the very elasticity of the system would be a good augury for the future.

A committee of this association has been investigating for the past two years into the extent to which women have recently replaced men in industry. A certain amount of exaggeration exists as to the number of women who have entered our factories or undertaken services left vacant by men who have joined the Forces. The total number is, in round figures, about 600,000, as against five million men who have joined either the Navy or the Army as a consequence of the war.

The entry of large numbers of women into industry has been viewed with a certain amount of alarm by the men; and trade unions have naturally stipulated, where possible, that these women shall receive the same rates of pay for the same work as the men, and that when the men return the women shall give place to them.

That there was little ground for alarm as to the influx of women can be realised by a consideration of a few facts and figures. The majority of men who enlisted were workpeople of one sort or another; of these, unhappily, some have been killed in battle or have been rendered incapable for work. Even so, the majority will come home requiring occupation. What opportunities will they find?

To answer this question at all satisfactorily it is necessary to consider some determining factors. Thousands of men have left indoor occupations and their accustomed town life and have been trained, drilled, and disciplined under open-air conditions. They have lived, worked, and fought in the open country in some cases for many months. The new experience has had potent effects. Physique has improved, the outlook on life has changed, in many cases new hopes for the future have been formed. Inquiry shows that there is a division of opinion as to the extent to which disbanded members of the Forces will decide on making a radical change in their mode of life. Yet the experience of what occurred after the South African War warrants us in assuming that considerable numbers will only return to indoor occupations and town life if there be no alternative. It is too soon yet to form an opinion as to what opportunities there will be for land settlement. But it is known that offers will be made, both at home and in various parts of the Empire. A moderate estimate of those accepting these offers, and of our losses of killed and permanently disabled, would be at least one million. Then we shall undoubtedly require, at any rate for some years, a much larger standing Army. Even on a peace footing this at a moderate computation may be put at a million men. These two figures, and neither of them errs on the side of exaggeration, will absorb two million men who will be permanently lost to the old occupations.

Moreover, there is good ground for anticipating that if the war concludes before our resources are unduly strained, and there is every prospect that it will, there will be a period of good trade. We have to restore our own depleted stocks of goods, our mercantile marine demands a large amount of new tonnage, railways and other transport services will require much new equipment. Turning to the Continent, parts of France, Belgium, and other of the Entente countries will need reconstruction works of considerable proportions, and in this work we shall play a great part. World markets, too, have been kept short of many manufactured goods. We shall be in a position both to finance and carry on a greatly extended system of industry and commerce, for not only is our banking system prepared to face this, but our man force has been greatly improved, and our industrial equipment to a great extent remodelled.

Reverting to the somewhat thorny question of the women who have been engaged on what were men's occupations, I see no cause for alarm. Many women came forward from motives of patriotism, and will gladly resume their former state. The question, I believe, will rather be how can we obtain the labour necessary to cope with the post-war demand.

The new equipment of our factories will place us in a position to increase very greatly our ouput, and this should enable us not only to face a possible labour shortage, but if the recommendations made by this section of the association meet with a favourable response, our labour force should enter upon a new period of prosperity consequent on a remodelling which has been rendered possible by a reorganisation of our industrial machinery. This new epoch for labour would include higher wages, shorter hours, and better working conditions. To effect these salutary advances both employers and employed need to exercise sanity of judgment, frankness in mutual discussions, and a recognition of the fact that the prosperity and material well-being of each is bound up in a common effort to maintain and develop our industrial and commercial position.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—The term has opened with a greatly reduced number of undergraduates. Exact figures are not yet forthcoming, but they will certainly be small. The current issue of the *University Gazette* contains the names of 312 members of the University who have lost their lives on active service during the last three months, all but a very few having been killed in action. The usual lists of lectures, demonstrations, and laboratory work have been issued by the heads of the various science departments. The programme published by the School of Geography includes lectures by the acting director on geographical method and on the distribution and economic geography of primitive societies; by the demonstrator, on regional geography of the British Isles; and by Messrs. Spicer and Kendrew, on land forms and climate. Practical classes will also be held. The Committee for Anthropology has arranged for lectures on physical anthropology, ethnology, theories of totemism, and primitive archæology. These will be given by Prof. A. Thomson, Miss Czaplicka, Mr. H. Balfour, and Dr. Marett. Demonstrations and informal instruction on a large variety of subjects connected with anthropology are also announced.

