

A MODERN STUDY OF CAULIFLORY

THE habit of flowering from buds borne upon the main branches and trunk, known as cauliflory, is well developed in many tropical genera. *Couropita*, *Napoleona*, *Artocarpus* and *Parmentiera* are well known examples. In Great Britain it is shown well by the Judas tree (*Cercis siliquastrum* L.), often grown in cultivation. In 1928 Prof. J. McLean Thompson began an intensive study of this southern European example of cauliflory and also of the carob (*Ceratonia siliqua* L.). As a result a very interesting paper on cauliflory in the carob, intended for the *Publications of the Hartley Laboratories* in 1941, has been issued instead provisionally in typescript, with

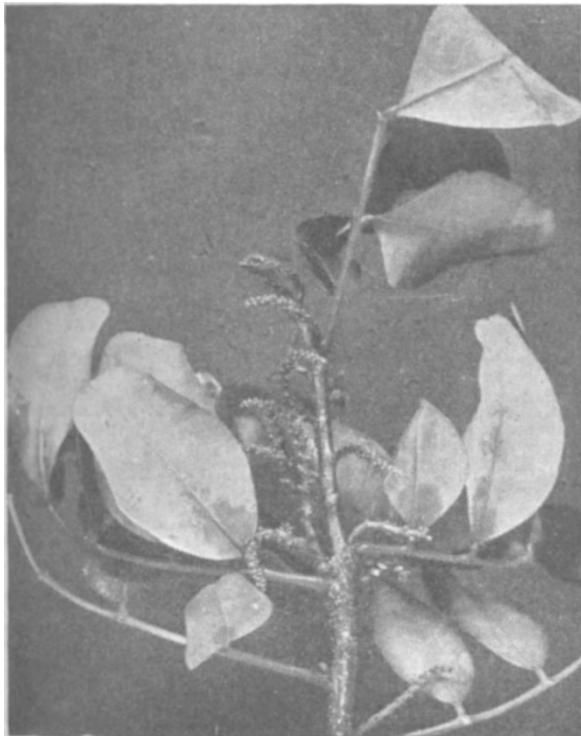


Fig. 1. EXTREMITY OF CAROB BRANCH SHOWING BASIPETAL PROGRESS OF PRIMARY LATERAL FLOWERING.

a comprehensive series of photographic illustrations and diagrams.

Linnaeus described the carob as triœcious, but McLean Thompson's extensive collections of the plant, in localities from the Maritime Alps to the Spanish frontier, make it quite clear that male, female and hermaphrodite flowers may be borne simultaneously or successively on any tree. As a result growers who discard trees at an early stage as staminate, or try to modify fruitfulness by grafting, are basing their practice on very inadequate observational data.

The outstanding interest of this work is in the new light it throws upon the habit of cauliflory.

The carob is an evergreen; each year the vegetative shoot bears, apparently, alternately but actually in 2/5 phyllotaxis, a number of large pinnate leaves. Flowering always commences by the terminal bud exhausting itself in the production of an inflorescence. So long as the terminal bud is vegetative, all lateral



Fig. 2. PORTION OF CAROB BRANCH WITH CLUSTERS OF SECONDARY MALE INFLORESCENCES.

buds are vegetative also, but after the terminal bud has thus become reproductive, flowering from lateral buds begins and works downwards step by step. The primary lateral inflorescences thus formed, when they die back, are cut off by a layer of cork near the base of the inflorescence, leaving a short stump still bearing small dormant buds. From these buds in later seasons secondary inflorescences may arise, the stump then increasing in size. Lower on the stems these basal stumps may continue to increase in size and, by extension of the axis tissues, may be carried up the stem from their original axillary position. Thus wens of tissue are formed from which inflorescences continue to arise, secondary ones from buds lying in pits on the swelling tissue, and tertiary inflorescences from endogenous buds that form in or below the cork phellogen covering these swollen outgrowths and burst outwards through cortex and cork.

