

ordinary type automatically on the neighbouring stand of Messrs. Creed and Co., Ltd. The Creed type of printer was recently described in *NATURE* (December 9, 1920, p. 472). The apparatus here exhibited is of the improved form, in which the use of compressed air is entirely done away with and a revolving type-wheel takes the place of the lever typewriter mechanism of the older apparatus. The main principles of the selecting arrangement whereby the Morse message is translated into type are the same. The new instrument has a working speed of 175 words per minute.

The most complete line telegraph exhibit is that of the Eastern and Associated Telegraph Companies, which includes a complete set of apparatus as used on a long cable circuit. This works with a Creed printer of the older pattern used with the Muirhead type of receiving perforator. Among objects of historical interest is an example of the original form of the Kelvin siphon recorder. Attention may also be directed to examples of different forms of relays used in cable work and an example of an "electrolytic magnifier," which is somewhat similar to a relay except that instead of containing actual contacts that are opened and closed by the galvanometer portion of the apparatus, the moving pointer alters the relative position of wires dipping into an electrolyte, and makes an alteration of resistance which affects the balance of the duplex circuits and actuates the receiving apparatus accordingly.

Recent advances in optical science are exemplified by the exhibits of Messrs. Chance Brothers, Ltd. A special feature is the demonstration of the properties of "Crookes" glass for ophthalmic purposes, which relieves the eyes from strain by absorbing the ultra-

violet rays while allowing the whole of the visible spectrum to pass. The company also exhibits for the first time a new "daylight" glass, by the aid of which colours may be matched by artificial light exactly as in daylight. This is a glass of a bluish tint which is accurately balanced in colour against the source of light to be used so as to absorb a selection of the rays and to allow a mixture to pass through which approximates very nearly to daylight. The problem is attacked in a different manner by the Sheringham Daylight, Ltd., who show specially constructed reflecting shades which achieve a similar result by reflection instead of by transmission. In both cases the source of light employed is the half-watt lamp. Another optical instrument which should not be missed is the Optophone, which enables the blind to read from ordinary type. This has already been fully described in *NATURE* (May 6, 1920, p. 295, and August 5, 1920, p. 722), and is exhibited by Messrs. Barr and Stroud, Ltd.

A very comprehensive example of the methods of modern medical research is presented by the display arranged by the Middlesex Hospital, which includes a large number of prepared sections relating to parasites and bacteria mounted in microscopes. Apparatus is also shown typifying the methods used both for routine and research in photomicrography, Röntgen-ray work, and various branches of biochemical and physiological investigation. St. Mary's Hospital Medical School has also an exhibit relating to the part played by medical research in the promotion of industrial efficiency. Among the subjects illustrated are breathing apparatus for diving, mining rescue work, and gas protection. Apparatus for the recording of muscular effort is also shown.

Human Tails.

AT a meeting of the Royal Anthropological Institute held on February 8, Dr. W. H. R. Rivers, president, in the chair, Prof. Arthur Keith, in making a report on a specimen of a human tail which had been bequeathed to the institute by the late Dr. J. C. McLachan, of Halifax, Yorks, took occasion to review the present state of our knowledge regarding the occurrence of true tails in human beings. The specimen submitted was a true human tail exactly similar to one very completely examined by Prof. Ross Harrison and described by him in the *Johns Hopkins Hospital Bulletin* of 1901. Prof. Harrison's specimen, which was removed from a boy aged six months, was 40 mm. long at birth, 70 mm. long when excised, contained striped muscle, and moved under various emotional states. Dr. McLachan's specimen was removed from a girl aged three months, measuring 105 mm. long in its preserved state, 11 mm. in diameter at the base, and tapering to a conical point. It also contained strands of striped muscle, and must have had the power of movement. As is the case in all such specimens, with three recorded exceptions, no vertebrae were present, nor could any segmental arrangement be observed in the central core. The skin covering the tail was studded with hair-roots and sebaceous and sweat glands.

