

strumentality. The great Tercentenary celebration of 1884 will, through all the future history of the University, be associated with his name. The conception of the celebration was altogether his, and its successful realisation owed more to him than to any one else. The shock of his unexpected death, on the 30th of November 1884, following so quickly on the memorable events of the preceding April, is still fresh in the memory of his colleagues in the University and in this Society.

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JAMES NAPIER. By Robert R. Tatlock, F.I.C., F.C.S., F.R.S.E.

James Napier was born in the village of Partick, one of the suburbs of Glasgow, in 1810. His father was a hand-loom weaver in humble circumstances, and his mother was a sempstress. At the age of seven or thereby he was sent to a small day school in the village, kept by Mr Neil, a medical student, where in less than twelve months he learned to read with comparative fluency. On account of the straitened means of his parents, however, he was then sent to work, and found employment as a "tearer" in a calico printing works, his remuneration being 1s. 3d. per week. When he was between twelve and thirteen years of age he was put to his father's trade, and, being conscious of the limited character of his education, he endeavoured successfully to earn a little money, by extraneous efforts of various kinds, to enable him to attend a night school for two winters, by which his writing and knowledge of arithmetic were greatly improved.

Owing to dulness in the weaving trade, he betook himself to that of a dyer, and was employed by the Messrs Gilchrist at their works, Meadowside, Partick, where, at the age of eighteen, he was promoted to the post of foreman "piece dyer," his wages being then 11s. per week. When only twenty-one years of age he married, on the slender income of 13s. per week. About the year 1833, on account of the dull condition of the dyeing trade, a trades-union was formed among the workmen, in which he joined, and would not be dissuaded, even by offers of extra remuneration from his employers, in consequence of which he was dismissed. He was next employed as a

dyer at Glasgow Field Bleach Works, where he remained for four years, after which, his health failing, he endeavoured to earn a subsistence by keeping a lending library, but without success, and ultimately returned to the dye-works where he was first employed, in the capacity of a clerk. Prior to this Mr Napier had written an essay of great excellence on dyeing, which had attracted the notice of the late Mr John Joseph Griffin, who combined the business of a dealer in chemical and philosophical apparatus with that of a publisher, in Glasgow, and afterwards in London. He accepted an appointment in this establishment to prepare and bottle chemical reagents, and to make up apparatus—an employment which he found very congenial, as in some autobiographical notes which he has left, he says:—"My position brought me into contact with all sorts of inquirers; people in different trades came, not only to buy apparatus, but to question about difficulties. I had access to all kinds of chemistry books, and gave willing search to help them, thus gaining a knowledge of different trades; but I wanted system, and to improve myself in this respect, I invited the members of our Mutual Instruction Society to my house, and went through a course of chemistry, following Graham's work. By these means, and by nightly study, I obtained a pretty good knowledge of the principles of the science." It was, doubtless, while in this employment that he made the acquaintance of the late Dr James Young, F.R.S., of Kelly, at that time laboratory assistant to the late Professor Graham, of Anderson's College, Glasgow, who afterwards became Master of the Mint, which resulted in a life-long and most friendly intimacy. In the year 1839 the results obtained by Mr Thomas Spencer in the new art of electrotyping and electro-metallurgy excited much interest, and Mr Napier, on Mr Griffin's account, carried out some laborious and important work with the object of applying the art to useful purposes, such as copying woodcuts and engraving plates, &c.; and in 1842 he was appointed to take a leading position in the London electroplating works of Messrs Elkington & Mason, where, it is needless to say, he discharged his duties in a manner which reflected the highest credit upon him, some of the work which he turned out being truly very fine. The interest he took in the process of copper-smelting led to the discovery of a great improvement in the refining and granulation of copper, by the application of soda ash, in which

he encountered much opposition, notwithstanding which the process was taken up and wrought by a private company in 1847, who acquired the Spitty Works at Swansea for the purpose, the result of which was that at the end of the first year the books showed a net profit amounting to £19,000, or upwards of 55 per cent., £900 of which fell to Mr Napier's share. In 1844 he devised and described a process for extracting silver from its ores by calcination with common salt, which was, in principle, identical with the "wet process," devised by Mr William Henderson many years later, for the extraction of copper from poor ores. He also, some time thereafter, patented a method for the removal of tin, antimony, arsenic, &c., from poor Cornish ores. In 1852 he revised and extended some magazine papers which he had previously published, and they were published and issued by Messrs Griffin & Co., under the title of *A Manual of the Art of Dyeing*. This was succeeded by his well-known book entitled *A Manual of Electro-Metallurgy*, which in 1860 reached a fourth edition.

