

strength and durability more costly varieties that have been imported from abroad.

Elwes tells us that it is doubtful when *Q. Cerris*, or the Turkey oak, was introduced into Great Britain, but since neither Evelyn nor other authorities up to his time mention it, we may safely assume that its introduction dated from about two hundred years ago, when it became very popular throughout the south of England.

English landscape and parklands have a world-wide reputation, and one of the most noticeable and characteristic features is the Turkey oak, which has a grace and beauty all its own. As Elwes emphasizes, it grows not only faster but also straighter than other oaks, and although somewhat similar in appearance there is a subtle difference. The rugged dark-coloured bark first attracts attention, which is afterwards turned towards the noble crown, more widely spreading than the common oak and adorned with a richer green and jagged leaf. The tree produces a very pretty mossy-cupped acorn. The colour of the timber is similar to that of the common oak. It has a bad reputation among craftsmen, as it is harder and heavier to work and more inclined to split in seasoning. It contains a larger proportion of sapwood than the common oak, the outer line of which quickly perishes. The inner line, when carefully dried off, becomes as hard and durable as the heartwood. I am inclined to think that it has been used in the place of ordinary oak, and despite the difficulties already mentioned, I believe that with proper treatment it would be found as useful and durable as other kinds.

In Norway, Sweden and Finland, where the forest wealth plays a most important part in the economic life of the countries, I understand a day is set apart when men, women and children set forth to plant trees. For nearly two hundred years the people of England have enjoyed or been spoilt by a prosperity unequalled, if not unsurpassed, by any other country except America, which ominously reminds us of the state existing in the Roman Empire 1800 years ago. The contrast between the action of our forefathers, to whom we owe the inheritance of our woodlands, and later generations, is nowhere more clearly seen than in the direction of reforestation.

I have been told that in the eighteenth century Admiral Collingwood used to walk out with his pockets full of acorns, which he distributed over his estate, and the owner of that country, which includes what is now called Chanctonbury Ring, used to ride or walk to the top of the hill every day during the season and sow beech mast or plant a tree.

No words of mine can better express the policy which should be adopted by the State to-day than those written by Evelyn 260 years ago:

"And if thus His Majesty's forests and chases were stored, viz. with this spreading tree at handsome intervals . . . benignly visited with the gleams of the sun . . . nothing could be more ravishing. . . . We should find such goodly plantations for the boast of our rangers, and forests infinitely preferable to anything we have yet beheld, rude and neglected as they are today, when his Majesty shall proceed, . . . to animate the laudable pride into fashion, forests & woods . . . will present us with another face, than now they do. And here I cannot but applaud the worthy industry of old Sir Harbotle Irmistone, who I am told from a very small nursery of acorns which he sowed in the neglected corners of his grounds did draw forth such numbers of Oaks of competent growth . . . and did wonderfully improve both the beauty and the value of his desmesnes."

TESTING WOOD PRESERVATIVES

AN article by J. Leutritz (*Bell Lab. Rec.*, 22, No. 4; December 1943) describes laboratory and outdoor tests made on wood preservatives used for impregnating poles for communication lines. Sticks $\frac{3}{4}$ in. square and about 3 ft. long are cut from boards of southern pine sapwood, the uniform size of these samples facilitating calculation of the wood density and the amount of preservative retained, as both are based on volume.

Laboratory tests on preservatives are now carried out in an experimental cylinder by either full- or empty-cell methods. For the former, the air is evacuated from the cylinder containing the specimens, and after a specified time the cylinder is filled with preservative, air pressure being applied to force the latter into the wood cells; about 30 lb. of preservative can be injected per cu. ft. of wood. In the empty-cell treatment the cylinder air pressure is raised to from 25 to 50 lb./sq. in. Then the preservative is pumped in, and the pressure is raised still higher to force the preservative into the wood. Upon releasing the pressure, the expansion of the initial air trapped by the preservative forces out the excess from the wood, and theoretically only the cell wall is coated. Vacuum is applied after the pressure is released to empty the cells more completely. The initial air pressure largely determines the amount of preservative which will be forced out of the cells, while the difference between the initial and final pressures controls the distribution and penetration.

About twenty sticks are selected for each charge and the sample is weighed before and after treatment, the gain being taken as the basis for calculating the amount of preservative retained. Then the sticks are cut at the centre to give specimens treated under identical conditions for comparison by the laboratory rot test and by field exposures. For field-exposure tests the specimens are buried to a depth of 7 in. in a uniform distribution throughout the test plot. They are examined once a year and the amount of decay at and below the ground-line is rated. Since some specimens survive several years or do not fail under exposure tests, a time rating was devised which takes into consideration their past performance.

When a preservative shows promising results in laboratory and field tests, larger material of fence-post size and eventually 10 ft. posts are treated and exposed in 'test gardens'.

