

most efficient at high speeds. When, however, it was applied to marine propulsion, owing to the inefficiency of propellers at high speeds, a compromise had to be made. Yet its inherent qualities led the marine steam turbine quickly to surpass the turbo-generator in point of size, and only ten years elapsed between the debut of the *Turbinia* at the Diamond Jubilee review of 1897 and the construction of the 70,000 h.p. turbines of the *Lusitania* and *Mauretania* and the adoption of steam turbines for all classes of warships except submarines. When referring to the steam turbine in his Gray Lecture to the Institution of Mechanical Engineers in 1930, Eng. Vice-Admiral Skelton said: "Its application is one of the few important marine changes which were made without any setback, and the initial success and the rapid extension of the system is undoubtedly attributable to the experience gained in its long and gradual development under proper conditions on shore, no less than to the soundness of the conceptions of the inventor and his thorough exploratory work in connexion with the marine application".

It had been realised quite early that in ships it would be an advantage to have some form of reduction gear between the turbine and the propeller, and the development of steam turbines afloat during the last twenty-five years presents several aspects, first the progress with direct driving turbines, secondly the use of turbines coupled to the propeller shafts with either mechanical, hydraulic or electric transmission gear and thirdly the combined use of reciprocating engines and turbines. The most notable direct-driven turbine ships of the last quarter of a century include the *Aquitania* (62,000 h.p.), *Berengaria*

(65,000 h.p.), *Majestic* (84,000 h.p.) and the *Leviathan* (82,000 h.p.); and large warships such as the *Iron Duke* (31,000 h.p.), *Malaya* (75,000 h.p.) and *Repulse* (112,000 h.p.). Helical-toothed reduction gear, tried out by Parsons in the *Vespasian* in 1909, was adopted in turbine-driven cross-channel vessels and destroyers in 1911 and quickly came into favour. By September 1919 the total horse-power of geared marine turbines completed or under construction was about 18,000,000. The use of gearing enabled the efficiency of both turbines and propellers to be increased, turbines of 20,000 h.p. with gearing being equal to turbines of 30,000 h.p. without gearing. H.M.S. *Furious* (90,000 h.p.), H.M.S. *Hood* (144,000 h.p.) and H.M.S. *Nelson* (45,000 h.p.) all have geared turbines, as also have the modern Atlantic liners *Bremen*, *Europa*, *Conte di Savoia* and *Rex*, while the machinery of the *Queen Mary* will be of this type.

Hydraulic transmission between the turbine and the propeller has never been extensively used, but electrical transmission, first used on a large scale in the United States Navy, has made rapid strides. The French liner *Normandie* is fitted with electric drive, and will have four main turbo-generators of 34,200 kw. delivering current to the motors on the propeller shafts, the whole plant rivalling in size and interest the machinery of a big power station.

Marine engineering practice has sometimes forged ahead of and sometimes lagged behind land practice, but to-day it tends to run on parallel lines. Progress during the last twenty-five years has been due to many eminent engineers, among whom the inventors of steam turbines, such as Parsons, De Laval, Curtis, Zoelly and Rateau, hold the place of honour.

News and Views

Prof. P. Kapitza and the U.S.S.R.

It is common knowledge in scientific circles that Prof. P. Kapitza, director of the Royal Society Mond Laboratory at Cambridge, and Messel professor of the Royal Society, has been detained in Russia since last September by order of the Government of the U.S.S.R. Kapitza came to England as a member of a Russian scientific commission in 1921. He soon started to work as a research student at Cambridge under the supervision of Lord Rutherford, and after some preliminary work on radioactivity he commenced work on the production of intense magnetic fields, and in 1925 a new laboratory, financed by the Department of Scientific and Industrial Research, was opened for the work. By the use of a special alternator, Kapitza was able to produce fields up to 300,000 gauss, and to carry out experiments showing the existence of new phenomena in conduction and in magnetostriction. Since most of these phenomena

are more pronounced at low temperatures, a hydrogen liquefaction plant was added in 1929, and in 1930 the Royal Society made a special donation of £15,000 to enable a new laboratory to be built to house the original apparatus, together with a helium liquefaction plant. It was characteristic of Kapitza that he was not satisfied to take over existing designs of helium liquefiers, but began immediately to work on the construction of a new type of liquefier which required no liquid hydrogen. This liquefier is an illustration of Kapitza's special technical gift, for it incorporates a piston type engine, which works down to the temperature of liquid helium. This liquefier, which was described in *NATURE* of May 12, 1934 (p. 708), was perfected last summer, and Kapitza was able to carry out preliminary experiments using strong magnetic fields combined with helium temperatures before leaving for Russia in September to attend the Mendeléeff Congress.

