

acids, an integral part of the indigo problem (1877).

On coming to Newcastle, Bedson showed courage in linking his chemical fortunes with those of the district by attacking the chemistry of coal. His pioneering work included the demonstration of the presence of paraffins up to pentane, the investigation of the wet oxidation of coal and the solvent action of pyridine. These methods have in later days proved of the utmost importance in the hands of Bone and Fischer. Other important aspects of his work were connected with the explosive nature of coal dust in air and the composition of colliery waters. He also demonstrated the presence of argon in rock salt, and as a regular lecture experiment he showed the rhythmic precipitation of copper ferrocyanide in gelatine many years before its rediscovery by Liesegang. With Charleton-Williams he translated Lothar Meyer's "Modern Theories of Chemistry" and in 1896 gave the Lothar Meyer Memorial Lecture in London.

Up to the end of last century, scarcely any student entering the College had any prior knowledge of chemistry, and as the numbers were growing rapidly, the staffing of his department invariably lagged behind the number of students to be instructed. Members of staff taught for thirty-five hours a week, including some evenings, and were fortunate to get Wednesday afternoon free for research! By contrasting these conditions with those obtaining in universities to-day, Bedson's original work constitutes a remarkable achievement. In addition to the above handicap, he became necessarily more involved in the administration of the rapidly growing institution, of which he became vice-principal; he was also later a justice of the peace.

Although of small stature, Bedson was of striking personality and a very successful teacher. His lectures, on the preparation of which he spared neither time nor trouble, were clear, logical and well illustrated by experiments. Cheerful and ever humorous, he was yet a strict disciplinarian of the old school, but was nevertheless loved and respected by his students, to whom he was affectionately known as 'Peter'. It is, however, alleged that on one occasion an errant student on being questioned by his professor replied that he was seeking salt-petre! His

chief recreation was music. He was a competent violinist and an ardent concert-goer.

He is survived by his lifelong helpmeet, Mrs. Bedson, and one son and one daughter, the former an eminent bacteriologist.

A few years after his retirement his successors founded "The Bedson Club" in honour of the man who had done so much to establish the School of Chemistry in the University of Durham. So his name goes on, though we mourn the loss of an able chemist and a father to King's College.

In the preparation of this note I have had the invaluable help of Dr. J. A. Smythe, for long a member of Prof. Bedson's staff. G. R. CLEMO.

#### The Rev. E. N. Neumann, S.J.

THE REV. EMMANUEL NAVARRO NEUMANN, S.J., died on January 30, 1941, according to the Memorabilia Societatis Jesu of December 1941 (delayed on account of the War). The greater part of his research studies and labours was spent in the field of geodynamics. He operated observatories, issued bulletins, developed seismographs and published more than three hundred separate articles on seismology. With other Jesuit men of science he was exiled from Spain by the anti-clerical Government in 1931, and resided in Italy for some time. On August 11, 1938, the Cartuja (Granada) Observatory was restored to the Jesuits and Father Navarro Neumann was present. He was in poor health and experienced much physical suffering for many years, and in 1939 retired from active scientific work.

WE regret to announce the following deaths:

Dr. T. McFadden, senior demonstrator in physics at the Queen's University, Belfast, on March 25, aged twenty-six.

Dr. H. G. Rule, reader in chemistry in the University of Edinburgh, on March 15, aged fifty-five.

Prof. Warrington Yorke, F.R.S., Alfred Jones professor of tropical medicine in the University of Liverpool, on April 24, aged sixty.

## NEWS and VIEWS

### Ionospheric Variations during the Sunspot Cycle

In a lecture entitled "Radio Exploration of the Ionosphere", delivered before the Wireless Section of the Institution of Electrical Engineers on April 7, Sir Edward Appleton described the results of an eleven-year series of ionospheric measurements just completed by Mr. R. Naismith and himself. The work began so far back as 1931, the critical frequency method of measuring the ionization density in the various atmospheric layers being employed (see NATURE, February 7, 1931). Measurements made by this method had not been in progress more than a couple of years before it was suspected that electron concentrations were varying in sympathy with solar activity. The need for continuing the observations for a complete sunspot cycle of just over eleven years was then realized and plans made accordingly. During the course of the cycle, other observers, in different

parts of the world, have adopted the same method, and a world survey of the electrical state of the upper atmosphere by means of it is now in progress. The British observations have been made as part of the programme of the Radio Research Board of the Department of Scientific and Industrial Research.

The ionization in the  $E$  and  $F_1$  layers has been found to increase by 50-60 per cent from sunspot minimum to sunspot maximum, indicating a corresponding increase of 120 per cent in solar ultra-violet light, which is known to be the ionizing agency in question. The ionization in the  $F_2$  layer has varied even more markedly, especially in winter. Such a change has an important bearing on long-distance radio transmission, which proceeds by way of ionospheric reflexion. It is now clear that the range of short wave-lengths available for this purpose increases very substantially with solar activity. The

international allocation of such wave-lengths for short-wave broadcasting after the War must therefore be based on the ionospheric results obtained during the last sunspot cycle.

