of 1906 necessitated the erection of a very elaborate and complicated arrangement of shoring to uphold the masonry while the work of underpinning the walls was being carried on. The foundations of the eastern portion of the cathedral were found to be dangerously insecure, being in fact laid upon a bed of soft marl only 10 ft. below the surface of the ground, in spite of the fact that at a depth of 16 ft. a hard solid stratum of gravel, at least 6 ft. thick, is arrived at. The medieval builders without doubt entertained suspicions as to the sustaining power of their proposed foundation, and so to ensure stability, as they thought, strengthened it by placing below the masonry horizontal layers of beech trees, filling up the interstices with hard chalk and flints. These contrivances were not sufficient to prevent the gradual sinking, through succeeding centuries, of the heavy mass of masonry. This not only affected the footings of the building, but caused fissures of an alarming nature in the vaulting and walls. Under the direction of Mr T. G. Jackson a carefully designed arrangement of shoring was applied, consisting of raking shores, flying shores and needling, for the purpose of the under- pinning, with specially designed timbering to support the arches and vaulting while they were undergoing repair. The foundations were found to be much undermined by water, which filled the excavations made for the underpinning in such quantities that it was necessary to employ a diver to deposit cement concrete in bag- fuls upon the gravel bed to which the new foundations are taken down. The illustration (fig. 7) will readily explain the external shoring above described, while fig. 8 shows the interior shoring of the presbytery.

Authorities.—The principal works of reference on this subject are: C. H. Stock, *Shoring and Underpinning;* T. Tredgold, *Ele­mentary Principles of Carpentry;* J. Blagrove, *Shoring and its Application.* (J. BT.)

**SHORNCLIFFE,** a military station in Kent, England, on high ground immediately north of Sandgate and 3 m. W. of Folkestone. It was first established in 1803, when Sir John Moore here trained the troops which afterwards formed the Light Division in the Peninsular War. Its position was chosen as a strategic position on the flank of the French invader who was expected at the time to descend upon the English coast.

**SHORT, FRANCIS JOB** (1857- ), English engraver, was

bom at Stourbridge, Worcestershire, on the 19th of June 1857. He was educated to be a civil engineer, and was engaged on various works in the Midlands until 1881, when he came to London as assistant to Mr Baldwin Latham in connexion with the Parliamentary Inquiry into the pollution of the river Thames. He was elected an associate member of the Institute of Civil Engineers in 1883. Having worked at the Stourbridge School of Art in his early years he joined the National Art Training School, South Kensington, in 1883. He also worked at the life class under Professor Fred Brown at the Westminster School of Art, and for a short time at the Schools of the Royal Institute of Painters in Water-colours. His real life-work now became that of an original and translator engraver. He was a keen student of the works of J. M. W. Turner; and his etchings and mezzotints from Turner’s *Liber Studiorum* (1885 seq.), wonderful examples of painstaking devotion and unrivalled skill, were among his earliest successes, showing the deepest sympathetic study of the originals combined with a full knowledge of the resources of engraving and unwearied patience. Short received the highest praise and constant advice and encouragement from Ruskin, and the co-operation of students of Turner such as Mr W. G. Rawlinson and the Rev. Stopford Brooke. After completing the series from the existing plates of Turner’s *Liber* Short turned to the subjects which Turner and his assistants had left incomplete. Several fine plates resulted from this study, bearing the simple lettering “ F. Short, Sculp., after J. M. W. Turner, R.A.,” which told very little of the work expended on their production even before the copper was touched. Short also reproduced in fine mezzotints several of the pictures of G. F. Watts, “ Orpheus and Eurydice,” “ Diana and Endymion,” “ Love and Death,” “ Hope,” and the portrait of Lord Tennyson, all remarkable as faithful and imaginative renderings. His own fine quality as a water-colour painter made him also a sympathetic engraver of the landscapes of David Cox and Peter de Wint. His subtle drawing of the receding lines of the low banks and shallows of river estuaries and flat shores is seen to perfection in many of his original etchings, mezzotints, and aquatints, notably “ Low Tide and the Evening Star ” and “ The Solway at Mid-day.” Other plates that may be mentioned are:— “ Gathering the Flock on Maxwell Bank,” a soft-ground etching; “ The Ferry over the Blyth,” “ Walberswick Pier,” soft-ground; “ Dutch Greengrocery,” “ Noon on the Zuider Zee,” “ De- venter,” “ Strolling Players at Lydd,” “ An April Day in Kent,” and “ Staithes,” all etchings; “ A Wintry Blast on the Stour- bridge Canal,” “ Peveril’s Castle,” and “ Niagara Falls,” dry points; “The Curfew,” “ A Span of old Battersea Bridge,” and “ Sunrise on Whitby Scaur,” aquatints; “ Ebbtide, Putney Bridge,” “ The Weary Moon was in the Wane,” “ Solway Fishers,” “ The Lifting Cloud,” and “ A Slant of Light in Polperro Har- bour,” mezzotints. Short was elected A.R.A. in 1906 when the rank of associate-engraver was revived. As head of the Engrav- ing School at the Royal College of Art, South Kensington, he had great influence on younger engravers. Short was elected to the Royal Society of Painter-Etchers and Engravers in 1885, and took a prominent part in conducting its affairs. In 1910 he succeeded Sir Seymour Haden as president. He received, amongst other distinctions, the gold medal for engraving at the Paris International Exhibition, 1889, and another gold medal (*Rappel)* 1900.

