

account of the properties of the deuterioammonias, NDH_3 , ND_2H and ND_3 , is given.

Experiments on the hydrolysis of palmityl chloride and the enzymic hydrolysis of triolein, on the effect of heavy water on the respiration and fermentation of yeast, on xanthin oxidase, and on the cytochrome-indophenol oxidase system, as well as on the swelling of gelatin, have been reported by Rideal, Hughes, Yudkin and Kemp (*J. Chem. Soc.*, 1105; 1934). The results with yeast confirm the result found by Pascu that heavy water possesses toxic properties. No effect on the rate of hydrolysis of palmityl chloride or triolein was found, nor on the activity of xanthin oxidase or cytochrome-indophenol oxidase. The effect on the swelling of gelatin on replacing water by heavy water up to 90 per cent deuterium content was inappreciable.

University and Educational Intelligence

THE handbook of lectures and classes for teachers arranged by the London County Council for the session 1934-35 has recently been issued. Courses are being arranged in most branches of education, and will be given at various centres in London. Copies of the handbook and further information can be obtained from the Education Officer, The County Hall, Westminster Bridge, London, S.E.1.

DR. H. W. CHASE, Chancellor of the University of New York, spoke in his inaugural address on June 13 about the freedom of the individual as a condition of the advance of civilisation—a subject on which confessions of faith have been proclaimed on many occasions of late in American university circles, especially since the advent of the Hitler regime in Germany and the consequent eclipse of *Lehrfreiheit*. While insisting on the necessity for freedom in universities, Dr. Chase reminded his hearers of their obligation to maintain the scientific temper, especially in the fields of the social sciences, now attracting the labour of so many research workers. The address is reproduced in *School and Society* of June 23.

THE Advanced Studies Committee of the University of Oxford has recently published a collection of abstracts of dissertations for the degree of Ph.D. It is vol. 6 of a series of such abstracts and covers the period October 1932-December 1933. Since the institution of this degree in British universities in 1917, there has been no little uncertainty and controversy as to what it does and should imply, and its standard in relation to other post-graduate degrees; and the matter was three years ago considered of such importance and general interest that it was selected as one of the subjects for discussion at the Fourth Congress of the Universities of the Empire. These Oxford abstracts are full enough to give in many cases a fair indication of the standard of the candidate's work, their average length being about two thousand words. They are grouped under the faculty headings: physical sciences (27), biological sciences (3), modern history (6), medieval and modern languages (5), theology (2), *lit. hum.* (1), oriental languages (1) and social studies (1). Several are of wide general interest, notably a study by D. M. Eastwood of Somerville of "The Revival of Pascal in France".

Science News a Century Ago

British Association at Edinburgh

The Edinburgh meeting of the British Association was held on September 8-15, 1834. In the *Analyst* (London) it was stated that a dinner was held on the opening day at 5 p.m., attended by 350 persons, with Sedgwick as chairman. He proposed the health of M. Arago, the Astronomer Royal of France. In reply, "M. Arago dwelt on the advantages that must result from the union of the minds of Europe; he regarded it as the pledge of the peace of the world because intellectual supremacy daily acquires more direct power over the affairs of nations, and when the intellectual rulers are banded in friendship the nations subject to this influence cannot be forced into hostility". These sentiments, we read, produced considerable impression. Following the dinner, the inaugural opening of the meeting took place elsewhere, Sir Thomas Brisbane presiding.

The business of the meeting was dealt with by six sections: (1) Mathematics and Physics; (2) Chemistry and Mineralogy; (3) Geography and Geology; (4) Anatomy and Medicine; (5) Natural History; and (6) Statistics.

The subjects discussed in the Section of Mathematics and Physics ranged from capillary attraction, meteorology, magnetism and optics to engineering. Sir David Brewster described some experiments on reflection from crystals, Rennie submitted a report on hydraulics, and Scott Russell dealt with his observations of the traction of boats in canals. The chair in the Section of Chemistry and Mineralogy was taken by Hope, who was occasionally relieved by Dalton. In this Section there was a discussion on chemical notation, while Daubeny described experiments on thermal waters and the heating power of fuels, and Kemp dealt with the liquefaction of gases. Among those who contributed to the proceedings of the Section of Geology was Agassiz.

The Lord Provost awarded diplomas of the freedom of the City to M. Arago, Dr. John Dalton, and Dr. Robert Brown. Evening lectures were given by Dr. Lardner on Babbage's calculating machine; by Prof. Buckland on fossil reptiles; and by Prof. Whewell on phenomena connected with the tides.

Edinburgh as a Meeting Place

The secretaries for the Edinburgh meeting were Robison and J. D. Forbes. It was largely due to Forbes that the Association met at Edinburgh. A year previous he had written to Sir Thomas Brisbane and to Murchison advocating the claims of Edinburgh as opposed to those of Dublin, Bristol and Liverpool, and in his letter to Murchison he said: "Then as to Bristol, the idea is a new one. Liverpool was spoken of, but as far as I recollect, not the other, nor do I think it a good position. But putting this out of the question, what I object to is your calling Edinburgh a University town, and therefore that it ought not to follow Cambridge. This is quite a mistake. The University gives no character to Edinburgh, and I fear will give little to the meeting. You must be perfectly aware that it is not an academical place, and that the University has nothing to offer. It has no status, no funds, no power. In short, you must never think of the University when you come here, nor compare it in the remotest degree with Oxford and Cambridge. . . ."

