

Mission was able to bring to France at the earliest possible moment much new information on operational research, radar, aeronautics, nutrition and medical research, etc.

Prof. Mandelbrojt ended his address with a proposal for the foundation of an International Rapkine Memorial Fund consecrated to the solution of those problems in which Rapkine had been interested, and to which he had devoted his genius.

Dr. Magat described how in February 1941, when he left as a refugee for America, his state of mind was low, and the future uncertain. When he arrived, the first person he saw was Rapkine, and wherever anyone arrived Rapkine was there to meet them. "It is important," he said, "for them to feel that they are not alone here."

Prof. J. D. Bernal read an appreciation by Prof. P. M. S. Blackett, who had written that Rapkine, in setting up his Mission, had from the very beginning seen more clearly than others the real facts of the situation. He realized what could be achieved, and what not, and he laid his plans accordingly. But vision and intelligence alone would not have led him to the success he attained; what made this success possible were his gifts of character—such a combination of intelligence, persistence and charm, with first-class scientific ability, as are rarely found in one man.

Prof. Bernal added on his own behalf that Rapkine's personality and achievement had been taken too much for granted. We accepted him as part of the atmosphere and of the century. But, in fact, Rapkine was the pattern of the man on which the scientific world of the future will be based.

Mr. J. G. Crowther described how Rapkine joined at an early stage in the founding of the Society for Visiting Scientists. He was a foundation member of the Executive Committee, and the first assistant secretary. In the latter capacity, he was asked to search for a house, with the suggestion that one might be found in Old Burlington Street. Within twenty minutes he returned with news that the present premises of the Society were available and suitable. Mr. Crowther said that Rapkine was sometimes known among his friends as the 'Prophet'. That, indeed, was what he was: leading his people out of persecution, and by his character and example revealing to them the moral law.

Sir Robert Robinson, in concluding the proceedings, described the premature loss of Rapkine as irreparable, and one to be compared with that of Moseley in the First World War. He hoped in particular that Prof. Mandelbrojt's proposal of an International Rapkine Memorial Fund would be instituted.

SOLDERING

MR. W. R. LEWIS, development officer of the Tin Research Institute, recently gave the Institution of Electronics a review of the problem of soldering, particularly those aspects which have led to the continuous-belt technique of soldering articles together, or for making tin-plate boxes, when the method of heating is with high-frequency currents generated by thermionic-valve plant. The union of metallic surfaces is greatly facilitated by previous 'tinning', that is to say, coating the juxtaposed surfaces with pure tin or a solder, either electrolytically or by hot-dipping; 'tinned' surfaces can be brought very close together and the space between,

even if only a few thousandths of an inch, filled with solder, ingress being by capillary action. Thus the making of tin-plate boxes, in which the edges of the pieces are hooked or bumped together, entirely depends on this capillary action, using rings of solder wire, cored with the requisite flux.

The action of the flux is to remove the oxide film. Recent advances include many organic materials which, under the moderate temperatures prevalent in soldering, decompose and release acid, particularly hydrochloric acid, for cleaning the surface. Among these substances are oleic acid, abietic acid (already in resin or rosin), as well as the more frequently used ammonium and zinc chlorides. In the 'activated' fluxes the aim is to produce at the union just sufficient acid to remove the film, so that no appreciable acid is left to give rise to corrosion in damp atmospheres. The choice of flux depends on the metals to be joined, and some fluxes are better than others; for example, phosphoric acid for steel, copper and brass, and lactic acid for iron and brass. The problem with aluminium is to get the tin or solder into intimate contact with the base metal without the oxide film intervening, and this is frequently achieved by vigorous scratching. An alternative suggestion is to build up the oxide film by treatment with phosphoric acid and nitric acid so that it breaks away more easily; the flux then protects the base metal surface while it is being 'tinned' with a high-tin solder.

The art of soldering has been greatly enhanced by the standardized methods of testing solderability, such as the spreading test, the Schumacher-Bouton-Phipps twisted-wire test for capillarity, the Earle test developed in Great Britain during the War for recording the surface pulls across the solder on a kollagraph, and the war-time *D.T.D.* 599 specification. A word of warning must be noted, with respect to the difficulty of controlling the thickness of fine electro-plated films of 'tinning' when large batches of small articles are placed in the electrolytic bath; a considerable factor of safety should be used to ensure a universal minimum.

FORTHCOMING EVENTS

(Meetings marked with an asterisk * are open to the public)

Monday, March 21

FARMERS' CLUB (at the Royal Empire Society, Craven Street, Strand, London, W.C.2), at 2.30 p.m.—Prof. W. Ellison: "Reclamation and Use of Marginal Land".

PHYSICAL SOCIETY (at the Royal Institution, 21 Albemarle Street, London, W.1), at 5 p.m.—Prof. A. O. Rankine, F.R.S.: "Experimental Studies in Thermal Convection" (Guthrie Lecture).

PSYCHOLOGIST PRESS ASSOCIATION (at the Alliance Hall, Palace Street, London, S.W.1), at 7 p.m.—Dr. J. C. Flugel: "Psychology and the Problems of Peace". (Further Lectures on March 28 and April 4.)

ROYAL GEOGRAPHICAL SOCIETY (at Kensington Gore, London, S.W.7), at 8.15 p.m.—Mr. Eric Shipton: "Travels in Sinkiang".

Tuesday, March 22

ROYAL ANTHROPOLOGICAL INSTITUTE (at 21 Bedford Square, London, W.C.1), at 5 p.m.—Dr. W. E. H. Stanner: "Sociological Problems of the Groundnut Scheme in Tanganyika".

EUGENICS SOCIETY (at the Royal Society, Burlington House, Piccadilly, London, W.1), at 5.30 p.m.—Mr. J. C. Trevor: "Some Problems of Race".*

INSTITUTION OF ELECTRICAL ENGINEERS, MEASUREMENTS SECTION (at Savoy Place, Victoria Embankment, London, W.C.2), at 5.30 p.m.—Discussion on "Magnetic Amplifiers" (to be opened by Mr. F. H. Belsy).

MANCHESTER GEOGRAPHICAL SOCIETY (in the Geographical Hall, St. Mary's Parsonage, Manchester), at 6.30 p.m.—Prof. L. Dudley Stamp: "Alaska".

INSTITUTION OF ELECTRICAL ENGINEERS, NORTH-WESTERN CENTRE (at the Engineers' Club, Albert Square, Manchester), at 7 p.m.—Dr. G. H. Tupling: "The Early Metal Trades and the Beginnings of Mechanical Engineering in Lancashire" (Fourth Annual University Lecture).