

a foreman. He was now twenty-three years of age, and had three hundred men under him. He found that the discipline he had willingly undertaken at the Baron's Quay Foundry was not thrown away; and he secured the friendship of the late Mr. J. H. Beattie, M. Inst. C.E. After finishing the works on which he was engaged in London, Mr. Dunn went to Holland for a short time, but returned on account of his health. In the year 1838 he took the management of the St. George's Foundry, where he was promised a small share in the profits; but, being disappointed, he started the Windsor Bridge Iron Works at Pendleton, near Manchester, in 1847; but they did not prove successful. Between March, 1845, and November, 1871, Mr. Dunn took out twenty-three patents, principally for improvements in machinery. One of them, dated the 18th of March, 1862, for "Improvements in the construction of bridges, roofs, houses, and other structures," cost £662 10s. for printing and paper, and the price of the specification was £2 13s. per copy. He was a Member of the Institution of Mechanical Engineers, of the Institution of Naval Architects, and of the North of England Institute of Mining and Mechanical Engineers; and was elected an Associate of the Institution of Civil Engineers on the 4th of April, 1854.

He died on the 15th of December, 1871, and was buried on the 20th of the same month in Davenham churchyard, Cheshire.

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Mr. JOHN SAMUEL ENYS, who was born on the 21st of September, 1796, was lineally descended from the ancient family of Enys, of Enys, where his ancestors had been located even from the time of the Plantagenets. In the first parliament of Charles II. Samuel Enys, Esq., represented Penryn, and the name of the family appears on every page of the list of county sheriffs.

Mr. J. S. Enys was educated at Winchester, matriculated at Exeter College, Oxford, and took an honorary third in classics. He succeeded to the family estates about half a century ago, on the decease of his great-uncle, Francis Enys, Esq., and he first directed his attention to Scotch farming on the land which he retained in his own hands.

Energics such as he possessed, combined with an insatiable desire for the acquisition of knowledge, could not long be confined to farming. He became an active magistrate, and in the public business of the county his high integrity and sound opinion soon gained for him the confidence of all; he was thus enabled to

bring forward and carry many useful improvements in the roads, bridges, and general communications of the county.

He next turned his attention to the improvements in the steam-engines used for pumping at the Cornish mines, which had been introduced by Trevithick and others, whose merit he desired to have recognised; and upon this and kindred subjects he wrote several interesting and useful papers which have been printed in the "Minutes of Proceedings of the Institution of Civil Engineers," the "Transactions of the Royal Cornwall Polytechnic Society," the "Reports of the British Association," &c. A list of the majority of them is appended to this Memoir.

Forming an acquaintance with the late Sir Henry de la Bèche, then superintending the Government geological survey of Cornwall, sufficed to direct his attention to geology and mineralogy, and especially to that of his own immediate district, and in this he found great aid in the facility of pencil, which he had assiduously cultivated, originally in the study of architecture, in which he attained considerable proficiency. Of this he found the benefit when, in after years, he visited Italy with his family, and beguiled the weariness of forced repose, which, [during] the first attacks of his illness, would otherwise have been very irksome to his active spirit. The interest he took in improving the form and stability of fishing-boats, and, eventually, of larger craft, must not be omitted; and he worked out by calculation, drawings, and models, some interesting problems in ship-building. He married Miss Catherine, the eldest daughter of the late Davies Giddy Gilbert, of Eastbourne, then President of the Royal Society; and thus becoming acquainted with all the best scientific men of the day, he entered with avidity into the numerous improvements of the period, and had free scope for his energy and intelligence. Up to within a few years of his death he was a constant attendant at the meetings of the British Association, as of the learned and scientific societies of the metropolis of his own country, and his decease, which occurred on the 29th of May, 1872, is as much regretted among the large circle of friends he had made as in his own family circle, where his uprightness, probity, high feeling, and affection for all around him were justly estimated. He was a worthy model English country gentleman.

† He joined The Institution of Civil Engineers as an Associate. March the 12th, 1839, and was a very frequent attendant at the Meetings, writing Papers, and taking an active part in the Discussions.

