

largely of popular origin. In modern China these divine personages have become entirely assimilated to the form of popular belief: they appear as the 'Gods of the Place' of the Buddhist temples; and in their artistic representation, as with other popular deities, full rein is given to the Chinese ability in portraying the imaginatively horrific or grotesque with extreme artistic skill. Little heed is given to the classical serenity of the divine prototype.

When Buddhism was introduced into Tibet in the seventh century of our era, the religion of the Tibetan people was a form of crude shamanism something akin to that which has been recorded among the tribes of Siberia and of which certain features, such as the trance and acute hysteric affection, occur in eastern Asia and the Malay Peninsula.

The cults of 'devil worship' as they have been termed, in reality cults of natural forces, still survive in eastern Tibet, where they have

been organised in imitation of and in opposition to Lamaism. Their significance in this connexion, however, lies in the fact of their incorporation in part in the doctrines of Lamaism and the place given, in consequence, in the iconography of Lamaism to this and the cognate elements adopted from Saivistic doctrine in the form of the 'terrible divinities'. Of these there are eight in number, whose appearance is no less terrifying than the attributes and functions attributed to them in story. Thus *Srīdevī*, the protectress of the two Grand Lamas of Lhasa and Tashilhumpo and the most ardent defender of the doctrine of Buddha, was armed by all the gods, and married the king of the ogres. *Hayagrīva*, the protectress of horses, scares away demons with her neighing; while *Yamāntaka* is a terrible manifestation of the *Bodhisattva Mañjuśrī*, who in this form subdued the King of Hell, and so forth. Here is indeed material for profitable study in relation to the original doctrine of the Buddha. E. N. F.

Obituary

DR. H. D. ARNOLD

THE death has occurred at the age of forty-nine years of Dr. H. D. Arnold, director of research of the Bell Telephone Laboratories, New York. Upon completion of his graduate studies at the University of Chicago in 1911, Arnold began what was destined to be a most distinguished, and from a practical point of view, a most far-reaching career of research. His initial problem being to develop a satisfactory telephone repeater, he was the first to recognise the wide potentialities inherent in the de Forest three-electrode audion. Not only did he carry through a complete laboratory study showing the importance of a high vacuum and of the space charge effect, but he also developed theories for obtaining proper physical constants for the valve in the way of input and output impedances and amplifying ratios, and adapted this newly conceived electronic tube to the telephonic problem of long-distance communication by wire and radio. Concurrently, he developed a manufacturing technique for producing in quantities a device of much higher order of vacuum than was known in the lamp industry. For his extensive pioneer work on the three-electrode valve, Arnold was awarded the John Scott medal in 1928.

Later, as director of research of the Bell Telephone Laboratories, Arnold planned and directed an exhaustive study of speech and hearing together with the related problems of recording and reproduction of sound. Economically, the most important outcome of this programme has naturally been the increase of exact knowledge as to the requirements and limitations to be placed upon the transmission of speech in telephone systems. It has also resulted, however, in a surprising number of modern acoustical accomplishments among which the electrical picking-up, recording and

reproduction of sound as employed in the modern improved gramophone, in broadcasting, and in talking films, stand out pre-eminently. The discovery of new magnetic alloys, including permalloy with its surprising properties and with the resulting revolution of the submarine cable art, is equally significant though in another field.

An expert organiser and director of the work of others, Arnold yet possessed in rare degree the qualifications for individual research. He was one of the outstanding authorities in telecommunication and acoustics.

DR. MARY BRODRICK

THE death is announced of Miss Mary Brodrick, who was well known as an Egyptologist. Miss Brodrick entered College Hall, London, as a student in 1888, studying Egyptology at University College, where she was under the tuition of Dr. Stuart Poole and Mr. (afterwards Sir) Peter le Page Renouf. This, however, was not her first introduction to the subject, as she had already studied at the Sorbonne in Paris, taking archaeology and Hebrew under G. Maspero and Ernest Renan. In 1894-96, Miss Brodrick held the Pfeiffer fellowship, lectured at the British Museum and travelled in Italy, Greece and Egypt. In Egypt, where Maspero had recently been appointed director-general of antiquities, she did much valuable work under him, translating Mariette Bey's "Aperçu de l'Histoire d'Égypte", editing Brugsch Bey's "Egypt under the Pharaohs" and revising Murray's "Guides" to Palestine, Syria and the Lebanon. She also rewrote Murray's "Guide to Egypt".

