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COVER: American troops on field maneuvers were present at many nuclear detonations—18 prior to 1957, the year of Smoky. Monitors indicated that few received other than low doses of radiation, but now many individuals are developing cancer. Investigators want to know why. See p. 92. (Photo: Department of Energy)

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LETTERS

Ghost story

Although reader Ronald B. Gitchell was commenting on matters related to the speed of light in his recent letter (SN: 1/14/78, p. 19), his remarks seem quite opaque to me. He appears to be ignorant of the theory of relativity, and if so, he is unequipped to take exception to D. Lynden-Bell's explanation of the apparent superluminal speeds of some quasars (SN: 12/10/77, p. 390).

When an observer measures object A to be receding from him at $.8c$, and object B to be receding in the opposite direction at $.7c$, then by special relativity the velocity of A as measured by B will be

$$\frac{.8c + .7c}{1 + \frac{(.8c) \cdot (.7c)}{c^2}} = .96c,$$

thus fulfilling the requirement that no observer should measure a physical object to be moving at more than the speed of light *relative to himself*. Mr. Gitchell is not justified in speaking of the relative speed of $1.5c$ measured by any particular observer as an absolute, nor can he speak of the velocity of an object "relative to the natural universe" if he wishes to retain relativity. If Mr. Gitchell wants to abandon relativity in favor of his own theory ("The Basic Laws of Physical Reality"?), he should give us a comprehensive account of it rather than sniping away at side issues.

Timothy P. Mann
Milwaukee, Wisc.

I take exception to the remarks of Ronald B. Gitchell where he commented on superluminal speed ghosts. The velocity of the one car relative to the other is not 200 km/hr as Mr. Gitchell stated, but rather 199.999999938186 km/hr. Also, the velocity of object 0-1 relative to object 0-2 (or vice versa) is not $1.5c$ but rather $0.9615c$.

Furthermore, the individual velocities of $.8c$ and $.7c$ of the two objects 0-1 and 0-2 respectively are not relative to the "natural universe," but simply relative to us as an observer. The "Basic Laws of Physical Reality" are never known for certain, as Mr. Gitchell implies, unless someone has just recently been in touch with God.

Mr. Gitchell's conclusions are based on Newtonian concepts, which we now know cannot be supported by experimental evidence. Newtonian mechanics has been replaced by relativistic mechanics because the former did not take into account the fact that the velocity of light was finite.

With regard to superluminal speed ghosts, it must be recognized that we never see an object itself. We only see the optical image of it formed by the reflected light rays. Since the velocity of the reflected light is finite, a moving object will not be where it appears to be because it will have moved on while the reflected light was enroute to the eye. As a result, the velocity of the optical image will not necessarily be the same as that of the object itself. Although relativity predicts that material objects themselves cannot go faster than the speed of light, it does predict that the optical image can indeed go faster than the speed of light if the object is approaching the observer, and will reach an infinite value when the velocity of the actual object reaches the speed of light. Thus, a moving object can appear to go faster than the speed of light even though it actually isn't. Observed superluminal velocities should not be any cause for alarm.

Stanley R. Drake
Kansas City, Kans.

Psychoanalytic education's plus

Joel Greenberg's (SN: 1/21/78, p. 40) report on my presentation at the American Psychoanalytic Association on a questionnaire study of spouses may be misinterpreted. Unfortunately, the article reports only upon negative results of this survey. I do think that your readers need also to know that many of the data from this study point to positive effects of psychoanalytic education. Most responses indicated that psychoanalytic education resulted in more help than strain for the marital relationship. Twice as many spouses (48 percent) found psychoanalytic education helpful to the raising of their children than the 21 percent who found it detrimental as noted in the article by Greenberg. As to analysis itself as separate from the rest of psychoanalytic training, 63 percent of spouses found that this treatment was helpful while 19 percent thought it harmful to their relationship to their spouses. The women spouses stated that their husbands' training was of greater help to their career than men spouses. In response to written out comments, many thought that if it were not for psychoanalytic training some other professional reason would be found to compromise their spouses' time.

In an overall review of the questionnaire study, it certainly points to the direction of a significant percent of spouses finding psychoanalytic training stressful to their family. However, it would only be fair to say that a greater percentage have found it helpful.

Norman B. Levy, M.D.
Brooklyn, N.Y.

Correction:

Our budget story on the Department of Health, Education and Welfare was in error. An increase of \$42 million was requested for NIH. The major portion of the funding (\$32 million) would go to child health and development.

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