venience of visitors, a small number only of the seats will be allotted on Monday afternoon, and a considerable number of places in all parts of the building will be held in reserve for those who arrive on Wednesday, August 17.

At 3 p.m. on Thursday, August 18, the High Sheriff of Cambridgeshire will entertain the association at a garden party in the grounds of Emmanuel College, and at 5.30 p.m. the Registrary of the university will deliver a lecture at the theatre on the growth and origin of the university. At 9 p.m. there will be a reception of the association by the local committee in Trinity College.

On Friday afternoon, August 19, the mistress and resident staff of Girton College will entertain 500 members of the association at a garden party, and in the evening Prof. George Darwin will deliver a lecture in the theatre on ripple-marks and sand-dunes.

Saturday, August 20, will be devoted to excursions to places of interest in East Anglia. The local committee hopes that prominent members of the association will, so far as possible, take part in the excursions, which promise to be of considerable interest. A set of excursion guides and a map, which has been specially prepared by the Director-General of the Ordnance Survey, will be given to each member of the association.

The following is a list of the excursions:—

Audley End and Saffron Walden.—Audley End House will be visited by permission of the Lord Howard de Walden; the church and museum in Saffron Walden form other items in the programme.

Brandon and Didlington Hall.—The most attractive features of this excursion will be the flint knapping industry at Brandon, Lord Amherst's Egyptian collections, rare books and illuminated MSS. at Didlington Hall.

Cromer.—Mr. Clement Reid, F.R.S., has arranged an attractive itinerary for those interested in the geology of the Norfolk coast.

Dykes of Cambridge.—This excursion includes an inspection of the well-known Fleam Dyke and Devil's Ditch, under the guidance of Prof. Ridgeway; opportunity will also be afforded for botanising on the dykes. By the invitation of Mr. Richard Marsh, trainer to H.M. the King, tea will be provided at Egerton House, Newmarket.

Ely.—A visit to the cathedral, a building of exceptional architectural interest, under the guidance of the Dean, forms the most important feature of this excursion.

Wicken Fen and Upware.—Members will travel from Cambridge to Upware in steam launches. This excursion is likely to be of considerable interest to geologists, entomologists, and botanists.

Hatfield and St. Albans.—A visit to Hatfield House, by permission of the Marquis of Salisbury, visits to St. Albans Abbey, the site of Verulam, the sites of the battlefields of St. Albans, and the orchid houses of Messrs. Sanders, form the chief attractions.

Lincoln.—The exceptional architectural and archæological features of Lincoln seemed to the committee sufficient justification for arranging an excursion to this city, in spite of its distance from Cambridge. The Mayor of Lincoln invites members to tea in the Castle grounds.

Norwich.—The cathedral, the hospital of St. Giles, and St. Andrew's Hall are the most important buildings to be visited. Hospitality is offered by the Mayor of Norwich, and by Mr. and Mrs. James Stuart.

Sandringham, Lynn, and Castle Rising.—This excursion, which is likely to prove one of the most popular, includes visits to the Lynn churches, the castle and church at Castle Rising, also the grounds, kennels, stables, and dairy at Sandringham. Tea will be provided by invitation of H.M. the King.

Wisbech.—The Lord Lieutenant of Cambridgeshire has kindly invited members of the association to visit the old-world town of Wisbech, and facilities will also be afforded for inspecting the woad works.

The committee is greatly indebted to the authors the excursion guides for the full and interesting accounts which they have written of the places to be visited.

On Saturday the master and fellows of Peterhouse invite 600 members of the association to an evening party at 9 p.m.

On Sunday evening at 8.30 p.m., there will be a performance of unaccompanied sacred music by the combined choirs of King's, Trinity, and St. John's Colleges in the Chapel of King's College.

On Monday, August 22, the Lord Lieutenant of Cambridgeshire and the Mayor will entertain the association at a garden party in the Botanic Garden at 4 p.m. On Tuesday afternoon Mrs. Sidgwick, principal of Newnham College, invites 500 members to a garden party in the college grounds. The large room of the Cavendish Laboratory has been placed at the disposal of the committee for the exhibition of specimens. For information as to exhibits, application should be made to Mr. P. V. Bevan, the Cavendish Laboratory.

Arrangements have been made for members to have exceptional facilities for visiting the Botanic Garden, University Laboratory, the Observatory, the University Press, as well as college buildings and gardens. Cambridge schools and the Addenbrooke's Hospital may also be inspected at stated times, and visits have been arranged to several works in Cambridge, and to nursery gardens at Sawbridgeworth and Broxbourne.

In a subsequent article some account will be given of the sectional proceedings, together with a list of some of the colonial and foreign guests.

MODERN PRINTING PRESSES.

THE recent issue of M. A. Ducrot's "Presses modernes typographiques," published by the house of Gauthier-Villars, Paris (7 f. 50 c.), provides an opportunity for a short account of modern printing presses. The work is copiously illustrated, and describes, from a mechanical point of view, every kind of machine, from the small but handy platen to the awe-inspiring rotary, whilst the intermediate classes of cylinder machines are represented by many varieties, both of the single and double kind.

The only English work of a similar nature, devoted exclusively to machinery, is Wilson and Grey's "Modern Printing Machinery," published so far back as 1888, and therefore not up to date. This is to be deplored considering the great advance made in that department of the printing craft.

Although artistic printing was not altogether an unknown quantity during the nineteenth century, much progress was made in a general way during the latter part of that century, which also marked the introduction of machinery, but its general adoption was a matter of time. Through William Morris's work at the Kelmscott Press, much impetus was given to what may be termed the decorative side of printing, but the invention of the many processes of reproduction in connection with letterpress illustration, and the enormous development of such processes, have necessitated printing machinery of a different and much improved character in order to cope successfully with the demand for graphic literature.