Dr. Brodrick served as a member of the Advisory Council and of the Committees of Philology and Literary Archaeology at the Columbian International Exposition, and did much valuable work

in the service of Egyptological studies in America while acting as English honorary secretary for the Egypt Exploration Fund in the United States. These services were recognised in 1893 when the University of Kansas bestowed upon her the degree of Ph.D. In 1896 she was elected a life member of the Bibliothèque Nationale of Paris and life member of College Hall, London.

A further period of strenuous work in Egypt caused a breakdown in health from which Dr. Brodrick never completely recovered, although she continued to lecture occasionally and to write, while keeping closely in touch with the work and affairs of the institutions of the University of London, with which she had been connected. The best known of her works in this later period was "A Concise Dictionary of Egyptian Archaeology".

By the death, on July 9, of Mr. William Gamble, at the age of sixty-eight years, the world of printing-art has lost one of its most outstanding figures. His long association with the firm of Penrose and Co. (later A. W. Penrose and Co., Ltd.), and his editorship of the well-known "Penrose's Pictorial Annual", witnessed a period

of striking advance in colour photography and its application to printing. In this field, as in photography and process engraving, he was a recognised leader, and his technical advice was continually sought after until the time of his death. He was the author of a number of important books dealing with colour photography, engraving, lithography, and music engraving. He was a fellow of the Royal Photographic Society and of the Optical Society, and was recently elected to the fellowship of the Institute of Physics.

WE regret to announce the following deaths:

Prof. J. W. Hinton, professor of physics in Ceylon University College, Colombo, formerly lecturer in the University of Otago, New Zealand, on July 15, aged thirty-eight years.

Sir Joseph C. Verco, president of the Royal Society of South Australia in 1903-21, known for his services to medicine in Australia, on July 30, aged eighty-two years.

Sir Emery Walker, Sandars reader in bibliography in the University of Cambridge in 1924, a well-known authority on typography, on July 22, aged eighty-two years.

News and Views

Centralisation of Anthropological Studies

ON p. 208 of this issue we publish a communication from Prof. J. L. Myres in reference to the article "Centralisation of Anthropological Studies" appearing in NATURE of July 22, p. 113, in which he directs attention to the efforts made to bring about an improved organisation in the science of anthropology in Great Britain since 1896 and earlier. Such efforts have been noted from time to time and made the subject of comment in NATURE, nor must it be assumed, if no reference has been made to them on this occasion, that they have been overlooked. Lest any confusion should arise, however, it may be as well to point out that the various movements chronicled by Prof. Myres have by no means had an identical objective. Each has pressed for such measures as the circumstances of the time have seemed to demand. At the turn of the century, both on public and on academic grounds, an Imperial Bureau of Ethnology was deemed the most pressing need: the Joint Committee for Anthropological Research and Teaching, which works in association with the Royal Anthropological Institute, is the form taken by the most recent and successful effort. This latter has provided an effective medium for authoritative pronouncement of anthropological opinion on matters of policy, and for the promotion of concerted action. The 'Joint Committee', however, is not an academic body; and the consolidation of anthropological teaching and research within the universities on some such lines as those suggested in NATURE should strengthen the hand of the representatives of the universities on the Committee, rather than conflict with its functions.

Mechanisation and Unemployment

A PAMPHLET entitled "Unemployment: Its Realities and Problems" issued by the Engineering and Allied Employers' National Federation, Broadway House, Tothill Street, London, S.W.1, contains the result of an inquiry conducted among members of the Federation into the general subject of unemployment and particularly the proposal to establish a working week of forty hours. The pamphlet expresses the belief that the signs are that our civilisation still possesses the urge and impulse to recover from its latest shock and resume its upward march. Stress is laid upon the moral effect of confidence in recovery and part of the world's sufferings are still attributed to the six years' arrested growth caused by the late War. The importance of a growing appreciation of the real causes underlying the present depression is recognised as in itself one of the best hopes of amelioration. There is no royal road to the cure for unemployment and the complexity of the factors involved and particularly the psychological effects make progress inevitably slow and difficult. While the part which international co-operation must play is admitted, sufficient emphasis is scarcely laid on this fact and the pamphlet might easily give the impression that national effort alone is sufficient. Particular attention is directed to the increase in total employment which has accompanied the growth of unemployment and it is considered that the unemployment crisis is not the result of mechanisation, a conclusion which was discussed in the leading article in NATURE of July 29, p. 149. It is also concluded that displacement of male by female labour is not true of industry as a whole, but the arguments presented against the