OBITUARY NOTICE

PERCIVAL SPENCER UMFREVILLE PICKERING

CHEMISTS and biochemists everywhere will learn with deep regret of the death of SPENCER PICKERING on the night of Sunday, December 5th, after a long and wearisome illness at the age of 62.

He came of a long line of distinguished ancestors; his father was Percival A. Pickering, Q.C., and his mother was a Stanhope, daughter of John Spencer Stanhope and granddaughter of the famous Coke of Norfolk, Earl of Leicester, by his romantic marriage with his young ward. Pickering was proud of his descent, as well he might be, and spent no little time in editing the family records and tracing their extensive relationships.

He was educated at Eton, but the classics did not appeal to him: when he entered Balliol he read science and in 1881 took a First Class Honours degree. From the outset, however, he was a very independent minded student, and one of his first published papers was a controversion of an opinion held by his tutor.

Being possessed of sufficient private means the question of a career did not worry him as it does some; he was able to follow his bent and pursue his scientific studies unhampered by financial considerations. But he was not attracted by the life at a university. He went down after he had taken his degree and set up a laboratory at his house in Bryanstone Square, London, where he carried out his well-known measurements on the physical properties of mixtures of acids and water.

His results led him to controvert the dissociation hypothesis of Arrhenius. An account of the phenomena as he saw them is given in Thorpe's *Dictionary of Chemistry* under the heading "Solutions." In reading his papers, even those who do not agree with his conclusions are forced to recognise that he handled his data well and was seriously trying to find out what really lay behind them.

Although an independent worker he did not cut himself off from institutions; he accepted a lectureship at Bedford College which he held from 1881 to 1887. He also took part in other intellectual activities and early became a member of the Athenaeum. Had he continued in his work he would have become a useful critic of physical chemistry, standing outside the dissociation school, and he could not have failed to exercise an important influence on the development of the subject.

By a serious accident in the laboratory, however, he had lost an eye and suffered a severe shock which led to so much illness that his doctors advised him to spend part of his time in the country. He accordingly came to Harpenden which though then only a village was already a place of scientific associations, there being no fewer than four Fellows of the Royal Society among its inhabitants—J. B. Lawes, J. H. Gilbert, R. Warington, and

Richard Lydekker. In 1890 Pickering was himself elected into the Royal Society, thus making the fifth. Although not robust in body he was too vigorous in spirit to be idle and he worked on the land. He still continued his physical work for a time but finally he turned his scientific activities in a wholly different direction: he planned out a series of experiments on fruit trees that should do for them what the Rothamsted experiments had done for farm crops. With the aid of the Duke of Bedford, an old college friend, this was accomplished: a field at Woburn was prepared in 1894, planted with fruit trees and the well-known experiments were begun. Seventeen reports have been issued and one, the last, is now in the press. The work has been of considerable interest to biochemists and plant physiologists because of the many problems it raises: it has been of practical importance because it has shown fruit growers that many of their traditional practices require serious overhauling. Pickering delighted in a result that was entirely opposed to conventional doctrine and greatly enjoyed the sceptical amazement with which fruit growers regarded his trees, planted as they thought entirely wrongly, manured entirely wrongly, and yet undeniably growing better and producing more fruit than those managed on ordinary horticultural lines.

It must be admitted that Pickering had good grounds for his attitude, as horticulture in the nineties, however advanced as an art, was in a deplorably backward state as a science.

His first striking result was that the manuring of fruit trees does not conduce to fruit production. This has since been confirmed; it is known that fruitfulness is in some sense opposed to vegetative growth. The result, however, caused some surprise at the time and it was opposed to the doctrine of some of the pundits of the day.

Another surprising result which is not yet accepted by practical growers is that in planting trees the essential thing is to ram tightly, injury to the root during the process being immaterial. The accepted custom is to handle the roots very carefully, to press the soil firmly round, but not to ram. Pickering's view was that intimate contact with the soil stimulated the production of new vigorous roots so that the tree was much better off than if it had been planted in the usual way.

He also studied the effects of fungicides and insecticides and put some of the rather crude formulae on to a sound chemical basis.

Perhaps his most important work from the physiological point of view was concerned with the mutual effects of one growing crop on another. This arose out of an observation at Woburn that the effect of growing grass round apple trees is to arrest all healthy growth and absolutely stunt the tree. The leaves become unhealthy and light coloured, the bark also becomes light coloured, while the fruit loses its green matter and becomes waxy yellow or brilliant red. Where the grassing was done gradually the trees accommodated themselves somewhat to the altered conditions, but never grew so well as when grass was absent.

The effect might have been due to various causes: changes in aeration, temperature, water supply, food supply or physical condition of the soil, but careful experiments failed to show that any of these factors came into play. Covering the soil with cement excluded air at least as thoroughly as grass, and yet did not produce the grass effect, nor was it suppressed by wet seasons, liberal watering, or a supply (in pot experiments) of sufficient water or nutrient solution to keep the soils of grassed and ungrassed trees equally moist, or equally well supplied with food. On the other hand, the grass effect was produced when perforated trays of sand containing growing grass were placed on the surface of the soil in which trees were growing, so that the washings from the grass went straight down to the tree roots. There seemed no possibility of the grass roots in the tray abstracting anything from the soil, and the only explanation appears to be that a toxin is excreted by the grass. Such a toxin however must be very readily decomposed because no toxic properties could be discovered by laboratory tests either in soil that had been removed from the grass roots or in the washings from the above-mentioned trays. He subsequently showed that the phenomena are general and hold whatever crops are grown in pots or trays. In consequence we must be prepared to consider possible toxic effects of one plant on another growing alongside of it, and the parts such effects may play in determining natural plant associations and in explaining some of the bad effects of weeds.

This work will, it is hoped, be developed; it is far too important to remain as it is. It is thoroughly typical of his method: he would make some simple observation that many others must have had the opportunity of making and yet had missed, and then he would show that its significance was far deeper than at first appeared.

This originality of mind combined with accuracy of experimental work and refusal to be bound by any tradition was thoroughly characteristic of the man. His interests, however, were not confined to his investigations. He had clear cut artistic perceptions and surrounded himself in his home with things of beauty. He sympathised much with the leanings of his brother-in-law, William De Morgan, towards the pre-Raphaelite school and he had some of De Morgan's work in his house; its sincerity and fidelity to nature appealed to him, and, moreover, though austere and of iron self-control, he had a strong vein of sentiment in his character. This combination of artistic feeling with high scientific ability is fortunately not rare in England, and when it occurs it is usually associated with some remarkable traits of character. Pickering was a good example of the scholar and gentleman, a welcome member of some of the best circles, and withal one who judged men exactly as he found them, refusing to be bound by convention in the ordinary affairs of life just as he refused its bondage in his scientific work.

E. J. RUSSELL.