inconceivable facility, and for which he charged a very high price, according to the instructions which had been given him on that head. It is affirmed, that for some of them he received 400 guineas a-piece. He soon found himself loaded with honours and riches ; and as he had a noble and generous heart, he lived suitably to his fortune. He married Maria Ruthven, grand-daughter of the first earl of Gowrie ; and though she had but little fortune, maintained her in a style equal to her birth. He generally kept a mag­nificent equipage, and a numerous retinue. He died in Blackfriars on the 9th of December 1641, at the early age of forty-two, and was buried in St. Paul’s near the tomb of John of Gaunt. He left a daughter, married to Mr. Step­ney, the grandfather of George Stepney the poet. Lady Vandyck was afterwards married to Richard the son of Sir John Pryse of Newton-Averbecham, but by her second husband she had no issue,

VANE, a thin slip of bunting hung to the mast-head, or some other conspicuous place in the ship, to show the direc­tion of the wind. It is commonly sewed upon a wooden frame called the *stock,* which contains two holes for slipping over the spindle, upon which it turns about as the wind changes.

VANNES, an arrondissement in the department of Mor­bihan in France, extending over 638 square miles, com­prehending eleven cantons, divided into seven communes, and containing a population of 125,898 in 1836. The capi­tal is the city of the same name, which is connected with the gulf of Morbihan by a canal about two and a half miles in length. It is well fortified, is the seat of a bishop, has a ca­thedral and other three churches, 1850 houses, and 11,623 inhabitants in 1836. The chief trade is in corn, butter, and honey; and a fishery for anchovies affords occupation to many of the people. Lat. 47. 39∙ 14. Long. 2. 52. 16. W.

VAR, a department of the south-east of France, formed out of the eastern part of ancient Provence. It extends in north latitude from 43° 2' to 44° 0', and in east longitude from 5° 29' to 6’ 59' and comprehends 2854 square miles. It is bounded on the north by the department of the Lower Alps, on the north-east by Piedmont, on the south-east and the south by the Mediterranean sea, and on the west by the mouths of the Rhone. It is divided into four arron- disements, which are subdivided into thirty-five cantons, and those into 210 communes.

The population in 1836 amountcd to 323,404 persons, all of whom adhere to the Romish communion, or, if there are any protestants, they are in no place so numerous as to form a congregation for public worship. The language of the common people is the Provençal, but in the cities and towns the French is gradually driving out the ancient tongue. The face of the country presents mountains, rocks, hills, valleys, and small plains, with some beautiful and even romantic prospects. The north and north-east parts are the most mountainous, as they contain a portion of the maritime Alps, proceeding out of Piedmont, which, for the most part, are bare of trees, and, especially on their south sides, exhibit naked perpendicular precipices. These are all calcareous, but a range extends from Hieres to Frejus, which are of granite, and more thick of trees, among which are cork, chesnut, cestus, myrtle, and firs. In the western part is the remarkable mountain Saint Beaume, with a la­byrinth in the calcareous substance of it, that extends from the western boundary of the department, the mouths of the Rhone, to Ollioules, and is well known by the name of *les faux d’Ollioules.* In general the soil is far from fertile, and is more indebted to the labour of the inhabitants than to its quality for its powers of production. It is better adapted for fruits, such as grapes and olives, than for wheat, barley, or other grain.

The department is watered by numerous mountain streams. The river which gives name to the department, rises in the mountain Camelione in Piedmont, receives the

water of the Esteron, forms many small islands, and, after a course of sixty miles, enters the Mediterranean ; but it is not navigable in any part. Along the sea-shore are nu­merous pools and morasses, some of which communicate with the sea.

The climate is mild, the great heats of summer being tempered by the breezes from the sea and the mountains. Rain is unusual, except when the wind drives the clouds from the sea. With the exception of about twenty days, there is a continual spring; and even in those few days the thermometer seldom sinks to the freezing point. In January the fields are clothed with fresh green, and in February the trees put forth their blossoms.

Agriculture is in *a* neglected state, so that the corn produced does not supply half the consumption, and in sum­mer the grass is so burnt up, that the cattle must be driven to the mountains for pasture. Neither cows, sheep, nor horses are abundant, but many swine are bred and fattened. The chief beasts of burden are asses and mules.

The chief productions are wine, oil, silk, and the bet­ter kinds of fruit, oranges, citrons, and lemons, some dried fruits, a few dates, and abundance of chesnuts and other kinds of nuts. Honey and wax are collected in con­siderable quantities. There are no minerals raised, except about 600 tons of fossil coal. On the sea-shore a suffici­ency of salt is produced by the natural heat of the sun. The fishery on the coast yields abundance of tunny, an­chovies, sardinias, and mackerel, with a small but delicate small fish called the monnat. The manufactures are in­considerable, and merely for home consumption. The de­partment elects three deputies for the legislative chamber.

VARDOOSETTAH, a town of Hindustan, in the pro­vince of Tinnevelly, twenty-three miles S.S.W. from Ma­dura. Long. 78. 11. E. Lat. 9. 36. N.

VARIATIONS, Calculus of. 1. The object of this calculus is the discovery of the form of a function which shall fulfil certain conditions, not expressed in direct terms, but involved in a finite integral. The first instance of a problem of this kind appears in a scholium to Prop. 34, b. ii. of the *Principia,* published in 1687. (See Prob. 2. below.) Newton gave the correct result ; but he supplied no demonstration, nor do we find any method of solution applicable to such cases until ten years afterwards. In the *Acta Eruditorum* for 1696, John Bernoulli enunciated the problem of the brachystochrone, (Prob. 1. below), and invited mathematicians to give a solution. After a considerable interval, his brother, James Bernoulli, gave in his result, which was, that the curve required is the cycloid. As the mode of demonstration which he adopted is very nearly that which was employed by all the earlier writers on the subject. It will not be uninteresting to exhibit it here.

2. The problem is the following : “ To find that curve down which a body falling by the force of gravity will move from A to B in the shortest possible time.”

The principles employed in the solution are these two : 1st, that when a quantity is a maxi­mum or minimum, a slight change in the variables will produce no variation in the value of the function ; 2d, that what is true of the whole quantity is likewise true of every portion of it.

The second prin­ciple requires that the time down PQR should be less than the time down any other line, as PSR;