

and use of physicists in the Army and Navy only for work requiring their training. The Committee states that there is not sufficient understanding of the importance of physics in the war effort, especially on the part of the general public and of some local boards of the Selective Service. To remedy this, it is suggested that a public relations programme be commenced to educate the general public to the position, and to impress on students and teachers of physics the importance of continuing their work.

### Control of Opium and Other Dangerous Drugs

MEETINGS in connexion with the international control in narcotics have just been held in London under the International Conventions concluded in 1925 and 1931. The Permanent Central Opium Board, which exercises, under the auspices of the League of Nations, the supervision over the manufacture of, and trade in, opium and other dangerous drugs in all parts of the world, has held its forty-first session. It was attended by Sir Atul Chatterjee, president (India), Mr. Herbert L. May, vice-president (United States of America), Sir Malcolm Delevingne (United Kingdom), Mr. J. H. Delgorge (The Netherlands), and Dr. George Woo (China). The Board carefully scrutinized the world position as it appears from the statistical reports sent in for the year 1941 by fifty sovereign States and some sixty-six dependencies and colonies and other territories. It also considered certain questions of policy and solutions of problems arising from the special circumstances of the War. Under the terms of the Conventions, the Board's report on its work is being sent to the Secretary General of the League of Nations.

The other international organization operating under the Conventions, namely, the Supervisory Body, has the task of examining annual estimates sent by Governments of their drug requirements, and members of it met for consultations to consider questions arising on the estimates for 1943, and issuing the Supervisory Body's annual statement on world requirements of narcotic drugs for that year.

### Collaboration in the British Empire

THE Peter Le Neve Foster Lecture on "Empire Relations", delivered by Viscount Bennett before the Royal Society of Arts on June 3 (*J. Roy. Soc. Arts*, 90, 613; 1942), gives a lucid survey of the development of the relations between the parts of the British Empire from the sixteenth century to the organization of the present Imperial Conference system in 1907, when these conferences became a fixed method of consultation between the self-governing Colonies and Great Britain and one another. Mainly from a constitutional point of view, Lord Bennett gives an account of the further development of the system and its limitations, notably its failure effectively to promote Imperial development on scientific lines. Imperial conferences since 1907 have been concerned with almost every conceivable subject, including communications, patents, development of Empire resources, research, timber reserves, wool production, etc., but while they have afforded an opportunity for representatives of all the nations of the Commonwealth to meet one another and discuss personally Empire problems in the light of their experience and special knowledge of their own communities, they have led to no agreement upon any adequate method for providing continuous consultation on matters of

common concern. Urging the need for an earnest effort to make the story of the Empire better known to the youth of Great Britain, Lord Bennett stresses the importance of providing the means for adequate and continuous consultation. This is essential for common action by the Governments of the Empire to attain a common end, and he suggests that a member of each of the Governments of the Overseas Dominions might be resident in London. Regular meetings between the Prime Ministers or representatives of their several Governments, utilizing air transport and with a permanent secretariat, might provide a solution of the problem.

### A Proposed World Calendar

THE World Calendar Association, Inc., New York, has published details for a proposed new calendar to commence in 1945 ("The World Calendar—A New Calendar for a New World." Pp. 32. World Calendar Association, Inc., 630 Fifth Avenue, New York). On the basis of a 364-day year, the year is divided into four quarters, each of 91 days. The first month of each quarter contains 31 days and each of the others 30 days, and January, April, July and October contain each 31 days. Every year and in consequence every quarter begins on a Sunday, and it is suggested that the national holidays of every country can be arranged to come on Mondays, if the people wish it, thus producing long week-ends. Christmas Day falls on Monday every year, and it is suggested that Easter should be the second Sunday in April, that is, April 8. As a result of fixing Easter for this date, the other movable Christian festivals, Ash Wednesday, Good Friday, Ascension Day, Whitsunday, etc., would occur on the same date every year. Such a stabilization of the hitherto movable festivals would place Advent Sunday on December 3 and Trinity Sunday on June 3—exactly six months apart. The 365th day will be at the end of December and it is recommended that it should be designated as a World Holiday by all countries accepting the new calendar. This World Holiday is an extra Saturday, called the Year-End Day. Leap Year Day is placed at the end of June, in the middle of the year, and it is also an extra Saturday and a World Holiday. The beneficial effects of the reform are explained in connexion with the various phases of life—industry, labour, Government, law, finance, science, etc.; and an appeal is made to the citizens of different countries to lend their support to the scheme.

