

635 tons; London, 1915-16, 453 tons; Sheffield, 1914-15, 395 tons; Malvern Wells, 1915-16, 56 tons. He stated that there was evidence of a general reduction of atmospheric impurity during the winter of 1916-17 as compared with the preceding one, probably due to reduced consumption of raw coal. Mention was made of certain problems awaiting solution, such as the relation of impurity to wind and distance from source, also to incidence of disease. Does smoke in the air reduce or increase the number of bacteria? What is the vertical distribution of suspended matter and the selective power of rain or snow in bringing down impurity?

MANCHESTER.

Literary and Philosophical Society, March 5.—Mr. W. Thomson, president, in the chair.—E. L. Rhead: The corrodibility of cast-iron. The paper dealt with the effects of the impurities in producing during the solidification of the metal various solutions, in which the impurities were concentrated. This was especially the case with the phosphide. The concentration depended on the lower melting point of the solution thus formed. Reference was made to the production of graphite. Specific instances in which the failure of cast-iron vessels was due to the increase in volume resulting from the corrosion, and the influence of the structure due to the segregation and coarse graphite, were dealt with and specimens shown. Attention was also directed to the high silicon iron now used for chemical plant, and segregation was shown to take place to a marked extent.

PARIS.

Academy of Sciences, March 4.—M. Paul Painlevé in the chair.—The president announced the death of Prof. Blaserna, correspondent of the Academy for the section of physics.—A. de Gramont: The ultimate rays of great sensibility of columbium (niobium) and zirconium.—C. Guichard: A particular class of curves several times isotropic.—W. Kilian: The fauna of the Hauterivian stratum in the south-east of France.—Mr. Amundsen was elected correspondent of the Academy for the section of geography and navigation in succession to the late Dr. Albrecht.—J. F. Ritt: The repetition of rational functions.—M. Vaitron: Demonstration of the existence, for integral functions, of paths of infinite determination.—M. Doyère: Remarks on the resistance to motion of geometrically similar vessels.—J. Rey: Entropy diagram of petrol.—Sir R. Hadfield, C. Chéneveau, and Ch. Génèau: The magnetic properties of manganese and of some special manganese steels. Manganese, when freed from occluded gases, is paramagnetic. Data are given for manganese-carbon steels, and steels containing, in addition to these two elements, nickel, tungsten, chromium, and silicon.—A. Valeur and E. Luce: The reduction of the CH_2I group joined to nitrogen.—G. Fouque: Dicyclohexylamine, its solid hydrate and alcoholate.—P. Russo: Geology of the plain of El Hadra, western Morocco.—J. Repelin: New species of the genus *Entelodon*.

March 11.—M. Paul Painlevé in the chair.—Ch. Lallemand and J. Renaud: The substitution of civil time for astronomical time in nautical almanacs. At sea sailors use civil time, but for their observations make use of tables where astronomical time is employed, and it is desirable that this possible source of confusion should be removed. Both the French and British Admiralties considered the proposal favourably, and the volume of the "Ephémérides nautiques" now in preparation (1920) will have civil time substituted for astronomical time.—W. Kilian: New remarks on the fauna of the Hauterivian, Barremian, Aptian, and Albian strata in the south-east of France.—M. Tilho was elected a correspondent for the section of geography and navigation in succession to the late General Gallieni.—

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Tr. Lalesco: A point of the theory of nuclei capable of symmetry.—M. Brillouin: Biaxial media.—F. Cloup: Tempering and work hardening in carbon steels.—M. Travers: The colorimetric estimation of tungsten. The method is based on the reduction of tungstic acid by titanous chloride to a blue oxide, which, under certain conditions, remains in colloidal suspension. The reaction cannot be applied if vanadium, phosphorus, or molybdenum is present.—J. H. Sinclair: The age of the sandstones of French Guinea.—L. Genté: The age of the strait connecting the Mediterranean and the Atlantic through Morocco in the Miocene epoch.—A. Guébbard: Remarks on the "écorce résistante."—G. Rebul: A method of predicting barometric variations.—J. Amar: The law of cicatrization of wounds. The number of factors is so large, and the phenomenon so complex, that it is doubtful whether any attempts at mathematical expression can be successful.—B. Geslin and J. Wolff: New observations on the degradation of inulin and "inulides" in the root of the chicory.

BOOKS RECEIVED.

The Theory of Electricity. By G. H. Livens. Pp. vi+717. (Cambridge: At the University Press.) 30s. net.

Electricity Meters: Their Construction and Management. By C. H. W. Gerhardt. Second edition. Pp. xx+504. (London: Benn Bros., Ltd.) 15s. net.

Stanford's War Maps. No. 27: Europe and Northern Asia. (London: E. Stanford, Ltd.)

Some Problems of Modern Industry. By W. L. Hichens. Pp. 61. (London: Nisbet and Co., Ltd.) 6d. net.

Proceedings of the Aristotelian Society. N.S. Vol. xvii. (London: Williams and Norgate.) 12s. 6d. net.

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