

regards production and consumption; nutritional needs and national fitness; population problems and genetics questions; scientific agriculture, afforestation, land reclamation; regional distribution of industry; hydro-electric power, new industrial developments (light metals, carbide and acetylene, plastics, cellulose, synthetic fats); aircraft and poison gas defence; psychology and war; educational use of cinema; vocational outlet for trained workers; and several others. These are to be grouped around the various sciences to which they are related. The chairman (Sir Richard Gregory) referring to the fact that many of these problems have been discussed at recent meetings of the British Association, suggested that the closest co-operation be maintained with the Association, and it was agreed that, if possible, suggestions be made to recorders of suitable sections for the inclusion of such papers in the programme of the next meeting at Nottingham. Material on the above or other suitable topics should be sent to the Honorary Secretary, Research Co-ordination Committee, Hazlitt House, Southampton Buildings, W.C.2 (Telephone, Holborn 1713).

Relativity and the Quantum Theory

In a lecture given before the Newcastle-upon-Tyne Astronomical Society on November 5, Prof. R. A. Sampson discussed "The Spectroscope in the Observatory". Remarking that the spectrum, along with Wilson's cloud chamber and photographs of diffraction patterns due to electrons, furnishes visible records of things that are too small to see, Prof. Sampson pointed out that Dirac holds it is quite impossible to make a rational theory of these things without reconstructing our ideas of the nature of matter altogether. This has led to the two great theories of modern times, namely, relativity and the quantum theory. They are not yet fully reconciled. In his opinion, there are considerable philosophical difficulties in holding either. Relativity, on its merits, may seem a probable theory, but it cannot do its feats without making time an equal co-ordinate with the familiar three of space. Now we cannot think time away, without sacrificing the possibility of expressing ourselves intelligibly to others, and living in a world where history and cause and effect have no meaning. Nor does it upset our own affairs alone; we see the grass grow in summer and die away in winter. That must be an illusion. It seems to Prof. Sampson a simpler hypothesis to suppose that the intellect is limited. The quantum theory, which is obviously on the right lines, makes in small matters an enormous logical difference, and gives a new meaning to the question "Will the sun rise to-morrow?"—for example, when we are dead, or last century, before we were born. We must confess that we have no means of verifying whether it does or not. It seems that both these theories spell the exhaustion of the constructs of the intellect, of which a necessary part is the four elements of space-time, which must be exhausted sooner or later. Leaving these philosophical questions, Prof. Sampson gave a

description of the ordinary theory of stellar sequences, etc., including the Russell diagram of the relation of luminosity to spectral class, and white dwarfs.

Supervision of the Nation's Food Supply

In the fifteenth Benjamin Ward Richardson Lecture which was delivered on November 10 before the Royal Sanitary Institute, Dr. Gerald Leighton, late Medical Officer of the Department of Health for Scotland, stated that from the public health point of view three conditions are required for the proper supervision of the nation's food supply. In the first place, there must be a concentration and collection at certain centres of large quantities of the food material, so that there may be adequate inspection. Although the necessity of this condition was recognized more than forty years ago by the United States Department of Agriculture, which established a well-regulated system of slaughter houses, Great Britain has been very slow in adopting the system of public abattoirs, the need of which was so strongly urged by Benjamin Ward Richardson himself. The second condition necessary for effective supervision is the supply of a sufficient number of highly trained inspectors. Great progress has been made in this respect during the last twenty years, training for students as meat inspectors being provided by veterinary colleges, some universities and other educational bodies. Lastly, a uniformity of system and practice is essential. The inspectors should be trained to work on a uniform system and to a uniform standard instead of, as in the old days, each inspector being a law to himself. Dr. Leighton then dwelt on the desirability of securing and adopting the most rapid, skilled and humane methods of slaughtering all kinds of animals for human food, a topic which formed part of the life work of Richardson. In conclusion, he expressed the view that in the progress of the supervision of a nation's food, the introduction of legal standards, as in most European countries, America and various parts of the Empire, for the majority of foods is the most important step for future development.

The London Telephone Trunk Exchange

In a paper read on November 13 to the Students' Section of the Institution of Electrical Engineers, Mr. H. M. Wells discusses the effects of the rapid increase of the telephone service in Great Britain on the methods of working. The country is divided up into zone areas and subdivided into group areas. Major trunk lines connect main zone exchanges with London and with one another. They are so designed that a minimum of duplicate plant is necessary. By the use of thermionic amplifiers, the volume of speech fed into a line is made equal to the volume received at the far end. When things are properly adjusted, there is thus no loss of sound. One result is that the speech on the London-Moscow circuit is as good as that on a local London call. The insulation materials of the cables used are paper and 'air-space'. The 'air-space' is filled with carbon dioxide which possesses desiccating qualities and

