

opportunities for doing which may offer themselves, and leave it to the leader of the Expedition to decide on the spot and at the time what work will be done.

I have already pointed out that the basis of international co-operation has been laid in the choice of routes and the consequent division of districts within which the land stations are to be established. The German Expedition takes the Indian Ocean and Atlantic side, and the British the Pacific side of the Antarctic area. An expedition from a third side would find a wide and important field of activity to the south of South America. As regards physico-geographical, geological, biological and gravity observations, scarcely any further co-operation is required than the simultaneous carrying out of observations in the different areas. Should the British Expedition include a second ship, it would be possible to carry on biological deep-sea research round the Antarctic area over a much wider circle than we can attempt with one vessel.

A clearer understanding is still required, in my opinion, for co-operation in meteorological and magnetic research, to decide, in the first place, the scope and the methods of research to be pursued during the voyage and during the year's sojourn at the land station; and in the second place, what additional work beyond that undertaken by the two expeditions it may be possible to arrange. My scheme for the first of these plans is already sketched out as far as regards the meteorological work; the magnetic programme requires still further consideration. The understanding with the British Expedition on this question is now under discussion. For both branches of science the choice of routes and of districts in which the stations will be placed is very appropriate, as observations will be made in the vicinity of the south magnetic pole on two sides, and both stations lie in the probable position of the Antarctic anti-cyclone, which appears to extend furthest north on the Indian Ocean side. The second point, which concerns the organisation of simultaneous observations outside the Antarctic area, is still unsettled. The British Antarctic Expedition has already in view the establishment of a scientific station in New Zealand, while Germany is planning a branch station on Kerguelen. These would furnish valuable data for comparison with the results obtained by the expeditions themselves. Yet, we must go further, but not so far, I think, as M. Arctowski suggested in his Paper to the British Association at Dover. It is greatly to be wished that during our expeditions the Observatories of Melbourne and Cape Town would undertake similar observations, and it would also be a good thing if a station could be placed near Cape Horn or in South Georgia, as well as one in the North Polar region, say at Bossekop. Thus the problems of the Antarctic regions could be attacked simultaneously from without and from within.

A resolution of the St. Petersburg Meteorological Congress, in August last, in favour of such co-operation was received with pleasure. The International Geographical Congress at Berlin went further, and unanimously approved the appointment of a committee charged with (1) Laying down the scope and the means of investigation for the magnetic and meteorological work of the expeditions; (2) The organisation of similar series of observations on the expeditions, and perhaps also exerting influence for the establishment of observations at other places.

On the German side, the members of this joint committee are Profs. Hellmann, v. Drygalski, Eschenhagen and A. Schmidt; and on the British side, Dr. R. H. Scott, Dr. Buchan, Prof. Schuster and Capt. Creak. The programme prepared on the German side for the meteorological and magnetic work has already been sent to the British members of the Committee to be considered by them, and afterwards discussed and definitely settled

by the whole committee. We may expect in this, as in all other points, a complete and useful co-operation between the two expeditions.

ERICH VON DRYGALSKI.

#### THE VAN 'T HOFF CELEBRATION AT ROTTERDAM.

ALLUSION has already been made in the columns of NATURE (No. 1575, vol. lxi.) to the celebration of the twenty-fifth anniversary of the doctorate of Prof. van 't Hoff, which took place at Rotterdam on the 22nd of last December. The following further particulars may perhaps be of interest to English readers.

Some eighteen months ago it was decided by a committee of old students that the event should be celebrated in a suitable manner. To this end, in the first place, invitations were sent out to all former students of van 't Hoff, requesting them, if possible, to contribute a paper to a volume to be presented to the savant on his jubilee day. The invitation was responded to most cordially, and before the end of last September some twenty-six papers had been received by the committee. The original intention was to publish these in book form, but, as the result of a later suggestion and the kindness of Prof. Ostwald, the publication took the form of a jubilee volume of the *Zeitschrift für physikalische Chemie*.

The jubilee ceremony itself was held on the date above-mentioned in Rotterdam, the birthplace of van 't



Prof. J. H. van 't Hoff.

Hoff, where by reason of family ties he is usually to be found during the last days of each year. The "Bataavsche Genootschap voor Natuurwetenschappen" had invited a considerable number of Dutch and foreign men of science, as well as all old students of the professor, to a special meeting of the society at 3 o'clock in the afternoon. At the appointed time the hall was crowded with enthusiastic admirers of Holland's great physical chemist, many of whom had travelled far to pay their tribute. Not a few had come from Germany, and in addition Belgium, Switzerland, Austria, Japan and England were represented. Amongst the number present were Profs. Ostwald, Spring, Lobry de Bruyn, Roozboom, Abegg, Goldschmidt, Hamburger, Hollemann, Lorenz, and Drs. Bredig, E. Cohen, Meyerhoffer, Reicher. Presently, amidst the cheers of the audience, van 't Hoff, supporting

his aged mother, entered the hall, followed by the various members of his family. The proceedings were opened by an address from the Mayor of Rotterdam, whose words, however, like those of some of the following speakers, being Dutch, were only intelligible to a limited number of the audience. Suffice to say that van't Hoff was the recipient of a series of memorials and congratulatory addresses from various scientific corporations. The University of Utrecht, van't Hoff's *alma mater*, sent a deputation, and the chemical students of Amsterdam, where van't Hoff till recently occupied the chair of chemistry, were also officially represented. The afternoon's programme concluded with the presentation to the professor of his own biography by Dr. Ernst Cohen, and of the before-mentioned jubilee volume on behalf of former students by Dr. Meyerhoffer. To each of the speakers van't Hoff replied in a few words, expressing his thanks for the honour accorded to him, in simple and unaffected language.

