Following are the excerpts from the web site http://www.the-actuary.org.uk/monthsissues_frames/articles/04_05_06.asp

THE ARITHMOMETER

…

Charles Xavier Thomas

It was not until 1820 that the first practical calculating machine appeared. This was the arithmometer, invented by Charles Xavier Thomas of Colmar in Alsace, who lived from 1785 to 1870. … The arithmometer could cope with addition, subtraction, multiplication and division. Instead of a keyboard, the machine had a series of slides for entering numbers. For addition, the turn of a handle added these numbers into the row of 'total' dials shown on a moving carriage on top of the machine. A reversing switch enabled the machine to perform subtraction while turning the handle in the same direction. Multiplication was performed by repeated addition and division by repeated subtraction. The mechanical means, by which digits which had been 'set' into the machine could be added to the number in the 'total' dials, was based on the same 'stepped reckoner' Leibniz had used in 1694.

Thomas's machine was not an instant success. It was remodelled numerous times, presumably to increase its reliability and reduce its heavy cost. Early versions did not have a handle – instead there was a silk ribbon which had to be pulled outwards to start the machine!

Thomas promoted his machine via various exhibitions. Starting in 1844 with the French national exhibition of industrial products, the arithmometer was granted an honourable mention, but was considered inferior to a rival machine (Roth's adding and calculating machine). Five years later, Thomas tried again. This time he was awarded a silver medal and the jury report devoted three pages to his machine. The gold medal, however, went to a machine by Maurel and Jayet. In the 1851 Great Exhibition in London, once again the arithmometer received a prize medal, but was judged inferior to a Russian entry (Staffel's machine).

Thomas then embarked on an ambitious marketing campaign for his machine, in which he gave examples to numerous royal families in Europe. As a result, he received many decorations and endorsements that he was able to use in his promotional material. Then came the Paris exhibition of 1855, for which Thomas created a special giant machine which looked like a piano – some six feet long, complete with 15 setting sliders and 30 result dials. Despite this immense effort, the machine once again failed to achieve first place, this honour going to the Scheutz difference engine, which calculated and printed mathematical tables.

Extending the scope

…

The arithmometer was particularly useful in insurance. Actuaries may have been the first professional group to adopt it. From the 1860s there was a steady stream of articles showing how the machine could be used in the construction of actuarial tables. A letter in *JIA* 12 of 1865 indicates that Major-General Hannyngton was experimenting with the use of the arithmometer in actuarial work, when he wrote; 'I am convinced that the days of hard work in the actuary's craft are coming to an end'. He followed this up by a paper to the Institute in 1873 (*JIA* 16), fully describing the use of the machine for calculating actuarial functions. During the actuarial valuation of the Prudential Insurance Company in 1877, they had 24 arithmometers at work in valuing the 2.5m policies then in force. Unfortunately, the machine was not always reliable in such heavy use. Springs would sometimes snap and mechanical defects would develop from time to time.

In 1892, the Council of the Institute decided to buy an arithmometer (costing £36) as a gift to Peter Gray, for his 'very valuable services in connection with the Mortality Experience Investigation'…