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## Chemistry beyond the Academy

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Outside the formal courses offered by the universities, which existed largely to fulfil the needs of medical students, chemistry teaching proliferated in a multiplicity of forms in late 18<sup>th</sup> and early 19<sup>th</sup> century Scotland. Some courses were offered with clear aims in mind, but many of those studying chemistry were caught up in a wave of enthusiasm, simply wanting to discover more about what the subject embraced. There were plenty of proficient teachers available who were willing to help fulfill the demand: the names James Anderson (1739-1808), Thomas Thomson (1773-1862), Andrew Ure (1778-1827), Andrew Fyfe (1792-1861), Edward Turner (1798-1837), William Gregory (1803-1858), David Boswell Reid (1806-1863) and George Wilson (1818-1859), all of whom found high-status employment and fame later in their careers, spring to mind.. Benefiting from the success of the courses, publishers were encouraged to provide chemical texts, while instrument makers marketed cheap chemistry equipment, allowing practical work to be undertaken at home. The subject covers a broad spectrum of how chemical knowledge was to spread, and it incorporates the expansion of Scottish universities and how they allowed for the development of extra-mural teaching, the origins and spread of the mechanics movement, and how an understanding of chemistry could be regarded as a social attainment.

Of those who signed on for the lectures of the legendary Joseph Black (1728-1799), relatively few were studying to fulfil the professional requirements needed for graduation in medicine. A number of those attending would become surgeons, but it is clear that many attended out of curiosity for the science or because they thought it would be useful for them in their line of work. It is therefore unsurprising that this created an atmosphere which encouraged teaching outside the university, where to be successful, lecturing skills were paramount. It was not infrequently remarked that while the professors were dull, the extra-mural lecturers brought excitement to the subject. Many students wished to perform experiments for themselves. Black's successor Thomas Charles Hope (1766-1844) had the reputation of discouraging experimentation, driving students into the arms of teachers who were providing courses extramurally. To take account of the inevitable drift

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away from the university-provided teaching, extra-mural courses were allowed to count towards the university requirements of those intending to become doctors, providing the teachers had certain qualifications themselves. Hope had a particularly acrimonious argument with a man he had hired as his assistant, David Boswell Reid, who attempted to have a separate chair of practical chemistry established. Eventually Reid privatised himself, and offered popular extra-mural courses in a house intimidatingly close to Hope's official lecture theatre.

University-style teaching did not account for all demands. Providing for those at a lower end of the social scale who wanted to know something of science, mechanics institutes were established, where courses were given in the evenings for low fees. These had their roots in Glasgow at the end of the eighteenth century in Glasgow University and the Andersonian Institution, though the first independent institute, the Edinburgh School of Arts, was established at in 1821. Here, a systematic course of chemistry was immediately offered by Andrew Fyfe, author of *Elements of Chemistry... A Manual of Chemistry for the Use of Pupils of Mechanics Institutions* (1827). He regularly filled the lecture room, before he was appointed to a professorship at Aberdeen University. Mechanics Institutions sprang up all over Scotland; by 1851 there were about 55 of them, ranging in membership from 20 to 700. Even a small town such as Kelso (in the south of Scotland), with a population of around 4,000, had a regular course of chemistry lectures provided by a local minister of religion, whose course incorporated experimental demonstrations. Over the period 1768 to 1860, forty-six extra-mural teachers have been identified in Scotland (though this includes a few who also provided 'official' university courses). Over the period under consideration, there ran a swathe of fascination for chemistry. Dr Johnson's biographer, James Boswell, who attended Black's special course of chemistry offered to solicitors and advocates, was certainly in the minority when he wrote "We were mainly lawyers... I did not feel much curiosity for the science."

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