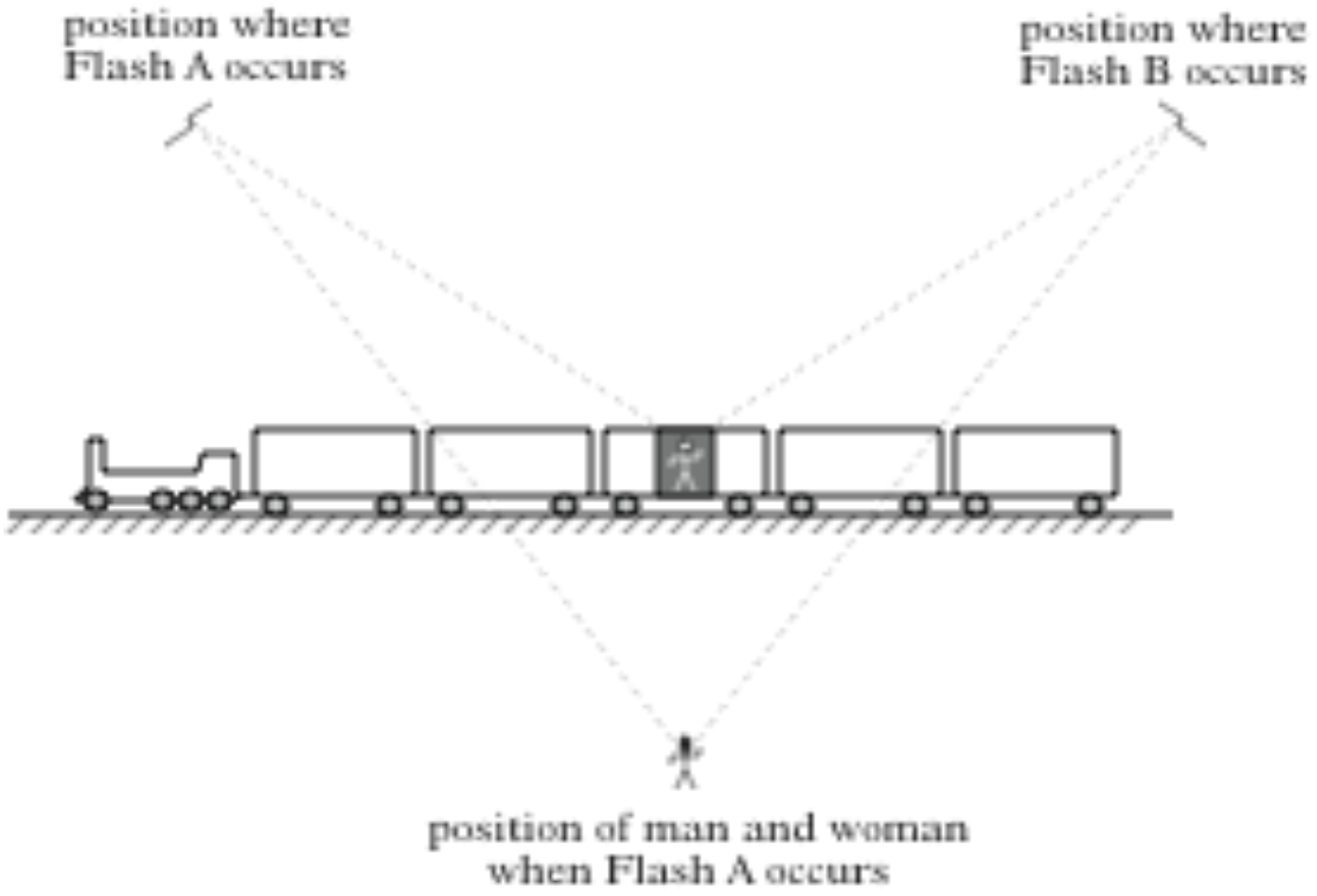
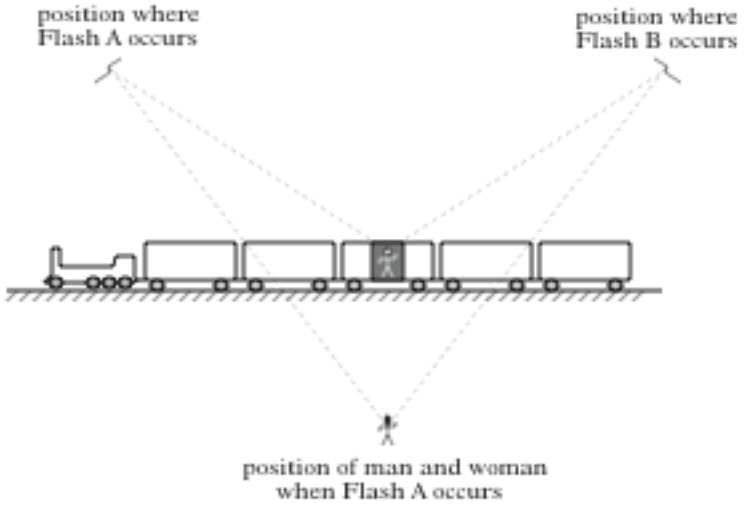
The Train and the Lightning

From Martin Gardner's
Relativity for the Millions

•Did the flashes occur simultaneously?



•Two individuals observe two lightening flashes that occur some distance apart. One of the individuals, a man, stands in a field. The other individual, a woman, is in a train. There is relative motion between the two.



•It is known that when lightening flash A occurs, the man is opposite the woman and the physical location of the flashes are equidistant from both (that is, the distance between flash A and the man, and flash B and the man, are the same; likewise for the woman).

•Furthermore, the man sees the flashes at the same time (i.e., the light from both reaches him at the same instant) and the woman sees the flashes at different times (flash B arrives later than flash A).

•Again, it is known that when lightening flash A occurs, the man is opposite the woman and the physical location of the flashes are equidistant from both (that is, the distance between flash A and the man, and flash B and the man, are the same; likewise for the woman).

•Also, the man sees the flashes at the same time (i.e., the light from both reaches him at the same instant) and the woman sees the flashes at different times (flash B arrives later than flash A).

•THE QUESTION IS, *do the lightning flashes happen simultaneously?*