Papers published by Mr. J. S. Enys in the Transactions of Learned and Scientific Societies, &c. :—

- “Some Remarks on the Granite found near Penryn, and on the Mode of Working it.” (London Phil. Mag. May, 1833, p. 321.)
- “Tables relative to the Properties and Practical Application of Steam.” (Trans. Roy. Cornwall Poly. Soc. 1835, p. 44.)
- “Observations on the Application of Expansive Steam.” (Trans. Roy. Cornwall Poly. Soc. 1836, p. 70.)
- “On the Performance of Steam Engines in Cornwall.” (Report Brit. Assoc. 1836, p. 130.)
- “Observations on Duty and Horse Power.” (Trans. Roy. Cornwall Poly. Soc. 1837, p. 70.)
- “Observations on Expansion Diagrams and on the Duty of Scoop Wheels and Pumps in Draining Fens.” (Trans. Roy. Cornwall Poly. Soc. 1838, p. 154.)
- “The Application to Government for a Depository for Mining Records.” (Report Brit. Assoc. 1839, p. xxiii.)
- “Remarks on the Duty of the Steam Engines employed in the Mines of Cornwall at different Periods.” (Transactions of The Institution of Civil Engineers, vol. iii., p. 449.)
- “Remarks on the Connection which exists between Improvements in Pit Works and the Duty of Steam Engines in Cornwall.” (Report Brit. Assoc. 1841, p. 103.)
- “Report of a Committee appointed at the Tenth Meeting of the Association on the Construction of a Constant Indicator for Steam Engines.” (Report Brit. Assoc. 1841, p. 307.)
- “Remarks on Floating Light Vessels.” (Trans. Roy. Cornwall Poly. Soc. 1842, p. 71.)
- “Remarks on Ships’ Fastenings and Steamboats.” (Trans. Roy. Cornwall Poly. Soc. 1842, p. 107.)
- “Report of the Royal Cornwall Polytechnic Society Premiums offered by J. S. Enys.” (Trans. Roy. Cornwall Poly. Soc. 1843.)
- “Plan for Floating Light Vessels and Buoys.” (Trans. Roy. Cornwall Poly. Soc. 1851, p. 35.)
- “On the Application of the Displacement Curves of Fish to the Construction of Boats.” (Trans. Roy. Cornwall Poly. Soc. 1854, p. 41.)
- “Photographs of Quarries near Penryn, showing the Structure of the Granite.” (Report Brit. Assoc. 1858, p. 80.)
- “Remarks on the Intensity and Quantity of the Junction Changes of Sussex and Cornwall, considered as Mining Districts.” 1863.

- “On Specimens of Hornblende and Serpentine from the Junction at Porthalla.” (Trans. Roy. Cornwall Poly. Soc. 1863, p. 43.)
- “On the Probable Course of the Tyrian or Carthaginian Ships to Cornwall.” (Trans. Roy. Cornwall Poly. Soc. 1866, p. 68.)
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MR. CHARLES AARON HASLETT was born at Hallowell, in the State of Maine, in the year 1822. At an early age he manifested precocious talents in mathematics. He attended a High School, and was trained as a teacher, more especially with reference to that branch of science. His health, however, would not permit him to follow that comparatively sedentary calling, and he therefore commenced a course of studies in civil engineering, under Mr. Mason of Cambridge, Massachusetts. This was about the year 1848; and he soon after became eminent as a railway surveyor, and compiled “The Engineer’s Pocket Field Book,” which became at once the reference and the companion of railway Engineers in the United States and Canada. It gives a compendium of the American system of laying out curves on railways, and embraces numerous tables and original formulæ. It is believed that Mr. Haslett was the first to introduce the system of calculation by Versed Sines, by which many problems of field work are abbreviated. After the publication of this book, Mr. Haslett’s services as a ‘Locating Engineer’ were eagerly sought after by railway companies.

The principal railways in which he was engaged were the European and North American and the St. Andrew’s, in New Brunswick, where he served under Mr. A. L. Light, M. Inst. C.E.; the Intercolonial railway of Canada, under Mr. H. G. C. Ketchum, Assoc. Inst. C.E.; the San Paulo railway of Brazil, where he was employed in the construction of the celebrated inclines, and of the Mugi Viaduct, designed by Mr. Brunlees, M. Inst. C.E.; the Virginian Central, the Union Pacific, the Western Pacific, and many smaller railways of the United States; and finally, Mr. Haslett was chief of the surveying staff on the Southern Pacific railway of California, where he died in June, 1872. He had just completed the survey of the last-named railway, and was returning to San Francisco, where he had left his family, when he was suddenly seized with bilious colic, accompanied by violent cramps. All the remedies that could be procured by the surveying party were immediately applied and administered, but without avail. No physician was within reach he was in the midst of a sandy desert,