pure iron and lead showed that the effect of strain is a minor and ephemeral factor in corrosion in neutral solutions; a trace of impurity appears to assist local corrosion, but the amount of corrosion is not proportional to the amount of impurity. The effect of a trace of impurity is probably a trigger action. The main function of oxygen in corrosion is not that of a depolariser, but rather to oxidise the metal directly, and also in some cases the products of corrosion.

Two chief types of corrosion are distinguished: (*a*) The general type, usually characteristic of acid corrosion; and (*b*) the local type, usually characteristic of corrosion in water and salt solutions. The latter is generally characterised by the formation of an adherent scale on the metal, which may contain colloid. The significance of colloids in corrosion appears to be as follows: A metal immersed in water sends positively charged metal ions into the liquid, and becomes itself negatively charged. With commercial metals, the metal also becomes superficially oxidised if dissolved oxygen is present. The hydroxide produced can take up the ions given off by the metal, and thereby becomes a positively charged colloid. Some of this will diffuse away, permitting further reaction between oxygen and the metal surface. Oxidation stops until this hydroxide can pass into the colloidal state by acquiring positively charged metal ions. This, in general, does not take place till the colloid initially formed has diffused into the presence of electrolyte, when it is precipitated by the anion of the dissolved salt, the cation neutralising the charge on the metal corresponding to that on the colloid. Then the metal can send more ions into solution, and the uncharged hydroxide can acquire a charge. If the colloid produced can diffuse away, the process can continue and corrosion develop. If the colloid precipitates directly on the corroding surface it will, in general, adhere and stop corrosion. In the case of a corrosion pit, it is only when the colloid diffuses through an aperture in the gel-deposits at the mouth of the pit that it meets electrolyte and is then precipitated. Such precipitation merely thickens the external gel-deposits. The latter protect the metal surrounding the pit, and emphasise the local nature of the corrosion.

Vitamins.

THE Sections of Physiology and Agriculture of the British Association held a joint discussion on vitamins at Hull on Friday, September 8.

Prof. J. C. Drummond spoke of the great strides that have been made since the discovery of the vitamins by Hopkins in 1912. Both the existence and the indispensability of these substances are now generally accepted. The far-reaching importance of the qualitative composition of the diet of man and animals is being gradually appreciated, and the significance of those factors which exist in extremely minute amounts recognised. Three substances of the so-called vitamin class have been differentiated with certainty, and it is possible that more exist. They do not appear to be of one chemical type, and the only ground for grouping them together is that they occur, and are effective, in very small amounts. Parallel examples from the inorganic food constituents are known, such as the value of minute doses of iodides in the treatment and prevention of fœtal athyrosis in swine.

The green tissues of plants would seem to be the chief site of vitamin synthesis, although lower forms of plant life devoid of photocatalytic pigments can apparently produce the vitamin B. Plant tissues undoubtedly form the direct or indirect source of the vitamin supply of animals, but we are entirely ignorant as to the rôle of the vitamins in the plant itself.

Storage of the vitamin A may take place in the tissues, liver, and body fat of animals, and may serve as a reserve from which are drawn supplies to maintain the vitamin concentration of milk if the diet during the lactation period should be deficient.

In collaboration with Dr. Zilva a prolonged investigation of the origin of the large stores of vitamin A in cod-liver oils has recently been made. It has been ascertained that the marine diatoms synthesise the vitamin, and that it is transferred to the tissues of minute animals (plankton) which thrive on the unicellular plants. These in turn form the food supply of larger species, particularly small fish, which in their turn are devoured by the larger fish, such as the cod. Through all these stages there is apparently a transference of the vitamin, ending finally in the storage in the liver of the cod. The modern methods of manufacture of cod-liver oil do not appreciably lower the vitamin value, but there are wide variations in the value of different samples which are probably connected with the seasonal changes in the feeding habits or physiological condition of the fish. Considerable work has been done on the chemical nature of the vitamin A, but an isolation has not yet been made. It is very stable, except to oxidative changes, and passes into the unsaponifiable fraction of the oil. Cholesterol, pigments, and other fractions of this fraction may be removed without loss of potency.

Capt. J. Golding gave a number of illustrations of the value of the application of vitamin theories in practical pig-feeding. Frequently the usual type of pig diet is deficient in vitamins, particularly vitamin A, and the beneficial influence of cod-liver oil or of feeding on pasture or lucerne in such cases is remarkable. In the compounding of rations care should be taken to ensure an adequate supply of food-stuffs rich in vitamins, otherwise there is danger of subnormal growth, impaired resistance to infections, and disturbances of the power to produce and rear normal young. The majority of the cereal products are deficient in vitamin A, and the amount in the diet is not raised much by the use of separated milk. Such diets can be supplemented by small additions of cod-liver oil, 1-2 oz. daily for full-grown pigs, or by access to pasture. Cod-liver oil is also valuable in maintaining the vitamin value of the milk yielded by cows on winter rations in stall, which otherwise tends to fall. The administration of cod-liver oil, if of good quality, does not produce flavour or taint in pigs or milk and butter.

Dr. Atherton Seidell (New York) described his attempts at the separation of the vitamin B from yeast by chemical methods. By adsorption of the vitamin from yeast extracts on to fuller's earth, and extraction of the activated solid with alkalies under suitable conditions, considerable concentration of the active substance could be effected. The resulting extract when fractionated by precipitation with silver salts gave active fractions, but these have not yet yielded a pure substance.

Prof. W. D. Halliburton referred to the need for caution that enthusiasm for a new word such as vitamin did not overwhelm the importance of other dietary units. There must not be a loss of perspective in viewing the function of these newly

discovered substances. There is also need for further research on the nature of the substances (auximones) which are believed to act as vitamins for plant growth.

