

quality or age by fluorescent effects. Many substances absorb ultra-violet rays and re-emit them as visible light of certain colours. The colours are specific and characteristic for each substance, but minute differences in chemical composition often cause large differences in the colours of the emitted light. An egg, for example, changes its colour from mauve-red when it is newly laid to pale blue as it grows older, and a mixture of margarine and butter appears an unmistakably different colour from pure butter.

#### A Geothermic Generating Plant

ITALY has not confined its attention to developing hydro-electric power. At Bastardo in Umbria, Italian lignite is used to supply a large electric power station. In addition, there has recently been exploitation of the natural steam resources of the borax mines geysers in Tuscany. The Larderello geothermic electric station is the best known. Antonio Giordano, in an article published in the *Electrical Times* of October 19, gives an account of its growth from 1905 to the present time. Its capacity initially was 16,000 kilowatts. In the past twelve months, in association with the electrification of the Viareggio-Rome section of the Turin-Naples railway, running along the western Italian coasts, a new geothermic generating plant of 50,000 kw. capacity has been built. Its operation in the first few months has been so successful that the Borax Company of Larderello has placed orders for two new 12,000 kw. machines, for the necessary heat transformers, etc., and for the construction of a completely new power station at Castelnuovo, which will house five generating sets each of 12,000 kw. When the new developments are completed, the aggregate capacity of geothermic generating plants in Italy will amount to 135,000 kw., and the possibilities of further extensions are not exhausted. A problem connected with the exploitation of natural steam for power generation purposes is its purification. The difficulty was solved successfully by Prince Ginori Conti, chairman of the Larderello Company, by means of specially designed evaporator units. These consist of primary pipes through which the natural steam is circulated at a pressure of 3 kgm. per sq. cm., the pipes being immersed in water in a cylindrical tank. The energy is generated in the turbo-alternators at 25,000 volts and transmitted to the substations along the Viareggio-Rome railway, where it is converted to 3,000 volts direct current. The new station at Castelnuovo will also serve this railway.

#### Report of the Cambridge Observatory, 1938-39

THE work carried out at the Cambridge Observatory under the directorship of Sir Arthur Eddington includes photo-electric observations for the purpose of testing the constancy of the light of stars similar in physical constitution to the sun (dwarf *G* stars). With the Northumberland equatorial, 165 measures of double stars were made, 51 being less than 1" in separation. Dr. Woolley began laboratory experiments in preparation for a determination of the sun's apparent magnitude, planned, in conjunction with

Mr. C. R. Davidson, to be carried out in South Africa in 1940. The apparatus had been brought to a stage at which it is possible to measure with a probable error of 0.01 mag. the transmission in sensibly monochromatic light of a dark glass cutting down three magnitudes. The polarization of a spectrograph was carefully determined in several wave-lengths, and a preliminary determination of the coefficient of reflection from an unsilvered glass surface was made. Both theoretical and observational work have been carried out by research students: Dr. M. Krook (Isaac Newton student) investigating certain problems involving non-coherent absorption; D. S. Evans concluding his work on the influence of Stark effect on the centre-to-limb variation of the contours of the Balmer lines; J. Jeffreys (Isaac Newton student) on photometric work in conjunction with Dr. Woolley's research on the sun's apparent magnitude, and H. Corben working on relativistic quantum theory. The Director has investigated the problem of how far the properties of a star of variable polytropic index are intermediate between those of polytropes corresponding to the two extreme indexes. This research is given in *Monthly Notices*, 99, 4. By Grace of the Regent House on June 10, 1938, the Observatory was constituted a Department in the Faculty of Mathematics, and the Observatory Syndicate was discharged. The Syndicate had been in continuous existence for 109 years, an earlier Syndicate, appointed "for considering the propriety of building an Observatory", having met from 1818 until 1824.

#### Plant Hormones in Horticulture

THE chemical recognition of plant hormones was quickly followed by the synthesis of substances capable of initiating the formation of roots in the stems of many plants. These substances have been used in plant propagation, causing almost in a 'catalytic' manner an acceleration of the rooting process accompanied by a more profuse root system. H. L. Pearse has now reviewed the work of thirty or more investigators who have endeavoured with considerable success to apply recent scientific discoveries to horticulture in this way ("Imperial Bureau of Horticulture and Plantation Crops. Technical Communication No. 12: Plant Hormones and their Practical Importance in Horticulture". By Dr. H. L. Pearse. Pp. 88. Bibl. 248. 3s. 6d.). There follows a valuable index showing approximately one thousand examples of propagation and the treatments used. This is not a complete list, and some difficulties in presenting the results of many workers in one table have been neatly overcome; but comparative reference would have been made easier by a standardized method of stating the concentrations employed. Results obtained by the additional use of vitamin B<sub>1</sub> (aneurin), known to influence the growth of excised roots *in vitro*, and other substances are also brought under review. The widespread use of aneurin is not recommended as yet, although at East Malling, as elsewhere, Pearse observed some stimulation in the subsequent growth of rooted cuttings which had received small quantities of