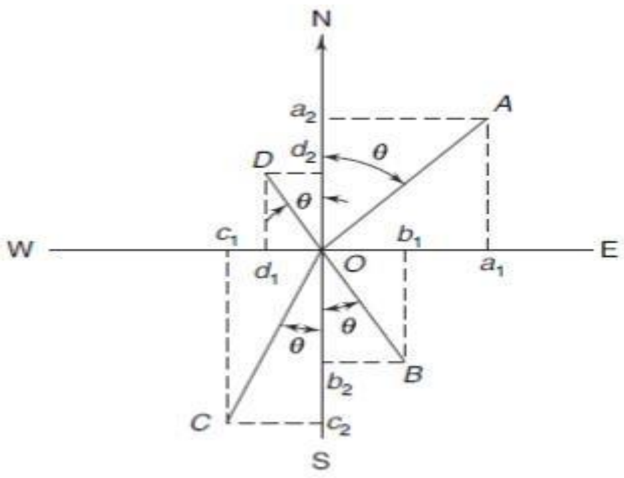
4.3 GALE'S TRAVERSE TABLE

Traverse computations are usually done in a tabular form. One such form is Gale's traverse table (Table 5.1) and is widely used because of its simplicity. The following steps are involved in theodolite traversing and these are illustrated in Table 5.1.

1. In the case of theodolite traversing, the included angles are adjusted to satisfy the geometrical conditions, i.e., the sum of the included angles should be (2n ± 4) 90°, where n is the number of sides of the closed traverse. The plus sign is used when the angles are exterior angles, and the minus sign when they are interior angles. In the case of compass traversing, the observed bearings are adjusted for local attraction.
2. From the observed bearing of a line, e.g., line AB in Table 5.1, the whole circle bearings of all other lines are calculated and then these bearings are reduced to those in the quadrantal system.
3. From the lengths and computed reduced bearings of the lines, the consecutive coordinates, i.e., latitudes and departures are worked out.
4. A check is done to find out whether the algebraic sum of latitudes and the algebraic sum of departures are zero. If not, a correction is applied using the transit rule. In the case of a compass traverse, the correction is applied by Bowditch rule.
5. The independent coordinates are then worked out from the consecutive coordinates. The origin is so selected that the entire traverse lies in the north-east quadrant. This is done to facilitate plotting of the traverse on a sheet with the left-hand bottom corner of the sheet as the origin.

LATITUDES AND DEPARTURES

The latitudes and departures of the traverse lines can be calculated if the reduced bearings and lengths of the lines are known. Northing Oa2 and easting Oa1 are taken as positive, whereas southing Ob2 and westing Od1 are taken as negative, as shown in the Fig.



Latitude of OA	=	northing	=	l cos θ (+)
Departure of OA	=	easting	=	l sin θ (+)
Latitude of OB	=	southing	=	l cos θ (–)
Departure of OB	=	easting	=	l sin θ (+)
Latitude of OC	=	southing	=	l cos θ (–)
Departure of OC	=	westing	=	l sin θ (–)
Latitude of OD	=	northing	=	l cos θ (+)
Departure of OD	=	westing	=	l sin θ (–)

Here, l, θ are the length and reduced bearing of the respective line.