Forbes and Vernon Harcourt

During the meeting Forbes entertained Whewell, Peacock and Vernon Harcourt in his house at Greenhill. Of the last he said in a letter: "I learn every year to look with more admiration and affection on that remarkable man; nor shall I ever cease to look back with peculiar satisfaction on that meeting at York which brought me first into connection with him. . . ." Forbes had every reason to be satisfied with the success of the meeting, for the treasurer, Taylor, was able to announce that whereas the membership at York had been 350, at Oxford 700, and at Cambridge 1,400, the membership at Edinburgh had risen to 2,200.

Exposure of Raingauges

Among the activities initiated by the British Association was the measurement of the quantities of rain falling at different heights above the ground. The observations were carefully made on a pole above the top of York Minster at a height of 212.9 ft., on the top of the Yorkshire Museum at a height of 43.7 ft., and on the ground near by; the second report on the subject was communicated at Edinburgh. It was clearly established that the recorded amounts decreased with height above the ground, the decrease being greater in winter than in summer. The cause, however, was completely misunderstood, the increased catch near the ground being attributed to the increase in size of the drops as they fell through the lowermost layers of air or, by Luke Howard, to the actual formation of new drops near the ground. The circumstance that the vertical decrease is greater in winter than in summer was attributed to a direct effect of temperature. It is now known that the true cause of the decrease of the catch of rain as the gauge is raised above the ground is the increase of wind velocity with height, the wind forming eddies which sweep the drops past the opening of the gauge. The effect is greater in winter than in summer because the average wind velocity is greater in winter.

Early Gold Mining in South America

In the course of his excursion in Chile in August and September 1834, Darwin visited both copper and gold mines. On September 13 he says: "we slept at the gold mines of Yaquil, which are worked by Mr. Nixon, an American gentleman to whose kindness I was much indebted during the four days I stayed at his house. . . . When we arrived at the mine, I was struck by the pale appearance of many of the men, and inquired from Mr. Nixon respecting their condition. The mine is 450 feet deep, and each man brings up about 200 pounds weight of stone. With this load they have to climb up the alternate notches cut in the trunks of trees, placed in a zigzag line up the shaft. Even beardless young men, eighteen and twenty years old, with little muscular development of their bodies (they are quite naked excepting drawers), ascend with this great load from nearly the same depth. A strong man, who is not accustomed to this labour perspires most profusely, with merely carrying his own body. With this very severe labour, they live entirely on boiled beans and bread. They would prefer having bread alone; but their masters, finding that they cannot work so hard upon this, treat them like horses and make them eat the beans. . . ."

Societies and Academies

PARIS

Academy of Sciences, July 16 (*C.R.*, 199, 173-248).
J. VINOGRADOV: Some new results in the analytical theory of numbers. **EMILE OSTENC**: The ergodic principle in Markoff chains with variable elements. **SERGE FINIKOFF**: Projective deformation of a couple of congruences. **M. MURSI**: The values of the modulus of $\sigma(z)$ at infinity. **ANDRÉ WEIL**: A characteristic property of finite groups of substitutions. **AUGUSTE LAFAY**: The modifications of the Magnus phenomenon determined by the structure of the wind. Study of the effects of an air current on a polished rotating cylinder, with special reference to the existence of eddies in the air current. **MME. EDMÉE CHANDON**, **EDOUARD BOUTY** and **ANDRÉ GOUGENHEIM**: Time determinations obtained with the aid of an equal altitude instrument, with prism and impersonal micrometer. Results obtained using a Baillaud self-recording optical micrometer. Comparison of three instruments. **VENCESLAS POSEJPAL**: The formation of hydrogen in a vacuum. In a previous communication (*C.R.*, 198, 59) the author shows that certain hypotheses concerning the ether lead to the prediction of the formation of hydrogen in a vacuum. Further experiments are now described giving the effect of any hydrogen pre-existing in the tube. These show that any hydrogen pre-existing in the vacuum tube will not invalidate the interpretation given in the earlier note. **MARCEL PAUTHENIER** and **MME. MARGUERITE MOREAU-HANOT**: The study of an electrified space containing material particles. **EDMOND GUILLERMET**: The electrolysis of the chlorides of zinc and cadmium in methyl alcohol. **JEAN SWYNGEDAUV**: Study of the anodic depression in the electrolysis of gelatine. **PIERRE FLEURY**: An addition method for the exact study of the current given by a photoelectric cell as a function of the incident light flux. **PIERRE SOUTY**: The influence of circularly polarised light on the velocity of mutarotation of some sugars. A solution of a sugar giving mutarotation is divided between two polarimeter tubes and exposed to beams of dextrorotatory and levorotatory polarised light. It is shown that the photochemical effect is asymmetrical. **HORIA HULUBEI**: Intense sources of protons applicable to transmutations. The use of palladium charged with hydrogen for the production of the protons necessary for certain transformations markedly simplifies the working method, and gives yields equalling or surpassing other methods. The new technique can be extended to the production of deuterons. **JEAN AMIEL**: The preparation and explosion temperature of some complex compounds of copper nitrate, perchlorate and chlorate with ethylenediamine. The chlorates explode with great violence on heating and might prove useful as primers. **HENRI PARISELLE** and **F. CHIRVANI**: The emetic of saccharic acid. **JAMES BASSET**: The synthesis of ammonia under very high pressures, above 1,000 kgm./cm.². The apparatus described and figured can work for long periods at permanent pressures between atmospheric pressure and 5,000 kgm./cm.². At pressures of 2,000 kgm./cm.² and higher, the velocity of the reaction is increased to such an extent that the presence of a special catalyst is unnecessary. The presence of impurities in the gas mixture is less material; thus coal gas may be used as the source of the hydrogen. **J. PRAT**: The thermal decomposition of the