

## Chemistry at the British Association.

THE attendance at Section B during the Edinburgh meeting of the British Association was exceptionally large, and was well maintained throughout, so that, although the meeting-place of the section was the commodious chemistry lecture-room of the University, it was sometimes impossible to find accommodation for all those who wished to hear the discussions. The joint meetings with other sections were very popular, and the practice adopted by the section in recent years of having only a small number of papers at each session led to the interest in the proceedings being well maintained owing to the full discussion of important papers.

The programme contained a number of contributions to the subject of chemistry in its bearing on the problems of animal and vegetable life. The joint discussion with the Section of Physiology on oxidations in living tissues has already been reported (NATURE, November 10, 1921, p. 353). The president's address on "The Laboratory of the Living Organism" (NATURE, October 20, 1921, p. 243) was one of the most successful features of the meeting. Dr. Forster omitted the more technical portions of his printed address, and delivered an exceptionally lucid lecture which must have made clear to many students of chemistry who had not previously studied recent work in biochemistry both the importance of the subject and the fascinating character of the reactions which take place at atmospheric temperatures and without the presence of energetic condensing agents in the living organism. The paper by Prof. Robinson, which followed on the presidential address, elaborated one aspect of the same subject, the author indicating the reactions by means of which flavones, anthocyanins, and other compounds which occur naturally as plant pigments may be derived from carbohydrates by condensations which are capable of occurring at the atmospheric temperature.

Profs. Baly and Heilbron and Mr. Barker dealt with the synthesis of formaldehyde and carbohydrates from carbon dioxide and water under the influence of light. These reactions are brought about by light of very short wave-length, but in the presence of certain coloured substances, which act as photo-catalysts, they can take place in light of a lower frequency. Chlorophyll, on account of its optical properties, is an ideal photo-catalyst for both stages of the carbohydrate synthesis. Dr. E. J. Russell pointed out that although magnesium is an essential constituent of chlorophyll, the addition of magnesium salts to the soil does not increase the amount of photo-synthesis in plants, as does the addition of that of potassium salts. He also remarked that the first product of carbohydrate synthesis in the plant is cane-sugar, which is then hydrolysed. The formaldehyde hypothesis, proposed fifty years ago by von Baeyer, is thus still a matter of controversy. A paper by Prof. Jaeger, of Groningen, had to be taken as read on account of the time occupied by the preceding discussions. In this the author showed that the decomposition of simple organic acids and their salts in solution by ultra-violet light was in a high degree dependent on the presence of catalysts, the results thus having a bearing on the question of photo-synthesis.

Another group of papers dealt with physical chemistry. The discussion on the structure of molecules, held jointly with Section A, was highly successful, and has already been reported (NATURE, October 13, 1921, p. 218). Theories of atomic

structure, which have hitherto been the special concern of the physicist, are now invoked to explain chemical phenomena, especially those connected with valency; hence the new interest taken by chemists in the subject. Three papers on surface tension were also communicated to the section. Prof. Jaeger described the experimental methods by which he has been able to measure the surface tension of liquids between the temperatures of  $-80^{\circ}$  and  $+162.5^{\circ}$  C. The method consists in determining the pressure needed to cause a gas bubble to burst when emerging from a platinum capillary immersed to a known depth in the liquid. The results obtained from molten salts indicate that if Eötvös's relations be assumed to hold, these liquids must be highly associated, but that the validity of the assumption is doubtful. The method is not applicable to metals, as it is necessary that the liquid should wet the platinum. Mr. Cosmo Johns described his observations on the surface of freely flowing liquid steel. The optical properties of such a surface indicate that it is free from oxide, and the author has previously explained this fact as being due to an atmosphere of iron vapour. Evidence for such an atmosphere was now given, the particles collected from the atmosphere near to the outlet of the furnace being relatively richer in manganese (the more volatile metal). The behaviour of these fine particles under the influence of gravity and of a magnetic field was also described. Prof. Desch gave an account of measurements of foam cells in soap and other foams. The most frequently occurring figure proved to be the pentagonal dodecahedron, slightly distorted. An examination of the crystal grains of several metals proved that these grains had the form of foam cells, graphs showing the frequency of occurrence of similar faces coinciding completely, from which the conclusion was drawn that the grain boundaries are determined by surface tension.

A question of national interest was raised by the paper on the modern dye industry contributed by Prof. H. E. Fierz, of Zürich. The main argument of the paper was that the capacity for production of dyes now largely exceeded the demand, and that it was impossible for the dye industry to remain self-contained. The intermediate and final products lent themselves readily to conversion into pharmaceutical and photographic chemicals, technical colloids (viscose, bakelite, etc.), and similar products. The chemical industry must therefore be regarded as a whole, and a new organisation was necessary.

A discussion on atmospheric pollution by smoke concluded the session. Dr. Owens described the apparatus used by the Advisory Committee, and showed records taken at various stations in London, whilst Mr. W. Thomson described the somewhat different apparatus used in Manchester, and exhibited a long series of records from that town. The principal difference noticed was the regular occurrence of a weekly maximum on Monday in the smoke pollution of Manchester, which was never observed in London. That the clearness of the atmosphere during the coal dispute of 1921 was due to the absence of smoke, and not merely to the exceptionally fine weather, was proved by comparing the sunshine records from different parts of the same town. The report of the Fuel Economy Committee, which had a bearing on the same subject, was received, but was not discussed by the section.

