along the chord to each station would be known. Now we can either assume the time of the occurrence of the quake to be known, as is nearly always the case when the epicentre is in inhabited regions, as was the case in San Francisco, Valparaiso, and Kingston, or we may compute it indirectly from the observed times of arrival of the shock at the various stations. The former assumption suits our purpose better. Now see what our problem looks like. It is something like this analogy: Many trains leave Ottawa at the same time in different directions; one arrives at Halifax at a certain time, one in Washington, one at St. Louis and one at Vancouver. If we divide the distance travelled by each, by its respective time consumed, we will get the average speed or rate of propulsion. Granting the same motive power, the road that had the least resistance, the easiest grades would show the highest speed. The distance travelled then combined with the time gives us the average velocity. Now let us return to our earthquake record where we have given the accurate time of transmission, for it is the difference between the time of the actual occurrence of the quake and the time the shock arrives. With the distance our *a priori* knowledge is not so certain for we may say that there are an infinite number of distances between any two points upon the earth, it depends upon the path that the particular wave, which has recorded itself, has taken to reach us from the origin. Torricelli tells us that "nature abhors a vacuum," and similarly nature abhors the roundabout way but follows the line of least resistance at hand. Have you ever followed a mountain stream and seen how it picks out the route of greatest descent, being the easiest and quickest to get down to the valley? Similarly must be the route of our first shock, or preliminary tremors as they are technically called. Now we are safe in assuming that there is some law of increase of density, be it due to pressure or molecular arrangement or both, as we go down in the earth for a considerable depth anyway. This assumption combined with our knowledge of the behavior of different solids of various densities for the propagation of waves leads us to the conclusion that the path of the earthquake wave