Thompson describes these deep-seated buds as lying in the living tree, in deep-seated pockets filled with a mucilaginous fluid which has apparently digestive action and thus frees the newly organized bud meristem from the cortical tissues in its immediate vicinity. The figures reproduced illustrate characteristic terminal, lateral primary and secondary

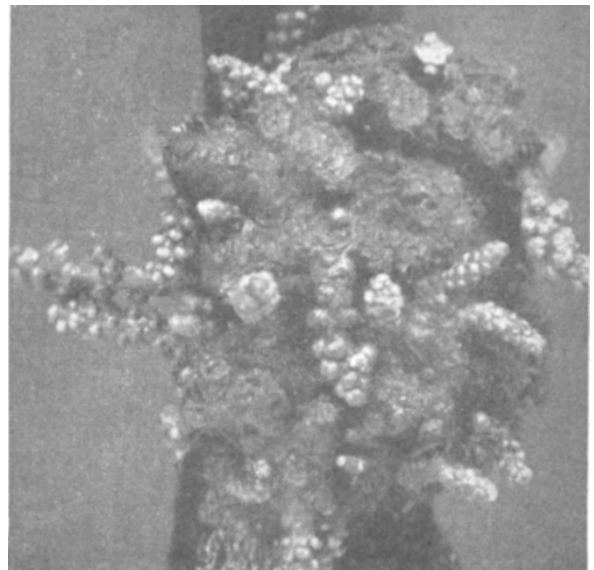


Fig. 3. PORTION OF A CAROB BRANCH WITH A LARGE WEN BEARING BOTH SECONDARY AND TERTIARY INFLORESCENCES.

inflorescences and a large wen bearing both secondary and tertiary inflorescences.

Endogenous buds on roots are, of course, well known, but endogenous buds on stems such as are associated with this cauliflorous habit seem to be a new observation.

Each leaf trace is tri-lacunar, and Thompson shows how the axis, as a result, shows fifteen broad rays in transverse section, grouped in a way determined by the phyllotaxis. Most of the endogenous buds arise opposite the rays, some evidently close to the vascular cambium, in positions where in apple or willow, for example, dormant root initials are frequently seen; other bud initials may be seen organizing in positions outside this up to the position of the phellogen.

FORTHCOMING EVENTS

Wednesday, April 28

NORTH-EAST COAST INSTITUTION OF ENGINEERS AND SHIPBUILDERS (at Bolbec Hall, Newcastle-upon-Tyne 1), at 6.45 p.m.—Mr. S. Mathwin Davis: "Naval Architectural Education"

Thursday, April 29

INSTITUTION OF ELECTRICAL ENGINEERS (at Savoy Place, Victoria Embankment, London, W.C.2), at 5 p.m.—Sound Films of Honorary Members and Faraday Medalists—Lord Hirst and Dr. F. B. Jewett, at 5.30 p.m.—Prof. D. R. Hartree, F.R.S.: "Mechanical Integration in the Solution of Electrical Problems" (Thirty-fourth Kelvin Lecture).

APPOINTMENTS VACANT

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

HEAD OF THE ELECTRICAL ENGINEERING DEPARTMENT of the Rutherford Technical College—The Director of Education, City Education Office, Northumberland Road, Newcastle-upon-Tyne 2 (April 29).

INSTRUCTOR FOR TRAINING RADIO MECHANICS, WITH GOOD QUALIFICATIONS IN THEORY AND PRACTICE OF RADIO WORK, and a LECTURER IN MECHANICAL ENGINEERING, at the Rugby College of Technology and Arts—The Organizer of Further Education in Rugby, Rugby (April 30).

HEAD OF THE DEPARTMENT OF CHEMISTRY AND METALLURGY in the Wolverhampton and Staffordshire Technical College—The Director of Education, North Street, Wolverhampton (April 30).

LECTURER IN MECHANICAL ENGINEERING SUBJECTS—The Clerk to the Governors, South-East Essex Technical College, Longbridge Road, Dagenham (April 30).

TEACHER OF ONE OR MORE OF THE FOLLOWING SUBJECTS: ENGINEERING, DRAWING, WORKSHOP PRACTICE—The Principal, County Technical College, Gainsborough, Lincs (May 1).

