

and the power to solve, in its own ways, the problem of population. If there be the possibility of enlargement of the means of subsistence, of renewed expansion, then this should be completely explored; but if such expansion is impossible, then the aim of society must be to ascertain the limits in which an optimum population can enjoy the maximum of liberty. In both tasks the method must be that of the social experiment. Though Prof. Hjort mainly restricts himself to a discussion of the method of research and experiment in its application to social problems, he does not avoid the conclusion that an economically re-united Europe would afford conditions for a new emancipation, for a recovery of the freedom that the War destroyed. For, he holds, this would bring peace, and peace amongst men is not a natural state of things; it does not make itself, but must be made.

Representation of Science on Government Commissions

As announced last week in this column, the Postmaster-General is about to set up a committee to consider the development of television, and to advise on the conditions under which any public television service should be provided. It is understood that the personnel of the committee is to consist of representatives of the Post Office, the British Broadcasting Corporation, and the Department of Scientific and Industrial Research. A committee so constituted, presuming that some of the members have practical knowledge of the problems involved in television, would command that measure of public confidence which is necessary if its deliberations are to find general acceptance; and it would be an advance on many Commissions and committees appointed by the Government in this respect. For reasons which it is difficult to understand, there has been a lamentable tendency on the part of Ministers to pass over scientific men in setting up Royal Commissions, committees, and departmental committees, even when matters in which scientific and technical issues are involved.

It is to be hoped that the constitution of the television committee is a sign that the Governmental mind is being quickened in this respect. Time and again, we have urged that no body set up to consider any subject with scientific or technical ramifications can be adequate or complete unless it includes scientific workers or technicians in its personnel. The Parliamentary Science Committee—a body representing the British Science Guild, the Association of Scientific Workers, and a number of learned societies—has also taken up the matter, urging the Prime Minister to insist on his colleagues observing this principle. Some fifteen months ago the Postmaster-General appointed a Post Office Advisory Committee. If this body is to be of real service it will, presumably, have to advise on technical matters such as telephony and telegraphy. Yet no one with scientific or technical qualifications was appointed amongst a numerous membership. There is now a vacancy occasioned by the death of the Hon. Mary Pickford, thus affording an opportunity of rectifying this state of affairs.

Scientific Method and Politics

THE first instalment of a tabular analysis of various social and economic systems, in the form of answers to a questionnaire prepared by the Engineers' Study Group on Economics (*NATURE*, 132, 635, Oct. 21, 1933) is to appear in the forthcoming issue of *Progress*, the organ of the Association of Scientific Workers. The Study Group, apart from research investigations, arranges for discussions on questions of the moment, at which those engaged in any branch of scientific work are welcomed. On May 16 Mr. Harold Macmillan, M.P., will address the Group on "Reconstruction". The meeting will be at 7.45 for 8 p.m. at Denison Hall, 296 Vauxhall Bridge Road, Victoria, and Sir Richard Gregory will take the chair. Tickets may be obtained from the honorary secretary of the Group, Col. P. Johnson, Gunnersbury House, Hounslow, Middlesex.

THE interest which scientific workers are beginning to show in social and economic questions is not restricted to Great Britain. In France there are several active groups. The Centre Polytechnicien d'Etudes Economiques (12 rue de Poitiers, Paris; president, M. Gerard Bardet) consists mainly of former students of the Ecole Polytechnique, one of the best-known engineering colleges in France, and is now in its third year of existence. Another, the Centre d'Etudes Economiques de l'Alimentation (39 boulevard de Sebastopol, Paris; president, M. André Roussel) was formed by the fusion of three pre-existing groups drawn from the Ecole Polytechnique, Ecole des Centraux and the Institut Agronomique. Both organisations publish bulletins regularly, giving the results of their studies on economics and production and distribution of foodstuffs.

Unemployment and Poverty in India

IN a recent article in the *Karachi Daily Gazette*, Capt. Petavel, formerly lecturer on the poverty problem at the University of Calcutta, strongly advocates the formation of co-operative colonies as a solution of the problems of unemployment and poverty in India. He suggests that the colonies should be open not only to those who have merely their labour to offer, but also to those who would contribute capital, land or equipment. All would be co-operators in their way, and would have a share of the products. The workers' remuneration would be mainly in kind, but part might be in money. This would enable the more ambitious to save, and in time to launch out on any small undertaking they might fancy. If they failed, they could return to the colony, which would thus provide opportunity with security. As the colonies developed, they could adopt a system of 'exchange tickets' redeemable in the produce of the colony. Thus it is claimed purchasing-power would always be commensurate with productive power. People could always get work in the colony, because they would get a ticket to take away what they had produced. To reinforce his argument, the author refers to the Swiss Labour Colony at Witzwil and that at Llano in Louisiana.

