

rill has pointed out, if we were met together this afternoon to settle this business for ourselves, we probably could so settle it, though we are not likely to settle it for the world at large. But one feature of the Naturalists' discussions has been, as I have watched the discussions, that the members of the society get together to consider in a particularly interested spirit matters which they do not propose to settle, but from the analysis of which they hope that a current of thought may be started which will ultimately result in good. For that reason we have had speakers this afternoon who are representative of geology, zoology, botany and psychology, and who are representative of the country from the Atlantic to the Pacific. I think that we may congratulate ourselves that, although the audience that has listened this afternoon has not been large, the discussion may be brought, perhaps, before a larger audience, and will perhaps start a current of thought in a useful way that will in time contribute to a solution of the problem.

I am going to read one more letter, again without the signature, but a letter from one of the strongest executives of one of the strongest universities in the country:

I wish very much that I were able to cooperate in the discussion which you propose. Unfortunately, my presence is out of the question, on account of an important previous engagement for the very day which you name; and I am not yet quite ready to send any brief formulation of my views on the degree question. I do not believe that the time is quite ripe for such radical measures as I have in mind; and I would rather that those who think that they can do some good by moderate reforms should have every chance to make their experiments unimpeded by destructive criticism. If those who believe that conservative reform is possible can prove their case I shall be very glad. I should wish * * * to be in a position to cooperate with them on any measures which might give promise of reform. Then if reform measures fail the radicals will have a clear field.

The meeting was then declared adjourned.

SCIENTIFIC BOOKS.

Wilhelm Ostwald: Von PAUL WALDEN.

It is well known that in December last the twenty-fifth anniversary of the doctorate of Ostwald was celebrated in Leipzig. On this occasion a 'Jubelband,' being the *forty-sixth* volume of the *Zeitschrift für physikalische Chemie*, and containing original papers from thirty-four of Ostwald's former students, was presented to him. The 'Jubelband' contained a brief sketch of Ostwald's life and work by van't Hoff, but the book under review deals with both in a much fuller manner.

Walden discusses the life of Ostwald in five periods: 'The Youth in Riga, 1853-1871'; 'The Student in Dorpat, 1872-1875'; 'The Teacher in Dorpat, 1875-1881'; 'The Professor in Riga, 1881-1887'; 'The Professor in Leipzig, 1887 up to the present.'

Ostwald does not seem to have been a marked success as a gymnasium student, and not to have taken his work in a really serious manner until he came to Dorpat. His first scientific publication, which appeared in 1875, shows the bent of his mind at the early age of twenty-two. It bore the title, 'On the Chemical Mass Action of Water.' This was soon followed by his 'Volume Chemical Studies,' which are now recognized to be works of real permanent value.

That tremendous activity and power to work, which is possessed by Ostwald to an unusual degree, began to manifest itself during the Riga period. It was during this period that the first edition of the great *Lehrbuch der Allgemeinen Chemie* appeared—the book which led to the organization of the modern school of physical chemistry. It was in Riga also that the *Zeitschrift für physikalische Chemie* was founded. This was to be the official organ of the new physical chemistry which was just being organized, and has probably contributed more to the development of this branch of science than all other publications, in that it brought together in one place

the various lines of work which constituted the new science.

This, however, is all introductory to Ostwald's greatest work. In 1887 he was called to Leipzig to the chair of physical chemistry just vacated by Gustav Wiedemann. To him as director of 'Des zweiten chemischen Laboratoriums' students came from all parts of the world. Through these, and with his own hands, an enormous amount of work was done. These investigations, which were published, when completed, in the *Zeitschrift*, have since been collected and comprise several large volumes. This large amount of work was done under very unfavorable conditions. A small laboratory, poorly lighted and poorly equipped with apparatus and conveniences, may be said to describe fairly the old laboratory of Ostwald in Leipzig.

The cosmopolitan character of the Leipzig laboratory in the nineties, when it was the good fortune of the writer to have studied with Ostwald, is shown by the fact that of the students who were following physical chemistry as their major subject, the following nationalities were represented: Germany, America, Canada, England, Scotland, Belgium and Russia. Indeed, there were more Americans working with Ostwald at that time than there were of any other nationality, including Germans.

This condition of things is all changed now. The fame of Ostwald as investigator and teacher drew such a large number of students that the old quarters became entirely inadequate. A fine, new Physikalisch-chemisches Institut has been built for Ostwald, and this has now become the home of the 'Leipzig School' of physical chemistry.

The most striking characteristics of Ostwald are his untiring industry, his fertility in ideas and his absolute unselfishness. As an illustration of his power of work, Walden points out that his collected works number already more than 16,000 pages, and in addition to this he has directed probably more than one hundred investigations; has edited the *Zeitschrift*, which is now in its forty-eighth volume, and has founded the *Annalen der Philosophie*.

As illustrating Ostwald's power to work, the writer recalls returning to Leipzig with Ostwald from Berlin in 1894, when van't Hoff delivered his now famous '94' lecture before the Berlin Chemical Society. It was between two and three in the morning when Leipzig was reached. We learned next morning that Ostwald had not retired on returning home, but had spent the remainder of the night in developing some idea that had occurred to him during the journey.

The fertility of Ostwald's mind in new ideas can not have failed to impress any one who had been with him even for a short period, and also the unusual freedom with which suggestions, often of very great importance, were made to any one who had the desire and ability to work them out in the laboratory. And when the work was done the student was told to publish the investigation as if the whole was his own. The result is that a large part of the work done in Ostwald's laboratory does not bear his name, although the original suggestion came from him, and every stage of the investigation was under his daily scrutiny.

All in all, it is difficult to overestimate what Ostwald has already done for chemical science. He is the organizer of the modern school of physical chemistry. But he has gone much farther and shown how the generalizations of the new physical chemistry can be applied to general inorganic chemistry, by both the investigator and the teacher. It is not too much to say that he has inaugurated a new day into the field of general chemistry.

Walden concludes his interesting life of this great man by calling attention to Ostwald's love of art; not as an admirer of finished pictures in a gallery, but as a painter of them. Indeed, one of Ostwald's own pastels is reproduced in Walden's book.

It is interesting to learn not only of the serious work of a leader in natural science, but also how he spends his leisure. In Ostwald we have the love of the scientifically exact, combined with that of the purely beautiful in nature.

HARRY C. JONES.