UNDER the comprehensive title of "Sterilisation of Water by Chlorine Gas" a paper by Capt. J. Stanley Arthur was read before the Institution of Mechanical Engineers on November 19. The part of the paper dealing with the general aspect of the subject adds little or nothing to our knowledge, and contains statements which, to say the least, are still debatable. For example, the author states that water treated with chlorine gas is less liable to an objectionable taste than when treated with bleaching-powder, and, further, that any taste so imparted can readily be removed by the addition of sulphur dioxide. Other experimenters have found that there is little or no difference between bleaching-powder and chlorine gas as regards taste, and also that some tastes produced by chlorination are absolutely unaffected by the further addition of sulphur dioxide. Also, no mention is made of the pioneer work on chlorination of Houston and McGowan at Lincoln in 1905 or of any of Houston's later work on the subject. The greater part of the paper consists of the detailed description of an American device for accurately administering the dose of chlorine and its adaptation for the purpose of sterilising the water-supply to the troops during the war. These descriptions are very clearly stated and well illustrated with careful drawings. No other types of chlorinators are described, although there are others equally efficient now on the market. The paper concludes with a warm tribute to Sir William Horrocks for his work on water purification for the Army, and is further evidence of the great part played by the sanitary section of the R.A.M.C. in winning the war; it is probable, however, that Sir William and his colleagues would be the first to acknowledge their indebtedness to others not mentioned in Capt. Arthur's paper.

THE latest catalogue (No. 407) of second-hand books offered for sale by Mr. F. Edwards, 83 High Street, Marylebone, W.1, is devoted to botany, ranging over the subjects of agriculture, gardens, orchids, trees, fruits, fungi, lilies, and roses. It should be of interest to many readers of NATURE. Many choice and rare works are listed, among them several herbals, a complete set of the *Annals of Botany*, *Curtis' Botanical Magazine*, 1787–1915, and Sir J. D. Hooker's "Botany of the Antarctic," 6 vols.

WE are informed that the office of the Assistant Commissioner of Forestry for England and Wales (Mr. Hugh Murray) is now situated at 30 Belgrave Square, London, S.W.1. The headquarters of the Commission remains at 22 Grosvenor Gardens, London, S.W.1.

Our Astronomical Column.

THE LEONID METEORIC SHOWER.—Mr. Denning writes that on November 15 and 16 the Leonids returned in moderate numbers. Mr. C. P. Adamson, observing at Wimborne, Dorset, watched the sky during a period of ten hours, and saw thirty-three Leonids out of a total of ninety-eight meteors recorded. The radiant point was placed at 150°+22°, and the display furnished objects of the usual swift and streak-leaving character.

Miss A. Grace Cook, at Stowmarket, also witnessed the return of the meteors on the same nights and determined the radiant in precisely the same position as Mr. Adamson. Mr. A. King made observations from Lincolnshire, and on November 15, during a watch of three hours between 11h. 18m. and 14h. 37m., saw thirty meteors, of which nine were Leonids directed from a radiant at 152°+23°. Other showers were seen from 63°+22° (five meteors), 107°+35° (seven meteors), and 116°+49° (five meteors) at the middle of November.

The reappearance of the Leonids adds another link to the chain of past observations, which prove that this stream of meteors is visibly continuous throughout the entire orbit, and that it may be viewed every mid-November when the prevailing atmospheric conditions are favourable.

RADIATION PRESSURE ON ELECTRONS AND ATOMS.—Mr. Leigh Page discusses this subject in *Astrophys. Journ.* for September. It was formerly concluded that radiation pressure reached a maximum for particles of diameters comparable with a wave-length, and fell off rapidly for smaller particles. The present paper shows that this result neglects resonance, and that the radiation pressure on an atom "depends on the intensity of that portion of the incident radiation which has a frequency equal to the natural frequency of the oscillator." It is deduced that the pressure of solar radiation is greatest on an atom which has a resonant frequency in the infra-red near to wave-length 9000 Å., being within one-third of this maximum value for the range 4000 Å. to 28,000 Å. The pressure may be further increased if the atom has more than one resonant frequency.

It is shown that in certain circumstances the repulsive force may be thirty times that due to gravitation. It thus seems sufficient to explain most of the phenomena of comets' tails, and removes the difficulty formerly felt, namely, that the spectroscope shows the presence of certain gases in the tail, for the molecules of which the pressure was thought to be negligible. The author states that since writing the paper he has found that some of his conclusions were published by M. Gouy in 1913 (*Comptes rendus*, vol. clvii., p. 186).

PERTURBATIONS IN A STELLAR ORBIT.—There are not many cases where perturbations in stellar orbits can be observed with any degree of accuracy. Mr. J. S. Paraskevopoulos examines the case of 13 Ceti in *Astrophys. Journ.* for September. This is a visual binary with a period of 6·88 years, while the brighter star is a spectroscopic binary with a period of 2·0818 days. The eccentricity of the orbit of the visual pair is 0·725. The author has remeasured a number of spectrograms taken at the Yerkes Observatory between 1906 and 1913, deducing separate orbits at three different epochs. These show that the period is shorter by 1/200 day at apastron of the visual companion than at periastron, this being analogous to the period of the moon at aphelion and perihelion. Motion of the line of apsides is well established. It is concluded that the mass of the visual companion does not fall far short of, and may exceed, that of the spectroscopic pair. Taking the parallax as 0·050″ (J. A. Miller), m/M becomes 1·32.

The system 85 Pegasi is referred to, in which Prof. G. Van Biesbroeck deduced that the mass of the brighter component was only 0·36 of that of the whole system.