

led to shortages here and there which are not being compensated by discovery. Salvage and recovery are with us as permanent aspects of the conservation of resources, and not only as part of a war economy. Scrap recovery is of increasing importance and must figure with natural resources in any scheme affecting the control of raw materials. Referring to remarks made by Mr. Hutchings, principal director of salvage and recovery, Ministry of Supply, regarding economy in use and in manufacture, Sir James emphasizes that there must be substitution of one material for another so as to prevent a scarcity of one raw material holding up production. Salvage involves policy and planning to ensure that the materials required are in the right place at the right time and in the right amount, and the discovery of available materials, as well as their collection and disposal to the best advantage. In regard to metal scrap, an international convention for marking material made from the main types of alloys to help in their easy identification is required, as well as improved methods for sorting and cleaning old scrap and getting it into suitable form for re-melting. Losses by corrosion when scrap, often finely divided, is kept for long periods, must also be avoided by early removal of dumps. In the grand strategy of post-war reconstruction, the prevention of all waste throughout the world, Sir James urges, must occupy a dynamic position, and he includes in his survey not merely minerals, rubber, bones, oil, paper, kitchen waste, but also wastage of human material in industry or through defective education.

#### Engineers' Study Group on Economics

THE tenth anniversary of the foundation of the Engineers' Study Group on Economics was marked on May 8 by a social gathering at the home of Lady Rhys Williams; among those present were Sir Richard Gregory, Prof. F. Soddy, Lord Marley and representatives of organizations interested in economic and social reform. Formed initially by a group of engineers through the efforts of the late Mr. John L. Hodgson, the Engineers' Study Group soon enlisted the support of other technical and scientific workers and, under the presidency of Sir Richard Gregory and later of Sir Richard Paget, set out to prove that the scientific method can be applied to social and economic problems. Among its earlier reports were an "Analysis of Twenty-four Social and Economic Systems" and "The Design of a Family Budget with Special Reference to Food" (see *NATURE*, April 11, 1936, p. 627). Much of the work of the Group—which covers an unusually wide field, from statistical data on national production to psychological hints on how to deal with misguided enthusiasts—is issued in the form of duplicated reports which are circulated among members and associated organizations.

Perhaps a unique feature of the Engineers' Study Group on Economics is the way in which it sifts all types of suggestions and helps those who wish to build up groups and associations in the pursuit of desirable social ends. Lady Rhys Williams, who has prepared some carefully thought out proposals on the lines of the Beveridge Report (see *NATURE*, December 12, 1942, p. 692), referred to her long association with the Group. Mr. Raymond Perry, chief executive officer of the Committee for the Scientific and Industrial Provision of Housing—whose report on pre-fabrication may well prove an important step in solving the post-war housing

shortage—acknowledged his indebtedness to the E.S.G. and to the Research Co-ordination Committee, at the headquarters of which his own committee began its work. Prof. Jacques Metadier, wishing to start a journal to foster co-operation among scientific men of the United Nations, approached the E.S.G. and received help and advice which led to the publication of the "Solidarity" series. Mr. W. H. Edridge, of the Joint Council for Monetary and Economic Research—a body which has brought together many separate groups working towards monetary reform—likewise mentioned the collaboration of the E.S.G., which through its unobtrusive and disinterested help has won the confidence of many attempting to solve the problems of a rapidly changing world. Representatives of other organizations added their commendation of the work of the Engineers' Study Group, the address of which is now 20 Buckingham Street, London, W.C.2.

#### Crack Detection in Non-Ferrous Materials

At a demonstration given in London recently, the potentialities of the 'Hyglo' system of detecting flaws in non-ferrous metals and other materials were demonstrated. From its name it will be recognized as an application of the well-known phenomenon of fluorescence to the illumination of flaws, cracks, inclusions and porosity, which are thereby rendered quickly noticeable when examined under the ultra-violet lamp. This particular system is specially notable, from the point of view of the user or potential user, by reason of the simplicity, rapidity and certainty of its operation, and of the ease with which it can be introduced into a scheme of mass production. The articles to be examined are first dipped for about two minutes in a solution containing the fluorescent material and a substance which at its boiling point produces a vapour to quench fluorescence on the surface. By preparing a sufficient number of articles at the end of each day, the work of inspection can be started at once in the morning and can proceed without interruption. When the articles so treated are brought under an ultra-violet lamp, the fluorescent material which has penetrated the cracks, spongy places or other flaws glows strongly and defective articles can be recognized at once.

At the demonstration, various specimens could be examined, and these included aluminium castings, bronze rings and porcelain insulators. In most of these the defects might easily have been overlooked in visual examination even with the aid of a magnifying glass, but under the ultra-violet lamp they were unmistakable. It was evident that to some extent the seriousness of a particular flaw might be gauged by the greater intensity of the fluorescence due to the deeper penetration, but this should be regarded as of secondary importance, as the first consideration is that the flawless articles should be separated from those which have defects—the final decision on any defect is a matter which requires individual inspection. The suggestion that the system could be operated in conjunction with a conveyor belt is quite feasible, as two lamps can be used. After passing the first lamp each article is turned over by an automatic arm and so both sides come under examination. It will be noted that the 'Hyglo' system requires the two essential operations of dipping and exposure to ultra-violet light. The ancillary operations of washing and chalk dusting have been entirely eliminated and as a result the work can be carried