The sittings for the reading and discussion of

papers were confined to the mornings, but the section was also occupied in the afternoons. Prof. Barger gave a demonstration in the University of methods for the micro-analysis of compounds containing carbon, hydrogen, and nitrogen, whilst other afternoons were devoted to excursions. Much interest was taken by members in the inspection of the new University chemical laboratories at Liberton, which are arranged as single-story buildings with a central store,

the arrangement being convenient and economical, whilst allowing the greatest possible freedom when alterations have to be made. Other visits included the Heriot-Watt College, Messrs. Younger's brewery, the North-British Rubber Co.'s mills, Pumpherstone Oil Works, and the pharmaceutical works of Messrs. Duncan, Flockhart and Co. The rubber works and the shale oil works proved to be specially attractive to members.

### Rehtia, the Venetic Goddess of Healing.

AT a meeting of the Royal Anthropological Institute held on January 11 Mr. J. Whatmough read a paper on "Rehtia, the Venetic Goddess of Healing." The Venetic goddess Rehtia (or, as her name might have appeared in Latin, *Rectia*), for whom an apt Greek parallel in name and functions, as well as in characteristic votive offerings, has been found in the Spartan Artemis Orthia, was worshipped not far from the modern town of Este (15 miles south-west of Padua). Her cult, known perhaps to a handful of scholars all told, bears, according to Mr. Whatmough's new explanation of an important group of her offerings, a close likeness to that of the Italic Juno as the protecting goddess of women, with whom Rehtia should be compared rather than, as previously, with the Etruscan Nortia. The group of inscribed votive offerings in question—the so-called "nails" and "wedges"—now better regarded as pins with pendant axe-shaped talismans of a well-known Hallstatt type, was made all but exclusively by women, as the dedicatory inscriptions show. From the shrine of Orthia at Sparta come large numbers of bronze pins, comparable with the Venetic pins which, it is suggested, were given, originally at all events, by women as votive offerings before (or just after) childbirth.

Just as Orthia is expressly described as "The Restorer," or as a healing deity who "restored women to health after childbirth and preserved their infants" (and as such was associated at Epidaurus with Asclepius *Orthios*), so Rehtia is called *Sanatis*, "the Healer," and the word *akeo* which appears on another class of her votive offerings seems also to refer to her healing functions (compare Greek *ἀκέομαι*). Women paying their vows to Juno Lucina at Rome had to loosen all knots and fastenings about their clothing and take down their hair; it would then be appropriate for them to offer their dress- and hair-pins (or votive objects copied from these) to the goddess. The miniature talismanic axes would imply a magical purpose, the safeguarding of mother and child during gestation and after delivery. With *Sanatis* and *akeo* we can compare such epithets of Juno as *Lucina*, *Februa* (*Sanatis* especially in this connection), *Fluonia*, and *Sospes*. It would be a simple step in the development of the goddess (as of

Juno) for her to become the saving goddess of both sexes and all classes. The chief duty, however, within her purview would be to maintain or to restore physical health—the soundness, fitness, *rightness* of the body.

Livy, describing events which occurred in 302 B.C. (nearly a century before the beginning of the romanisation of Transpadane Gaul), refers to a temple in the country of the Veneti not far from Padua which he ascribes to Juno; Strabo calls it a temple of the Argive Hera. Most probably the ancient Veneti worshipped a great goddess Rehtia whose functions were similar to those of the Italic Juno and the Argive Hera, so that later observers like Livy and Strabo, familiar with both the more famous Roman and Greek cults, noted the similarities between these and the Venetic cult, and regarded them as essentially the same, if, indeed, we are not further to conclude that with the extension of Greek and Roman religions and civilisations an actual identification had taken place.

Mr. Peake, in discussing Mr. Whatmough's theory, agreed that the bronze objects were not "nails" and "wedges," but pins, though possibly cloak-pins rather than hair-pins, and "axes." The use of the long cloak-pin in the Iron age, when for practical purposes the pin had developed into the fibula, was possibly to be explained by religious conservatism. He also suggested that possibly the wedge-shaped "axe" talisman had developed from the anthropomorphic form of talisman rather than the latter from the former. A third possibility was that they were merely ornaments made to jingle, similar to those common among all horse-loving peoples such as were the invaders of Italy from the north in the Late Bronze and Early Iron ages. While Rehtia could doubtless be equated with Orthia and with Juno, question arose whether the cult was Mediterranean. The Argive Hera is markedly Mediterranean, but Orthia belongs definitely to the northern peoples, as probably did Rehtia. No doubt there had been amalgamation, but the more distinctive features were northern. In their culture some things point to the Veneti being northerners, and probably they were one of the waves of immigration, evidence of the earliest of which was found at Bologna.

### British Mycology.

THE Transactions for 1920 of the British Mycological Society published in July last are evidence of the increasing activities of the group of botanists whose work is amongst the fungi. The presidential address by Mr. Petch deals with fungi parasitic on scale-insects, and includes an historical account of the growth of knowledge since the first record of a fungus growing parasitically on a scale-insect was made by Desmazières in 1848 at Caen, in Normandy. The list is now a long one, and will doubtless be further extended; and though the majority of scale-insect fungi

are tropical, there is some work to be done on them in the British Isles. In the tropics enormous destruction of scale-insects is effected by these fungi, and, as some of the scale-insects are serious pests of economic plants, the suggestion naturally arose that the pests might be controlled by means of the entomogenous fungi. A special investigation was undertaken by the United States Bureau of Entomology in Florida, but the results agree with those of other experiments, and Mr. Petch affirms that after thirty years' trial there is no instance of the successful control of any