HEADMASTER OF THE WIMBLEDON JUNIOR TECHNICAL SCHOOL—The Chief Education Officer, County Hall, Kingston-on-Thames (May 3).

ASSISTANT LECTURER TO TEACH IN THE BUILDING DEPARTMENT, and an ASSISTANT LECTURER TO TEACH IN THE TEXTILE DEPARTMENT, of the Junior Technical School of the Burnley Municipal College—The Director of Education, Education Offices, Burnley (May 3).

ASSISTANT MASTER FOR A JUNIOR COURSE IN BUILDING at the Scarborough Technical Institute—The Secretary, Education Offices, County Hall, Northallerton (May 8).

ASSISTANT ANALYST—The City Analyst, 152 Great Charles Street, Birmingham 3 (May 8).

ASSISTANT LECTURER IN ELECTRICAL ENGINEERING—The Bursar and Acting Registrar, University College of North Wales, Bangor (May 15).

ASSISTANT ENGINEERS (CIVIL) for the Government Railways in West Africa—The Secretary, Overseas Manpower Committee (Ref. 397), Ministry of Labour and National Service, Sardinia Street, Kingsway, London, W.C.2.

FIRST ASSISTANT TO THE HARBOUR ENGINEER of the Colombo Port Commission, Government of Ceylon—The Secretary, Overseas Manpower Committee (Ref. 791), Ministry of Labour and National Service, Sardinia Street, Kingsway, London, W.C.2.

GRADUATE LECTURER IN MATHEMATICS AND SCIENCE, and a LECTURER IN BUILDING SUBJECTS (INCLUDING WOODWORK OR PLUMBING) with ABILITY TO TEACH ELEMENTARY MATHEMATICS—The Clerk to the Governors, Technical College, Chesterfield, Derbyshire.

ASSISTANT MISTRESS TO TEACH BIOLOGY AND GENERAL SCIENCE—The Mistress in Charge, Folkestone Day Technical School for Girls, at the Technical Institute, Quaker's Yard, Glamorgan.

VISITING PART-TIME PSYCHOLOGIST—The Secretary, Child's Guidance Clinic of the Lady Chichester Hospital, 33 West Street, Brighton.

REPORTS and other PUBLICATIONS

(not included in the monthly Books Supplement)

Great Britain and Ireland

University of Leeds: The Brotherton Collection. The Seventh Report of the Committee, Session 1941-2. Pp. 6. (Leeds: The University.) [143]

The Problem of Unemployment. Pp. 40. (London: Lever Brothers and Unilever, Ltd.) [143]

E. A. W. Point of View on Post-War Reconstruction. Interim Report collated by Elsie E. Edwards. Pp. 54. (London: Electrical Association for Women.) 2s. 6d. [53]

Are there Human Instincts? By Prof. T. H. Pear. (Reprinted from the "Bulletin of the John Rylands Library", Vol. 27, No. 1, December 1942.) Pp. 32. (Manchester: Manchester University Press.) 1s. 6d. net. [103]

University of Cambridge: School of Agriculture Memoirs. Memoir Nos. 13-14: A List of the Papers published by the Members of the Staff of the School of Agriculture and its Associated Research Institutes during the Period Oct. 1st, 1940-Sept. 30th, 1942. Pp. 8. (Cambridge: School of Agriculture.) 6d. [103]

Hours of Work and their Influence on Health and Efficiency. By Dr. H. M. Vernon. Pp. 38. (London: British Association for Labour Legislation.) 9d. [113]

National Smoke Abatement Society. 13th Annual Report, 1943. Pp. 16. (Epsom: National Smoke Abatement Society.) [153]

War-time Information for Pharmacists. Compiled by the Pharmaceutical Journal. Second edition. Pp. 64. (London: Pharmaceutical Press.) 1s. [163]

Social Insurance in the Soviet Union. By Maurice Dobb. Pp. 16. (London: National Council for British-Soviet Unity.) 2d. [183]

Institute of Welding: Welding Research Council. Technique for the Gas Welding of Copper. (T.6.) Pp. 28. (London: Institute of Welding.) 2s. 6d. [193]