### The Problems of the A-Type Stars

Otto Struve and P. Swings have an article with this title in the August issue of the *Observatory* (No. 809, 64, August, 1942). Morgan pointed out about seven years ago that there is some physical factor other than temperature and surface gravity concerned in the production of the spectra of these stars. The theory of ionization has failed to solve the problem, and the authors are convinced that existing interpretations, which are very unsatisfactory, should be abandoned. They believe that a new solution should be attempted along lines which have been forced on them by the results of their recent work on stellar shells, Wolf-Rayet stars and planetary nebulae. It is suggestive that certain peculiarities occur in that region of the sequence of the stellar spectra where the Lyman lines and the Lyman continuous absorption cause a large redistribution of the energy in the continuous spectrum. This redistribution has a

profound effect on the continuous spectrum of an A star, as shown by the curve computed by Pannekoek for a temperature  $T_0 = 8,480^\circ$ , and it must have a marked influence on the ionization as well as on the excitation of those elements the ionization potentials of which lie in the region of 12 volts. Research in recent months has led the authors independently to the conclusion that this physical dilution of radiation—as contrasted with the geometrical dilution observed in shells—plays a very important part in a number of problems, and various instances of this are given. A wide variety of unexplained observations are capable of interpretation along the general lines suggested by the authors, details of which are to be published in the *Astrophysical Journal*. Departures from thermodynamic equilibrium are now being emphasized by recent developments in stellar spectroscopy, in contrast to the long and successful period characterized by the use of thermodynamic equilibrium.

### Infra-red Baking

A RECENT article by H. Seymour (*The Electrician*, August 21) surveys the present state of the technique of infra-red baking of industrial finishes. The article makes brief reference to early development and mentions that although first patented some seven years ago, radiant heating received little attention until adopted by the Ford Motor Co. It is emphasized that the rate of temperature rise depends primarily on the difference between the energy gain of the stock by absorption of radiation, and the loss of heat by re-radiation and convection; and that the temperature of the stock and its surroundings should be of the same order of magnitude. Depending on the linear absorption coefficient and absorptivity of the film, baking or heating may occur from the inside outwards, the outside inwards, or uniformly throughout the film.

A description is included of the various types of radiant heating lamps, and of their early development; reflectors and their surfaces; and the present trend of design. Reflector surface fouling by dust and fumes receives special mention, while reference is made to a new type of unit with a sealed lens which obviates cleansing, reduces the fire hazard, and avoids reflector surface damage. An intensity survey is included which discusses the possibilities of obtaining uniform energy intensities over surfaces normal to the lamps. The results of recent research into the infra-red absorption characteristics of various paint pigments ground in similar vehicles are given. The conditions for maximum utilization of electrical energy are examined and it is stated that this obtains when the air temperature is higher than the stock temperature. Vapour removal, performance ratio, maximum heat densities and oven arrangements are discussed, and the view is expressed that future practice will utilize radiant heat lamps augmented by auxiliary heaters.

### Soldering Electrical Joints

AN article in the *Electrical Review* of August 28 describes the technique and selection of suitable materials. The process of soldering may be defined as the uniting of metals by means of an alloy melting at a lower temperature than their fusing points, as distinct from welding in a state of fusion. The solder alloys with the surface layers of the parts to be joined and the process is not simply one of adhesion. There

are two broad classes of soldering, namely, soft soldering in which tin-lead alloys are mainly used and hard soldering in which alloys of copper-zinc (brazing) or of silver-copper-zinc (silver soldering) are employed. Soft soldering is used very extensively in electrical work and silver soldering to some considerable extent, brazing is rarely used. The electrical conductivity of soft and hard solders is considerably less than that of copper, varying with composition between approximately 9 per cent and 13 per cent for soft solders and 20 per cent and 40 per cent for silver solders.

Some or all of the following points must be considered in the selection of soldering processes for joints in current-carrying conductors. (1) Thorough cleansing and adequate heating, but not overheating. (2) As little solder as possible should be used, to obtain low electrical resistance and high mechanical strength. (3) Solder must not weaken at normal working temperatures. (4) Due to high centrifugal forces encountered in many electrical joints (for example, soldered commutator connexions), solder must be both strong and ductile. (5) Fluxes of a corrosive nature must be avoided, and flux residue easily removable. (6) Solders used for joining copper in the manufacture of cables must be strong and ductile to withstand the subsequent drawing operations; silver solders are generally employed. The article gives tables of solder compositions, properties and characteristics.

### Health of the Swedish Army

ACCORDING to the August issue of the *Anglo-Swedish Review*, General Ivar Holmquist, Commander-in-Chief of the Swedish Army, has recently declared that, without going into technical details, he was sure that the Swedish soldier was one of the best in the world. What he lacked was only battle experience, but he was at least partly likely to make up for this by his excellent physique. Moreover, the nerves of the soldiers were in good order, they did not suffer from war weariness, the material was in first-class condition and had not been worn out by war, nor had the élite troops been decimated. Although it was deplorable that so much of the country's labour and resources had to be used for military purposes, the effort was not altogether wasted. For the general health of the nation it was important that the young men of twenty should receive one year's excellent physical training in the open air. During a recent tour of inspection among the mountains of Lapland, he was pleased to see with what vitality and enthusiasm these young men carried out a march of 13 miles in alpine terrain rising from 1,000 to 3,000 feet and then delivered an attack down a mountain slope carrying the heavy equipment of machine-guns and trench mortars which had been conveyed on sledges during the march.

### Public Health in Peru

IN a recent article (*Bol. Of. San. Panamericana*, 21, 540; 1942) Dr. Constantino J. Carvallo, the Minister of Public Health, Labour and Social Welfare, gives a description of public health in Peru from December 1939 to July 1941. The chief health problems of this country are malaria, tuberculosis, children's diseases, venereal diseases and other contagious disorders. Health campaigns which have already begun include surveys, health examinations, vaccination, establishment of clinics and dispensaries, early treat-