THE widow of Prof. Gwynne Vaughan has presented to the Botanical Department of the University of Glasgow the collection of more than 2000 slides, in mahogany cabinet, belonging to her late husband, and the originals of all his published memoirs.

A SPECIAL course of short lectures is to be given by Mr. E. F. Etchells to the Junior Institution of Engineers on alternate Friday evenings, beginning on October 20. The subjects are:—"A Commonsense Notation for Engineers," "The Practical Use of Units in the Evaluation of Formulæ," "How to Memorise Formulæ," "Logic of the Differential and Integral Calculus," and "Practical and Illustrative Examples of the Application of the Newer Concepts."

THE Joint Matriculation Board of the Universities of Manchester, Liverpool, Leeds, and Sheffield conducts a matriculation examination which ensures one

common standard for entrance to the separate universities. The various universities are represented on the board, and about five practical teachers are co-opted, so that the schools and universities are kept in touch with one another. According to the *Morning Post* of October 13, Birmingham University is to be included in the operations of the board, and thus another step is taken in the direction of securing a uniform standard for entrance to a university. We also learn from our contemporary that the Vice-Chancellor of Liverpool University, who is the chairman of the Joint Board, stated at a special meeting of the Liverpool University Court on October 12 that the University authorities at Bristol proposed recently that the Bristol University should be included in the scheme, but a final decision had been postponed until after the war.

AN address by Sir Henry A. Miers on "The Place of Science in Education" is printed in *Education* for September 15. In outline the views expressed may be summarised as follows:—In elementary schools science can be little more than common-sense thinking about, and intelligent interest in, the ordinary events of everyday life, the main aim being to encourage a feeling of the necessity for personal trial and effort in understanding what is seen and done. In secondary schools there should be a systematic course of experiments, especially in the physics and chemistry of ordinary life, in order to encourage a habit of reasoning from what has been observed. This systematic course should be preceded by an introductory course dealing with scientific facts and ideas. All the work here outlined should precede the division of the school into "moderns" and "classics." On the modern side real scientific training is obtained from the laboratory work which becomes essential, but on the classical side science might well deal with general principles through the history of science and discovery, the whole subject being taught in language of a literary character freed from technical phraseology. Such a scheme involves the teaching of general elementary science in the preparatory schools.

IN the *Fortnightly Review* for October the subject of science and the *rôle* to be assigned to it in the curriculum of the higher schools and universities is considered in a suggestive article entitled "Education To-day and To-morrow," by Mr. P. E. Matheson. Reference is made to the manifesto issued a few months ago pleading for a larger infusion of scientific knowledge into the public service, and it is suggested that whilst the critics have made good their complaints of serious defects in our war administration some of the criticisms are to be met by other means than educational reform, as, for example, the conversion of men of business to the belief that scientific research pays. Mr. Matheson admits that unless we have more science in the schools we shall perish. But it is declared that we are up against faults of character and a disbelief in the value of disciplined intelligence. Yet we cannot hope for a cure for these defects either in respect of employers or of persons in the higher service of the State unless it be through the schools and as a result of systematised training, not only in languages, history, literature, and mathematics, but also in the facts and potentialities of scientific knowledge, together with the due training of hand and eye, and accompanied by those formative agencies which promote self-reliance and sterling character. The article is a welcome indication of a more liberal attitude towards the claims of science in the schools and universities.

