During the War there were fears of a large increase of minor illnesses. It became urgent for the Ministry of Health to have some measure of the amount of illness in Britain and of the proportion of minor ailments. Successful experiments were carried out by the Social Survey to test the possibility of regular surveys of illness. From the beginning of 1945 the Survey has shown that morbidity statistics could be systematically produced, for the first time in history, covering all illnesses of the whole population, and not merely notifiable diseases. These statistics are published by the Registrar General. They are of obvious use in the preparations for the full operation of the National Health Act. This survey of sickness permits a precise estimate of the amount of working-time lost through all illness, or through the various types of illness, and also which are the major illnesses in particular regions or groups in the population.

Other intensive studies have dealt with : domestic heating and lighting, to help the Building Research Station and committees of the Ministry of Works prepare building standards ; old people's occupation and family responsibilities, in connexion with a long-term investigation to be made by the Industrial Health Research Board ; and water heating, an inquiry carried out in March 1947 for the Ministry of Works. The last-named report gives the distribution of water-heating appliances in Great Britain. It examines their distribution by type of district and region, type and age of dwelling and economic group ; the extent to which they are used, their relative popularity, and the complaints they give rise to. There is also information about the use of laundries, and bathing habits. Studies are now being planned of consumer expenditures. These budgetary inquiries are designed to provide detailed information about expenditure among all sections of the population. The continuous flow of data to be supplied by these studies will help to provide the basis for a long-term employment policy, and they may be of use in helping to analyse the effects of taxation.

Thus, the Social Survey is now producing social data in a very wide field, and by its work is demonstrating that social scientists can develop observational techniques which provide adequate factual material from which to draw socially valid conclusions. An essential technique developed by the Social Survey is that of population sampling. Trained field-workers interview samples of the general public, or of particular sections, with a recording schedule devised so that the results of the inquiries made can be expressed statistically. Two hundred local investigators are so distributed throughout the country that they can reach the whole population. There is a research staff of twenty, and a technical staff of sixty (dealing with machine tabulation, computation and coding). The research officers include anthropologists, psychologists, sociologists, economists and statisticians. The Survey budget for the past year amounted to £60,000.

The main conclusions from war-time experiences, as stated by Mr. Louis Moss, director of the Government Social Survey, in a paper read to the Institute of Public Administration, in April 1946, are : first, the general utility of the information obtained ; second, the importance of public co-operation ; third, the general feasibility of sampling as a technique capable of producing information in many different fields ; fourth, the value of the personal interview as a method of collecting detailed information on factual matters, and matter of opinion ; fifth, the knowledge of the kind of organisation necessary to carry out such surveys systematically on a national scale ; and sixth, the value of the mixed team—not only of social scientists, but including also natural scientists. For example, the co-operation of technicians and physical scientists with the social scientists on the Survey's staff has made it possible to devise methods of work which for the first time are capable of providing a picture of the complex housing situation of Britain.

The techniques employed by the Survey are helping to lay the basis for an empirical social science. They have produced basic data suitable for the studies of the research worker in economics. They have shown the way in which changes in demand could be studied in a quantitative manner. In addition, the study of attitudes is a field for the social psychologist and the sociologist. For example, in mining, not only are the social and industrial conditions of importance, but also the attitudes of potential recruits. Similarly, in the field of behaviour there is much for the social psychologist to do. The social scientist has still a great deal to learn, and the work of the Social Survey is providing a detailed experience of methods and an accumulation of social data which will be of great help.

What of the future ? The statement of the Lord President of the Council in the House of Commons, when announcing the panels of his Industrial Productivity Committee, that the social sciences had a part to play, is a recognition that adequate administrative and executive action in the complicated social and economic fields demands a scientific approach. Thus, survey techniques will surely have a part to play in studying consumer needs in austerity Britain, where limited resources are available for consumer goods production.

War-time experience demonstrated that the Social Survey reports were of value when implemented at administrative level. Therefore, in arriving at a final decision about the place of the Survey in the Government machine it would be necessary to ensure the closest contacts with those responsible for making decisions on social and economic policy.

