felony of rape itself – dealt with a much higher proportion of sexual offences during this period than the assize courts, given the well-known formal and informal difficulties that have long accompanied attempts to prosecute sex crimes (22–3). Bates' decision to include transcriptions of these evocative testimonies, and above all her invaluable scene-setting and explanation of why each particular case study was selected for transcription, will be particularly welcomed by those using the book in undergraduate teaching, where students may well have not had an opportunity to read depositions before and will be unfamiliar with their particular style and the logic of how the court proceedings were recorded.

The book also helps to nuance our understanding of the extent to which different types of criminal offence might be understood through a national or local lens by the urban and rural communities within which they occurred during the long nineteenth century. Research on same-sex desire in northern England and gang violence in early twentieth-century Glasgow by Helen Smith and Andrew Davies, respectively, has demonstrated that communities might well insist on a specific regional approach to particular sorts of criminality that could contrast sharply with the judicial or cultural approach demanded by the metropolis.[1] In contrast, the widespread popular and judicial sympathy for infanticide defendants in the same period invariably followed the same broad trajectory across England and Wales.[2] The demonstration by Bates that very similar issues and competing knowledge claims were made by physicians and magistrates based in both Somerset and Middlesex during the course of the nineteenth century thus raises intriguing questions for readers about the extent to which national, rather than local, constructions of what constituted child sexual abuse, how consent could or should be determined and the power of the medical profession to help detect, prevent and punish the crime held sway. This book will be of great interest to all medical humanities scholars working on the nineteenth century and a key addition to both undergraduate and postgraduate reading lists.

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Angela N.H. Creager, *Life Atomic: A History of Radioisotopes in Science and Medicine* (Chicago, IL and London: University of Chicago Press, 2013), pp. xvi, 489, $45, ISBN: 978-0-226-01780-8.

In *Life Atomic*, Angela Creager recasts the history of science and medicine in the United States. Hers is a history from below. In Creager's hands, we see the full scope of biomedical research from the perspective of the radioisotopes that flowed out of nuclear production facilities and through an intricate network of laboratories, environments and living bodies. Isotopes went everywhere in the post-war period, and Creager follows them with rigour and verve.

As its title suggests, *Life Atomic* unearths that sweeping impact of the atomic age, and especially the Atomic Energy Commission (AEC), on medicine and the life sciences. While radioisotopes had been in use for decades, the rapid growth of nuclear technology

[1] Helen Smith, *Masculinity, Class and Same-Sex Desire in Industrial England, 1895–1957* (Basingstoke: Palgrave Macmillan, 2015); Andrew Davies, *City of Gangs: Glasgow and the Rise of the British Gangster* (London: Hodder & Stoughton, 2013).

[2] Daniel J.R. Grey, "'The agony of despair": Pain and the cultural script of infanticide in England and Wales, 1860–1960', in Rob Boddice (ed.), *Pain and Emotion in Modern History* (Basingstoke: Palgrave Macmillan, 2014), 204–19.

during and after World War II inaugurated a new supply chain and, especially after the war, a new need to depict the atom as a symbol of progress in an era of peace. This need energised the immense and rapid dispersion of radioisotopes and sustained a range of uses – therapeutic, scientific and industrial – in the face of mounting evidence about the unforeseen consequences of exposure to radioactive material.

Creager's account is in a sense, then, an ironic one. The hope required to build and sustain the vast infrastructure at the heart of *Life Atomic* was undercut, again and again, by the actual results that scientists and health professionals achieved as they engaged with these materials. Chapters on the production, dissemination and regulation of radioisotopes give way to an exploration of their impact in a range of fields. Most central – and of most interest to historians of medicine – is the history of nuclear medicine, from hype about curing cancer to using isotopes in everything from the study of metabolism to medical diagnostics. Creager shows how optimistic attempts to harness the atom always entailed new knowledge about the risks involved. If radioisotopes were 'magic bullets', their potential power made them particularly prone to misfiring.

These ironies are most poignant in Creager's chapter on 'Guinea Pigs'. Here, a delicate dance unfolds between 'the government's vigorous promotion of the scientific and medical benefits of radioisotopes' (263) and growing recognition of the harms produced by radioactive exposure. In government, military and private studies, human subjects (including pregnant women) ingested radioactive materials to aid the study of a range of metabolic and immunological processes. As knowledge about the adverse effects of even low-level radiation emerged, the government and its private customers worked to develop a range of regulatory practices – including 'informed consent', used for the first time in the context of such studies – that continue to govern human subject research today. Creager insists that we cannot presume 'the necessity of federal government regulation to protect subjects of medical investigations' (308). Instead, she shows how calls for oversight emerged from an uneasy balance between research and regulation.

