of the pure crystalline material in olive oil, of such strength that 1 mgm. contains 0·025 γ.

The Conference recommends that pure β-carotene be adopted as the standard for vitamin A, in place of the present standard, which is a mixture of the isomers of carotene. The value of the unit is unchanged and one such unit is contained in 0·6 γ of the new standard : the old standard contained the same activity in 1·0 γ. The standard preparation is to be issued in solution in a vegetable oil, in which it has been shown that it does not lose colour on incubation in the presence of air at 37° C. for 7 days, the strength of the solution being such that 1 gm. contains 500 units, or 300 γ of β-carotene. The Conference report states that it has been found that measurement of the coefficient of absorption at 3280 A. affords a reliable method for measuring the vitamin A content of liver oils and concentrates, and that the value obtained for $E_{1\,cm.}^{1\,per\,cent}$ 3280 A. can be converted into a figure representing units per gram by multiplying by the factor 1,600. This figure is the average of a series of comparative and independent tests on the unsaponifiable fractions of liver oils and on concentrates of high potency.

For vitamin C the Conference recommends the adoption of l-ascorbic acid as standard, the unit being the activity of 0·05 mgm. of the pure substance. (The previous standard was lemon juice, one unit being contained in 0·1 c.c. : it has since been found that the potency of lemon juice varies, but the adoption of the new standard does not involve any significant change in the value of the unit.) It was decided to ask the Institute of Medical Chemistry, Szeged, through Prof. A. Szent-Györgyi, to prepare a batch of 500 gm. of the standard and to ask Prof. W. N. Haworth to co-operate in controlling its purity.

Among the subjects suggested for future work are the provision of a sample of cod liver oil as a subsidiary standard of reference for vitamins A and D and the investigation of the anomalous action on certain species of different sources of vitamin D.

All the standards are kept at the National Institute for Medical Research, London, acting for this purpose as the central laboratory on behalf of the Health Organisation of the League of Nations.

University and Educational Intelligence

CAMBRIDGE.—The General Board recommends that the following additional University teaching offices be established : (a) an assistant directorship of research in the Faculty of Economics and Politics ; (b) an assistant directorship of research in colloid science ; (c) a University lectureship in the Department of Mineralogy and Petrology ; (d) a University demonstratorship in agricultural engineering (subject to financial provision being made by the Ministry of Agriculture and Fisheries) ; (e) two University lectureships in the Department of Pathology ; (f) a University lectureship in experimental psychology ; (g) a readership in industrial psychology (subject to the provision by the Medical Research Council of the stipend and pension contribution) ; (h) an assistant directorship of research in industrial psychology (subject to the provision by the Medical Research Council of the stipend and pension contribution).

EDINBURGH : On the recommendation of the Senatus, the Court has approved of the establishment of a Sharpey-Schafer lectureship in physiology, a fund for the endowment of this lectureship having been contributed by pupils and friends of Sir Edward Sharpey-Schafer. The first of the lectures, to be given biennially, will be delivered in the coming summer term.

LONDON.—The Buckinghamshire County Council has decided to make a grant of £5,000, payable over ten years, towards the erection of new buildings in Bloomsbury.

A grant of £2,000 has been made by the Pilgrim Trustees to the London School of Economics towards central expenditure on the Land Utilisation Survey. The grant, which is for staff salaries and the preparation of the report on the Survey, is estimated to cover the cost of completing the Survey as far as central expenditure is concerned. Local bodies and others are subscribing to local expenditure, and it is hoped that sufficient additional contributions from these sources will be obtained to complete the total cost of the work. The Pilgrim Trustees have further given valuable assistance to the Survey by setting aside a sum of £1,000 which can be drawn upon as required by the London School of Economics to secure the continuance of the publication of the maps. This sum is to be repaid by the School from the publication account of the Survey.

Science News a Century Ago

Walker's Eidouranion

"The Strand Theatre," said The Times of March 31, 1835, "from which Thalia and Melpomene have been banished by the Lord Chamberlain, has during Lent become the residence of Urania. Mr. Walker, the well-known popular lecturer, and perhaps the original lecturer, on the motion of the heavenly bodies and the phenomena of the planets, has commenced his very interesting lectures at this house. His lectures, and the reputation he has deservedly acquired by them, his apparatus and machinery, are so well known to almost all persons, that there is no need of giving a further description of them. They are in their contrivance elaborate and complex, but the illustration which they afford of the subject which he discusses is at once simple and intelligible. . . . The lecturer himself enters into his subject with a spirit of inquiry, and an earnestness of endeavour to familiarize science, which are very refreshing to those whose attempts at gaining information have been chilled by the technical formality of more stately teachers. . . . At a time when the theatres are closed against dramatic performances the public cannot do better than devote a few hours to the acquirement of the scientific knowledge which these lectures, and similar lectures, convey and there can be little doubt that to the younger branches of the community they will convey that information to which young persons are exceedingly averse, unless it is conveyed in such a manner as to excite attention without distracting the understanding and wearying the patience." The lecturer was presumably Deane Franklin Walker (1778–1865) who, like his father Adam Walker (1731 ?–1821), lectured on science at Eton and Harrow and other public schools.

