

ornament. All stages were shown, from early Anglian, in some respects resembling early Welsh, through the best Anglian period of native art and the decadent pre-Danish period, to the full Viking-age Scandinavian, which, however, received its fullest development beyond the boundaries of Northumbria.

Dr. Kivers presented a communication on "The Cultivation of Taro." In Melanesia and Polynesia taro is cultivated by means of irrigation, which is used for this purpose only. Perry has shown that irrigation has a distribution which corresponds closely with that of megalithic monuments, sun-cult, and other objects and customs which seem to have been carried over the earth by one migration or a connected series of migrations. The exclusive use of irrigation for the cultivation of taro in Oceania suggests that it also belongs to the group. This is confirmed by the distribution of the plant, which, when its tropical habit is taken into account, corresponds in general with that of other elements of the megalithic complex. An exception to this general correspondence occurs in the New Hebrides, where taro is absent or unimportant in a large part of the island of Malekula, although this island possesses a highly developed megalithic culture. Other evidence shows that the megalithic culture reached Melanesia in two chief waves, an earlier associated with mummification of the dead, and a later with interment of the dead in the extended position. The distribution of the cultivation of taro by irrigation in southern Melanesia points to its carriage by the earlier of these two migrations.

In "Personal Experience as an Element in Folk-tales" Miss Freire-Marreco pointed out that the striking resemblances between the dreams of children and those of adults of low mentality on one hand, and the myths of uncivilised peoples on the other, are to be explained, not by a semi-mystical analogy between the childhood of individuals and that of the race, but by supposing that very many folk-tales are founded on reported dreams, day-dreams, and trance experiences.

A study of "The Organisations of Witches in Great Britain" by Miss M. Murray showed that the witches practised a definite religion, with chief festivals, or sabbaths, at Candlemas, Roodmas, Lammass, and Hallowmas. The chief of the witches, called by Christian writers "The Devil," was regarded as a god incarnate in a man, or, when disguised in the skin of an animal, as incarnate in that animal. The ritual of admission into the society comprised the renunciation of any previous religion, dedication of body and soul to the god of the witches, vows of absolute obedience, baptism and the giving of a new name, and finally the signing of a contract or marking on the body, possibly by tattooing.

In papers on "A Summer and Winter among the Natives of Arctic Siberia" and on "The Physical Type of the Northern Tungus" Miss Czaplicka gave a descriptive account of the country and the native manners, customs, and types. Generally she showed that the Tungus in the north approach in type the Palæo-Siberians, and in the south the Mongols.

Mr. and Mrs. Scoresby Routledge described some of the results of their expedition to Easter Island, in the course of which they mapped and excavated the region of the terraces and of the images, and collected all that was still known of the old native culture. Little is now known by the natives with regard to the statues, though the last was overthrown so recently as 1830. The various features of the statues were, however, traced to customs of which knowledge remains. The life of the island appears to have turned on the finding of the first egg of a certain migratory bird, and it is possible that the statues were portrait-models on a large scale erected each year to commemorate the official discoverer of the egg. There

were ten clans on the island perpetually at war, and cannibalism was rife. A special sanctity attached to the Miru clan, who alone had an Ariki, or chief, who was an authority on the tablets in an as yet unknown script found on the island, and who presided when these were read. It is not certain that these are very old, for white men who came in ships were regarded as gods, and ceremonies in their honour could be traced back for three generations.

In discussing the relations between "Magic and Religion," Dr. Jevons emphasised the importance of distinguishing from the earliest times between practices thought to be beneficial and of a religious character and those thought to be harmful and universally reprobated of a magical kind. Contrary to the views of Dr. Marett, he maintained there never had been or ever could be a magico-religious period or any practices which could be described as both magical and religious.

AN IMPERIAL DEPARTMENT OF MINERALS AND METALS.

PROF. HENRY LOUIS described in NATURE of October 5 (p. 91) the need for the organisation of the mineral and metal resources and industries of the Empire. We reprint below the memorandum which has been sent to Sir William S. M'Cormick, administrative chairman of the Advisory Council for Scientific and Industrial Research, by the leading technical societies concerned with the subject. The proposal for the establishment of a central Department of Minerals and Metals has also been communicated to the Dominion Governments.

On behalf and by authority of the councils of the following institutions:—The Iron and Steel Institute (incorporated by royal charter as representing the iron and steel industries); the Institute of Metals (incorporated as representing the users and manufacturers of non-ferrous metals and alloys); the Institution of Mining Engineers (incorporated by royal charter as representing coal and iron ore mining and allied industries); and the Institution of Mining and Metallurgy (incorporated by royal charter as representing the mining of minerals other than coal and iron ores and the production of metals other than iron and steel); We, the undersigned, have the honour to submit the following considerations and recommendations in the hope that, through the intervention of the committee of the Privy Council for Scientific and Industrial Research, measures may be taken to provide the necessary machinery for the protection and advancement of the economic welfare of the mineral and metal industries of the Empire.

The absence of effective co-ordination of the organisations of these vital industries has been demonstrated and brought into prominence by the war, in many directions. The grave results to the national interests are generally admitted.

There are highly organised geological surveys and departments of mines in nearly all foreign countries, and their influence in the development of mineral resources is a factor of the first importance. There are similar well-organised departments in some of the British Dominions, but there is no connecting link or central "clearing-house" in the metropolis of the Empire to co-ordinate information on its mineral resources, to stimulate their development, and to safeguard Imperial interests.