*The Etched and Engraved Work of Frank Short,* by Edward F. Strange (1908), describes 285 plates by the artist. (C. H.\*)

**SHORTHAND,** a term applied to all systems of brief hand­writing which are intended to enable a person to write legibly at the rate of speech. Synonyms in common use are steno- graphy (from *στevbs,* narrow or close), and tachygraphy (from *τaχbs,* swift), or occasionally brachygraphy (from *βραχbs,* short).

*Greek and Roman Tachygraphy.—*The question of the existence among the ancient Greeks of a system of true tachygraphy, that is, of a shorthand capable of keeping pace with human speech, has not yet been solved. From surviving records we know that there were, both in the 4th century B.c. and in the early centuries of the Christian era, as well as in the middle ages, systems in practice whereby words could be expressed in shortened form by signs or groups of signs occupying less space than the ordinary method of longhand writing. But such systems appear to have been systems of brachygraphy or stenography, that is, of shortened writing, which were not necessarily also systems of tachygraphy properly so called. If, however, as there is some reason to believe, the Roman system of tachygraphy, as exhibited in the Tironian notes (see below) was derived from a Greek system, it may fairly be inferred that the latter system was also a developed system of tachygraphy. But, be that as it may, no very early specimens of Greek shorthand have hitherto come to light; and the key to the decipherment of the steno- graphic inscriptions in the waxen book\* of the 3rd century in the British Museum (see below) still remains to be discovered. We are therefore in the dark whether we have in this MS. an example of true tachygraphic writing. Here it may be noticed that certain words of Diogenes Laertius have been taken to imply that Xenophon wrote shorthand notes (*bποσημeιωσaμtvQs)* of the lectures of Socrates; yet a similar expression in another passage, which will not bear this meaning, renders it hardly possible that tachygraphy is referred to.

The surviving records of Greek shorthand are not very numerous, although they are scattered through a long period of time, beginning with the 4th century b.c. and extending to the 14th century. They have been arranged in three groups. At the head of the first group, which embraces all that has been found dating down to the 3rd century, is a remarkable inscription, unfortunately fragmentary, on a marble slab discovered on the Acropolis of Athens in 1884, which is attributed to the 4th century B.c. ; and it is on this discovery that the actual claim of tachygraphy to have been practised among the ancient Greeks chiefly rests. The inscription describes a system, or rather part of a system, whereby certain vowels and consonants can be expressed by strokes placed in various positions. But here, too, it has been urged that we have the explanation of a system of brachygraphy only and not one of tachygraphy. To the first group also belong a few specimens of shorthand writing on papyri of the 2nd and 3rd centuries, and, above all, the most important MS. of Greek stenographic symbols hitherto discovered. This is the waxen book already referred to (Brit. Mus., Add. MS. 33,270), consisting of seven wooden tablets coated with wax on both sides, and two covers thus coated on the inner sides, which seems to have been the exercise- book of a shorthand scholar who has covered its pages with symbols, which in places are repeated again and again as if for practice.