The Tides of the United Kingdom

On April 2, 1835, Whewell read a paper to the Royal Society entitled "On the Results of Tide

Observations, made in June 1834, at the Coast-Guard Stations in Great Britain and Ireland". Through representations made by Whewell, orders had been given for simultaneous observations of the tides at all the stations of the Preventive Service on the coasts of England, Scotland and Ireland from June 7 until June 22, 1834. The observations were sent to the Admiralty, and a part of them had been reduced. From them Whewell had been able to deduce many important inferences. He found that the tides in question were not affected by any general irregularity having its origin in distant sources, but only by such causes as were merely local, and that therefore the tides admitted of exact determination with the aid of local meteorological corrections. The curves expressing the tides of high-water presented a very satisfactory agreement with theory. A diurnal difference in the height of the tides, he said, manifests itself with remarkable constancy along a large portion of the coast under consideration. The tide hour appeared to vary rapidly in rounding the main promontories on the coast, and very slowly in passing along the shores of the intervening bays, so that the co-tidal lines are brought close together in the former cases, and in the latter run along nearly parallel to the shore ; circumstances which would account for comparative differences of level and of corresponding velocities in the tide stream.

Theories of Electricity

Prof. William Ritchie (1790–1837), after being a schoolmaster in Scotland, went to Paris, where he studied under Thenard, Gay Lussac and Biot. In 1829 he became professor of natural philosophy at the Royal Institution, and three years later was given a similar post in the University of London. On April 3, 1835, he gave a lecture at the Royal Institution on the "Comparison of the two Theories of Electricity". The first of these theories, he explained, supposed that electrical phenomena depended upon the existence of a fluid universally diffused through matter and space, the particles of which repel each other inversely as the square of the distances. If we abstract a portion of this fluid from a body, the latter becomes negatively electric ; while if we add a portion, we produce the phenomena exhibited by positive electricity. Another theory considered electricity to be a compound substance, consisting of two elements, positive and negative electricity. None of the phenomena is observed until this fluid is decomposed, and then a portion of it goes to the attracted body. Perhaps, said Prof. Ritchie, the fluid may be the ether to which the phenomena of light seem attributable.

The Dublin and Kingstown Railway

"The following is a statement," said the *Mechanics' Magazine* on April 4, 1835, "of the number of passengers, of different classes, conveyed along this railway during the first quarter of a year since it was opened, namely, from the 17th December 1834 to the 17th March 1835 :

1st Class fare,	1s. each	10,008
2nd ditto	8d. each	72,148
3rd ditto	6d. each	94,961

Total number of passengers 177,117

The whole of this immense number of passengers has been carried without the slightest accident of any sort. The receipts during the same period have amounted to £5,283 16s. 8d."

Societies and Academies

LONDON

Royal Society, March 21. D. R. HARTREE and W. HARTREE : Self-consistent field, with exchange, for beryllium. Fock's equations for the self-consistent field of an atom, including exchange effects, have been completely solved numerically for the normal state of neutral Be. In connexion with the numerical calculations of energy values, a new check, depending on the direct calculation of the difference of energy values calculated using the solution of Fock's equations and using any other wave functions, is developed and applied. The inclusion of the exchange terms has a small but appreciable effect on the $(1s)$ wave function, which becomes more like that for the Be^{++} ion, and a considerable effect on the $(2s)$ wave function, which contracts, and also becomes smaller near the origin compared to its maximum value. These changes are qualitatively of a kind to bring calculated values of certain atomic properties into better accord with experiment. H. R. HULME, J. McDOUGALL, R. A. BUCKINGHAM and R. H. FOWLER : The photo-electric absorption of X-rays in heavy elements. A method is developed for finding the photo-electric absorption coefficient for the K-shell, σ_K. The calculations are rigorous and are not subject to the restriction $Z \ll 137$, where Z is the atomic number. Theoretically it is possible to apply the method for all values of $h\nu$, the energy of the quantum absorbed, but, as a considerable amount of numerical work is necessary, it is not practical for large values of $h\nu/mc^2$. Values of σ_K are given for $h\nu/mc^2 = 0.693$ and 2.21 for elements with atomic numbers 26, 50 and 84. The values obtained do not differ much from those given by Hall, using a method which is discussed. His expression has therefore been used for σ_K in the region $h\nu > 5mc^2$ and graphs have been constructed giving the photoelectric absorption *per atom* for various elements in the range $h\nu > 0.7mc^2$ or 3.4×10^5 e.v. The values obtained for lead are in excellent agreement with the experimental results as given by L. H. Gray's empirical formula.

DUBLIN

Royal Irish Academy, February 25. R. Ó CINNÉIDE : Some 2.4.derivatives of thiophene. 2–Thiophene-carboxylic acid condenses with N–methylolamides to form derivatives of the general formula 2.4. $HOOC.C_4H_2S.CH_2NHCOR$. These derivatives, on acid hydrolysis, give the amino-acid 2.4.$HOOC.C_4H_2S.CH_2NH_2$, which can readily be oxidised to the known acid 2.4.$C_4H_2S.(COOH)_2$. The hydroxy-acid 2.4.$HOOC.C_4H_2S.CH_2OH$ can also be obtained from the above amino-acid.

PARIS

Academy of Sciences, February 11 (*C.R.*, **200**, 501–596). A. GOSSET : The partial longitudinal resection of the inferior vena cava in the course of the ablation of a right pararenal tumour. Description of a rare operation. HENRI LAGATU and LOUIS MAUME : Leaf diagnosis of tobacco. The comparative influence of the scoria of dephosphoration, of superphosphate and of the basic phosphate on the PNK equilibrium. EDOUARD CHATTON and MLLE. BERTHE BIECHELER : *Amœbophrya* and *Hyalosaccus* : their evolutive cycle.