found to be rotating with a speed of about 350 km./sec. A list of the shell lines between λ 3896 and λ 4923 is given in the paper, and it is shown that the mean degree of ionization in the shell was less in 1950 than in 1938. The apparent rotational velocity of the shell is 150 km./sec., and, on the assumption of the conservation of angular momentum between the shell and the star, this gives a projected velocity of rotation of the shell of 230 km./sec. The fraction of neutral, once-ionized and twice-ionized iron for a number of temperatures and electron pressures computed by Saha's equation are given, and from a consideration of the data it is shown that in 1938 the shell may be described as a body of gas in thermodynamic equilibrium with $T \sim 9{,}000°$ K. and log $P_e \sim 1{\cdot}5$, while in 1950 log $P_e \sim 3$, the temperature remaining practically the same. It was pointed out by Struve in 1938 that this description cannot account for the appearance of HeI λ 3965 in the shell spectrum, which requires that the radiation field be dilute and of a high temperature, but it is shown that these apparently contradictory requirements are reconciled and that the shell is probably confined to an equatorial ring or bulge. The 1949–50 radial-velocity measures of the star and shell show that the star was expanding with respect to the shell for a short time after Slettebak had announced an enhanced shell spectrum in *H.A.C.* 1050. It is suggested that the increase of pressure—probably the cause of the change of ionization observed—was due to the outer layers of the underlying star expanding for a short period and compressing the equatorial bulge.

The Comet of November 1948

A REPRINT from *Science and Culture* (**14**, p. 302) has been circulated by the director of the Solar Physics Observatory, Kodaikanal, and this publication contains a description of the comet of November 1948, with nine photographs taken between November 11 and December 7, 1948. Visual and photographic observations of the comet were made on thirteen days, and on two other days only visual observations were possible. A table lists its spherical co-ordinates between the above dates, and various other details are given with three diagrams. The comet, known as 1948 *l*, made a spectacular appearance during the total eclipse of the sun on November 1, 1948; its perihelion distance was 0·135335 and its orbit was practically parabolic.

Love Waves in Earthquakes

IN the seventh paper of his recent series on surface waves, Yasuo Satô has examined theoretically the travel-time of Love waves (*Bull. Earthquake Res. Inst., Tokyo Univ.*, **30**, Pt. 4, 305; December 1952). The work includes calculations, (1) assuming the focus is in the superficial layer, and (2) assuming the focus is in the lower medium. He obtains equations for (1): $x_c' = (H + E)/[(V_{\text{Love}}/V_s)^2 - 1]^{1/2}$, x_c' being the critical distance where Love waves can first be observed, H the depth of superficial layer, E the depth of the point below the bottom of the superficial layer where the emergent ray—produced backwards—would intersect the vertical through the focus, and V_{Love} and V_s the velocities of the Love and transverse waves respectively in the superficial layer. For (2), $x_c = H/[(V_{\text{Love}}/V_s)^2 - 1]^{1/2}$. Assuming a structure for the upper crust in Japan as determined by T. Matuzawa, the following two sets are obtained: $\rho' = 3{\cdot}4$ gm./cm.^{3}, $\mu' = 68{\cdot}9$ km. gm. sec., $V_s' = 4{\cdot}5$ km./sec.; $\rho = 2{\cdot}7$ gm./cm.^{3}, $\mu = 29{\cdot}4$ km. gm. sec., $V_s = 3{\cdot}3$ km./sec. Satô calculates that the intercept time of a wave with a period of half a minute is about ten seconds, and the critical appearance-distance is about two hundred kilometres. This theoretical result agrees with some unpublished observational facts ascertained by T. Akima using his low-pass filter.

Pythium Parasites of Sitka Spruce Seedlings

FUNGI belonging to the genus *Pythium* are frequently found on the roots of various plants, in circumstances which indicate some degree of parasitism. J. H. Warcup (*Trans. Brit. Mycol. Soc.*, **35**, Part 4, 248; December 1952) has demonstrated that three species were actively parasitic on Sitka spruce seedlings grown on alkaline soil. One species (*P. ultimum*) was indeed found to be naturally abundant in the soil of nurseries in alkaline regions (*p*H 6·8–7·2) and rare or absent in those under more acid conditions (*p*H 5·3–5·5). Symptoms varied from 'damping-off' to a slow foot-rot. Partial sterilization by steam or formalin treatment controlled the disease; the plants, moreover, grew much better after this treatment and were more numerous.

Announcements

MR. H. NORMAN G. ALLEN has been re-elected chairman of Council of the British Internal Combustion Engine Research Association for the current year.

MR. T. O. MUIREADHAIGH, of the Department of Industry and Commerce of the Republic of Ireland, has been appointed chairman of the National Committee for Geodesy and Geophysics in succession to Mr. J. C. B. MacCarthy (*Nature* of July 25, p. 142).

WELLCOME Pharmaceutical Research Fellowships, of an annual value of £350 each, have been awarded to J. Thomas and G. L. Willey for a second year in both cases. Mr. Thomas will continue, in the Department of Pharmacy of the University of Manchester, his study of the chemical synthesis of biological activity, particularly bactericidal action, of a new series of quaternary ammonium compounds. At the University of Leeds Mr. Willey will continue his research on the possibility of selectivity of action of nicotine-like stimulant compounds.

THE Pharmaceutical Society has awarded its Ransom Fellowship, worth £300 a year for two years, to Mr. Keith Henry Palmer for research, in the Pharmacy Department of the University of Nottingham, on plant chemistry with special reference to the separation of naturally occurring mixtures of alkaloids. The Society's research scholarship, also of £300 a year for two years, has been awarded to Mr. Kenneth Albert Kerridge, for work in the Department of Pharmacy, Chelsea Polytechnic, on the aspects of trace metal chelation in relation to bacteriostasis.

THE English Electric Research Fellowship in Aeronautics, tenable at the College of Aeronautics, Cranfield, has been awarded for the academic year 1953–54 to R. G. Anderson, of the Mathematical Section of the Aircraft Division of the English Electric Co., Ltd., Warton Aerodrome, Preston. The Perring Scholarship for a two-year course at the College, beginning in October this year, has been awarded to A. Coull, a graduate in civil engineering of the University of Aberdeen.