were not present at the meeting on January 5, 1926, when the paper was presented. The railway companies made it plain that what they objected to was any mention whatever of the subject of electrolysis. They offered as their excuse that the subject was a personal one and against the ethics of the American Institute of Electrical Engineers to study or discuss it. Evidently they forgot that the American Committee on Electrolysis, which published a unanimous report in 1921, was organized by and worked under the auspices of the American Institute of Electrical Engineers, and that on this committee were representatives of the American Electric Railway Association and the American Railway Engineering Association.

If the attitude herein presented is held by the electric railways of America, then the stray current electrolysis problem will have to be solved in the courts of law, which is not believed to be an ideal place to reach a satisfactory solution of any engineering or scientific problem.

I would like to learn the opinions of other engineers and scientists in regard to this matter.

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SCIENTIFIC BOOKS

J. C. Poggendorff's Biographisch-literarisches Handwörterbuch für Mathematik, Astronomie, Physik, Chemie und verwandte Wissenschaftsgebiete. Bd. V: 1904–1922. Redigiert von Professor Dr. P. WEINMEISTER. I. Abtlg.: A-K. Leipzig, Verlag Chemie, 1925.

FOR those who are engaged in scientific reference work "Poggendorff's Biographisch-literarisches Handwörterbuch zur Geschichte der exacten Wissenschaften . . . aller Völker und Zeiten" is an indispensable tool. The first two volumes were published in parts. The printing commenced in 1858 and the last part was issued in 1863. The third volume, covering the period from 1858 to 1882, was published in 1898 and the fourth volume, dealing with the period from 1883 to 1902/3, was published in 1904. The war and the war's aftermath caused a temporary discontinuance of this monumental undertaking, but we hail now with great satisfaction the appearance of the first part (A-K) of the fifth volume, which embraces the years 1904–1922.

The conception of this work originated with Johann Christian Poggendorff (1796–1877). As editor of the "Annalen der Physik und Chemie" (1824–1876), as author of "Lebenslinien zur Geschichte der exacten Wissenschaften" (1853), which contained the dates and main works of 150 scientists of the sixteenth to nineteenth century, as author of "Geschichte der Physik," edited after the author's death by W. Barentin and published in 1879, and as a scientist, who by his own inventions and investigations will never be forgotten, no one was better fitted for such a gigantic task. It took Poggendorff fifteen years of his spare time to complete the first two volumes. The third volume was edited by Dr. W. W. Feddersen and Professor A. J. von Oettingen, the fourth volume by von Oettingen alone, and the present volume by Professor T. Weinmeister. Of course a biographical work of such a character could not be compiled by one man and all the editors gratefully acknowledge the great help rendered them by many scholars in different countries.

The principles which guided the editors in their program are of the greatest importance. The title-pages of Volumes 1, 2 and 3, which are almost identical, say very plainly that the Biographisch-literarisches Handwörterbuch is only devoted to the representatives of the exact sciences and enumerates mathematicians, astronomers, physicists, geometricians, mineralogists, geologists, etc. In Volumes 3 and 4 after the geologists the geographers are named. On the title page of the fifth volume the words "exacte Wissenschaften" are omitted and the title reads "Biographisch-literarisches Handwörterbuch zur Mathematik, Astronomie, Physik, Chemie, und verwandte Wissenschaftsgebiete."

In the classification and history of sciences there were generally two divisions recognized: The exact sciences and the cultural sciences (Geisteswissenschaften). With the growth of our fields of knowledge and by a changed conception of different branches of science the term "exact sciences" has lost its old meaning and application. For this reason it seemed to be proper to replace the term "exact sciences" by the term "natural sciences," which is subdivided into "descriptive natural science" and "exact natural science." It was Virchow who said, "Every science is natural science." Taking this into consideration, let us see how Poggendorff and his successors in the editorship of the Handwörterbuch proceeded. In the introduction of the first volume Poggendorff states precisely that scientists whose works dealt with the living nature (lebende Natur) were excluded. This principle—very regrettable—eliminated anthropologists, biologists, botanists and zoologists. The editors of the third volume, Drs. Feddersen and von Oettingen, adhered to the same principle outlined by Poggendorff, although they had received some communications protesting against the undue preference of mathematicians, physicists, etc. On the other hand, they recognized the difficulties facing them in the