THE annual congress of the Textile Institute, which met at Leeds on October 13, was in the main concerned with the question of scientific research in the application to the needs of the textile industry. Much has been done of late years in the encouragement of research in the great textile schools of Manchester for cotton goods, and in those of Leeds and Bradford for woollen and other animal fibres, but there is still to lament the indifference of manufacturers to the fruit of such research and to the importance and value of skilled, scientific labour. Dr. Sadler, in welcoming the delegates, pleaded for better appreciation on the part of manufacturers, and for a higher scale of remuneration for those engaged in research in our universities and in the technical colleges attached thereto. When shall we have an English example such as that of the firm of Zeiss, in Jena, which in the course of years has contributed considerably more than 100,000*l.* to the University of Jena as a mark of its appreciation of the value of the scientific assistance it has received therefrom? It is not merely in the adoption of ingenious mechanical contrivances to displace hand labour and so to increase production, the invention of which is shared by the textile-producing nations, but the question goes far deeper than this, in the closer investigation of the fibres with a view to their more successful treatment; in the discovery and scientific manipulation of new fibres, even to the production of artificial fibres; and in the skilful adaptation of material, hitherto regarded as waste, to the production of saleable goods. In the latter aspect of the question the superior chemical training and skill of our foreign competitors on the Continent have enabled them to compete most seriously with important branches of our textile trade, especially in respect of the dyeing and finishing of textile goods. The future of the coal-tar industry was the subject of an address by Prof. A. G. Perkin, who maintained that the production of synthetic dyes, in which Germany had outdistanced this country so completely, was due to the neglect of the manufacturer, the chemist, and of the technical schools. We needed, said Mr. J. H. Lester, of Manchester, a better organisation of industrial education, research and co-operative agencies of all concerned on scientific lines, in order to ensure the maintenance and progress of our industries. There was not, said another speaker, Dr. M. O. Forster, a sufficient supply here of well-educated, clear-brained, intelligent young men of sound character and real perseverance in the chemical world.

THE attention which is being directed to educational topics in the public utterances of men distinguished in various forms of national activity is, it may be hoped, an indication that the importance of a sound and well-balanced system of national education in this country is beginning to be understood. On October 11 Lord Haldane delivered the first of a series of lectures on after-war problems, arranged by a joint committee of Birmingham University and the Workers' Educational Association. He said it was his wish to devote his remaining days to being a missionary on the great question of education. We remember, however, that though, when president of the British Science Guild, he was an advocate of increased attention to education and science by the State, he did little, when he possessed political power, to see that the nation was given the fullest scientific and educational equipment. In his address on October 11 he maintained that what we want is training, and it is the mental training of the future generation that is going to count. When peace comes, he continued, we shall hear no more in Germany about 16-in. guns, but a great deal about continuation schools. The Germans are training up a generation of skilled workmen with whom we cannot compete. We must take care to train the children of our working classes in at least as good a way as the Germans

have been able to train theirs. Mr. L. A. Legros also referred to education in his presidential address to the Institution of Automobile Engineers on October 11. Never, he said, in the history of engineering has the ignorance of science by the politicians, the military, and other authorities been so openly displayed as in the early stages of the war, and never has it proved so costly in time, in life, and in material. How many lives and how many millions of pounds, he asked, would the country have been saved if as much study in time and thought had been expended on science as on classics by our law-makers and law-givers? He pleaded that science should be given its proper place in education, and that due care should be exercised in providing suitable training for those women who, as mothers and teachers, would have charge of the earliest training of our future men.

SOCIETIES AND ACADEMIES.

PARIS.