Dr. Monkton Copeman agreed with the importance of vitamins for the young and growing organism, but questioned whether they are as important, or not actually deleterious, to the mature animal. In some researches which had recently been made under the auspices of the Ministry of Health, evidence had been obtained that patients suffering from malignant growths had received benefit from a course of feeding on dietaries deficient in vitamins. There was also a definite, if microscopic, fall in the Registrar-General's figures for cancer during the years of the war, when food restrictions were in force.

British and American Fine Chemicals.

THE "Catalogue of Chemical Products" issued by the British Drug Houses, Ltd., is now so well known to chemists that there is little need to do more than direct attention to the new edition, issued on September 21, which includes several thousand chemicals, many of them recent additions. The firm caters not only for chemical laboratories, but also supplies an extensive range of requisites for microscopic work, such as stains, mounting media, embedding materials, liquids of known refractive index, etc. Special mention may be made of the list of about 50 indicators for which the catalogue gives a useful table showing the PH range in each case, including the universal indicator, a mixture to be used for determining rapidly and in one operation the approximate PH of a solution by the colour developed.

A new edition (No. 8) of the list of organic chemicals sold by the Eastman Kodak Co. in the United States has also been issued recently. It includes about 1400 products and has two good features which British firms might copy with advantage. It indicates, usually by means of the melting- or boiling-point, the degree of purity of the product, and states which materials have been made or purified in the firm's own laboratories. The American firm seems to realise the necessity of securing as quickly as possible a reputation for quality similar to that enjoyed by a few of the German makers before the war, and the features just alluded to have no doubt been introduced into their list with that object.

The Eastman list begins with an introduction in which, after recording progress, a frank appeal is made to chemists to co-operate with the company in making the United States independent as regards the supply of these essential materials, by indicating possible means of improving the quality, furnishing information as to supplies of new or rare organic chemicals available for purchase, and suggesting new materials for manufacture.

British manufacturers should realise that British chemists are equally interested in this matter so far as this country is concerned, and similar appeals in their lists would probably have an excellent effect. There are few research laboratories in which there are not residues of rare organic chemicals available for disposal, and most laboratories of university standing could, from time to time, do something towards supplying complex organic chemicals.

It has been urged against the Board of Trade lists drawn up under the Safeguarding of Industries Act that they "protect" many chemicals which, owing to the small demand and the cost of labour, can never be made in this country. The co-operation of university laboratories might also be a means of overcoming this difficulty.

University and Educational Intelligence.

CAMBRIDGE.—Mr. E. C. Francis, Trinity College, has been elected Fellow and mathematical lecturer at Peterhouse. Mr. C. G. Lamb has been appointed reader in electrical engineering.

The allotment made in 1920 of 165,000*l.* for the endowment of the School of Biochemistry from the estate of the late Sir William Dunn has been increased by a further sum of 45,000*l.* It is of interest to note the allotment ordered by the Court for the subdivision of the total sum of 210,000*l.*, namely (*a*) 96,000*l.* for the site and building of the Institute of Biochemistry; (*b*) 18,000*l.* for equipment, maintenance, and improvements out of annual income; (*c*) 89,000*l.* for salaries and the expenses of research work out of annual income; (*d*) 7000*l.* for a fund to meet contingencies and unforeseen expenditure.

A studentship for study and research in the languages, literature, history, archæology or art of ancient Greece or Rome or the comparative philology of the Indo-European languages is to be founded from a bequest under the will of the late Sir John Sandys, Public Orator.

MANCHESTER.—On Monday, October 30, Mr. Harold L. Cohen opened the Lewis Departmental Library in the Faculty of Commerce and Administration. This library, and also certain scholarships, have been provided from a gift by Messrs. Lewis with the object of encouraging co-operation between the university and the business community of the city. The Faculty of Commerce has made rapid progress during recent years, and it is hoped that university graduates may find increasing opportunities to demonstrate the value of a university training in commerce.

Mr. E. J. Sidebotham has been appointed honorary lecturer in public health, and Mr. G. J. Langley hon. assistant lecturer in physiology.

The following appointments have also been made: assistant lecturer in electrical engineering, Mr. L. S. Palmer; special lecturer in textile design, Mr. Henry Cadness; Osborne Reynolds fellow, Mr. F. D. Reynolds; Vulcan fellow, Mr. F. Heywood; Leech fellow, Mr. C. D. Hough.

ST. ANDREWS.—The University Court has now made an appointment to the chair of natural philosophy in the United College, which became vacant at the end of last academical year by the retirement of Prof. Butler. The new professor is Dr. H. Stanley Allen, of the University of Edinburgh. Dr. Allen was educated at Kingswood School, Bath, and Trinity College, Cambridge. Afterwards he held a post as assistant lecturer at the University College of Wales, Aberystwyth; he also did research work in physics at the Cavendish Laboratory, Cambridge, under the direction of Sir J. J. Thomson, and was in charge of Lord Blythswood's physical laboratory at Renfrew. In October 1905 Dr. Allen was appointed to a post in the physics department of King's College, London, where, after being lecturer for some years, he followed his chief there (Prof. C. G. Barkla) to the physics department in Edinburgh. In the course of his career Dr. Allen has had a varied experience of the teaching of physics, and he has made some notable contributions to the scientific literature of the subject.

THE following Parliamentary candidates for university constituencies have been returned unopposed:—Scotland: D. M'Coig Cowan (N.L.), Sir Henry Craik (U.), and Sir George Berry (U.). Queen's, Belfast: Sir William Whitla (U.). Sir George Berry is the only new member from these two constituencies.