however, is generally attributed to Descartes, who made it more widely known. Snell died at Leyden on 30th October 1626.

In addition to the *Eratosthenes Batavus* he published *Cyclometria sive de circuli dimensione* (Leyden, 1621, 4to), and edited *Cœli et siderum in eo errantium observationes Hassiacæ* (ibid., 1618, 4to), containing the astronomical observations of Landgrave William IV. of Hesse. About his *Tiphys Batavus s. Histiodromice, de navium cursibus et re navali* (1624), see Navigation, vol. xvii. p. 255, note. A trigonometry *{Doctrina triangulorum)* by him was published a year after his death.

SNIPE (Anglo-Saxon *Snite,* Icelandic *Snipa,* Dutch *Snip*, German *Schnepfe),* one of the commonest Limicoline birds, in high repute no less for the table than for the exciting sport it affords. It is the *Scοlοpax gallinago* of Linnæus, but by many later writers separated from that genus, the type of which is the Woodcock *(q.v.),* and hence has been variously named *Gallinago cælestis, G. media,* or *G. scolopacina.* Though considerable numbers are still bred in the British Islands, notwithstanding the diminished area suitable for them, most of those that fall to the gun are undoubtedly of foreign origin, arriving from Scandinavia towards the close of summer or later, and many will outstay the winter if the weather be not too severe, while the home-bred birds emigrate in autumn to return the following spring. Of late years British markets have been chiefly supplied from abroad, mostly from Holland.

The Snipe is fortunately too well known to need description, for a description of its variegated plumage, if attempted, would be long. It may be noticed, however, as subject to no inconsiderable variation, especially in the extent of dark markings on the belly, flanks, and axillaries, while examples are occasionally seen in which no trace of white, and hardly any of buff or grey, is visible,—the place of these tints being taken by several shades of chocolate- brown. Such examples were long considered to form a distinct species, the *S. sabinii,* but its invalidity is now generally admitted. Other examples in which buff or rust-colour predominates have also been deemed distinct, and to these has been applied the epithet *russata.* Again, a slight deviation from the ordinary formation of the tail, whose rectrices normally number 14, and present a rounded termination, has led to the belief in a species, *S. brehmi,* now wholly discredited. But, setting aside two European species, to be pre­sently noticed more particularly, there are at least a score, more or less nearly allied, belonging to various parts of the world, for no considerable territory is without its representative. Thus North America produces *G. wilsoni,* so like the English Snipe as not to be easily distinguished except by the possession of 16 rectrices, and Australia has *G. australis,* a larger and somewhat differently coloured bird with 18 rectrices. India, while affording a winter resort to multitudes of the common species, which besides Europe extends its breeding range over the whole of northern Asia, has the so-called Pin-tailed Snipe, *G. stenura,* in which the number of rectrices is still greater, varying from 20 to 28, it is said, though 22 seems to be the usual number. This curious variability, de­serving more attention than it has yet received, only occurs in the outer feathers of the series, which are narrow in form and extremely stiff, there being always 10 in the middle of ordinary breadth.

Those who only know the Snipe as it shows itself in the shoot­ing-season, when without warning it rises from the boggy ground uttering a sharp note that sounds like *scape, scape,* and, after a few rapid twists, darts away, if it be not brought down by the gun, to disappear in the distance after a desultory flight, have no con­ception of the bird’s behaviour at breeding-time. Then, though flushed quite as suddenly, it will fly round the intruder, at times almost hovering over his head. But, if he have patience, he will see it mount aloft and there execute a series of aerial evolutions of an astounding kind. After wildly circling about, and reaching a height at which it appears a mere speck, where it winnows a random zigzag course, it abruptly shoots downwards and aslant, and then as abruptly stops to regain its former elevation, and this process it repeats many times. A few seconds, more or less according to distance, after each of these headlong descents a mysterious sound strikes his ear—compared by some to drumming and by others to the bleating of a sheep or goat,@@1 which sound evidently comes from the bird as it shoots downwards, and then only ; but how the sound is made is a question on which many persons are still unde­cided. There are those who maintain that it proceeds from the throat, while some declare it is produced by the wings, which sharp-sighted observers say they can see in tremulous motion.