Radioisotopes did more than reconfigure science and medicine in the post-war period. As Creager demonstrates, they also enabled a new way of thinking about life itself. Researchers in a range of fields, from biochemistry and physiology to ecology and public health, came to rely on radioisotopes as 'tracers' of the complex, often hidden, processes at work in our bodies and the environment. The use of atomic tracers allowed researchers to measure metabolic rates more precisely and quantify the bio-accumulation across the food chain. What is more, tracers revealed the specifically *temporal* qualities of such systems, enabling new understanding of the dynamic patterns underlying energy flows on scales from the cellular to the continental. Such discoveries reinforced new approaches to complex interactions in medicine and the life sciences that continue to shape research programs and funding priorities in the twenty-first century.

Creager does more than expose this 'tracing' epistemology – she adopts it. This self-conscious appropriation of topic as method is the most exciting feature of *Life Atomic*. Historians of science and medicine often invoke the rhetoric of 'actor's categories', calling on one another to attend to the language in which historical actors understood themselves. Such warnings are, in part, a shared effort to ward off the evils of presentism – or, even worse, Whiggism – in historical analysis. Creager has gone one step further. Rather than rest in the comfort of actor's categories, she has blurred the line between actor's and analyst's *concepts* as well. Just as scientists traced 'dynamic transformations', so Creager 'uses radioisotopes as historical tracers' (4). The same features that made them useful for biomedical research have enabled Creager to tell their history, and indeed the history of science and medicine, in a new way. Call it 'endogenous analysis'.

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Life Atomic is thus a historical epistemology from the inside out. Creager's method is reminiscent of what Marxists call immanent critique and what Clifford Geertz once called 'internal conversion'. (It is, I think, an accident of history that Geertz's term is drawn from atomic physics.) Methodological innovation, in this mode, need not be imported. It can be found in the sources themselves. Creager gives us an epistemology of tracing; other histories will afford other endogenous analytics. *Life Atomic* is not a call for more histories of tracers, then – it is a call for a new kind of history, one framed less in terms drawn from without than in terms unearthed from within. Though Creager is too humble to admit it, her book suggests a new methodology for the history of science and medicine, if not history itself. If we adopt it, historical scholarship might become more unified and more pluralistic at once.

Creager has given us more than a new history. *Life Atomic* models a new way to write such histories. It should be read by anyone interested in understanding the past on its own terms.

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Mary de Young, *Encyclopedia of Asylum Therapeutics, 1750–1950s* (Jefferson, NC: McFarland, 2015), pp. vi, 368, $55, paperback, ISBN: 978-0-7864-6897-3.

In her *Encyclopedia of Asylum Therapeutics*, sociologist Mary de Young has written an engaging volume that unearths practices and theories directed toward mental disorders and connects strands of treatment within psychiatric institutions across centuries. The volume really is an encyclopaedia, with entries arranged in alphabetical order from 'Awakenings' to 'Total Push'. Within each entry, de Young explains the term, offers alternative names or ways in which the concept might have been noted, and traces its history. De Young uses sources that explain medical ideas and practices, but also employs others to illustrate how recipients of the treatments experienced them and how they were received by the public. The volume offers a view of the eclectic methods that asylum physicians have employed over the centuries, from some that have been well described ('Psychosurgery') to others that have faded from modern memory ('Rotation, Oscillation and Vibration').

The encyclopaedia entries are well referenced and there are bibliographies for each one that include both primary and secondary sources. Some entries are more extensive than others – 'Shock Therapy' is appropriately long at twenty-four pages, while 'Metallotherapy' gets three pages. De Young includes practices that are rooted in specific times and places ('Hypothermia') as well as others that span centuries and continents ('Expressive Therapy' includes art, music and dance). Many entries discuss interventions done on patients' bodies, although de Young does include psychological factors such as 'Moral Treatment'. Some of the entries help to clarify concepts frequently encountered by scholars and teachers of the history of psychiatric institutions, such as 'Hydrotherapy', 'Forced Feeding' and 'Mechanical Restraints'. The scope is international, but Western in its orientation.

Although de Young's emphasis throughout is on therapeutic approaches by asylum physicians, she is careful not to let the encyclopaedia become either heroic in celebrating physicians' achievements or overly polemic in its criticisms of past practice. While it would be easy to read the entries as evidence of the ridiculous (or harmful) ways in which asylum physicians have done things to patients (a reading that is supported by