

Contemporary Birthdays.

December 12, 1838.	Prof. W. C. Unwin, F.R.S.
December 12, 1866.	Prof. E. W. MacBride, F.R.S.
December 12, 1855.	Mr. Arthur William Clayden.
December 13, 1861.	Prof. A. G. Perkin, F.R.S.
December 15, 1869.	Sir John F. C. Snell, G.B.E.
December 16, 1884.	Prof. John W. Bews.
December 16, 1859.	Prof. Douglas H. Campbell.
December 16, 1854.	Prof. John T. Cash, F.R.S.

Prof. UNWIN celebrates his eighty-eighth birthday on Sunday, and very hearty congratulations are accorded to this distinguished veteran of the engineering world. Educated at the City of London School, he began his technical career as a pupil in the firm of William Fairbairn, Manchester. For twenty years he taught the principles of engineering at the Central Technical College, City and Guilds of London Institute. Prof. Unwin is a past president of the Institutions of Civil Engineers and Mechanical Engineers.

Prof. MACBRIDE, the distinguished zoologist, who occupies the chair of zoology in the Imperial College of Science and Technology, South Kensington, was born at Belfast and educated there at Queen's College, and at St. John's College, Cambridge. From 1897 until 1909 he was Strathcona professor of zoology in McGill University, Montreal. A teacher of distinction, Prof. MacBride has made noteworthy contributions to invertebrate embryology. In 1924 he published his "Introduction to the Study of Heredity."

Mr. CLAYDEN was born at Boston, Lincolnshire, and educated at University College School, from whence he graduated at Christ's College, Cambridge. From 1894 until 1920 he was principal of University College, Exeter. Mr. Clayden has contributed much of sterling value to meteorological photography.

Prof. A. G. PERKIN, who, it will be recalled, retired recently from the chair of colour chemistry and dyeing in the University of Leeds, was born at Sudbury. He was educated at the City of London School and Royal College of Science. In 1924 the Royal Society awarded him its Davy medal for researches on the structure of natural colouring matters.

Sir JOHN SNELL was born at Saltash, Cornwall, and educated at Plymouth Grammar School and King's College, London. A past president of the Institution of Electrical Engineers, he is a member of the Advisory Council, Department of Scientific and Industrial Research, and the General Board, National Physical Laboratory. Sir John's advice and guidance are sought frequently in parliamentary projects concerning the technical industries.

Prof. BEWS, born at Kirkwall, Orkney, graduated at the University of Edinburgh. Assistant professor of botany there (1908-10), he left to take up the chair of botany in University College, Natal. In 1924 he published "Plant Forms and their Evolution in South Africa."

Prof. D. H. CAMPBELL, botanist, was born at Detroit, U.S.A. After graduation at the University of Michigan, he studied at Bonn, Tübingen, and Berlin. Professor of botany at Indiana University from 1888 until 1891, he was then elected to a similar chair at Stanford University, California. Prof. Campbell is a foreign member of the Linnean Society of London and a fellow of the Royal Society of Edinburgh. He is the author of "Plant Life and Evolution" (1911) and of many papers on systematic botany.

Prof. CASH, a graduate of the University of Edinburgh, is Emeritus Regius professor of materia medica in the University of Aberdeen.

Societies and Academies.

LONDON.

Royal Society, December 2.—T. M. Lowry and W. R. C. Coode-Adams: Optical rotatory dispersion (Pt. 3). The rotatory dispersion of quartz in the infra-red, visible, and ultra-violet regions. Measurements of optical rotatory power of quartz were begun in 1908 with the view of testing, in the most drastic way possible, methods that were being developed for studying rotatory dispersion in organic compounds. Data are now given for the rotatory power at 20° C. of a column of quartz, 496.4735 mm. in length, over a range of wave-lengths from 25,170 Å.U. to 2263 Å.U. Observed rotations range from 450° to 101,332°, and rotations per mm. from 0.906° to 202.328°/mm. The latter can be expressed, over the entire range of wave-lengths, by the formula—

$$a = \frac{9.5639}{\lambda^2 - 0.0127943} - \frac{2.3113}{\lambda^2 - 0.000974} - 0.1905.$$

This formula postulates the existence of bands of selective absorption at 1130 Å.U. and 310 Å.U. The influence of infra-red bands is covered by the small constant -0.1905.

O. W. Richardson: Structure in the secondary hydrogen spectrum (ν). Fulcher's red bands as extended by various authors form a sequence of bands with the respective vibration transitions $0 \rightarrow 0$, $1 \rightarrow 1$, $2 \rightarrow 2$, $3 \rightarrow 3$, $4 \rightarrow 4$, and $5 \rightarrow 5$. The green bands belong to the same group and have the vibration transitions $1 \rightarrow 0$, $2 \rightarrow 1$, $3 \rightarrow 2$, $4 \rightarrow 3$, and $5 \rightarrow 4$. Associated with these are five bands in the infra-red with transitions $0 \rightarrow 1$, $1 \rightarrow 2$, $2 \rightarrow 3$, $3 \rightarrow 4$, and $4 \rightarrow 5$, and four in the blue-green with transitions $2 \rightarrow 0$, $3 \rightarrow 1$, $4 \rightarrow 2$, and $5 \rightarrow 3$. The blue bands arranged by Dieke form a sequence in another group and have the transitions $0 \rightarrow 0$, $1 \rightarrow 1$, $2 \rightarrow 2$, $3 \rightarrow 3$, and $4 \rightarrow 4$. Belonging to this group are three other sequences with transitions 1 up, 1 down, and 2 down respectively. There are also at least three less well-developed groups in the violet side of these. The Q (1) lines of the bands with $0 \rightarrow 0$ vibration transitions are given by the Rydberg-Ritz formula

$$\nu = A - \frac{R}{(m - 0.056704 - 0.06080/m^2)^2}$$

where $A = 29330.305$, $R = 109678.3$, and $m = 3, 4, 5, 6, 7, 8$. The value of A is close to that of the second member when $m = 2$. It follows that the various groups of bands are associated with electron transitions $3 \rightarrow 2$, $4 \rightarrow 2$, $5 \rightarrow 2$, etc. The lines of the Q branches are connected together by a combination rule which extends not only within each group but also from each group to the others.

R. H. Fowler: General forms of statistical mechanics, with special reference to the new quantum mechanics. This paper discusses a very general form of statistical mechanics which includes as special cases the classical form, the form of Bose and Einstein, and of Fermi and Dirac. It is shown generally that assemblies of many independent systems are always thermodynamic systems. The correct form for material particles obeying the laws of quantum mechanics is then discussed, and the arguments in favour of the form of Fermi and Dirac summarised. The applications of this form are then greatly extended. Previously it had been applied only to structureless mass-points; it is here shown how to treat assemblies as general as any handled in the classical form. Problems of distribution in space according to the new mechanics are also briefly treated.

R. H. Fowler and E. K. Rideal: On the rate of maximum activation by collision for the complex