

Das Gesetz der Translation des Wassers. Von T. Christen, Oberförster. Pp. viii + 179; with one lithographed plate. (Leipzig: Wilhelm Engelmann; London: Williams and Norgate, 1903.)

MUCH has been written about the flow of water in pipes, channels, and rivers, considered from the point of view of the hydraulic engineer, and many attempts have been made to obtain empirical formulæ for purposes of numerical calculation. In this volume the author proposes the formula $v = k\sqrt{(QI)/\frac{1}{2}B}$, where v is the mean velocity, Q the total flow per second, I the gradient as a sine, and B the half-breadth of the channel. A comparison of the results of the author's formulæ is made, both with the results of experiment and with those of other writers, especially Bazin, and calculations are given of the velocity curves for different sections and under different conditions. Reynolds's critical velocities are also discussed. The book contains a bibliography, tables of coefficients, and a diagram of the author's experiments and of velocity curves.

The new laws are admittedly only empirical, and the author indicates that many points might with advantage be discussed at greater length, but he has certainly succeeded in including a large amount of important and suggestive information in a book of small compass, and his theories will be read and discussed with the greatest interest by hydraulic engineers and experimenters who have worked in the subject.

Colloquies of Common People. By James Anstie, K.C. Pp. 530. (London: Smith, Elder and Co., 1902.)

THE English language contains few good specimens of the philosophical dialogue, perhaps none except the masterpieces of Berkeley. In attempting to revive this most difficult form of composition Mr. Anstie has ventured on a daring task, and I fear cannot be said to have achieved a great success. Like others before him, he forgets that a dialogue is intolerable unless its author is dramatist enough to confer individual character on the interlocutors; nothing is heavier reading than wedges of disquisition by mere puppets. Of the variety of topics handled by Mr. Anstie's puppets it is impossible to give any summary, as they appear to begin their discussion anywhere and to argue anyhow. They seem, however, in the course of his five hundred odd pages to touch on most of the current topics of ethics and psychology. The reader should at least have been assisted to follow their excursions by a table of contents and an index. A. E. T.

A Country Reader. II. By H. B. M. Buchanan, B.A. (Cantab.). Pp. viii + 233; with illustrations. (London: Macmillan and Co., Ltd., 1903.) Price 1s. 6d.

As Mr. Buchanan says, a child is much more likely to learn to read fluently and with intelligence if his reading book is concerned with subjects falling within his everyday experience, and from this point of view the set of readers, of which this is the second, will prove useful and popular in rural primary schools. The various sections of the book deal in simple, interesting language with the characters and uses of the goat, the donkey, the cat, our common reptiles, the fish of our ponds and streams, pastures and grasses. The illustrations are numerous and exceptionally good, though it is a pity the author has omitted to indicate the scale of the drawings; there is some fear, for instance, that quite a wrong idea of the relative sizes of the carp and minnow will be obtained by the pupil from the pictures which face one another on pp. 96 and 97.

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LETTERS TO THE EDITOR.

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Gases Occluded by Radium Bromide.

RUTHERFORD AND SODDY (*Phil. Mag.*, 1902, p. 582; 1903, p. 453 and 579) pointed out that the almost invariable presence of helium in minerals containing uranium indicated that that gas might be one of the ultimate products of the disintegration of the radio-elements. Rutherford, moreover, determined the mass of the projected particle which constitutes the "α-ray" of radium (*Phil. Mag.*, 1903, p. 177) to be approximately twice as great as that of the hydrogen atom, an observation which points in the same direction. These α-particles are readily absorbed by solids, and should accumulate in the solid salts of radium and in the radio-active minerals.

We have been engaged for some months in examining the spectrum of the "radio-active emanation" from radium, and during this work the opportunity presented itself of examining the gases occluded by 20 mgrs. of radium bromide which had been kept for some time in the solid state. These gases, which are continuously generated, have already been partially examined by their discoverer, Giesel, and by Bodländer (*Ber. deutsch. chem. Ges.*, 36, p. 347), and found to consist mainly of hydrogen and some oxygen. We have found that after removing hydrogen and oxygen from the gases evolved from 20 mgrs. of radium bromide, the spectrum showed the presence of carbon dioxide. On freezing out the carbon dioxide, and with it, a large proportion of the radium "emanation," the residue gave unmistakably the D_3 line of helium. This was confirmed by sealing off the tube, and comparing its spectrum with that of a helium tube. The coincidence of the two lines may be taken to be at least within 1/10th of the distance between D_1 and D_2 , or say 0.5 of an Ångström unit.

This observation, if confirmed, substantiates the theory already mentioned, and brings ordinary methods to bear on the changes occurring in radio-active bodies.

WILLIAM RAMSAY.

FREDERICK SODDY.

July 10.

P.S. (July 13).—We have repeated the experiment with 30 mgrs. of fresh radium bromide, kindly placed at our disposal by Prof. Rutherford, which had probably been kept for several months in the solid state. Entirely new apparatus was constructed for the purpose, and better precautions were taken to exclude from the spectrum tube carbon dioxide and the emanation. The spectrum was practically that of pure helium, with the addition of two new lines. The lines identified are:—

Red	6677	Green-blue ..	4932
Yellow (D_3) ...	5876	Blue	4713
Green	5016	Violet	4472

The additional lines are one in the red and one in the green; these we have been unable to identify.

The Extirpation of *Culex* at Ismailia.

I BEG to enclose for publication the translation of a report received from the general secretary of the Suez Canal Company regarding the effects of the anti-malaria campaign at Ismailia since the visit of Sir William MacGregor and myself last September. While it is obviously too early to speak definitely regarding the result on the malaria rate, the secretary is able to announce that mosquitoes of the genus *Culex* "ont été supprimés d'une manière presque