In the former, even people classed as 'unemployables' have been made self-supporting. In India he suggests a start could most easily be made with an educational co-operative colony in which young persons could work and receive their education. Elderly persons might also be included to act as leaders, or to work in departments of their own. In order to start a fund for experiment on the lines advocated by Capt. Petavel, the Mayor of Karachi has announced that he will give Rs. 5,000 and 50 acres of good land near Karachi.

Re-equipment of Collieries and Steelworks

In the supplement to the *Daily Telegraph* of March 19, Dr. A. H. Railing says that the need for the reorganisation of certain of the basic industries of Great Britain is urgent. As a result of recent applications of scientific knowledge, great advances have been made in developing new plant for the economic mining of coal and the manufacture of iron and steel products. In recent years the grouping of collieries makes it possible to use large turbo-machines and thus considerably lowers the cost of generating electric power. This solution of the problem of the handling and transport of coal will contribute greatly to the economic success of the undertaking. A colliery equipped with a modern coal-cleaning installation can command higher prices for its output. Loss and waste due to the breakage of coal can now be reduced to a minimum by using anti-breakage devices. By grouping together iron and steel works it would be possible to utilise the by-product gases of the iron and steel industry. An installation of large turbo-generator units in such a station would enable it to have a thermal efficiency as high as that obtained in the largest modern power station. The by-product gases from the industry would in this way acquire the same heat value as the coal used in coal-fired power stations. Many of the rolling mills in Great Britain have been installed for very long periods and their retention in service militates against securing the high quality of product demanded to-day. An electrically driven rolling mill of modern design can be regarded in the light of a precision tool, capable of an output of material possessing the highest degree of accuracy obtainable in rolling practice. The electric furnace also opens out great possibilities. One of the valuable properties of the high-frequency electric furnace is that, when operating, it gives rise to an automatic stirring action which secures a uniform product.

Street Traffic Signals, 1868-1934

IN 1868 the City of Westminster introduced a method of mechanical signalling to help the police to control the traffic. A semaphore, having a red and green gas lamp for night use, was employed, but unfortunately an explosion put an abrupt end to this experiment. Early in this century, road signals similar to railway signals were used for controlling a few tramways and also the traffic on Tower Bridge. So far back as 1918, colour light signals were used to control street traffic in New York. The Siemens and

General Electric Railway Signal Co. (S.G.E.) installed the first modern British traffic signal at a busy road junction in Wolverhampton in 1926. The most recent development of the vehicle-actuated signals is the 'Autoflex' system of the S.G.E., a full description of which is given in the Engineering Supplement of the *Siemens Magazine* for April. It was first brought into use in November 1933 and there are now several installations giving very satisfactory service. In this system vehicles approaching a road junction pass over pneumatic detector mats, installed in the paths of the various traffic streams, and so notify their movements to an electrically operated controller. The mats are equivalent to the eyes and ears of a traffic policeman. If vehicles leave the intersection on the wrong side of the road the mats are insensitive. The top of the mat is rounded and projects slightly above the road level presenting a good striking face, so that it is not possible for high-speed vehicles or caterpillar tractors to ride over it without registering. If no suitable gap occurs within a predetermined time, the continuous stream is arbitrarily interrupted and the right of way transferred. There is no necessity for long 'amber' periods since signal changes take place only when the intersection is clear; two or three seconds are generally sufficient. The power required for a controller is only about 30 watts, which is less than that required by an ordinary lamp.

Crystalline Structure and Failure of Metals

THE eighth Edgar Marburg lecture of the American Society for Testing Materials was delivered by Dr. H. J. Gough, his subject being "Crystalline Structure in Relation to Failure of Metals—especially by Fatigue". Dr. Gough dealt almost exclusively with the results of X-ray examination of metals, and the paper contains what is probably the fullest résumé yet given of the subject. Some indication of the ground traversed will be obtained from the fact that the bibliography contains no less than 175 separate references. Starting off with a general discussion of the nature of the atomic bond and of the structure of solids in connexion with the basic problem of failure under stress, the methods of preparation of single crystals of metals, and crystal structure as revealed by X-ray investigation, Dr. Gough then proceeded to consider more specifically the distortion of single metallic crystals under simple static stresses, the influence of the crystal boundary upon strength and distortion and the effects of cold-working upon single crystals and multicrystalline aggregates. Coming to the subject of failure under 'fatigue' conditions, Dr. Gough dealt with metals crystallising in the face-centred cubic, in the close-packed hexagonal (discussing incidentally the twinning of zinc), in the body-centred cubic, and in the face-centred rhombohedral lattices. Finally, he considered the behaviour of single crystals as compared with that of multicrystalline metals. Dr. Gough's conclusions are not yet everywhere accepted, but whatever the individual opinions of readers of the lecture may be, it will be universally welcomed as providing, in a readily accessible form, an almost