Others, again, assert that it is caused by the vibration of the webs of the outer rectrices, and these last have in support of their opinion the fact that a similar sound may be made by affixing those feathers to the end of a rod and drawing them rapidly downwards in the same position as they occupy in the bird’s tail while it is performing the feat.@@2 But, however it be produced, the air will also ring with loud notes that have been syllabled *tinker, tinker, tinker,* while other notes in a different key, something like *djepp, djepp, djepp* rapidly uttered, may be heard as if in response. The nest is always on the ground and is a rather deep hollow wrought in a tuft of herbage, and lined with dry grass-leaves. The eggs are four in number, of a dark olive colour, blotched and spotted with rich brown. The young when freshly hatched are beautifully clothed in down of a dark maroon, variegated with black, white, and buff.

The Double or Solitary Snipe of English sportsmen, *S. major,* a larger species, also inhabits northern Europe and may be readily re­cognized by the white bars in its wings and by its 16 or occasionally 18 rectrices. It has also a very different behaviour. When flushed it rises without alarm-cry, and flies heavily. In the breeding season mud of its love-performance is exhibited on the ground, and the sounds to which it gives rise are of another character ; but the exact way in which its “ drumming ” is effected has not been ascer­tained. Its gesticulations at this time have been well described by Prof. Collett in a communication to Mr Dresser’s *Birds of Europe* (vol. vii. pp. 635-637). It visits Great Britain every year at the close of summer, but in very small numbers, and is almost always seen singly—not uncommonly in places where no one could expect to find a Snipe.

The third species of which any details can here be given is the Jack-@@3 or Half-Snipe, *S. gallinula,* the smallest and most beautifully coloured of the group. Without being as numerous as the common or full Snipe, it is of frequent occurrence in Great Britain from Sep­tember to April (and occasionally both earlier and later) ; but it breeds only, so far as is known, in northern Scandinavia and Russia ; and the first trustworthy information on that subject was obtained by Wolley in June 1853, when he found several of its nests near Muonioniska in Lapland.@@4 Instead of rising wildly as do most of its allies, it generally lies so close as to let itself be almost trodden upon, and then takes wing silently, to alight at a short distance (if it escape the gun), and to return to the same place on the morrow. In the breeding-season, however, it is as noisy and conspicuous as its larger brethren while executing its aerial evolutions.

As a group the Snipes are in several respects highly specialized, but here there is only space to mention the sensitiveness of the bill, which, though to some extent noticeable in many Sandpipers (see vol. xxi. p. 260), is in Snipes carried to an extreme by a number of filaments, belonging to the fifth pair of nerves, which run almost to the tip, and open immediately under the soft cuticle in a series of cells that give this portion of the surface of the premaxillaries, when exposed, a honeycomb-like appear­ance. Thus the bill becomes a most delicate organ of sensation, and by its means the bird, while probing for food, is at once able to distinguish the nature of the objects it encounters, though these are wholly out of sight. So far as is known, the sternum of all the Snipes, except the Jack-Snipe, departs from the normal Limicoline forma­tion, a fact which tends to justify the removal of that species to a separate genus, *Limnocryptes.@@*5(a. n.)

@@@1 Hence in many languages the Snipe is known by names signifying ‘Flying Goat,” “Heaven’s Ram,” as in Scotland by “Heather-bleater.”

@@@2 Cf. Meves, *(Efvers. K. Vet.-Akad. Forh.,* 1856, pp. 275-277 (transl. *Naumannia,* 1858, pp. 116, 117), and *Proc. Zool. Society,* 1858, p. 202, with Wolley’s remarks thereon, *Zool. Garten,* 1876, pp. 204-208.

@@@3 Though this word is clearly not intended as a nickname, such as is the prefix which custom has applied to the Daw, Pie, Redbreast, Titmouse, or Wren, one can only guess at its origin or meaning. It may be, as in Jackass, an indication of sex, for it is a popular belief that the Jack-Snipe is the male of the common species ; or, again, it may refer to the comparatively small size of the bird, as the “jack ” in the game of bowls is the smallest of the balls used, and as fishermen call the smaller Pikes Jacks.

@@@4 His account was published by Hewitson in May 1855 *{Eggs Br. Birds,* 3d ed., ii. pp. 356-358).

@@@5 The so-called Painted Snipes, forming the genus *Rhynchæa,* demand a few words. Four species have been described, natives respectively of South America, Africa, India with China, and Australia. In all of these it appears that the female is larger and more brilliantly coloured than the male, and in the Australian species she is further distinguished by what in most birds is emphatically a masculine pro­perty, though its use is here unknown,—namely, a complex trachea, while the male has that organ simple. He is also believed to under­take the duty of incubation.