ELECTROSTATIC ELECTRON LENSES

AN article by K. Spangenberg and L. M. Field (*Elec. Comm.*, 21, No. 3; 1943) describes and discusses the measured characteristics of a number of electrostatic lenses, giving the characteristic curves of nine different lenses belonging to three basic types. The forms tested were cylinder lenses of various spacings and diameter-ratios, aperture lenses (parallel plates with circular apertures on the beam axis) of various spacings, and, for comparisons, a lens formed by a cylinder and an aperture in a plate. By interpolating between the sets of curves given, approximate predictions of the properties of lenses of slightly different spacings or diameter-ratio may be made. The test method employed makes use of a

conventional electron-gun with parallel wire grids which, for measurement purposes, are placed before and after the lens to be tested. All the lens characteristics are deducible from measurements made on shadows cast by these measuring grids upon a fluorescent screen placed in the electron beam at a suitable distance from the gun.

The measured characteristics of the electron lenses are presented in the form of object-image distance curves termed p - q curves. These show the relation between object distance and image distance for any ratio of the voltages applied to the electrodes; they also show the lateral magnification associated with any combination of object and image distances. These curves are a graphical presentation of the complete solution of the lens formulae and they give immediately and directly the relation between all quantities necessary for lens design. The p - q curves further show the interrelation between all the operating characteristics, the quantities involved being object distance, image distance, lateral magnification, and voltage ratio. The object distance (p) is the distance from some reference plane in the lens structure to the point from which the rays emanate. The image distance (q) is the distance from the same reference plane in the lens structure to the point on which the rays are focused. The lateral magnification is the ratio between the height of any corresponding portions of image and object. The voltage ratio is the ratio of potentials on the two components of the electrode structure calculated on the basis of zero potential at the point at which the electron velocity is approximately zero, usually at the cathode. It is only the ratio of potentials and not the absolute magnitude that is of importance, since electron paths are independent of the scale of the potential for the same starting conditions. For completeness, the lens characteristics are also presented in the form of the conventional focal distance curves which show the variation with voltage ratio of the two focal lengths and of the two focal points. All the image-forming properties of the lens may be deduced from these parameters.

FORTHCOMING EVENTS

Wednesday, April 12

TOWN AND COUNTRY PLANNING ASSOCIATION (at St. Martin's School of Art, Charing Cross Road, London, W.C.2, in conjunction with the Exhibition "Reconditioning England"), at 3 p.m.—Mr. F. J. Osborn: "Preservation and Progress".

INSTITUTION OF ELECTRICAL ENGINEERS (TRANSMISSION SECTION) (at Savoy Place, Victoria Embankment, London, W.C.2), at 5.30 p.m.—Mr. G. W. Preston and Dr. H. G. Taylor: "Copper Conductors for Overhead Lines".

INSTITUTE OF WELDING (at the Institution of Civil Engineers, Great George Street, Westminster, London, S.W.1), at 6 p.m.—Dr. L. Reeve: "Factors Controlling the Weldability of Steel".

Thursday, April 13

GENETICAL SOCIETY (at the Linnean Society, Burlington House, Piccadilly, London, W.1), at 11.30 a.m.—Symposium on "The Application of Genetics to Plant and Animal Breeding".

INSTITUTION OF ELECTRICAL ENGINEERS (INSTALLATIONS SECTION) (at Savoy Place, Victoria Embankment, London, W.C.2), at 5.30 p.m.—Mr. C. A. Cameron Brown: "The Electrical Aspect of Farm Mechanization".

Friday, April 14

INSTITUTION OF CHEMICAL ENGINEERS (at the Connaught Rooms, Great Queen Street, London, W.C.2), at 11 a.m.—Twenty-second Annual Corporate Meeting; at 12 noon—Mr. F. A. Greene: "Our Title—a Reminder" (Presidential Address); at 3 p.m.—Mr. J. G. Bennett: "Coal and the Chemical Industry" (First J. Arthur Reavell Lecture).

SOCIETY OF CHEMICAL INDUSTRY (PLASTICS GROUP) (at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, London, W.C.2), at 2.30 p.m.—Symposium on "Electrical Properties of Plastics" (Mr. H. A. Nancarrow: "A Survey of Thermal Plastics as Dielectrics"; Dr. L. Hartshorn: "The Principles of High Frequency Heating"; Mr. E. Rushton: "Tracking").

ROYAL ANTHROPOLOGICAL INSTITUTE (joint meeting with the INTERNATIONAL AFRICAN INSTITUTE) (at 21 Bedford Square, London, W.C.1), at 5 p.m.—Mrs. G. M. Culwick: "Nutrition in East Africa".

ROYAL ASTRONOMICAL SOCIETY (at Burlington House, Piccadilly, London, W.1), at 4.30 p.m.—Prof. E. A. Milne, F.R.S.: "On the Nature of Universal Gravitation".

NORTH-EAST COAST INSTITUTION OF ENGINEERS AND SHIPBUILDERS (at the Literary and Philosophical Society, Newcastle-upon-Tyne), at 6 p.m.—General Discussion on "Radiological Testing" (Speakers: Sir Lawrence Bragg, F.R.S., Dr. S. F. Dorey, Dr. V. E. Pullin, Dr. H. Harris).