Academy of Sciences, September 25.—M. Camille Jordan in the chair.—E. **Belot**: The origin of the rotations and revolutions in the forward or backward sense, as well as the origin of cometary orbits.—J. **Guillaume**: Occultations of the Pleiades, observed on September 16, 1916, with the 16-cm. Brünner equatorial of Lyons Observatory.—M. **Boll** and L. **Mallet**: Determination of the practical constants of the Coolidge tube. The Coolidge tube is very stable, and the X-radiation can be maintained for a long time constant, both as regards emissive power and degree of penetration. It is easy to change from hard to soft rays and the reverse. The practical yield is of the same order as other focus tubes for soft rays. The radiation from a Coolidge tube is not appreciably more homogeneous than that of other tubes.—J. **Bougault**: The acidylsemicarbazides. A general account of their physical and chemical properties as a group.—P. **Paris**: *Sphaeromicola topsenti*, a new genus and species of Ostracod.—A. **Lumière**: The comparative action of antiseptics on pus and on pure cultures. The experiments were carried out with three disinfectants of different types—phenol, sodium mercury-phenol-disulphonate, and sodium hypochlorite. These were allowed to act under similar conditions upon the concentrated pus, culture of the pus, and a pure culture of the predominating staphylococcus from the pus, and also upon 1 per cent. dilutions of these. The albuminoid substances present in the pus attentuate slightly the bactericidal effect of phenol; this action is a little more marked with the mercury compound, and becomes very important with the hypochlorite.—R. **Wurtz** and E. **Huon**: The variolisation of heifers immunised against the vaccine.—Em. **Bourquelot** and A. **Aubry**: The biochemical synthesis of α-propyl-*d*-galactoside with the aid of a ferment contained in air-dried low yeast.

BOOKS RECEIVED.

A Census of New South Wales Plants. By J. H. Maiden and the late E. Betche. Pp. xx+216. (Sydney: W. A. Gullick.)

Vorschläge zur geobotanischen Kartographie. By Dr. E. Rübel. Pp. 14. (Leipzig: Rascher and Co.) 1.50 francs.

Catalogue of Scientific Papers. Fourth Series. 1884–1900. Compiled by the Royal Society of London. Vol. xv. Pp. vi+1012. (Cambridge: At the University Press.) 2*l.* 10*s.* net.

Joseph Pennell's Pictures of the Wonder of Work: with Impressions and Notes by the Artist. Pp. lii. (London: W. Heinemann.) 7*s.* 6*d.* net.

Transactions of the Royal Society of Edinburgh. Vol. l., part iv. Session 1913–14. (Edinburgh: R. Grant and Son.) 22*s.*

Checklist of the Recent Bivalve Mollusks (Pelecypoda) of the Northwest Coast of America from the Polar Sea to San Diego, California. By Dr. W. H. Dall. Pp. 44. (California: Southwest Museum.)

Arboreal Man. By Prof. F. Wood Jones. Pp. x+230. (London: E. Arnold.) 8*s.* 6*d.* net.

The Migrations of Fish. By Prof. A. Meek. Pp. xviii+427. (London: E. Arnold.) 16*s.* net.

DIARY OF SOCIETIES.

FRIDAY, OCTOBER 20.

INSTITUTION OF MECHANICAL ENGINEERS, at 6.—Trials on a Diesel Engine, and Application of Energy Diagram to obtain Heat Balance: The late Lieut. Trevor Wilkins; presented by Prof. Burstall.

TUESDAY, OCTOBER 24.

ZOOLOGICAL SOCIETY, at 5.30.—Notes on the Development of the Starfishes *Asterias glacialis* O. F. M., *Cribrella oculata* (Linck) Forbes, *Solaster endeca* (Retzius) Forbes, *Stichaster roseus* (O. F. M.) Sars: Dr. J. F. Gemmill.—Studies on the Anoplura and Mallophaga, being a Report upon a Collection from the Mammals and Birds in the Society's Gardens.—Part II.: B. F. Cummings.—Two New Species of Cestodes belonging respectively to the Genera Linstowia and Cotugnia: Dr. F. E. Beddard.—Notes on a Collection of Heterocera made by Mr. W. Feather in British East Africa, 1911–13: Lt.-Col. J. M. Fawcett.—The Structure and Function of the Mouth-parts of the Palæmonid Prawns: L. A. Borradaile.—Heude's Collection of Pigs, Sika, Serows, and Gorals in the Sikawei Museum, Shanghai: A. de C. Sowerby.

INSTITUTION OF CIVIL ENGINEERS, at 5.30.—James Forrest Lecture: The Development of Appliances for Handling Raw Materials and Merchandise at Ports and other Large Centres of Traffic: Sir John Purser Griffith.

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