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Letter to the Editor

With reference to Dr. Mackenzie's recent superb paper entitled Origin and Development of Differential Thermal Analysis [1], I thought it might be interesting to compare and contrast certain aspects of the development of DTA equipment described therein with the simultaneous developments in thermogravimetry.

For example, the use of liquid rheostats for temperature control in DTA in the 1930s (p. 333) is similar to that in TG. The first recorded use was by Pierre Vallet, in 1928 [2], although his apparatus was, perhaps, slightly more ingeneous. On the other hand, one of Dr. Mackenzie's references to a liquid rheostat is to the Japanese worker Satô [3] whereas, in TG, no early Japanese worker used such a device, manual activation of a variable transformer being the norm. The above reference is particularly interesting since Satô worked in the same University as Honda (Tohoku) who described the first thermobalance, in 1915 [4], which incorporated a manually activated transformer. Indeed, it is documented [5] that workers operating a thermobalance, in those days, in Japan, were obliged to adjust their liquid intake to enable them to endure an uninterrupted 10–14 hour stint at the variable transformer.

The use of motor-driven autotransformers in DTA is exactly paralleled in TG, particularly among early French workers. Again, ingenuity seemed to be the hallmark of several devices, one in particular being that described by Pierre Dubois [6] (who, incidentally, was working in the same laboratory as Le Chatelier) in which the rheostat was activated by a weight-driven pendulum clock. Due to severe financial restrictions, this particular clock was a very cheap cuckoo clock bought by Dubois in one of the Paris markets. Although the device worked well, his colleagues were rather disturbed by the audible appearance of the cuckoo at regular intervals, until he was eventually prevailed upon to remove the cuckoo.

Regarding the use of coal-gas vs. electricity as a means of controllable heat, my own investigations confirm almost exactly the dates quoted by Dr. Mackenzie, although derived from a much more parochial source. Thus, in the 1902 Annual Report of the National Physical Laboratory, Teddington, Middlesex, U.K., mention is made of several electric furnaces, in the Physics Division, capable of operating up to 1200 °C and in their 1904 Annual Report, an electric furnace is described capable of continuous operation at temperatures in excess of 2000 °C, a truly remarkable feat, for the time. By 1909, the NPL had decided to replace all gas fired furnaces, with the exception of those in the foundry, by electric furnaces on the grounds of economy and accuracy of control. In fact, by this date, the NPL had assumed the role of consultants to industry concerning the construction of

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electric furnaces for a variety of uses. Incidentally, Dr. Mackenzie's reference to Guichard's controlled gas supply for his thermobalance [7] (almost certainly the only thermobalance in the world still using gas heating in 1923) merits consultation by anyone with even the slightest interest in the devices of Heath-Robinson and Roland Emmett.

Finally, Dr. Mackenzie's reference (p. 321) to the use, by Le Chatelier for temperature recording, of a "lampe electrique de Nernst" deserves brief mention. Walther Nernst (1896–1941) achieved considerable academic fame, culminating in his being awarded the Nobel Prize in chemistry, in 1920, for his outstanding contributions to thermochemistry. His excursions into commerce were, however, less successful and his Nernst Filament ("lampe electrique de Nernst"), a ceramic body which, when heated, was used for lighting and for which he had great hopes, was soon superseded by metal filament bulbs. He also, as a matter of interest, invented an electric piano in which the sounding board was replaced by radio amplifiers. This was a complete failure and was, perhaps, why Albert Einstein commented [8] that Nernst had no interest in music!

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