience's psyche.

Understanding the changing-center-of-gravity phenomenon that Laws clearly explained provides greater insight into movement analysis outside of dance, too, as in sports. For example, a flexible high jumper's center of gravity can pass below the bar during a successful jump.

► **Arabesque turn:** There is a minor oversight in the text where Laws stated that it takes about two seconds to complete a single revolution of an arabesque turn. In the sidebar "Arabesque turn analysis," he used 1.25 seconds, a more practicable rate.

► **Losing and regaining balance:** Laws wrote: "Can a dancer do something to correct an unbalanced condition? One might think not, for the only source of horizontal force is at the supporting point itself." (In his analysis here, the dancer is standing on one foot and is not hopping or otherwise traveling.) His use of the term *pointe* is largely inaccurate, because standing on one foot, flat on the floor, you are on a triangular platform with the big toe, little toe and heel at the vertices. A dancer is only off balance when his center of gravity is no longer above any part of this triangle. Balance is most secure over the front of the foot, where the platform is broadest. The dancer's "squirm and wiggle" is an effort to return and maintain his balance over this area of the foot, whether he is truly off balance or not. For example, he could be standing back toward his heel and still be tenuously on balance. His effort is made to shift his weight forward to greater security.

When one is standing on *demi-pointe* (with the heel raised off the floor), the area of support is considerably reduced. Full *pointe* (on the tips of the toes with the aid of special shoes) does indeed

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