

founders of the cell theory? Why the amazing situation "that we still continue to call it after them"? It would seem, as suggested by Profs. Karling and Conklin, that bluff and brag on Schleiden's part entered very largely into the picture. He underestimated, ignored, or ridiculed really important contributions of predecessors and contemporaries, and thus gained a wholly unwarranted recognition; and Schwann borrowed from Schleiden's arrogant claims as to plant cells and applied the same views to animal cells. Prof. Conklin concluded his most interesting paper by suggesting that "it would be more accurate as well as more becoming to strike out of our literature these personal possession tags attached to important discoveries, such as . . . the cell theory of Schleiden and Schwann!"

The afternoon session of the symposium, devoted to the present and the future of the cell theory, developed what appeared like a cleavage in points of view between those who see the problem primarily in terms of physical forces (of surface tensions, physical pressures, and electrical attractions and repulsions), and those who hold that living matter exhibits certain characteristics (such as variability, selective direction, and unfoldment in a temporal sequence) which sharply differentiate the organic from the inorganic.

It was generally agreed that the organization of the cell is exceedingly complex and that there is still much to be learned about it. Yet, on one hand it was maintained by Prof. Baitsell that the difference between the organic and the inorganic is "not one of *kind* but merely of *degree of complexity*. . . . Since the same materials are used in both domains, they must conform to the same elemental patterns." Recent advances in cellular knowledge are due primarily to the work of physicists and chemists. Prof. Schrader, who was concerned chiefly with the present status of mitosis, asked for renewed consideration of a 'dynamic'

hypothesis. He suggested, however, that such a hypothesis meets with many difficulties which recent findings have by no means removed, and that it is a foregone conclusion that the final explanation will not be as simple as had once been thought.

On the other hand, it was pointed out by Profs. Weiss and McClung that, although "the cells derived from an egg have definite, innate capacities of their own . . . the fact that the individual cell can differentiate in a variety of directions but actually differentiates only in one, calls for factors which direct each cell selectively into its proper course. These factors, by their very nature, are super-cellular." They apparently derive from the organism as a whole and suggest the presence of "racial material in a linear order within the chromosomes. . . . Since living systems have unique phenomena of a higher order (than the non-living), like reproduction, metabolism, and consciousness, it is only logical to conclude that there must be units of a new order to explain them."

The participants in the afternoon meeting were in if necessary agreement that there is no sharp break between the living and the non-living. The progressive series of integrations does not stop at the molecular but continues to higher orders. Furthermore, the chemical elements found in the living orders, and their physical and chemical properties and interactions, are, it would seem, precisely the same as those found in the non-living orders. If there was difference of opinion, it appeared to be as to whether the integrations of a higher order (such as the cellular) could be completely explained in terms of principles derived from a lower order (such as the molecular), or whether, since the living orders have properties not found in the non-living, they must have their own peculiar units and be explained primarily in terms of those units. The future, it was held, should soon bring us closer to a resolution of such disputed questions. JOSEPH MAYER.

Obituary Notices

Prof. A. Smithells, C.M.G., F.R.S.

THE death of Prof. Arthur Smithells, on February 8 at the age of seventy-eight years, has removed from the world of science one of the most distinguished participants in the successful effort that has been made in the last half century to break down the barriers between a science too isolated and self-satisfied and a community too indifferent and unconscious of its own needs. No man could be more permeated than he was with a real reverence and enthusiasm for scientific work and achievement. His more intimate personal friendships were almost entirely with men of science, and his own work on

the structure of flame was marked by keen insight and exceptional experimental ingenuity and skill.

Smithells was trained at Owens College, Manchester, and went on to enjoy the pleasant life and invigorating mental atmosphere which Munich and Heidelberg offered to students in those days, returning to an assistant lectureship at Owens. But, at the early age of twenty-five years, he was called to the chair of chemistry at the Yorkshire College in Leeds, and there was faced with the responsibilities and opportunities of a provincial college which was aspiring to be a university, and of a school of chemistry in a great industrial centre. Then came a

division of his activities and a multiplication of interests. His distinguished presence and faculty for the vivid presentment of ideas in speech or writing, and his capacity for the formation of wise and tolerant judgments, won for him quickly the confidence of both academic and lay elements inside and outside the Yorkshire College, and his work in aiding its development into the University of Leeds, by way of the federal Victoria University, was of inestimable value. As a trusted member of Senate and Council, as pro-vice-chancellor and as chairman of the Board of Science and Technology, he placed himself unsparringly at the service of the University in a successful endeavour to collaborate in securing for it the best of university traditions, while maintaining and developing its special character as a school of applied science of international reputation.

