

importance in the country's economy but which are too scattered to justify numerous small training centres. A representative board of governors under the chairmanship of Sir Allan Gordon Smith has been working for twelve months on preparations for the opening of the College, and a prospectus has been prepared which will be published shortly. The two main courses to be offered are: a three-year general full-time course for youths of sixteen to seventeen who have attained School Certificate standard; and a two-year advanced full-time course to follow the general course or to be entered directly by students who have reached ordinary National Certificate standard in engineering. Facilities will also be available for short production courses, post-graduate study and horological research, and also for part-time classes.

The National College is intended as the source from which will emerge the potential managers, designers and other executives of the industry in Great Britain. It will be equipped with first-class modern machine tools for the production of horological mechanisms, and laboratories for design and measurement. The non-specialist subjects will be catered for by the normal extensive facilities of the Polytechnic. Fees for the full-time courses are at the rate of £60 a year, and it is intended in due course to establish a liberal scholarship scheme. The training of craftsmen for the industry will continue to be effected locally by co-operation between the factory and the neighbouring technical college.

More Warmth with Less Fuel

It is common knowledge that open coal fires radiate only a small fraction of the heat available from bituminous coal, most of the rest being carried up flues to the outside air. In many countries climatic conditions or the need for thrift enforce various means to avoid waste of fuel. Independent stoves are placed in living-rooms or heat is distributed throughout buildings by means of warm water or air propelled either mechanically or by gravitational action. To-day circumstances are compelling Britain increasingly to adopt similar methods. The growing use of closed stoves is a familiar example whereby 65 per cent of the heat of combustion can be distributed in a simple manner, at the cost of losing, wholly or partly, the heating by radiation from the glowing fuel. Another method, used in the so-called 'convector' fires, is an attempt to combine the merits of the open fire with recovery of heat from the products of combustion. These are led through a flue system whereby their content of heat is extracted and used for remote space heating. In some respects, this is analogous to a system of house warming common in the United States, where heat generated in the basement is allowed to percolate throughout by simple gravitation. The widespread construction of new houses offers advantages in such methods, advantages which are being taken.

On June 24, Mr. A. F. Dufton, addressing the Institution of Heating and Ventilating Engineers, recalled earlier observations on a pattern of open grate described as a "Cheminée de Nancy". The design was such that the heat radiated by the burning fuel was supplemented by heat extracted from the products of combustion before leaving the grate. The appliance consists of a twelve-inch stool grate with refractory back and cheeks. Above this stands an upwardly tapering metal trumpet which has an opening in front leaving the fire visible. The top

of the trumpet makes a close fit into a flue opening. All the products enter the chimney through the trumpet, which, becoming heated, supplies an additional area for space heating by convection and radiation. The performance as a warming agent of this grate, when burning two pounds of coal per hour, surpassed that of a normal grate consuming three pounds per hour. The advantage of increasing the area of an appliance was also shown by fixing behind an anthracite stove a metal drum 22 in. high and 14 in. in diameter. The products of combustion passed through the drum, the temperature of which was raised. The thermal efficiency of the stove was thus increased from 60 to 80 per cent. In discussing the merits of internal insulation, Mr. Dufton said that an adequate thickness of material of low thermal conductivity caused a rise in temperature of the surface and increase of comfort. Small thermal capacity conferred a quick response to change.

Crystal Structure Models

PROGRESSIVE school teachers as well as university workers and industrial chemists will be interested to learn that a company, known as Crystal Structures, Ltd., The Broadway Works, Farnham Common, Buckinghamshire, has recently been formed to manufacture crystal structure models. It is intended later to undertake the manufacture of various types of models, employing a considerable variety of materials, but at present production is confined to one-inch, drilled, wooden balls separated by metal spokes which indicate the co-ordination. The colours used conform to the recommendations of the X-ray Analysis Group of the Institute of Physics. In addition to a standard set of models for teaching or museum display, a set of fifty loose spokes and balls drilled along the twenty-six axes of symmetry of the cubic system are available for students to build models for themselves. Individual models can be made to order. It is claimed that errors of construction do not exceed 4 per cent in the dimensions of the unit cell, and the direction of the spokes is correct to within 2°. Inquiries may be made to the Works or to Dr. Nora Wooster, Brooklyn Crystallographic Laboratory, Cherry Hinton Road, Cambridge.

Low-Pressure Amplifier and Electro-pneumatic Converter

An eight-page illustrated folder received from Messrs. Negretti and Zambra, Ltd., 122 Regent Street, London, W.1, describes the Negretti and Zambra low-pressure amplifier and electro-pneumatic converter. The low-pressure amplifier is a pneumatic means of amplifying a very low pressure to a pressure of 5 lb./in.² and transmitting the result to a receiving instrument. It can be used for measuring or controlling absolute pressure, differential pressure, air or gas flow, air-gas ratio and specific gravity. The electro-pneumatic converter converts the voltage of a thermocouple or similar generator to a pressure of 1-5 lb./in.², thus furnishing sufficient force to actuate a recording mechanism. It can be used for humidity measurement and control.

Engineering Degree Courses for Ex-Servicemen

WRITING with regard to earlier notes on engineering degree courses for ex-Servicemen and those engaged in industry (*Nature*, 159, 497; 1947), Mr. O. S. Puckle states that the results of the inquiry have been sent to the Ministry of Education, which has handed