All the angles of the figure may therefore be found ; and, if they have been accurately observed, their sum, together with four right angles, will make twice as many right angles as th figure has sides (Geom. 21, 1). If the survey be­gin and end at thc same point, the positions of the begin­ning and end ought to coincide in the plan.

If the lines which join the objects do not form an en­closed figure, still the manner of proceeding may be the very same ; and the positions of many points may be de­termined by observing their bearings from other points having given positions in the plan, without the trouble of measuring distances on the ground ; and, in the whole pro­cess, the compass serves merely as an instrument for mea­suring angles.

In practice, the figure may be constructed in the field, or else a mode of registering the observations may be easily devised, from which a plan may be afterwards made ; and it may prevent mistakes, if the bearings of all the objects be reckoned from the north quite round the circle in one direction, either to the right or left. Thus, proceeding to the right, we may consider all lines on the east side of the meridian between due north and due south as making with it angles between 0° and 180°, and all lines on the west side between due south and due north as making angles between 180° and 360°.

It must be recollected that the magnetic does not coin­cide with the true meridian, and that the angle between them, called the variation of the compass, changes. It va­ries at different times and in different places (see Magnetism). In 1823 it was 27° 48' at Edinburgh, and 24° 10' at London : the deviation was westerly.

This mode of surveying was applied by Richard Nor­wood, an English mathematician of the seventeenth cen­tury, to determine the magnitude of the earth. Having found the latitudes of London and York, he travelled from the one place to the other, measuring along the road with a chain, and taking the bearings with a compass. He says, “ When I measured not, I paced ; and I believe the expe­riment has come within a scantling of the truth.”

In our article Mensuration, we have explained the prin­cipal problems by which heights and distances are deter­mined by trigonometry : these find continual application in surveying. The theory of levelling is a branch of the same subject ; this has been discussed in a particular article (see Levelling). Maritime surveying requires the solu­tion of this problem : *Three stations being given, and the angles which the lines joining them subtend at a fourth sta­tion in their plane ; to determine the position of that fourth station.* This is Problem V. in our article Mensuraηon of Heights and Distances, and is there resolved in the usual way. Since that was printed, Dr Wallace, emeritus professor of mathematics in the University of Edinburgh, lias published a work entitled “ Geometrical Theorems and Analytical Formulæ,” in which various new formulas and constructions are given for this and other geodetical prob­lems.

On extensive trigonometrical surveying, see the following works : Delambre, Base du Système Métrique Décimal, 3 vols. 1806-10; Biot et Arago, Recueil d’Observations Géodésiques, &c. 1821 ; Dalby, Mudge, Colby, &c. Trigo­nometrical Survey of Britain, 1799-1811 ; Puissant, Traité de Géodésie, 2 vols. 1819. (r.)

SURVIVORSHIP. See Annuπιes and Mortality.

SUSA, the ancient royal residence of the kings of Persia, built by Darius the son of Hystaspes, according to Pliny, though he perhaps only restored it, being a very ancient city, founded by Tithonus, father of Memnon. Its compass was said by ancient authors to be 120 stadia ; but the ruins give us the idea of a still greater extent. They are situated on the east side of the river Kerah, in the latitude of 32°, stretch­ing not less than twelve miles from one extremity to the other. These ruins consist of hillocks of earth and rub­bish, covered with broken pieces of brick and coloured tile. One of these hillocks is a mile in circumference, and 100 feet high. Another, though not quite so high, has double the circuit. Large blocks of marble covered with hiero­glyphics are frequently discovered by the Arabs. There is a building, apparently modern, called the tomb of Daniel.

Susa, a province of the department of Turin, in the con­tinental part of the kingdom of Sardinia. It is on the fron­tier towards France. It is 704 square miles in extent, and forms a large valley with two terminations or horns, through one of which is the road over Mount Genevre to France by the Cottian Alps, and the other passes over Mount Cenis, and so into Savoy; but the latter is by far the preferable road. In the western part of the province lofty rugged rocks and even glaciers are to be seen ; but in the west is an alterna­tion of valleys and gentle hills, with a fertile soil watered by the river Dora, which runs to Turin. The district produces abundance of wine, flax, hemp, and silk, but is deficient in corn, and chestnuts are much used as a substitute for grain. There are iron mines and marble quarries worked ; and much linen is spun and woven. The province has the title of a marquisate, and contains a city, with sixty-five towns and villages, and about 70,000 inhabitants.

The capital is the city of the same name at the foot of the Alps, on the river Dora, which here receives the Ei- nische. Thc town is badly fortified, and is rather meanly

built. It is the see of a bishop, has a cathedral and two monasteries, with nearly 2000 inhabitants, whose chief occu­pation is making gloves, and spinning cotton thread. It is a place of great antiquity, and must have been formerly of importance in a military view, from its situation on the only road then known from Gaul into Italy ; to defend which it had the castles of Santa Maria and La Brunette, which were destroyed by the French in 1796. Here stands a beau­tiful triumphal arch in honour of Augustus, which is in good preservation. This place is twenty-three miles from Turin, in longitude 6. 50. 10. E., and latitude 45. 8. N.

SUSEDOON, a town of Hindustan, province of Delhi, situated near the ancient canal of the Sultan Feroz. Long. 76. 30. E. Lat. 29. 20. N.

SUSPENSION, in musical harmony. See Music.

SUSPENSION BRIDGE is such a structure as is hung and stretched across some chasm, water-course, or other space, over which it is designed to form a passage. In Thi­bet, Peru, and various other remote regions, bridges on this principle, though of an extremely rude and perishable con­struction, and forming a most unstable and oscillating path, seem to have existed anterior to any thing which is at pre­sent known of the history of those countries ; but the intro­duction of suspension bridges into civilized states, at least on a large scale and of a substantial fabric, is of very mo­dern date. The leading features in the structure of the latter sort have hitherto, for the most part, consisted in fix­ing securely in the two opposite banks, the extremities of strong chains, which, being carried over piers or pillars, reach across the space to be passed, in such a manner that each portion of chain intercepted between two piers is al­lowed naturally to assume by its weight the figure of the curve thence named the *catenaria.* From these chains, a platform for the roadway is suspended by means of a series of equidistant vertical roads. Some bridges approaching to this description are said to have existed in China for many