

the Second World War', 'The archaeology of rock-etry' and 'Survival and reuse'.

The ingredients of gunpowder are charcoal, sulphur and saltpetre and its manufacturing techniques were shrouded in secrecy. Charcoal was readily available from Britain's wooded areas and saltpetre, or nitre, could be collected and refined but sulphur had to be imported, usually from Italy or Sicily. Chapter 1 traces the sources of early knowledge of gunpowder and its diffusion in Britain from the 13th century together with the location of manufacturing sites. During the Civil War the industry was centred on London, and from the middle of the 17th century many powder mills are documented for the first time. Developments during the 1650s on the River Lea in Essex made it one of the greatest concentrations of powder mills in the country.

Gunpowder manufacture was naturally affected by the exigencies of war and the ownership of the mills became an issue. It soon became clear that state intervention was necessary. Through the 17th century and the first half of the 18th, the mills were in private hands. The government agency for purchasing powder was the Board of Ordnance. Chapter 2 deals with the establishment of the Royal factories where manufacture was vested in the Crown. The first mills acquired were those in Faversham in 1759.

Chapter 3 deals with competition and rivalry in gunpowder manufacture in the second half of the 19th century, concentrating largely on The Royal Gunpowder Factory at Waltham Abbey. Chapter 4 charts the demise of gunpowder following the adop-

tion of cordite as the main propellant for the British services in the 1890s. The rise of the chemical explosives industry from 1850 to 1914 is dealt with in chapter 5. The Waltham Abbey site was a major part of this new industry. Chapter Six deals with the Great War of 1914–18 which the author describes as a 'chemists' war'. The chapter reveals a range of new chemical industrial sites and, although the Lea Valley was still important, it shows that there was a major new cluster of sites in the Liverpool–Manchester area. Rearmament between the two World Wars is dealt with in chapter 7 and reveals a great range of industrial sites. As a natural corollary to the development of the chemical explosives industry, chapter 8 contains a most interesting account of the archaeology of rock-etry. The account begins with the rocket-like fire-works of the 12th century, to the Congreve rocket developed at Woolwich Arsenal, and through to 1971. The last chapter deals with the legacy of powder works and their contribution to the industrial landscape. It is appropriate that the book's publication coincided so closely with the opening of the Royal Gunpowder Mills, Waltham Abbey to the public in May 2001.

The book is extremely well produced and contains a potent mix of historical narrative, contemporary illustrations, measured drawings based on site investigation and aerial photographs. The author's historical insight and interpretive skills should make the book a standard work on the subject for many years.

DENIS SMITH

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