### The Logic of Question and Answer

IN the issue of *Mind* for January 1943, Prof. A. D. Ritchie, under the title "The Logic of Question and Answer", discusses problems connected with the use of hypotheses in scientific method. He begins by denying the existence of 'hard' facts, a denial which should be platitudinous now but is not. A single observation, he argues, does not by itself provide empirical information. This is the function of a plurality of observations in certain relations. He goes on to develop the contention (which he derives from Prof. Collingwood's philosophy) that every proposition which really contributes to knowledge is an answer to a question, and that the question arises out of pre-existing knowledge, this knowledge itself being the answer to a previous question or questions. The fundamental question is always "What have we here?" If we ask the question about, say, a truck-load of coal, we find the answer by inspecting and testing samples. The number of samples we take and the way in which we take them will depend on knowledge we already possess about the coal, the method in which it is loaded in the truck, whether it is protected from the elements, etc. If we ask how we know that the samples are representative of the material, the answer is that we have chosen a way of sampling which answers the questions we were asking. If our questions are not answered, we must devise another method of sampling.

If all questions depend, in the way stated, on answers to previous questions, we must, it seems, at some point come back to absolute presuppositions. Prof. Collingwood drew this conclusion and further argued that each historical epoch had its own absolute presuppositions. Prof. Ritchie argues, first, that as we trace our questions and answers back we come to a point where what we have is some vague knowledge which is thrown at us by experience with a minimum of questioning and presupposition; secondly, that the presuppositions underlying the process of scientific discovery are purely formal, consist in something like Kant's list of categories, and must be common to all historical epochs because the process of scientific discovery is continuous.

### Health Services in Great Britain

THE February issue of *Agenda* is noteworthy for an article by Prof. Henry Cohen, "A Comprehensive Health Service". Surveying the various reports on the health services which have followed the PEP report of December 1937, Prof. Cohen stresses the point that medical opinion should be considered expert only in relation to the organization and administration of health services. Questions relating to the various methods of raising the necessary finance are outside its special province. Next, he urges that any plan for the future health service of Great Britain must not overlook the vital factors of provision for the training of personnel (medical education) and of encouraging the advancement of medical knowledge (research). In regard to personnel, Prof. Cohen emphasizes the importance of the general practitioner, who should know not only the patient's body but also his job, his home, his relations. Neither patient nor practitioner should be forced

unwillingly into a professional relationship. In addition to this personal relation of medical man and patient, and the maximum freedom of choice, every citizen should have the right to adequate and, so far as possible, the best available provision for the prevention and cure of disease and the achievement of positive health, covering all necessary domiciliary and institutional care, medical and post-medical.

The family should be the unit of health practice; and the family practitioner must be the focal point of all health services—preventive, educational and curative. Practice must be limited so that it affords adequate rest, leisure and holidays and all opportunities for 'refresher courses', and should be so rewarded that freedom from want for the practitioner and his dependants is secured. The profession should be self-governed and independent of political pressure, and the fullest opportunities should be provided for medical education and research. These general propositions should be assured of much support outside the medical profession. Prof. Cohen also emphasizes the importance of regionalism: the State is too large a unit in medical services, and the local authority too small. What he has to say of teaching hospitals is of close interest to scientific workers other than those who are actually members of the medical profession, and he directs attention to the opportunity of determining the eventual form of the health service of Great Britain which the demobilization of thousands of younger medical men at the end of the War may well afford, by experimenting with different types of health services in different areas.

### Biology and Health Education

THE importance of biological teaching in the schools as a basis for health education was stressed at a conference held in the City Museum, Leeds, on April 17. This, the first of a series being arranged throughout Great Britain by the Central Council for Health Education, was attended by some three hundred teachers, medical practitioners, youth leaders, social workers and educational and medical administrators. This fruitful co-operation between the two professions most concerned in health education was signalized by Dr. J. Johnstone Jervis (medical officer of health for Leeds) taking the chair during the morning session and by Alderman W. M. Hyman (chairman, West Riding Education Committee) during the afternoon session.

Dr. Robert Sutherland (medical adviser, Central Council for Health Education), speaking on "The Possibilities of Health Education", stressed the importance of the concept of health as a positive state of bounding well-being, rather than as a mere absence of disease. The address on "Health Habits and Hazards" given by Dr. J. F. Galloway (medical officer of health, Dewsbury) made the point that the greatest hope for the health of the future is in the schools. At the afternoon session, Mr. Cyril Bibby (education officer, Central Council) spoke on "The Methods of Health Education", and suggested ways in which parents, teachers, administrators, youth leaders, school doctors, dentists and nurses, health visitors, and by no means least, 'John and Jane Citizen', could co-operate. An open forum provided a very fruitful exchange of views between the various professions represented, and the conference closed with a display of health education films.