cranks, or are equivalent to larger or smaller wheels. Two- speed gears are becoming general, among which may be especially mentioned the Cryptodynamic. By means of these it is possible to change the gear of the machine so as to have a high gear under favourable conditions and a low gear when mud, wind, or an ascent make travelling difficult. Although chain gearing is used in nearly every machine made, connecting rods, wheels, or bands are fitted instead to some machines. The necessity for such mechan­ism has been avoided by making the wheel axle also the treadle axle ; but great instability is the result.

Machines in which the arms instead of the legs supply the power are made, and are of immense service to those who have lost the use of their legs.

Owing to the inconvenience caused by doorways being often too narrow to allow a tricycle to pass through, many machines are made to fold up into a narrower space or to shut up like a telescope.

It is important that the rider should be so placed that he can, without leaning forward, put most of his weight on the treadles, and this is more than ever needed as the steepness of an ascent in­creases, because the slope of the machine has a contrary effect. Slid­ing seats were arranged for this purpose ; but Mr Warner Jones has made use of a swinging frame which the rider can lock in any posi­tion he pleases. It is this same swinging frame which gives such comfort to the rider of the Otto bicycle, placing him at all times in the position most suitable for the occasion.

Carrier tricycles, in which due provision is made for the proper distribution of the load, are largely used by the post-office and by tradesmen in their business. The “ Coventry chair ” is a kind of bath chair driven as a tricycle by a rider behind. When invalids have overcome a certain prejudice as to the danger of this kind of vehicle, it will no doubt be more generally used.

In machines for two riders the riders sit side by side *{sociables)* or one is placed before the other (*tandems).* Sociable machines are both front-steering and rear-steering. Rear-steerers with each rider driving the wheel on his side only are nearly as objectionable as the single-driving rear-steerer. Front-steering sociables with dif­ferential gear are safe and comfortable ; but all sociables are slow machines. For nearly every make of single tricycle there is a corresponding tandem. The Coventry rotary in the tandem form suffers more from the single-side driving than in the single form, the rear-steering machines not so much, owing to the greater weight which the steering wheel has to bear. The Humber is less sen­sitive in the steering, owing to the greater moment of inertia of the frame and the front rider. The front-steerer cannot be made safer, but an excellent tandem is formed by placing the rear-rider on a trailing tail as in the Humber. Tandems have an advantage over sociables and perhaps over single tricycles in the matter of speed ; they are, however, not quite so safe, and their appearance alone prevents many from riding them. Many sociables and tandems are convertible into single machines with but little trouble.

The following tables of quickest times which have been accomplished up to the end of 1886 (certified by the National Cyclists' Union) will show the com­parative value of the bicycle and tricycle as racing machines.

*on a prepared racing path.*

|  |  |  |
| --- | --- | --- |
| Distance. | Time, tricycle. | Time, bicycle. |
| 1 mile | 2 min. 46∙8 sec. | 2 min. 32∙4 sec. |
| 5 miles | 14 „ 27∙6 „ | 14 „ 18 „ |
| 20 „ | 59 „ 10∙6 „ | 59 „ 6∙6 ,, |
| 100 „ | 6 hrs. 43 min. 32∙5 sec. | 5 hrs. 50 min. 5∙4 sec. |

Greatest distance in one hour

*on a public road.*

Land’s End to John o’ Groats@@1 5 days 10 hrs., tricycle. (about 870 miles) 1 5 ,, 1 ,, 45 min., bicycle.

Greatest distance in 24 hours { ^0⅛ miles, tricycle. y β }

TRIESTE (Germ. *Triest,* Slav. *Trst,* Lat. *Tergeste),* the principal seaport of the Austrian-Hungarian empire, is picturesquely situated at the north-east angle of the Adriatic Sea, in the Gulf of Trieste and at the foot of the barren Karst Hills. The old town, nestling round the hill on which the castle stands, consists of narrow, steep, and irregular streets. It is connected by the broad and hand­some Corso with the well-built new town, which lies on the flat expanse adjoining the crescent-shaped bay, partly on ground that has been reclaimed from the sea. The prevailing air of the town is Italian rather than German. The castle, built in 1680, is believed to occupy the site of

the Roman capitol (see below). Near it is the cathedral of S. Giusto, an unimposing but interesting building, mainly of the 14th century, and incorporating fragments of a Roman temple and early Christian churches. Don Carlos of Spain (d. 1855) is interred in the south aisle, and Fouché, Napoleon’s minister of police, in front of the church, while the churchyard contains the grave and monument of Winckelmann, the archæologist, who was murdered at Trieste in 1768. The Arco di Riccardo, also in the old town, derives its name from a popular delusion that it was connected with Richard Cœur-de-Lion, but is probably an arch of a Roman aqueduct. A collection of Roman antiquities found in or near the town has been formed near the castle. The most prominent building in the new town is the Tergesteo, a huge edifice containing the exchange and numerous shops and offices. The new municipal buildings, with the handsome hall of the pro­vincial diet, the Palazzo Revoltella, the offices of the Austrian Lloyd’s, and the handsome old exchange are also noteworthy. The church of S. Maria Maggiore is a characteristic specimen of Jesuit architecture, and the new Greek church is one of the handsomest Byzantine structures in the empire. The city hospital has accom­modation for 2000 patients. The huge Politeama is the largest theatre. In front of the Palazzo Revoltella is a monument to the emperor Maximilian of Mexico, who had been an admiral in the Austrian service. His sumptuous chateau of Miramar is one of the lions of the neighbour­hood. The capacious harbour, consisting of two parts, the old and the new, is protected by extensive moles and breakwaters, and has been greatly improved within the last ten or fifteen years. From the harbour the Canal

Grande extends into the town, allowing large vessels to unload at the warehouses. At the end of the Molo Sta Teresa is a lighthouse upwards of 100 feet high. The population of the town (6424 in 1758) and district of Trieste in 1880 was 144,844, of whom 74,544 belonged to the town proper and 133,019 to the town and suburbs. The town population is very heterogeneous, but the Italian element far exceeds all the rest. There are about 5000

@@@1 These two by the same rider.