The correct employment of the Social Survey will help to make more valid Graham Wallas' early comment that "the Government has come to be engaged not merely in preventing wrong things from being done, but in bringing it about that the right things shall be done".

MAURICE GOLDSMITH

INSECTICIDAL SMOKES

APPLYING insecticides in the form of a smoke is a long-established practice. Pyrethrum has been used in this way by the Chinese for centuries, and burning nicotine shreds in glasshouses has been a common practice in Great Britain and elsewhere for a long time. These practices were empirical and there were little or no quantitative data on their effect.

The smoke may be produced by dropping the insecticide on to a hot plate, by indirect heating in a specially designed generator, or by intimate mixing with a combustible powder which is then ignited.

During the Second World War, the use of insecticidal smokes propagated by mixing the insecticide with a pyrotechnic powder was considered for use in the campaign against the Japanese. Some work was done on the subject at the Chemical

Defence Experimental Station at Porton by E. W. Bateman and G. D. Heath (*J. Soc. Chem. Ind.*, **66**, 325; 1947). In this paper the main technical principles involved in the generation of insecticidal smokes are set out and the development of a pyrotechnic insecticidal smoke generator is described.

When this method is employed, one of the crucial problems is to obtain a suitable pyrotechnic powder. The requirements of this powder as listed by Bateman and Heath are that it should be capable of burning slowly and smoothly when mixed with at least an equal weight of insecticide; that the ignition temperature should be as low as possible, in order to avoid excessive heating before combustion occurs; that it must give rise only to products which will not react with the insecticide, and these products should so far as possible be gaseous, since the presence of a hot residue assists the decomposition of the vapour of the insecticide which is forced to pass through it; it must not be unduly sensitive to friction or to heat and should not be hygroscopic, since it must be capable of being handled with safety and of withstanding storage for long periods under tropical conditions. Experiments are described using potassium chlorate and sucrose as the pyrotechnic mixture, and D.D.T. or benzene hexachloride as the insecticide. With these two insecticides there is the complication that hydrochloric acid may be liberated on storage, and a stabilizer should be added. Magnesium oxide was added for this purpose.

Since the War considerable interest has been taken in the use of this method for the control of the pests occurring in glasshouses, warehouses, farm buildings, etc., and they are now being marketed commercially. The generators consist essentially of a thin-walled metal cylinder containing the insecticide mixed with the pyrotechnic powder, an igniter composition and a fuse. The fuse is ignited, and this in turn ignites the starting mixture which sets off the pyrotechnic mixture. The smoke issues through a cooling baffle on top of the cylinder. The baffle prevents ignition of the cloud.

Smoke generators with D.D.T. and azobenzene as lethal agents are being sold by the Murphy Chemical Co., Ltd., and Plant Protection, Ltd., are selling azobenzene smoke generators and 'Agrocide' smoke generators. The 'Agrocide' generator contains the gamma isomer of benzene hexachloride as lethal agent. The smokes containing azobenzene are intended primarily for the control of glasshouse red spider mite, and the D.D.T. and 'Gammexane' smokes for the control of a number of insect pests.

The Murphy Chemical Co. at a recent demonstration held at Ryder's Nurseries showed how easy it is to fill a glasshouse with insecticidal smoke by this method. The advantages claimed for this procedure are that it is cheap and quick to apply, and labour costs are reduced to a minimum; that it gives a far more uniform distribution of the insecticide than spray application, coating both sides of the foliage and penetrating to every part of the glasshouse. The generators are self-contained, needing no apparatus for distribution. They are simple and clean to use and storage space is considerably reduced. It seems quite possible that the method may form a useful and certainly convenient addition to the existing techniques for the application of insecticides; but more information, both physico-chemical and biological, is required before its value can be accurately assessed.

In addition to the practice of gaseous fumigation and spraying in an aqueous medium, the use of aerosols produced from solutions of the toxic chemicals in propellant gases liquified under pressure, and of concentrated solutions of insecticides atomized by means of compressed air, are now being studied, and smoke generation must stand comparison with all these methods.