That American engineers have in recent years taken the initiative in this direction will be admitted, but it is some consolation for English printers to observe that the home manufacturers are beginning to realise the situation, and are endeavouring to make amends and thus regain their position in the field.

In looking abroad it is customary to associate Messrs. Hoe's name with some of the best of American machinery, whilst for that of French origin the late M. H. Marinoni was looked upon as the best manufacturer of machinery especially adapted for newspaper or magazine work. To specify other names in either country would require space, although in fairness to Germany it must be said that many really good machines of various kinds are now before the trade and at work in this country.

To the lay reader it may be explained that the various classes of machinery used for letterpress printing are divided under certain heads, and may be broadly grouped as follows:—(1) rotary machines; (2) double cylinder perfecting machines; (3) single cylinder one-feeder machines; (4) single cylinder two-feeder machines; and (5) platen machines.

Commencing with the rotary kind, as its name implies, the action is that of continuous rotation whilst the machine is in motion. Although there are a few machines on the market with flat type beds that print from the reel, this class of machine generally prints from a surface made from either stereotype or electrotype plates, and curved to the cylinder similar to the one which gives the impression—the paper as it is unwound from the reel passing between the printing and impression cylinders continuously whilst the machine is running.

The paper is made to the required width and wound on reels; sometimes these webs contain paper two or three miles long, the length being regulated by the weight or thickness of the material. Such machines are used mostly for newspaper work, or magazines of a non-illustrated character, where a large number of copies are required, and each section or copy is cut and folded before it leaves the machine. They are also made in duplicate, quadruple, or even larger sizes, so that the machine is self-contained, and will produce just as many duplicate copies as it is constructed for.

It is true that illustrated work is now attempted on rotary machines, and whilst no doubt further improvements will be made in due course, the results are not altogether satisfactory so far, although illustrations in line are more successful than those produced by the half-tone process.

Perfecting machines have two cylinders, and are used mostly for newspaper or magazine work of shorter numbers, and occasionally for bookwork. These print both sides of the paper, which is in single sheets, before it leaves the machine, but the double impression is two distinct operations. Although this class of machine has been used for a great number of years, it is not adapted for the best class of bookwork owing to the difficulties of ink set-off. These machines, and all other than the rotary kind, print from a flat printing surface.

The single cylinder (one-feeder) is *par excellence* adapted for the best bookwork, whether illustrated or not. Of this class there is a great variety, the English make being called the "Wharfedale," and built on the stop-cylinder principle, that is, the cylinder over which the sheets of paper are carried, and which gives the impression to the printed sheet as it revolves, is stopped or locked on the return travel of the machine, when it is automatically released and revolves again as the type carriage or bed travels forward once more.

Other single cylinder machines are those of the two-revolution kind, that is, the cylinder revolves continuously in the same direction, once whilst the sheet is being impressed and again whilst the type bed is travelling back to its original position, thus making two revolutions for each copy printed. This class of machine is well represented by the Miehle and Century, both of which are of American manufacture, and are admirably adapted for high-class illustrated work of the magazine order because the inking facilities are so well considered.

Another kind of single cylinder machine is the two-feeder, and it may be described as being somewhat similar to the ordinary Wharfedale, but it has a longer travel for its type carriage, with an arrangement at both ends of the machine for inking and rolling the forme. Unlike the stop-cylinder of a single feeder machine, which is stationary on the return travel, the impression cylinder of the two-feeder immediately reverses on the completion of the revolution on the principle of the old "tumbler" machine. In doing this a fresh sheet is seized by a second set of grippers or fingers attached to the cylinder. By this method a sheet is printed at each propulsion of the machine in either direction.

Those of the platen kind are used for smaller work, mostly of a commercial character, and the action is somewhat similar to that of the old hand press, because both type and paper are impressed on the flat. They are made in many sizes, and some will print almost as large a sheet as the old hand press. Although one operator only is required, he will, with the aid of power, produce at least three or four times as much as two men at hand press with equally good results, provided the worker is a skilled hand.

CHAS. T. JACOBI.

CANCER RESEARCH.

As Dr. Bashford remarks in his introductory note to the report of the Cancer Research Fund,[1] the solution of the problem of the cause of malignant disease in man is really the logical destination and centre towards which all channels of cancer research must converge, rather than the starting point thereof. The zoological distribution of cancer has therefore formed one of the first lines of inquiry to be undertaken by the Cancer Research Fund, founded about two years ago, for investigating this dire disease. By the willing cooperation of many workers, a most interesting series of tumours has been obtained from the various domestic animals, from the mouse and hen, and from three species of fish, proving that malignant disease is not confined to man. The malignant growths of man seem to be incapable of transmission to animals, but a malignant new growth from one animal may occasionally be transmitted to another individual of the same species. This has been carried out by Jensen, of Copenhagen, and by Borrel, of Paris. Through the kind collaboration of Prof. Jensen, a specimen of epitheliomatous tumour of the mouse was obtained and successfully transplanted into mice, but not into other animals, thus confirming Jensen's results.

The last half of the report contains an account of Dr. Bashford and Mr. Murray's investigations on the cytology of malignant growths, illustrated with a number of drawings. The results obtained are practically the same as those of Prof. Farmer, Mr. Moore, and Mr. Walker, already detailed in these columns (NATURE, vol. lxix. p. 319), viz. that in the cancer process there is a transformation of the normal

[1] "Scientific Reports on the Investigations of the Cancer Research Fund. No. 1. The Zoological Distribution, the Limitations in the Transmissibility, and the Comparative Histological and Cytological Characters of Malignant New Growths." (Taylor and Francis, 1904.)