

Poisson, Cauchy), that the great work of Gauss on the theory of numbers, which for twenty years had remained sealed with seven seals, was drawn into current mathematical literature, and became, as Newton's 'Principia' had become a century earlier, an inexhaustible mine of wealth for succeeding generations.

18.
Chemical
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established
in 1826
through
Liebig.

About the same time the experimental side of exact research—the use of the chemical balance, through which Lavoisier and his followers had done so much to establish chemistry on a firm and independent basis—received a great impetus by the establishment of the *first chemical laboratories* within the pale of the universities.¹ In this direction the greatest influence probably belongs to the small town of Giessen, where Liebig opened his celebrated laboratory in the year 1826. It became the

Steiner in geometry left to his followers a large number of theorems and problems without proofs which he had solved by his methods; and it was only in quite recent times that the Italian Cremona succeeded in definitely clearing up the whole of this original and valuable bequest. See Hankel, 'Die Elemente der projectivischen Geometrie, chapter i.; Jacob Steiner, Werke, vol. ii. p. 495.

¹ On Liebig's laboratory see Hofmann's Faraday Lecture, p. 8. Chemical laboratories existed for teaching purposes before Liebig's at Giessen. Kopp ('Geschichte der Chemie,' vol. ii. p. 19) mentions one at Altorf, which was founded, 1683, by the council of the city of Nürnberg for academic teaching purposes. For the training of the modern school of chemists no man did more than Berzelius, in whose laboratory there were trained Chr. Gmelin, Mitscherlich, H. and G.

Rose, Wöhler, Magnus, Arfvedson, Nordenskiöld, Mosander, and others. Sir William Thomson (Lord Kelvin) in 'Nature,' vol. xxxi. p. 409, mentions the beginnings of laboratory-teaching at Glasgow by Prof. Thomas Thomson in 1828. But what was probably peculiar to Liebig's laboratory was the systematic and methodical training, on a specially devised plan, in qualitative, quantitative, and organic analysis, by which young persons were introduced to a thorough knowledge of chemical properties and manipulations. The guides, text-books, and tables for analytic work of Will, Fresenius, and others were elaborated to meet the requirements of such methodical teaching. Almost simultaneously with Liebig at Giessen, Purkinje at Breslau laid the foundation for the first physiological laboratory. See Du Bois-Reymond, 'Reden,' vol. ii. p. 367.