

and untiring in their use. Much of the information desired will depend upon their use, and will demand your exertions and diligence.

Observations will be obtained daily, if possible, both for latitude and longitude.

The meridian altitude of the sun, by the artificial horizon, you will observe daily if possible, also that of the north star; this observation you will find easy after a little practice, by bringing the two reflected images to cover each other. It is necessary to get the error of your watch in mean time by a star, east or west, to find the true time.

This can be done immediately before or after the observation by the north star, and be better than to depend upon the rate of your chronometer, which may alter in riding, though it is not probable it will much. It must be carried in the chronometer-fob of your waistcoat, which some of you may have near the arm. The best mode of observing a star in the artificial horizon, is to clamp your index and wait its contact. Choose for time those that are east or west, and of altitude about  $30^{\circ}$ . If you observe about the same hour every night, you will find the computation more convenient.

All your observations must be worked up as soon as possible after they are taken.

6th. Your route or travel must be kept by compass: this you will find without difficulty in an open country, but through the woods it will be better that each of your party be required to keep his reckoning, by which you can correct your own.

The longitude of Fort Vancouver is  $122^{\circ} 39' 34''$  W., and its latitude is  $45^{\circ} 36' 53''$  N., from which you will take your departure.

7th. To obtain the distance of remote objects, base-lines may be measured on the plains. For this purpose the steppings of a horse will give the best results, by first measuring his steps in one hundred or five hundred feet, and at the ends observe the angles and bearings.

8th. A tape-line is furnished you for getting the measurement of trees, short bases, &c., and any remarkable object you may meet with. Attend to the velocity of rivers by the distance that a chip will pass in any given number of seconds by your watch, and the ratio of a log-line may be adopted.

9th. At all your encampments you will get readings of your barometer, and the thermometer will be taken every six hours, and as often also as any change of altitude or temperature may require.

If by any accident your barometer should be broken on the heights, try the temperature at which water boils.

It is required of you to obtain the heights of all mountain ranges and