Mr Napier returned to Glasgow in 1849, and to his native place—Partick—in 1852, where he engaged in literary work and interested himself in its sanitary condition, analysing its potable waters, and instigating the movement which led to Partick being made a Police Burgh for its own local government. For several years he thus occupied himself, but retained his laboratory, employing himself as an investigating and consulting chemist. In 1860 he was requested by the Marquis of Breadalbane to visit and inspect a copper mine on his estate at Killin, on the south side of Loch Tay, which had been worked for years without profit, the result of which was that the works were started on the spot, under Mr Napier's superintendence, for preparation of copper regulus and the manufacture of sulphuric acid and artificial manures, but owing to the failure in the quality of the ore from the mine these were soon suspended. In 1861 he returned to Glasgow, and commenced business as consulting chemist, where he continued till 1864, when he erected sulphuric acid works at Vinegar Hill, near Glasgow, the operations of which occupied his time and attention for six or seven years. Being then relieved of the active management by his son, he returned to his literary pursuits, and soon produced his *Notes and Reminiscences of Partick* (1873), *Ancient Workers in Metals*, *Manufacturing*

*Arts of Ancient Times* (1879), and *Old Ballad Folk-Lore* (1879).

From the annexed list of his papers it will be seen that Mr Napier has earned for himself a recognised position in general science, and particularly in the special branches of technical chemistry and metallurgical science which were so congenial to him; and that, with a more liberal education, his mental activity and aptitude for scientific study would have won for him a great name in the scientific world.

Mr Napier was elected a Fellow of this Society in 1874. He was also a Fellow of the Chemical Society, and took much active interest in the local scientific societies with which he was connected, particularly the Philosophical, Natural History, and Archæological Societies of Glasgow. He was likewise a zealous worker in the management of Anderson's College, and of the "Young" Technical School, Glasgow, of which he was a trustee. The loss of his wife in the year 1881 proved a heavy blow to him, from which he never fully recovered; and on 1st December 1884 he terminated an active and useful life at the age of seventy-four, esteemed and respected by all who knew him.

#### BIBLIOGRAPHY.

1. On the Solubility of the Metals in Persulphate and Perchloride of Iron. *Chem. Soc. Mem.*, ii., 1843-45, pp. 16-20; *Phil. Mag.*, xxiv., 1884, pp. 365-370.
2. Observations upon the Decomposition of the Double Cyanides by an Electric Current. *Chem. Soc. Mem.*, ii., 1843-45, pp. 158-161; *Phil. Mag.*, xxv., 1844, pp. 779-881.
3. Observations on the Decomposition of Metallic Salts by an Electric Current. [1845.] *Chem. Soc. Mem.*, ii., 1843-45, pp. 255-260; *Archives de l'Electr.*, v., 1845, pp. 159-167; *Phil. Mag.*, xxvi., 1845, pp. 211-217.
4. Electricity Developed in Manufacturing Processes. *Walker's Electr. Mag.*, i., 1845, pp. 499-502.
5. On Electrical Endosmose. *Chem. Soc. Mem.*, iii., 1845-48, pp. 28-38; *Bibl. Univ. Archives*, ii., 1846, pp. 245-354; *Phil. Mag.*, xxix., 1846, pp. 10-21.
6. On the Unequal Decomposition of Electrolytes, and the Theory of Electrolysis. [1846.] *Chem. Soc. Mem.*, iii., 1846-48, pp. 47-53; *Phil. Mag.*, xxix., pp. 92-99.
7. On Copper Sheathing and the probable Cause of its Deterioration. *Glas. Phil. Soc. Proc.*, iii., 1848-53, pp. 161-173.
8. The Effects upon Health of inhaling the Fumes of Cyanide of Potassium Solutions. *Glas. Phil. Soc. Proc.*, iii., 1848-53, pp. 188-192.

