

# SPACE-TIME-FEYNMAN DIAGRAMS AND THE LITERATURE OF THE OTHER CULTURE

RAY HEFFERLIN  
 Southern Missionary College,  
 Collegedale, Tennessee 37315

Space-time diagrams are introduced very early in the educational experience of physicists, and attempts have even been made to make them familiar to the reading public (Gamow, 1962). This letter suggests that a personal involvement can be achieved by the use of "literature" to illustrate space-time diagrams. If one were discussing "literature" for a group of physicists, then of course the converse would be true.

Fig. 1 shows the geodesics of a few of the main characters in a biography of Roger Williams (Eaton, 1944). The transformation which places geographical locations along the x-axis of the diagram is arbitrary: they might be listed in the order of their mention in the book if one were making the diagram *a priori*.

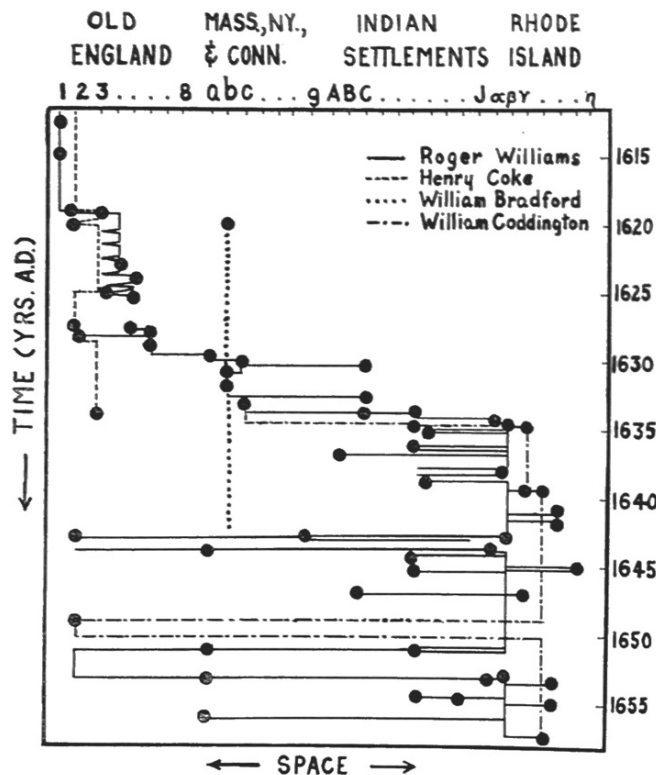


Fig. 1. Space-time diagram of bibliography of Roger Williams. Examples of locations: 1, Smithfield; 2, Parliament and other public buildings in London; a, Boston; b, Plymouth; A, Shawomet; B, Mohegan;  $\Delta$ , Seekonk;  $\beta$ , Providence. Small circles arbitrarily enumerate events.

The main difficulties with Fig. 1 are that events of great significance often happen too close together in time to be separated on a real time scale. Fig. 2 shows

the trajectories of the main characters in the Biblical book of Ruth, where the t-axis is scaled approximately so that events are equally separated, and so that non-stationary (space) trajectories do not blur. It can be seen that Fig. 2 is simple enough to appeal to people very early in their physics maturity.

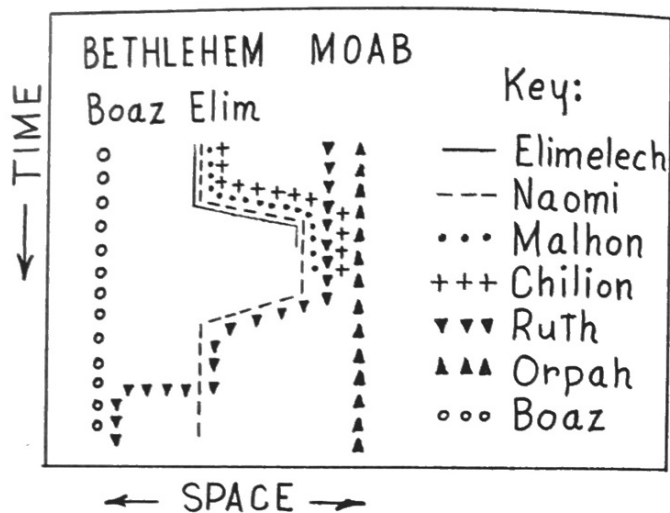


Fig. 2. Space-time diagram of book of Ruth. Two residences within Bethlehem are indicated.

Space-time diagrams can be used, further, in conjunction with literature wherein the roles of characters whose orbits never intersect are described sequentially (Stewart, 1947) (See Fig. 3) or wherein flashbacks occur (Also Fig. 3). It can be seen that the dotted lines, optional in part (a), are necessary in part (b), to show the "plot."

Other sorts of lines and shadings can fulfill yet another function, that of representing accords or discords between characters. Such representations are of interest because they can illustrate Feynman diagrams, in which particle type is plotted against time (Mandl, 1959). See Fig. 3(c).

These suggestions may challenge some Feynman diagram experts to the diagraming of some very complicated, real plots; they might stimulate some from the *literati* to a serious contemplation of physics; they are at any rate, one little bridge between the two cultures!