In the evening a highly successful dinner took place. It was interrupted by continual bursts of applause, as congratulatory telegrams arrived from almost all parts of the civilised world. To the series of toasts proposed in his honour, van't Hoff replied in his native tongue, making, however, a graceful variation in excellent English to acknowledge his appreciation of the presence of a guest from England at a time of national embitterment.

An account of the jubilee celebration at Rotterdam would scarcely be complete without a reference to the life and work of the man in whose honour it was held. For a complete and extremely interesting account readers are referred to Cohen's biography,<sup>1</sup> which has been consulted by the present writer in this connection.

Jacobus Henricus van't Hoff was born on August 30, 1852, at Rotterdam, where his father still practises as a medical man. While at school he showed an intense interest for natural science; many of his leisure hours were spent in carrying out simple chemical experiments at home. After passing through the Hoogere Burgerschool in Rotterdam, his parents decided that he should have a technical training, and for this purpose he was sent to the technical school at Delft. Two years' study at Delft sufficed for him to pass his technical examination, whereupon he proceeded to Leyden, devoting most of his time to the study of mathematics and physics. Remaining but one year at the latter University, he was attracted by Kekulé to Bonn, then at the height of its fame as the school of structural chemistry. Later, in the same year, we find him in Würtz's laboratory in Paris.

In September of the following year (1874) van't Hoff published in Utrecht a pamphlet, the contents of which form the foundation of our present stereochemistry. The proud structure built up on the ideas first expressed in this modest publication is one of the greatest chemical achievements of modern times. The adverse criticisms of Kolbe and other then existing authorities on structural chemistry are historical, but after twenty-five years' subjection to the crucial test of experiment, we can assert that the theory of the asymmetric carbon atom is one of the most firmly established in chemical science.

In December 1874, three months after the publication of his views on chemical structure, van't Hoff graduated as doctor of mathematics and physics at Utrecht, the title of his thesis being "Contributions to our knowledge of cyanacetic and malonic acids."

That the path of fortune has not always run smoothly for him appears from his experiences during the months following graduation. Repeated attempts to obtain a post as teacher failed, and finally leaving home, he departed to Utrecht with the intention of giving private

instruction. During this period he devoted his spare hours to writing "La Chimie dans l'Espace." Finally, in 1876, the desire to devote himself to teaching was gratified by his appointment as lecturer at the Royal Veterinary School at Utrecht.

In October 1877, on the elevation of the old Amsterdam Athenæum to the status of a University, van't Hoff obtained the post of lecturer on theoretical chemistry, and scarcely a year had elapsed before he was appointed professor of chemistry, mineralogy and geology, a chair he held until the commencement of 1896.

The activity he showed during his connection with the University of Amsterdam is well known. Notwithstanding very onerous routine duties, he continuously produced work of first class importance, and by his inspiration created a distinguished school of chemists.

"Physicam chemiæ adjunxit" is the maxim which characterises the life work of van't Hoff. His endeavours to fill up the gap in our knowledge of the connection between constitution and chemical properties led to the production of his "Études de Dynamique Chimique," to the setting up of a most important theory of equilibrium, and to the overthrow of Berthelot's principle of maximum work.

Closely bordering on the theory of equilibrium the problem of affinity next attracted his attention, and the application of thermodynamics to Pfeffer's osmotic experiments brought forth his great theory of solutions, according to which the physical laws (Boyle's, Gay-Lussac's, Avogadro's) holding for the gaseous state, apply equally well to dilute solutions. The most immediate result of this theory was the formulation by Arrhenius of the theory of electrolytic dissociation. The changes thus brought about in the nature of our chemical conceptions have been enormous, and the rapid development of electrochemistry in recent years stands in direct connection with the establishment of van't Hoff's laws of solutions. In 1890 the extension of his theory of solutions to the case of solids enabled him to show the existence of simple laws in solid aggregates, and much of our present knowledge with regard to the solid state of matter dates from this discovery.

In spite of seductive offers on the part of another Dutch University in 1893, and of two German Universities in 1887 and 1894, van't Hoff remained true to Amsterdam until 1895, when the Prussian Academy of Sciences made him a most brilliant offer. Not only was he elected a Member of the Academy, but at the instance of the latter, the Prussian Government placed at its disposal the necessary funds whereby van't Hoff is enabled to devote himself entirely to his work as investigator. In this way a foreign Government has recognised his services to science and provided the means for his searching genius to exert itself to its fullest extent.

During the past few years van't Hoff's attention has been chiefly turned to that province of physical chemistry dealing with transition phenomena, double-salt formation and double decomposition, and his present goal is the explanation of the formation of oceanic salt deposits on the basis of such investigations. Already a great deal has been accomplished, and especially for geologists most important results have been brought to light. From a politico-economic point of view the importance of such research for the great Stassfurt salt industry is obvious.

Prof. van't Hoff's laboratory is situated in Wilmersdorf, a suburb of Berlin. It consists of some four or five small rooms forming the ground story of an ordinary house. Here van't Hoff works with at most three or four students. He is in the happy position of a professor not obliged to lecture more than once a week, and not expected to do more than extend the bounds of human knowledge.

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<sup>1</sup> "Jacobus Henricus van't Hoff." Von Ernst Cohen. Mit einem Portrait und Bibliographie. Price M. 1.60. (Leipzig: Verlag von W. Engelmann.)