APPOINTMENTS VACANT

APPLICATIONS are invited for the following appointments on or before the dates mentioned:

MASTER FOR MATHEMATICS AND SCIENCE—The Clerk to the Governors, North-East Essex Technical College and School of Art, Colchester (April 11).

WAYNEFLETE PROFESSORSHIP OF METAPHYSICAL PHILOSOPHY—The Registrar, University Registry, Oxford (April 13).

LECTURER for Degree and National Certificate subjects in MECHANICAL ENGINEERING—The Organizer of Further Education in Rugby, College of Technology and Arts, Eastlands, Rugby (April 14).

LABORATORY STEWARD in the Science Department of the Doncaster Grammar School—The Chief Education Officer, Education Offices, Doncaster (April 15).

RESEARCH WORKER (who should be a PHYSICIST with some research experience) in the Coal Treatment Laboratory of the Mining Department—The Secretary, The University, Edmund Street, Birmingham 3 (April 15).

LECTURER (preferably a woman) IN BIOLOGY—The Warden, Goldsmiths' College, at University College, Nottingham (April 15).

ASSISTANT HYDROGRAPHIC SURVEYORS by the Kenya Government Public Works Department—The Ministry of Labour and National Service, Central (Technical and Scientific) Register, Advertising Section, Alexandra House, Kingsway, London, W.C.2 (quoting Reference No. E.904A) (April 15).

PRINCIPAL of the Yeovil Art and Technical Institute—The Chief Education Officer, County Hall, Taunton (April 15).

HEADMASTER of the Junior Technical School—The Chief Education Officer, Education Offices, Doncaster (April 15).

GRADUATE ASSISTANTS (full-time) FOR MECHANICAL ENGINEERING, ELECTRICAL ENGINEERING, and a GRADUATE (or equivalent qualification) IN BUILDING OR STRUCTURAL ENGINEERING, at the Darlington Technical College and Technical School—The Chief Education Officer, Education Office, Darlington (April 15).

TEACHER (full-time) OF ENGINEERING SUBJECTS, including Electricity—The Principal, Technical and Art Institute, Queen's Road, Watford, Herts. (April 17).

ASSISTANT (full-time) to teach WORKSHOP PRACTICE, ENGINEERING DRAWING, MATHEMATICS and ENGINEERING SCIENCE, at the Jarrow Technical School and Evening Institute—The Director of Education, Shire Hall, Durham (April 19).

SENIOR AND JUNIOR ENGINEERS (MECHANICAL AND ELECTRICAL) to carry out work of national importance in a Government Department (location, London)—The Ministry of Labour and National Service, Room 432, Alexandra House, Kingsway, London, W.C.2 (quoting Reference No. C.2097A) (April 22).

RESEARCH METALLURGIST, preferably with knowledge of ENGINEERING, by well-known North Country firm specializing in the Use and Heat Treatment of High-Carbon and Alloy Steels—The Ministry of Labour and National Service, Central (Technical and Scientific) Register, Room 432, Alexandra House, Kingsway, London, W.C.2 (quoting Reference No. F.2019XA) (April 29).

PROFESSORSHIP OF ENGINEERING SCIENCE—The Registrar, University Registry, Oxford (April 30).

LECTURER (full-time) IN CHEMISTRY at the Cardiff Technical College—The Director of Education, Education Offices, Cardiff (May 1).

CHAIR OF PHILOSOPHY at the University of the Witwatersrand, Johannesburg—Dr. William Cullen, 4 Broad Street Place, London, E.C.2 (May 1).

DIRECTOR OF THE INSTITUTE OF MEDICAL AND VETERINARY SCIENCE, Adelaide—The Agent-General and Trade Commissioner for South Australia, South Australia House, Marble Arch, London, W.1 (May 31).

CHAIR OF NATURAL PHILOSOPHY, United College, St. Andrews—The Secretary, The University, St. Andrews (June 15).

LECTURER FOR BIOLOGY AND HYGIENE—The Principal, St. Katharine's College, Tottenham, at Cary Park, Babbacombe, Torquay.

LECTURER in the Junior Technical School (subjects: MATHEMATICS, SCIENCE, DRAWING)—The Registrar, Technical College, Cheltenham.

SENIOR SCIENCE AND MATHEMATICS MASTER—The Headmaster, Alleyne's Grammar School, Stevenage, Herts.

DESIGNING ENGINEER for the Steel Tube Trade in Birmingham—The Ministry of Labour and National Service, Appointments Office, 2 Calthorpe Road, Birmingham 15 (quoting Reference No. 1368).

ASSISTANT MECHANICAL ENGINEER for the Sudan—The Secretary, Overseas Manpower Committee, Ministry of Labour and National Service, Alexandra House, Kingsway, London, W.C.2 (quoting Reference No. 1302).

REPORTS and other PUBLICATIONS

(not included in the monthly Books Supplement)

Great Britain and Ireland

British Standard Recommendations for the Storage of Micro-Film (British Standard 1153—1944). Pp. 6. (London: British Standards Institution.) 1s.

Town and Country Planning Association. Forty-fifth Annual Report. Pp. 8. (London: Town and Country Planning Association.) 143