almost evangelical sense of purpose, enabled him to harness the new mechanized print technologies of the 1830s and 1840s more effectively than any of his rivals. With his younger brother Robert, well-known to historians of science as the anonymous author of the evolutionary blockbuster *Vestiges of the Natural History of Creation* (1844), supplying attractive and edifying copy, *Chambers's Journal* was selling eighty thousand copies a week by the 1840s, far surpassing the circulation even of Charles Knight's famously cheap *Penny Magazine*. Such success elevated the self-made Chambers to the highest echelons of Edinburgh society, although, in line with his altruistic sense of publishing as a missionary vocation, much of his personal wealth was donated to charity.

New technologies also presented challenges as much as opportunities. *Steam-Powered Knowledge* is split into three sections, and Parts 2 and 3 describe how the firm of W. & R. Chambers responded first to the coming of the railways and then the advent of new transatlantic steamship routes. The railways afforded a fast and efficient distribution network that was especially important for Chambers, four hundred miles away from London in Edinburgh. For once, however, he was slower than his rivals, most notably George Routledge, to recognize that cheap print was actually the chief form of recreation available to travellers by train. It was Routledge, motivated solely by profit and without any of Chambers's proselytizing zeal for working-class education, who took the lead in developing the new formats of print and innovative methods of retailing them that emerged alongside the rapidly expanding railway network. Similarly, the Cunard Line steamships that dramatically reduced the length of transatlantic crossings in the 1840s opened up the enormous American market to Chambers's publications, with the publisher himself visiting the young republic in 1853–1854. But the cost of sending bulky cargoes of printed books and magazines by steamship remained exorbitantly high, and older sailing routes continued to be used as a cheaper alternative. It was instead piratical American publishers who benefited most from the speed of steamships, which enabled them to import just a single copy of one Chambers's works, reprint it without any international copyright restrictions, and release it to American readers barely days after its British publication.

Fyfe's fine book is another valuable contribution to the scholarly endeavour, over the last two decades, to integrate methods from the field of the history of the book with the history of science. *Steam-Powered Knowledge* differs from volumes like Marina Frasca-Spada and Nick Jardine's *Books and the Sciences in History* (2000), however, in one crucial respect. Science is regarded only as part of a broader spectrum of non-fictional information including history, political economy and classics, and is at no point singled out for special consideration. This explicit focus on 'knowledge' rather than 'science' is certainly attuned to the miscellaneous nature of much so-called 'useful information' in the early nineteenth century, and also reflects the thrust of the recent historiographic innovations summarized in Jim Secord's 'Knowledge in transit' (*Isis* (2004) 95, pp. 654–672). It is nonetheless a little unnerving to find such methodological arguments followed through in practice with such rigour and precision. *Steam-Powered Knowledge*, which employs the term 'science' only around fifteen times in the 261 pages of its main text, is an excellent work of history of science, but not necessarily as we are accustomed to think of it.

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Colin A. Russell and John A. Hudson, **Early Railway Chemistry and Its Legacy**. Cambridge: Royal Society of Chemistry, 2012. Pp. xiii + 193. ISBN 978-1-84973-326-7. £29.99 (paperback).
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As in all areas of cultural life, science history is subject to the vicissitudes of fashion. Some have noted that recently published work in the history of chemistry has not shown particular strength in

nineteenth- and twentieth-century matters and, moreover, it has been particularly weak in its consideration of industrial areas. Russell and Hudson buck the trend in this survey, which might, from its title, be thought to appeal to the 'anorak' enthusiasts market. In fact, it provides a highly competent overview of an unconsidered area. Whatever one's prejudices might have been before opening the pages of the book, the reader discovers how, over nearly two centuries, scientific research and its application have played a key role in the technology, politics, economics and social history of arguably the most important transport system of its times.

Railway systems of trains drawn by steam locomotives were developed in the 1830s in the north of England (the book covers only the British experience). It became apparent that advice of a chemical nature was important if railways were to succeed: there were issues concerning iron, non-ferrous metals, lubricants, water, air quality and fuel. In fact, chemistry was to pervade many aspects of nineteenth-century industrial life and it is noteworthy that the Chemical Society was founded in 1841 and the Royal College of Chemistry four years later, both indicators that practitioners were becoming professionalized. Initially, railway companies employed such chemists as consultants. Water analysis became important because hard water produced deposits in boilers, which reduced their efficiency and in extreme cases could cause explosions. Railways could not choose to move their location to areas of soft water, so analysis of water samples was routinely conducted by the larger companies (William West of Leeds started this as early as 1835 for the Stockton and Darlington Railway) and methods of water-softening were devised for treating the huge quantities needed. The quality of air in tunnels with locomotives passing through was feared by some; chemists showed that they had nothing to worry about.