9. Remarks upon Mineral Veins and Water-Worn Stones. *Glas. Phil. Soc. Proc.*, iii., 1848-53, pp. 231-238.
10. Remarks upon Sandstones used for Buildings, &c. *Glas. Phil. Soc. Proc.*, iii., 1848-53, pp. 313-322.
11. On Spurious Coins. *Glas. Phil. Soc. Proc.*, iii., 1848-53, pp. 344-350.
12. On Copper-Smelting. *Phil. Mag.*, iv., 1852, pp. 45-59, 262-271, 345-355, 453-465; v., 1853, pp. 30-39, 175-184, 345-354, 486-493.
13. Observations on the Trap Dykes in the Sea-Shore between the Bays of Brodick and Lamblash, in Arran. *Edin. New Phil. Jour.*, ii., 1855, pp. 81-83.
14. On the Action of Heat on Gold, and its Alloy with Copper. *Chem. Soc. Jour.*, x., 1858, pp. 229-233.
15. On Metallic Deposits found in two Chimneys attached to Reverberatory Furnaces, one being used for melting an Alloy of Silver and Copper and the other an Alloy of Silver and Gold. *Chem. Soc. Jour.*, xi., 1859, pp. 168-173.
16. On Incrustations in Steam Boilers. 1858. *Glas. Phil. Soc. Proc.*, iv., 1860, pp. 191-198.
17. Analysis of a small portion of Stone fused by Lightning. May 1854. *Glas. Phil. Soc. Proc.*, iv., 1860, p. 206.
18. On Trap Dykes between Condon and the south end of Whiting Bay, Island of Arran. *Glas. Phil. Soc. Proc.*, iv., 1860, pp. 321-324.
19. Black and Clayband Ironstones; their Composition and Valuation. *Glas. Phil. Soc. Proc.*, v., 1864, pp. 210-217.
20. On the Cyanides of the Metals, and their Combination with Cyanide of Potassium. *Chem. Soc. Mem.*, ii., 1843-45, pp. 82-96; *Phil. Mag.*, xxv., 1844, pp. 56-71. (This paper was prepared conjointly by Mr Napier and Mr C. J. O. Glassford.)
21. On the Dynamics of the Galvanic Battery. *Phil. Mag.*, xxii., 1864, pp. 52-54.
22. Notes upon Dyeing and Dyed Colours in Ancient Times. *Glas. Phil. Soc. Proc.*, v., 1864, pp. 175-197.
23. On Ancient Mortars and Cement. *Glas. Phil. Soc. Proc.*, 1867, x. pp. 86-98.
24. Notes on Partick in Olden Times. *Glas. Archæol. Soc. Trans.*, i., 1886, pp. 256-271.
25. On some Popular Superstitions common in Partick forty years ago. *Glas. Archæol. Soc. Trans.*, i., 1888, pp. 391-398.
26. The Farmer and the Chemist. *Glas. Phil. Soc. Proc.*, vii., 1871, pp. 387-398.
27. On the Results of some Experiments on the Leaves of various Trees and Shrubs. *Glas. Nat. His. Soc. Proc.*, iii., 1878, pp. 105, 106.
28. Miscellaneous Notes in Natural History. *Glas. Nat. His. Soc. Proc.*, iii., 1878, pp. 194, 195.

#### COMMUNICATIONS TO THE "SANITARY JOURNAL."

1. On Damp Walls and Newly Built Houses. Nov. 1, 1876, i. p. 156.
2. The best Means of Drying the Walls of Newly Built Houses. Dec. 1, 1876, i. p. 162.
3. The Rivers Pollution Scheme. April 1, 1879, iii. p. 53.
4. Water Supply for Villas. Oct. 1, 1880, iv. p. 255.