THROUGHOUT these years of developmental work, Kapitza had visited Russia almost every summer. During these visits he gave lectures and advised on the construction of new institutes, and it was known that he had at one time been offered the directorship of an institute in Russia, but Kapitza himself considered that conditions in the U.S.S.R. were not favourable for the development of his work. It came, therefore, as a shock to his colleagues to learn in October that Kapitza's return passport had been refused, and that he had been ordered to begin the construction of a new laboratory in Russia. The reasons underlying this action may be inferred from the following statement from the Soviet Embassy which appeared in the *News-Chronicle*:—"Peter Kapitza is a citizen of the U.S.S.R., educated and trained at the expense of his country. He was sent to England to continue his studies and research work . . . Now the time has arrived when the Soviet urgently needs all her scientists. So when Prof. Kapitza came home last summer he was appointed as director of an important new research station which is being built at Moscow". This commandeering of Kapitza's services on behalf of the U.S.S.R. ignores the personal and psychological factors involved, as was pointed out by Lord Rutherford in a letter to *The Times* of April 29. A man of Kapitza's highly-strung type must inevitably be profoundly disturbed by a sudden frustration of years of work; and it comes as no surprise to his friends to learn from reliable sources that his health has already been seriously impaired by anxiety and strain. The right of the Soviet to retain Kapitza in his native country can scarcely be questioned, but from the point of view of international science we venture to express the hope that he may be permitted to return to Cambridge to complete the investigations with the remarkable plant designed by him and installed in the Royal Society Mond Laboratory at the University.

Retirement of Sir Peter Chalmers Mitchell

LAST summer it was announced that Sir Peter Chalmers Mitchell was to retire from the post he had held for more than thirty years as secretary of the Zoological Society of London (see *NATURE*, Aug. 25, 1934, p. 280). At the annual meeting of the Society held on April 29, Sir Peter formally vacated the secretaryship and his successor, Prof. Julian S. Huxley, took his place. Sir Henry Mahon and Prof. J. Stanley Gardiner presented Sir Peter with his portrait, painted by Mr. William Nicholson, on behalf of some 1,250 members of the Society; very appropriately, the background of the portrait includes a map of the Whipsnade estate, with the development of which Sir Peter's name will always be associated. The response to the appeal for the portrait was so generous that it has been possible to send each subscriber a reproduction in colour of the portrait and also to present to Sir Peter a personal memento. The Duke of Bedford, president of the Zoological Society, in moving a resolution of thanks to Sir Peter for his many years of active and inspiring service to

the Society and to science, stated that whereas in 1902 the Society's Gardens in Regent's Park had 69,500 visitors, in 1934 the number had increased to 1,690,000, while the Society's high reputation as a scientific body has been similarly enhanced. The Society has been a pioneer, under the guidance of Sir Peter Chalmers Mitchell, in the improvement of the conditions under which animals are kept in captivity. On the more strictly scientific side, mention should also be made of the valuable investigations carried out by the succession of anatomists, pathologists and other workers who have been encouraged by Sir Peter to study the Society's collections.

King George's Jubilee Trust

No social change of our time is more significant than the way in which leisure has ceased to be the privilege of a few and become the concern, if not indeed the lot, of the many. In the problems which leisure now presents, there is none more serious and pressing than those which it presents in adolescence. The Jubilee Trust inaugurated by the Prince of Wales at St. James's Palace on March 1 is designed specially to deal with such problems, and a further reference to its objects was made in an appeal broadcast by His Royal Highness on April 12. The main objects of the Trust are to provide more and better facilities for the recreation and guidance of the younger generation, to encourage the cultivation of abilities, craftsmanship and all those outdoor interests and activities which make for mental and physical fitness. The Trust will assist, strengthen and extend the work of the many voluntary organisations in existence, the work of which is to promote the welfare of the boys and girls of Great Britain. It will enable similar movements to be started in places at present untouched, particularly through lack of local resources and the need of help from a central source. It should encourage co-ordination of effort and prevent the waste of money and effort in overlapping.

APART altogether from its direct activities, the existence of the Trust should encourage a more enlightened and generous attitude to the many problems which arise in regard to juvenile employment and leisure. It should lend powerful moral support to all agencies which are concerned with the education and recreation of young persons, whether in relation to industry or to citizenship. It may provide a focus from which powerful support will be forthcoming for all efforts to deal wisely with the tragedy of juvenile unemployment, with excessive hours of work or with any other matters which hinder the normal development of citizens possessing the qualities of physical, mental and spiritual fitness and ideas of service which make a people great. The Jubilee Trust aims at dealing with the most crucial educational task of the time—that of guarding from the worst dangers of unemployment or unsuitable work at the most critical time of their physical, moral and mental development that large section of our young people between fourteen and eighteen years of age who are drifting into manhood and