proper consideration of the allied sciences (Grenzgebiete). The single editor of the fourth volume (1883–1902/3), Dr. von Oettingen, has followed in the footsteps of his predecessors. In the fifth volume, edited by Dr. P. Weinmeister under the auspices of the Saxon Academy of Sciences in Leipzig and other academies, there are further limitations in the scope of the work. "To prevent the increase in the volume we have taken less consideration of the allied sciences." This policy of the editor and the academies which fathered the new volume is in my opinion a great mistake.

With the publication of Volume 5, the time had come not to limit but to widen the scope of the Handwörterbuch. Physical anthropology, biology (animal, botanical and human), comparative zoology, physiology, medical chemistry and entomology—these subjects should not have been omitted.

On the other hand, the new volume considered from a bibliographical standpoint deserves the highest praise and is a worthy successor to the previous volumes of this monumental work.

The policy of the previous editors to request scientists, especially those living outside of Germany, to prepare their own biographical statement was continued in this volume, without consideration of political boundaries. "Real science does not know political boundaries," says the editor. All the requests were answered and there will be found quite a number of original contributions by American, Belgian, English and French scholars.

In the preface of the fourth volume the editor recommends, in case the work should be continued, that for each branch of science to be dealt with an advisory board should be appointed to decide on the names to be included. It seemed that this suggestion was not carried out in the fifth volume. For the publication of future volumes I would like to recommend the election of such a board in each country, which would prevent regrettable omissions.

FELIX NEUMANN

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WASHINGTON, D. C.

Eleventh Report of the Committee for the Investigation of Atmospheric Pollution. Observations in the Year ended March 31, 1925.

WE have in this report[1] a review of the work done by nineteen authorities cooperating in collecting data from forty-eight different stations. Forty-four of the forty-eight gave complete results.

Extensive tables give the deposits in grams per square dekameter for each month, or metric tons per hundred square kilometers.[2] It is noted first that Birmingham, farthest from the sea, has least chlorine both for the past year and in the general average for five years. A rather curious relation appears to exist between the amount of sulphate deposited from the air and the amount of total impurity. The greater the total impurity, the lower the percentage of sulphates. Also there appears to be an inverse relation between percentage of carbonaceous matter and sulphates.

The effect of wind on impurity is graphically brought out by plotting the mean values of the suspended matter for all observations at particular wind velocities against wind velocity in meters per second. The result is a curve, the equation of which is $I = \frac{0.55}{V} + 0.27$, I being the concentration in milligrams per cubic meter and V the velocity in meters per second.

It is remarkable that this curve indicates a variation of the concentration of impurity inversely as the first power of the wind and not as some higher power, which one would expect if there had been free lateral and vertical spread of the smoke as well as the stretching-out downwind. The actual results show what a profound effect wind has on concentration.

When the wind drops below one meter per second in winter, a smoke haze or fog in London appears almost inevitable under present conditions.

From some experiments made by Dr. Owens, assuming that the density of the particles is 1, and the average diameter 0.8 micron, the velocity of settlement will be 0.003 centimeters per second and the number falling on one square centimeter per minute should be 2880. Actual results are greatly in excess of the theoretical number, indicating that other factors are operative.

"London Particular," it appears, is found by a replacement of water particles by smoke and not by a dirtying of the condensed water by smoke.

A. MCADIE

BLUE HILL OBSERVATORY

SPECIAL ARTICLES

THE IONS OF INERT GASES AS CATALYSTS

IN SCIENCE of December 25, 1925, several gas reactions were reported in which we had found that the ions of certain inert gases, produced by radiating a mixture of inert and reactant gases with alpha rays,

[1] Abstracts of earlier reports are to be found in SCIENCE, August 8, 1924, June 2, 1922, April 22, 1921, and November 28, 1919.

[2] To convert metric tons per hundred square kilometers multiply by 0.0256 to get English tons per square mile; 0.09 to get pounds per acre.