

Education, and, through it, with the provision of the best form of education for the new generation, and also for the publication of a State newspaper. Mr. Becker further proposes that all Parliamentary debates should be broadcast in full on a separate wave-length, and he proposes new parliamentary methods. He claims that his proposals harmonize the three estates of sovereign power, represented by the people, executive power and the power of the mind; but he emphasizes also the need for a spiritual basis if any new machinery is to work successfully.

Inter-American Relations

THE U.S. Office of Education is publishing a new series of some twenty pamphlets under the general title, "Education and National Defence", with the purpose of assisting educational institutions and organizations to make the greatest possible contribution towards the promotion of understanding and the encouragement of effective citizenship. Pamphlet No. 13 in this series, "Hemisphere Solidarity", is a teacher's guide on inter-American relations with special reference to Latin America, designed for senior high schools, to assist a better understanding of Latin-American neighbours and their contribution to the welfare of the western hemisphere as well as to stimulate thought on vital problems affecting mutual co-operation among the nations concerned. In addition to a discussion of methods of teaching hemisphere solidarity, it includes a suggested outline of problems and activities and a useful bibliography on sources of information.

Sir Charles Parsons and Turbo-driven Fans

THE Christmas issue of the *Heaton Works Journal*, which deals with the activities of Messrs. C. A. Parsons and Co., Ltd., contains an article on early turbo-driven fans. In 1894, when Sir Charles commenced his experiments on turbo-driven centrifugal pumps, he constructed the first turbo-driven fan. This was to the order of Ramage and Ferguson, Ltd., of Leith, who fitted it on board the S.Y. *Speedy* for supplying forced draught to the boilers. The unit was a very small one, the turbine developing about 3 h.p. at a speed of 4,000 r.p.m. The fan was of the screw propeller type, but no particulars of its duty or its dimensions are to be found among the records at Heaton Works. In the following year Sir Charles took out a patent, No. 3024, covering "Improvements in Stationary and Portable Pumps Actuated by Steam Turbines". The first part of this patent deals with turbo-driven centrifugal pumps, while the latter part is devoted to turbo-driven fans. The first of the figures given shows a modification of his invention in which he applies the turbine directly to a screw fan for forced draught, or ventilating purposes. One of the steam turbines is directly coupled to the fan shaft upon which the screw fan is fixed. It revolved at a speed of 2,000-3,000 revolutions per minute, gave a pressure of 12-22 in. of water and delivered 5,000-7,000 cu. ft. of air per minute. Simultaneously the second turbo-driven fan was constructed for the lead works of Messrs. Cookson and Sons at Howdon-on-Tyne. Like the first fan, it was required for forced draught purposes. The turbine developed 60 h.p. at 3,000 r.p.m. and operated with steam at 80 lb. pressure. The fan, which was 36 inches in diameter and directly coupled to the turbine shaft, delivered 60,000 cu. ft. of hot lead gases per minute at a pressure of 5 in. of water when running

at 3,000 r.p.m. The plant was run for nearly seven years day and night (Sundays included) in hot lead fumes, at a temperature of nearly 500° F. and was only stopped twice a year, to allow of the flues being cleaned out.

Octonarian Weights and Measures

IN "Octonaria" (*Math. Gaz.*, October, 1941) "Peter Simple" gives, in an account of an imaginary State, what is really a plea for a system of numeration and weights and measures based upon eight instead of ten. It is urged that continued divisibility by two is a property of the greatest importance. For example, the seven weights, each double the last, of 1, 2, 4, 8 ounces, and 1, 2, 4 pounds will make up every weight, to the nearest ounce, up to 127 ounces, whereas with the seven metric weights 1, 2, 2, 5, 10, 10, 20 grams, we get only as far as 50 grams. Some of the existing British measures fit easily into the octonarian system. For example, 8 pints = 1 gallon, 8 gallons = 1 bushel, 8 bushels = 1 quarter. As for money, if the crown (one eighth of £2) were divided into sixty-four pennies instead of the present sixty, each new penny would be fifteen sixteenths of the old.

The further proposal to have an octonarian system of numeration is more startling. In this, 10 would denote eight, 20 twice eight, 100 eight times eight, and so on. It is obvious that the risk of confusion would be very great, and the author's suggestion that 20 should still be called twenty, although denoting twice eight, seems to be a gratuitous increase of this risk. The plea that this system would reduce the length of the multiplication table does not seem a sufficient recommendation. The duodecimal system, which has many advocates, as allowing division by three as well as by four, is rejected by the author on account of the extended multiplication table necessary. There is one possibility not mentioned in this paper. If the octonarians and duodecimalians press hard enough, the British spirit of compromise may split the difference between eight and twelve and adopt a decimal and metric system.

Luminous Paint

IN NATURE of November 1, p. 529, reference was made to luminous strontium sulphide and its possible use for A.R.P. purposes. Dr. S. Rothschild points out that although this substance has a long afterglow when fresh, owing to its great sensitivity to moisture it soon deteriorates, even when protected with a special coating. It is only stable when kept airtight between glass plates and to a certain extent when embedded in plastics. Luminous calcium sulphide is less sensitive to moisture but also less bright. Luminous zinc sulphide, however, is stable even in damp rooms and is now obtainable with an afterglow sufficient for A.R.P. purposes.

A similar luminous effect can be obtained by illuminating a fluorescent substance with the appropriate radiation. The B.A.B. fluorescent system of lighting (Colloidal Research Laboratories, Ltd., 66-70 Petty France, London, S.W.1) has been applied successfully to mark the approaches to Piccadilly Underground Station and elsewhere. The fluorescent substance is applied in the form of hard wearing lacquer on a white undercoat, and is illuminated by either a mercury vapour or a white light lamp fitted with a 'black glass' screen which is claimed to pass only the band 3340-4000 Å., thus absorbing the dangerous radiations of shorter wave-length.