can be readily pumped out from the cable and replaced by fresh gas capable of restoring the dry atmosphere required to maintain a high insulation resistance. In the exchange itself, the type of apparatus employed is designed to permit calls to be completed on demand, that is, whilst the calling subscriber is held on the line. Timing the duration of calls is a problem which has received special attention. In the trunk exchanges, all calls are timed automatically; this obviates any error due to the human element, and, as the calls are expensive, this is very desirable. The particulars from the time-recording instruments, together with the called and calling subscribers' numbers, are entered on a ticket by the operator and circulated to a central pricing position. The circulation is effected by pneumatic tubes. The power for the exchange is derived from secondary cells of large capacity. A voltage of 50 is used for normal speech and apparatus purposes, but the signalling lamps on the switchboard are worked at six volts from an alternating current source.

Grading of Teak Squares

WITH the hearty co-operation of business firms, the Forest Research Institute at Dehra Dun has published a small pocket monograph entitled "Rules for the Grading of Teak Squares", prepared by L. N. Seaman, officer in charge, Timber Testing Station, and V. D. Limaye. In a preface, Mr. C. G. Trevor, Inspector General of Forests, states that the work was undertaken at the request of the Chief Conservator of Forests, Burma, and the Indian Railways, and the Burma forest officers were deputed to the saw mills of the five chief teak firms to observe and write down in tabular form all the defects in each teak square passed by the respective firms as belonging to different existing grades. The data so obtained were dispatched to Dehra Dun for analysis, and preliminary draft rules were drawn up by Mr. Seaman and his staff. These rules were discussed at a meeting held in Rangoon between the parties interested, and a trial was made of them. As a result of experience gained, the rules were re-written by Mr. Limaye (Mr. Seaman having left India on retirement) and are now published in the present handy form. The rules express, in so many words, the actual practice that is followed in the trade in the grading of teak squares. The rules have been accepted by the teak lessees of Burma and the timber adviser to the Railway Board and the Army. The rules are equally applicable to mill-sawn squares from Siam and other countries, and it is suggested that in future they will always be used for the buying and selling of teak squares.

Design in Industry

At the opening meeting of the new session of the Royal Society of Arts on November 4, the chairman of the Council, Sir Henry McMahon, announced the institution of a new distinction of D.I. (Designer for Industry) for designers for industry who have attained eminence in creative design. The distinction

is limited in the first instance to ten and the number of holders of it at any one time will not exceed thirty. The essence of the scheme is to encourage the improvement of industrial design by enhancing the status of the designer in the public regard, and thereby arousing a more general recognition of the importance of industrial art. This latest step is in continuance of the Society's efforts in this field from the eighteenth century onward, and is a natural development of the annual competition of industrial designs initiated in 1923 and of the Exhibition of British Art in Industry organized at Burlington House last year in co-operation with the Royal Academy. The very success of the Exhibition, which stimulated a widespread movement advocating the cause of art in industry, emphasized the fact that no recognition or distinction was heretofore available for designers, who through their great work for industry are deserving of wide public recognition of their valuable services to their country. This gap, it is hoped, will be filled by the new distinction.

The Geographical Magazine

THE completion of the second year of the *Geographical Magazine* directs attention to the value of its articles and the excellence of its illustrations, the photogravure and coloured plates in particular reaching a high standard. Among articles in the December issue is one by Dr. R. Zeller on the "Development of Alpinism in Switzerland" which is illustrated by a large number of old prints. In view of the modern vogue of alpinism, which the writer defines as an interest in high mountains and their exploration, it is worth noting that at least until the eighteenth century the Alps repelled travellers. The influence of two writers, von Haller and Rousseau, did much to direct attention to the Alps, but with a few exceptions there was little real mountaineering until Paccard and Balmat climbed Mont Blanc in 1786. Maps did not become available until the nineteenth century, and from the middle of that century onwards accurate maps and guide books were great stimuli to active alpinism, while the twentieth century may be said to have seen its popularization.

Demographic Statistics

ACCORDING to statistics recently published in Germany, the average duration of human life in most countries was about fifteen years longer in 1921 than in 1871. In 1880 in Germany, 261 out of 10,000 inhabitants died as compared with 212 in 1900 and 111 in 1930. During the same periods there were 205, 182 and 114 deaths in England, and 198, 176 and 113 in the United States. In Hungary the decline of mortality was most pronounced, there being 386 deaths per 10,000 inhabitants in 1880 and only 155 in 1930. During the same period of half a century, the percentage fall of mortality in different countries was as follows: Germany, 54.8; England, 44.4; France, 22.6; Italy, 41.7; Switzerland, 51.8; Sweden, 39.7; United States, 40.4; and Australia, 46.9 (*Bruxelles Méd.*, October 25).