At first sight it would seem that smoke generators will give a better distribution and penetration than any method short of fumigation, but will have less residual effect than the aerosols, compressed air atomization and spraying. It also seems likely that the method can be used in situations where successful fumigation would not be possible.

It would therefore appear that insecticide smoke generators are most likely to be used where good distribution and penetration are required and where residual effects are of secondary importance, in situations where successful fumigation would be difficult. Although at present they are marketed for indoor use, it appears that in certain circumstances they may be useful outdoors. One limiting factor in the use of this method is likely to be the amount of destruction of the active chemical occurring during the production of the smoke.

FORTHCOMING EVENTS

*(Meeting marked with an asterisk * is open to the public)*

Monday, April 12

ROYAL GEOGRAPHICAL SOCIETY (at Kensington Gore, London, S.W.7), at 5.30 p.m.—"Aerial Mountaineering" (Technicolour Film with Commentary by Colonel Walter A. Wood).

Tuesday, April 13

ZOOLOGICAL SOCIETY OF LONDON (at the Zoological Gardens, Regent's Park, London, N.W.8), at 5 p.m.—Scientific Papers.

INSTITUTION OF ELECTRICAL ENGINEERS, RADIO SECTION (at Savoy Place, Victoria Embankment, London, W.C.2), at 5.30 p.m.—Discussion on "Future Trends in the Design of Receiving Aerials" (to be opened by Mr. E. M. Lee).

SHEFFIELD METALLURGICAL ASSOCIATION (joint meeting with the SHEFFIELD SOCIETY OF ENGINEERS AND METALLURGISTS, at the Royal Victoria Hotel, Sheffield), at 6.15 p.m.—Dr. Ulick R. Evans: "Thin Films on Metals".

MANCHESTER GEOGRAPHICAL SOCIETY (in the Geographical Hall, St. Mary's Parsonage, Manchester), at 6.30 p.m.—Brigadier R. A. Bagnold: "Desert Sand Dunes".

WOMEN'S ENGINEERING SOCIETY (at 35 Grosvenor Place, London, S.W.1), at 7 p.m.—Miss L. Chitty: "Structural Engineering".

SOCIETY OF INSTRUMENT TECHNOLOGY, NORTH-WEST SECTION (at the College of Technology, Manchester), at 7.15 p.m.—Mr. H. Schmitt: "Automatic Control Applications in the Chemical Industry".

ROYAL ANTHROPOLOGICAL INSTITUTE (at University College, Gower Street, London, W.C.1), at 8 p.m.—Prof. Percival R. Kirby: "The Trumpets of Tut-Ankh-Amen and their Successors".

Tuesday, April 13—Thursday, April 15

INSTITUTE OF PHYSICS, STRESS ANALYSIS GROUP (in the English Theatre, The University, Edmund Street, Birmingham).—Conference on "Stress Analysis".

Wednesday, April 14

ROYAL SOCIETY OF ARTS (at John Adam Street, Adelphi, London, W.C.2), at 2.30 p.m.—Mr. Henry S. Horsman: "District Heating".

ROYAL METEOROLOGICAL SOCIETY (at 49 Cromwell Road, London, S.W.7), at 5 p.m.—Major H. C. Gunton: "Phenological Report".

INSTITUTE OF PETROLEUM (at Manson House, 26 Portland Place, London, W.1), at 5.30 p.m.—Mr. S. T. Minchin: "An Account of some Solid State Properties of Petroleum Waxes in Terms of their Composition".

INSTITUTION OF ELECTRICAL ENGINEERS, TRANSMISSION SECTION (at Savoy Place, Victoria Embankment, London, W.C.2), at 5.30 p.m.—Dr. W. Wanger: "Technical and Economic Aspects of the Transmission of Electrical Energy over Long Distances".

BRITISH INSTITUTION OF RADIO ENGINEERS, NORTH-EASTERN SECTION (at Neville Hall, Westgate Road, Newcastle-upon-Tyne), at 6 p.m.—Prof. M. G. Say: "The Pulse Signal".