In 'pure' chemistry, Smithells obtained the cooperation of his life-long friend, Julius Cohen, and that of his pupil, Dawson, for organic and physical chemistry respectively, and was largely responsible for the appearance of such names as Procter, Green and A. G. Perkin on the list of teachers and research workers in special departments of applied chemistry. His own lecture courses were admirably planned and delivered. Although of necessity so much diverted by claims of university statesmanship and administration, he worked for many years on the subject of flame structure. He became a fellow of the Royal Society in 1901 and president of Section B (Chemistry) of the British Association in 1907. His instinct urged the application of this branch of science to practice and led him to make contacts with the gas industry by a series of striking lectures and by productive conversations. One outcome was the foundation by the gas industry in 1910 of the Livesey professorship of coal gas and fuel industries in the University of Leeds as a memorial to Sir George Livesey, W. A. Bone becoming the first occupant of the chair. Another result was the formation of the Joint Research Committee of the University and the Institution of Gas Engineers, with Smithells as its first chairman. This Committee, unique at the time of its formation, has gradually increased the scope of its work, and Smithells was made its first honorary member a few weeks before his death. The Society of British Gas Industries too honoured him by election to its presidency in 1911.

Another way in which Smithells was anxious to see scientific training and method take its proper place in the arts of life was indicated by those activities which led to his appointment as honorary educational adviser on home science and household economics in King's College, London, where such ideas received more toleration than elsewhere and have since come into a well-deserved prominence.

In 1913 came a break in Smithells' activities at Leeds, arising out of the interest he had displayed in the training of Indian students. He was invited to go as special lecturer to the Punjab University, and accepted willingly since he was anxious to illustrate how, in his opinion, the subject of chemistry might be made to appeal to the mentality of

the Indian student and carry him from theory to practice.

His generous and peaceful soul, with its memories of student days in Germany, was greatly shocked by the outbreak of war in 1914; but, like many others, he felt impelled to help and, first as special lecturer in the Northern Command and later as chief chemical adviser on anti-gas training to the Home Forces, with an office at the Horse Guards and the rank of lieutenant-colonel, he rendered services which were recognized by the distinction of C.M.G.

In 1923, after a few more years at Leeds in the busy post-War period, Smithells resigned the professorship he had held so long in order to take up the congenial duties of the director of the Salters' Institute in London. There he was occupied in the selection of promising young graduates in chemistry who might receive the endowment of the Institute in a further carefully planned training which should fit them for responsible work in industry. His personal knowledge of, and friendship with, so many who counted in the universities and in the various chemical industries, and his powers of judging and advising young men were here invaluable, and he was actively occupied with the duties of this post until failing health dictated his retirement in 1937. It was during this period that he interested himself specially in the Institute of Chemistry and was president for the term 1927-30. He was Harrison lecturer in 1935. Manchester, the university of his studentship, and Leeds, that of his professorship, both conferred upon him the honorary doctorate of science.

In writing, as in speech, Smithells was both lucid and convincing. This was apparent in the accounts of his scientific work submitted to the learned societies and in his lectures. His letters were greatly valued by those privileged to receive them for the same qualities, with more intimate, human and humorous touches and occasional accompanying sketches of persons—often children, in whom he delighted. He could never settle down to the writing of a treatise or text-book, but the Oxford University Press published a collection of his addresses, under the title "From a Modern University", dealing with such subjects as "The Relation of Universities to Technical and Professional Education", "The University and Women's Work", "Professors and Practical Men" and "The Modern University Movement".

Arthur Smithells was the third son of James Smithells and Martha, the daughter of James Livesey. He was twice married—in 1886 to Constance Marie (daughter of F. Mawe) and in 1908 to Katharine (daughter of Arthur Booth), who survives him. He had two sons and one daughter by his first, and one son by his second marriage.

JOHN W. COBB.

Prof. Robert Wallace

PROF. ROBERT WALLACE, professor of agriculture in the University of Edinburgh from 1885 until 1922, died at Kincardine-on-Forth on January 16 at the age of eighty-five years. The chair of agriculture, the oldest in the country, goes back to 1790, and Wallace