Various departments of the Home Government, such as the Geological Surveys and Museum of Practical Geology, the Board of Trade, the Home Office, the Imperial Institute, and, since the outbreak of the

present war, the Foreign Office, the Admiralty, the War Office, and the Ministry of Munitions, have all been concerned with the collection of information bearing on the sources of supply of minerals and the production of metals. There does not appear, however, to have been any serious attempt to co-ordinate and render available even such information as has been collected by these departments, and it is certain that there have been considerable overlapping and duplication of effort with corresponding waste and confusion.

It is, we submit, obvious that the overlapping and confusion will be seriously increased if the various technical committees appointed by the Advisory Council attempt to collect the information which is essential to enable the beneficent object of the committee of the Privy Council to be attained, in its wider aspects, in regard to the mineral and metal industries.

We respectfully urge this view upon the serious attention of the Advisory Council, as already there are evidences of increasing overlapping and consequent waste of time and energy, which we believe it is one of the main purposes of the committee of the Privy Council to eliminate so far as possible.

In the opinion of the institutions represented by us the organisation of a central Department of Minerals and Metals is imperatively necessary in the public interest, and the work of organisation, which will necessarily take much time to complete, should be commenced at the earliest possible moment.

It cannot be doubted that if a properly organised and efficiently conducted Department of Minerals and Metals had been in existence, much valuable time, many lives, and vast sums of money would have been saved to the nation in the conduct of the present war, and much of the cost and inconvenience to British industries depending largely for their raw materials on mineral products would have been saved, with corresponding advantages to the prosecution of the war and to many industries.

A Department of Minerals and Metals should not only be in intimate relationship with the Geological Surveys and Mines Departments of the Dominions, but also with the organisations representing the different branches of the mining and metallurgical industries, whose co-operation in the work of the department should form a vital part of its machinery.

The Geological Surveys of Great Britain and Ireland and the Museum of Practical Geology should also form an integral part of the department.

The functions of the department should be active and constructive. All overlapping by other Home Government departments, and also by the institutions representing the industries, should be absolutely prevented.

The duties of a Department of Minerals and Metals would include:—

(1) Arrangements for expediting the completion of mineral surveys of the United Kingdom and of the Crown Colonies and other British possessions.

(2) The systematic collection and co-ordination of information bearing on the occurrence, uses, and economic value of minerals and their products, special attention being devoted to securing industrial applications for newly discovered minerals or metallurgical products and to finding mineral materials required for new metallurgical products or inventions. Some of this information should be promptly and widely disseminated in summarised form to those interested in the industries, through the medium of the existing publications of the institutions directly concerned.

(3) The investigation of all questions and problems relating to the utilisation of the mineral or metallurgical resources of the Empire.

(4) The co-ordination and dissemination of information on mining laws, development of mineral areas,

output, processes of extraction, plant, capital employed, markets, etc.

(5) A general review from time to time of the developed and undeveloped mineral resources and of the position of each mineral or metal, to ensure that the mineral wealth of the Empire is being exploited with due regard to Imperial interests.

(6) Generally, to advise the Imperial Government on all questions bearing on the mining and metallurgical industries. To perform this function efficiently, it is essential that complete information should be available, and also that the industries concerned should be consulted through their respective organisations.

We feel sure that the Advisory Council will fully appreciate the urgency of the question and the necessity for prompt action, so that the process of co-ordination may be inaugurated at once.

WM. BEARDMORE,	President.	} The Iron and Steel Institute.
G. C. LLOYD,	Secretary.	
GEORGE BEILBY,	President.	} The Institute of Metals.
G. SHAW SCOTT,	Secretary.	
W. THORNEYCROFT,	President.	} The Institution of Mining Engineers.
L. T. O'SHEA,	Hon. Secretary.	
P. STRZELECKI,	Secretary.	
EDGAR TAYLOR,	President.	} The Institution of Mining and Metallurgy.
C. McDERMID,	Secretary.	

THE BRITISH ASSOCIATION AT NEWCASTLE.

SECTION I.

PHYSIOLOGY.

OPENING ADDRESS (ABRIDGED) BY PROF. A. R. CUSHNY,
M.A., M.D., F.R.S., PRESIDENT OF THE SECTION.

On the Analysis of Living Matter through its Reactions to Poisons.

I WISH to-day to discuss an aspect of pharmacological investigation which has not been adequately recognised even by pharmacologists themselves, and which it is difficult to express in few words. In recent years great advances have been made in the chemical examination of the complex substances which make up the living organism, and still greater harvests are promised from these analytic methods in the future. But our progress so far shows that while general principles may be reached in this way, the chemistry of the living organ, like the rainbow's end, ever seems as distant as before. And, indeed, it is apparent that the chemistry of each cell, while possessing general resemblances, must differ in detail so long as the cell is alive. No chemistry dealing in grams, nor even microchemistry dealing in milligrams, will help us here. We must devise a technique dealing with millionths to advance towards the living organism. Here I like to think that our work in pharmacology may perhaps contribute its mite; perhaps the action of our drugs and poisons may be regarded as a sort of qualitative chemistry of living matter. For chemical investigation has very often started from the observation of some qualitative reaction, and not infrequently a good many properties of a new substance have been determined long before it has been possible