stands on an eminence, commanding an extensive view to wards the south. It is composed of four streets, uniting at the marketplace, which is a square with a cross, consisting of a plain octagonal shaft, with a quadrangular base ; and near to it is the town-hall, rebuilt in 1764, in which the quarter sessions for the division of Lindsay are held. The parish church is a large old edifice, including a chapel with some ancient monuments. There is a good market on Saturday. The population was, in 1801, 932; in 1811, 963; in 1821, 1234; and in 1831, 1384.

SPINAGE, or Spinach. See Horticulture.

SPINDLE, in *Geometry,* a solid body generated by the revolution of some curve line about its base or double ordinate ; in opposition to a conoid, which is generated by the rotation of the curve about its axis or absciss, perpendicular to its ordinate. The spindle is denominated cir cular, elliptic, hyperbolic, or parabolic, according to the figure of its generating curve.

SPINET, or Spinnet, (Ital. *Spinetta),* an old-fashioned musical instrument, of which the brass and steel wires were struck by quills fixed to the tongues of the jacks that were moved by finger-keys. It was the predecessor of the harpsichord and the pianoforte.

SPINNING is the art of forming continuous threads by drawing out and twisting together filamentous materials. This was at first a manual art, and was practised in the earliest ages. The simple tool first made use of, consisted of a piece of wood, with its lower extremity of a conical form like a boy’s top, and its upper portion long and tapering to a point, to which the fibres to be spun were fixed; this was termed a spindle, and in using was spun like a top to twist the threads. To the spindle an addition was soon made of the distaff, consisting of a piece of wood, round which the ma­terial to be spun was lapped. The distaff was held in the one hand of the spinner, while the other hand was engaged in drawing the fibres from the mass, and ever and anon giving fresh impetus to the motion of the spindle. This simple apparatus must have been early used, as, among the sculptures of the early Egyptian tombs, we find representations of females forming threads with the spindle; and singular though it be, the same apparatus may yet be found in a few places in Scotland, affording, in its toilsome progress, a striking con­trast to the whirling wonders of the cotton-mill.

A great improvement in the use of the distaff and spindle, by which the spinner’s hands were in a great measure left free to regulate the formation of the thread, was made by mounting the spindle in a frame, and using a larger wheel to drive it by a belt; and this again was further improved by using a treadle to effect the movement of the wheel by the foot of the spinner. No attempt, however, to introduce mechanism to supply the place of the skill and dexterity in manipulation, which the spinner could acquire only by assiduous practice, appears to have been made before the be ginning of the eighteenth century. At that time there were in common use two kinds of spinning implements. The one, called the *large wheel* was used in the spinning of w∞l and cotton, consisting of a large wheel or rim mounted in a frame, and having a belt to drive the spindle which projected from the side of the frame, and had the material to be spun affixed to its end. In spinning, the operator, usually a female, laid hold of the wool or cotton with the finger and thumb of her left hand, at a few inches distant from the spindle, and drew it towards her, while she turned the wheel with her right hand ; she thus extended and twisted repeated por tions, and as they were twisted, she, by guiding with her hand the thread she had formed, allowed it to be wound upon the spindle. Thus, from the carded cotton or wool, a loose flabby thread or *rove* was formed, which was again subjected to a similar drawing or extension, and twisted until reduced to a fine and compact thread. The other implement, called the *small* or *Saxon wheel,* was a more per­

fect apparatus, and was used for the spinning of flax; it had on its spindle a bobbin, on which the thread was wound, and a flyer revolving with greater rapidity than the bobbin to give the thread twist; a fixed distaff, on which the pre pared flax was loosely rolled ; and a treadle by which a rotatory motion was given to the wheel by the foot of the operator, whose hands were thus left at liberty to draw out the fibres of the flax in the requisite number to form the thread ; in doing this, the fibres were, from time to time, moistened with saliva, to make them more readily corn bine.

Such were the implements used in Britain and elsewhere, when, about the year 1738, an ingenious mechanist, John Wyatt, made an attempt to substitute mechanism for the hands and the skill of the spinner. To him is due the honour of discovering the principle of roller-spinning; a principle which, forty years afterwards, was fully developed by the genius of Arkwright The following account of Wyatt’s invention, by his son Mr. Charles Wyatt, will shew to what extent he carried the principle of roller-spinning.

“ In the year 1730, or thereabouts, living then at a village near Litchfield, our respected father first conceived the project, and carried it into effect; and in the year 1733, by a model of about two feet square, in a small building near Sutton Coldfield, without a single witness to the performance, was spun the first thread of cotton ever produced without the intervention of the human fingers, he, the inventor, to use his own words, ‘ *being all the time in a pleasing, but trembling, suspense.’* The wool had been card ed in the common way, and was *passed between two cy­linders, from whence the bobbin drew it by means of the twist.*

“ This successful experiment induced him to seek for a pecuniary connexion equal to the views that the project ex cited, and one appeared to present itself with a Mr. Lewis Paul, which terminated unhappily for the projector; for Paul, a foreigner, poor and enterprising, made offers and bargains which he never fulfilled, and contrived, in the year 1738, to have a patent taken out in his own name for some additional apparatus, a copy of which I send you; and in 1741, or 1742, a mill turned by two asses walking round an axis was erected in Birmingham, and ten girls were employ ed in attending the work. Two hanks of the cotton then and there spun are now in my possession, accompanied with the inventor’s testimony of the performance. Drawings of the machinery were sent, or appear to have been sent, to Mr. Cave, for insertion in the *Gentleman’s Magazine.*

"This establishment, unsupported by sufficient property, languished a short time, and then expired ; the supplies were exhausted, and the inventor much injured by the *ex­periment,* but his confidence in the scheme was unimpaired. The machinery was sold in 1743. A work upon a larger scale, on a stream of water, was established at Northampton, under the direction of Mr. Yeoman, but with the property of Mr. Cave. The work contained 250 spindles, and employed fifty pairs of hands.

“ The work at Northampton did not prosper. It passed, I believe, into the possession of a Mr. Yeo, a gentleman of the law, in London, about the year 1764; and, from a strange coincidence of circumstances, there is the highest probability that the machinery got into the hands of a person who, with the assistance of others, knowing how to apply it with skill and judgment, and to supply what might be deficient, raised upon it, by a gradual accession of profit, an immense establishment, and a princely fortune.”

The principles of Wyatt’s invention are contained in that portion of Paul’s specification which we here quote: “ The wool or cotton being thus prepared (by carding into slivers), one end of the mass, rope, thread, or sliver, is put betwixt a pair of rowlers, cillinders, or cones, or some such movements, which being twined round by their motion,