TEIGNMOUTH, a seaport and market town of Eng­land, in Devonshire, consisting of the parishes of East and West Teignmouth, and situated on the English Channel, at the mouth of the Teign and on the Great Western Railway, 14 miles south of Exeter and 209 west-south­west of London. It is somewhat irregularly built, partly on a projecting peninsula and partly on the acclivities rising behind the river. The Teign is crossed by a bridge 1671 feet in length, built of wood and iron in 1824. St Michael’s church, in East Teignmouth, erected in 1822-23 in the Decorated style, was enlarged in 1875. The other buildings include St Scholastica’s abbey (erected for Bene­dictine nuns in 18G2), the East Devon and Teignmouth club-house, the mechanics’ institute (1840), the temperance hall (1879), the sailors’ home (1881), the baths (1883), and the public market (1883). There are two. commodious quays and a pier 600 feet in length. Fine pipe and potters’ clay (from Kingsteignton) is shipped to Staffordshire. Coal and culm are imported, and there is also a trade with Newfoundland. Fishing is extensively carried on. The town, which is not incorporated, was formerly governed by portreeves. It now forms an urban sanitary district, which was extended on 29th September 1881. The popu­lation of the former area (1238 acres) in 1871 was 6751, and in 1881 it was 7120 ; that of the extended area (2347 acres) in 1881 was 8496.

Teignmouth is of very ancient origin. It received a grant of a market from Henry III. East Teignmouth was formerly called Teignmouth Regis, and West Teignmouth, Teignmouth Episcopi,— the manor having belonged to the see of Exeter until alienated by Bishop Vesey. Teignmouth was burned by French pirates in 1340, and was again devastated by the French on 26th June 1690.

TEINDS. See Tithes.

TELEGRAPH

TELEGRAPH (from τήλε and *γράφω*) signifies an instrument to write at a distance. The term is specifically applied to apparatus for communicating in­telligence to a distance in unwritten signs addressed to the eye or ear, and has only recently had application to those wonderful combinations of inanimate matter which literally write at a distance the intelligence committed to them. The chief object of the present article is to ex­plain the principles and practice of the electric telegraph, and we shall allude to other telegraphic systems only to illustrate the general principles of signalling.

A word expressing an idea may, according to a pre­arranged plan of signalling, be communicated by voice, by trumpet calls, by gun fire, by gesture or dumb signs, by lamp signals, by flags, by semaphore, or by electric tele­graph. The simplest system of word-signalling hitherto practised is that of the nautical flag telegraph, in which each hoist represents a word by a combination of four flags in four distinct positions (see Signals, Naval). If *n* denote the number of flags, supposed all different, out of which the four to be sent up may be selected, the num­ber of different ideas which can be expressed by a single hoist is *n*(*n* - l)(*n* - 2)(*n* - 3), since there are *n* varieties out of which the flag for each of the four positions may be independently chosen. To commit to memory so great a number of combinations, which amount to 358,800 if *n* = 26, would be a vain effort ; the operators on each side must therefore have constant recourse to a dictionary, or code, as it is called. For the sake of convenient reference each flag is called by the name of a letter of the alphabet, and all that the operator has to bear in mind is the letter by which each flag is designated. Sometimes the words to be expressed are spelled out by means of the flags as in ordinary language; but, as in most words there are more than four letters, as scarcely any two consecutive words are spelled with four or less than four letters, and as more than four flags at a time cannot be conveniently used, the system of alphabetic signalling frequently re­quires the use of two hoists for a word, and scarcely ever has the advantage of expressing two words by one hoist. It is therefore much more tedious than code signalling in the nautical telegraph.

In point of simplicity spoken words may be considered as almost on a par with the nautical telegraph, since each word is in reality spoken and heard almost as a single utterance. Next in order comes the system of spelling out words letter by letter, in which—instead of, as in the nautical telegraph, 358,800 single symbols to express the same number of ideas —26 distinct symbols are used to express by their combinations any number whatever of distinct ideas. Next again to this may be ranked the system by which several distinct successive signals are used to express a letter, and letters thus communicated by compound signals are combined into words according to the ordinary method of language. It is to this last class that nearly all practical systems of electro-telegraphic signalling belong. But some of the earliest and latest pro­posals for electric telegraphs are founded on the idea of making a single signal represent a single letter of the alphabet ; as instances we may name those' early forms in which separate conductors were used for the different letters ; a method suggested by Professor W. Thomson@@1 in 1858 in which different strengths of current were to be employed to indicate the letters ; and the various forms of printing telegraph now in use.

I. Historical Sketch of Early Telegraphs.

Although the history of practical electric telegraphy does not include a period of more than half a century, the idea of using electricity for telegraphic purposes is much older. It was suggested again and again as each new dis­covery in electricity and magnetism seemed to render it more feasible. Thus the discovery of Stephen Gray and of Wheeler that the electrical influence of a charged Leyden jar may be conveyed to a distance by means of an insulated wire gave rise to various proposals, of which perhaps the earliest was that in an anonymous letter@@2 to the *Scots Magazine* (vol. xv. p. 73, 1753), in which the use of as many insulated conductors as there are letters in the alpha­bet was suggested. Each wire was to be used for the trans­mission of one letter only, and the message was to be sent by charging the proper wires in succession and received by observing the movements of small pieces of paper marked with the letters of the alphabet and placed under the ends of the wires. A very interesting modification was also proposed in the same letter, viz., to attach to the end of each wire a small light ball which when charged would be attracted towards an adjacent bell and strike it. Some twenty years later Le Sage proposed a similar method, in which each conductor was to be attached to a pith ball electroscope. An important advance on this was proposed in 1797 by Lomond,@@3 who used only one line of wire and an alphabet of motions. Besides these we have in the same period the spark telegraph of Reiser, of Don Silva, and of Cavallo, the pith ball telegraph of Ronalds, and several

@@@1 See his *Mathematical and Physical Papers,* vol. ii. p. 105.

@@@2 From correspondence found among Sir David Brewster’s papers after his death it seems highly probable that the writer of this letter, which was signed “ C. Μ.”, was Charles Morrison, a surgeon and a native of Greenock, but at that time resident in Renfrew.

@@@3 See Arthur Young, *Travels in France,* p. 3.