Museums and World Affairs: with Special Reference to Engineering and Industry. Presidential Address by Dr. F. J. North delivered before the South Wales Institute of Engineers, at Cardiff, January 21st, 1943. Pp. 28. (Cardiff: South Wales Institute of Engineers.) [193]

Other Countries

Annual Report on the Forest Administration of Nigeria for the Year 1941. Pp. 19. (Ibadan: Forest Department.) [43]

Annals of the Carnegie Museum. Vol. 29, Art. 13: A Collection of Lepidoptera (Rhopalocera) from the Cayman Islands. By G. D. Hale Carpenter and C. B. Lewis. Pp. 371-396. (Pittsburgh, Pa.: Carnegie Museum.) [43]

Smithsonian Institution. War Background Studies, No. 5: The Natural-History Background of Camouflage. By Herbert Friedmann. (Publication 3700.) Pp. ii+17+16 plates. (Washington, D.C.: Smithsonian Institution.) [83]

Proceedings of the United States National Museum. Vol. 92, No. 3147: New Species of Bark Beetles (Pityophthorini) from Mexico and Tropical America (Coleoptera, Scolytidae). By M. W. Blackman. Pp. 117-228+plates 20-23. Vol. 92, No. 3153: Mexican Herpetological Miscellany. By Hobart M. Smith. Pp. 349-396. (Washington, D.C.: Government Printing Office.) [83]

Ceylon. Part 4: Education, Science and Art (D). Administration Report of the Acting Director of Agriculture for 1941. By E. Rodrigo. Pp. 16. (Colombo: Government Record Office.) 30 cents. [93]

Smithsonian Institution. War Background Studies, No. 7: The Japanese. By John F. Embree. (Publication 3702.) Pp. vi+42+16 plates. (Washington, D.C.: Smithsonian Institution.) [123]

Report of the Secretary of the Smithsonian Institution and Financial Report of the Executive Committee of the Board of Regents for the Year ended June 30, 1942. (Publication 3696.) Pp. iii+112. (Washington, D.C.: Government Printing Office.) 25 cents. [123]

U.S. Department of Agriculture. Circular No. 643: Owllet Moths (Phalaenidæ) taken in Light Traps in Kansas and Nebraska. By H. H. Walkden and D. B. Whelan. Pp. 26. 5 cents. Leaflet No. 229: The Potato Leafhopper, a Pest of Alfalfa in the Eastern States. By F. W. Poos. Pp. 8. 5 cents. (Washington, D.C.: Government Printing Office.) [123]

Indian Forest Leaflet No. 28: Ash Content of some Indian Fuel Woods. By B. S. Varma and A. C. Dey. Pp. 8. (Dehra Dun: Forest Research Institute.) 4 annas; 6d. [163]

Smithsonian Institution. War Background Studies, No. 6: Polynesians—Explorers of the Pacific. By J. E. Weckler, Jr. (Publication 3701.) Pp. iv+77+20 plates. (Washington, D.C.: Smithsonian Institution.) [173]

Smithsonian Miscellaneous Collections. Vol. 103, No. 7: The Musculature of the Labrum, Labium and Pharyngeal Region of Adult and Immature Coleoptera. By Carl Kester Dorsey. (Publication 3697.) Pp. ii+42+24 plates. (Washington, D.C.: Smithsonian Institution.) [183]

U.S. Office of Education: Federal Security Agency. Education and National Defense Series, Pamphlet No. 6: What Democracy Means in the Elementary School. By Helen K. Mackintosh. Pp. v+35. 15 cents. Education and National Defense Series, Pamphlet No. 10: National Unity through Intercultural Education. By Rachel Davis-DuBois. Pp. vi+34. 15 cents. (Washington, D.C.: Government Printing Office.) [183]

New Zealand: State Forest Service. Annual Report of the Director of Forestry for the Year ended 31st March 1942. Pp. 20. (Wellington: Government Printer.) 9d. [223]

U.S. Department of Agriculture. Farmers' Bulletin No. 1911: Preventing Damage to Buildings by Subterranean Termites and their Control. Pp. ii+37. (Washington, D.C.: Government Printing Office.) 10 cents. [223]