One of the common tasks assigned to the chemists was the analysis of iron rails. In the early days, wrought iron was used, but rails from this material were too soft and easily became worn. On the other hand, rails of cast iron (with high levels of carbon) were too brittle, and some other impurities had deleterious effects on their properties. It was at a time when railways were rapidly expanding that improved methods of steel production were devised by Bessemer in 1856, and by the late 1860s steel rails had become commonplace. Two railway companies even ran their own steelworks. Some samples made at Crewe and tested for their properties there and at Cammell's works in Sheffield were collected by the contemporary metallurgist John Percy and they survive in the Science Museum, London.

When the amount of chemical work grew to critical levels, railways started to employ specialists directly. The first 'railway chemist' was appointed to the London and North Western Railway at Crewe in 1864, and after a spell of the LNWR possessing the only railway laboratory others were soon established. The widespread scale of operations was impressive. A very helpful table in the book (developed from earlier work of others) shows where the laboratories were situated, when they were established and who was in charge of them. There were fourteen prior to the 1923 grouping, following which the four companies each identified a head chemist. 'Rationalization' followed nationalization in 1948, with British Rail running just four laboratories. In 1996, following the government's rather desperate privatization of railways, the story draws to a close with the operation of chemical laboratories being taken over by a newly founded firm of analytical consultants, Scientifics Ltd.

Early Railway Chemistry considers the nationally important advisory work of chemists, including arrangements which were made for coordination under wartime conditions, which included the occasional relaxation of rules concerning transport of dangerous goods, explosives in particular. The book also deals with the work chemists were required to perform when, increasingly, consignees of goods made claims (some mischievous) for damage, and it covers the more exotic tasks which chemists were assigned, such as advising on luminous paints for station name boards. In all these ways and many others, a subject largely untouched has been brought to

our attention. There must be other examples of behind-the-scenes work of scientists which await revelation.

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SADIAH QURESHI, **Peoples on Parade: Exhibitions, Empire, and Anthropology in Nineteenth-Century Britain**. Chicago and London: The University of Chicago Press, 2011. Pp. vii + 382 ISBN 978-0-266-70096-0. £29.00 (hardback).
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Paying to see live performances of extra-European peoples was enormously popular during the nineteenth century. For a fee – sometimes as little as a shilling – Britons could encounter representatives from various populations of the different continents of the world. The majority of these people came from colonized territories and were exploited by Europeans for personal, political and scientific gains. The practice of displaying humans is an important part of the legacies of natural history and anthropology. Moreover, it connects with Britain's imperial aspirations of the nineteenth century. It is against this backdrop that Sadiah Qureshi's *Peoples on Parade* tells the story of human diversity exhibits during the Victorian age. Beautifully written, and rich in detail, it should form the basis of all future investigations into the early history of human sciences in Britain.

The book is divided into three main sections, each of which examines a much-neglected aspect of what the author calls 'nineteenth-century living foreign people exhibits'. It attends closely to the processes involved in promoting, managing, producing and interpreting these shows. Section One discusses the significance of the street as a site of knowledge that shaped nineteenth-century understandings of human diversity. Chapter 1 is probably the most important part of the book, because it redefines our understanding of nineteenth-century foreign living people shows. In particular, Qureshi examines the writings of Victorian urban spectators, such as Henry Mayhew, who would travel the streets of London to observe the different human varieties lining the pathways of the British capital. By focusing on the urban poor, Qureshi is breaking away from traditional historical narratives on the history of human diversity that prioritize extra-European peoples from remote islands as the sole subjects of ethnological and anthropological investigations. This shift in focus is a refreshing change in the historiography that is greatly welcomed. It opens up many new questions about the significance of human variation studies inside Europe during the nineteenth century. Moreover, Qureshi's analysis of the promotional materials of nineteenth-century human diversity shows aligns her work with some of the recent scholarship on the popularization of science, Victorian visual culture and the history of observational practices within the natural sciences.

In Section Two of Qureshi's book the focus changes and she looks at the shows themselves. She examines the managers who organized the performances and the methods by which entertainers were recruited, and makes some analysis of how visitors were to interpret the exhibits. Once again, Qureshi identifies some of the more underdeveloped areas of the secondary literature on Victorian human diversity shows. For instance, Qureshi argues rather convincingly that managers occupied a key role in shaping the audiences' understandings of topics relating to race. This is a theme that has been largely ignored in the secondary literature. For the most part the emphasis is on managers' promotional techniques and economic gains. In Section Three of *Peoples on Parade*, Qureshi examines the relationship between living foreign people exhibits and the scientific study of races. She looks in detail at the role these shows played in educating researchers and the public about human variation, and she considers some important but often overlooked ethnological and anthropological figures, including Robert Gordon Latham, James Hunt and John Conolly.

There is much to be admired about Qureshi's detailed and sensitive look at the history of nineteenth-century human diversity shows. However, because of the delicate nature of many of the