Thanks to the labours of Keibel and Elze, and of Prof. Streeter, of the Carnegie Institution, and of his pupils, our knowledge of the development of a true tail in the human embryo may now be regarded as complete. At the end of the fifth week of development, when the human embryo is approaching 5 mm. in length, caudal (post-sacral) segments begin to be differentiated from the tail-bud represented by the growing tip of the tail. By the beginning of the

seventh week, when the embryo is about 12 mm. long, the human tail reaches its maximum growth and differentiation, there being then eight to ten caudal segments within the projecting conical tail. In the seventh week retrogression of the terminal and free segments takes place, and towards the end of the eighth week, when the foetus measures about 25 mm. (1 in.) in length, the surviving four or five basal or coccygeal segments become submerged, drawing with them the terminal atropic segments, the point of disappearance of the terminal atropic part being marked by a dimple. The caudal appendage which occasionally occurs in children represents a persistence of the terminal segmented part of the tail which normally atrophies by the end of the eighth week.

The disappearance of the tail from the body of man is not a human, but a pre-human problem. It is part and parcel of the wider problem of how and when the upright, or, as Prof. Keith would prefer to call it, the orthograde, posture was evolved. The orthograde group of Primates is represented to-day by the gibbon, orang, chimpanzee, gorilla, and man; in all of them the muscles of the spine, and of the thorax and abdomen, and all the spinal and other nerve reflexes which regulate the action of muscles, have been transformed to suit the orthograde posture; in all of them the external tail has disappeared and the basal or pelvic vertebrae of the tail have been reduced to a coccygeal form. The tail is more vestigial in the primitive small-brained gibbon than in man; it is the discovery of a pre-gibbon stock which should give us the history of the disappearance of the human tail, and from the scant data at present available we may infer that such a discovery is likely to be found in strata lying well towards the base of Tertiary deposits.

In pronograde apes, as in four-footed animals, the tail is made up of two parts which are structurally and functionally quite different. The free or terminal part is put to many uses; the pelvic or basal part is always associated with a visceral function. To it the rectum is always attached, and certain muscles which guard the pelvic outlet act upon the pelvic segments of the tail and use it as a perineal shutter. It is the external or post-pelvic segment of the tail which has disappeared from the body of man and the orthograde apes; the pelvic part has survived as the coccyx, and its visceral musculature as the levator ani muscle. With the evolution of the upright posture the pelvic muscles which act on the tail had to bear the steady burden of the abdominal viscera—had to be in action as long as the orthograde posture was maintained. They could not serve in the support of the viscera and the movements of the tail at the same time. Hence only the pelvic part of the tail was retained—the part on which the pelvic musculature acted. In pronograde apes the pelvic visceral musculature is attached to the peculiar chevron-like bones (hæmal arches) placed beneath the pelvic vertebræ of the tail; the reappearance of hæmal arches in the human embryo during the second and third months of development may be regarded as definite proof that man comes of a pronograde ancestry. *Tarsius spectrum*, for which Prof. Wood-Jones claims a special human relationship, is devoid of all features which mark the orthograde group of Primates; in its tail and tail musculature *Tarsius* is a pure pronograde Primate.

University and Educational Intelligence.

BIRMINGHAM.—The Doncaster Laboratory for Research in Mining is to be transferred to Birmingham University, under the directorship of Dr. J. S. Haldane, who has accepted the post of honorary professor.

CAMBRIDGE.—The council of St. John's College has appointed Dr. T. J. I'A. Bromwich to be prælector in mathematical science.

An interesting report issued by the Board of Research Studies shows that there are at present in residence seventy-two students admitted as candidates for the Ph.D. degree. The largest number working at any one subject is thirteen for physics. Botany and chemistry with eight each come next, followed by English and history with seven each. Graduates of British universities number thirty-three; sixteen come from Colonial universities, ten from India, and six from the United States.

An analysis of the voting last term on the admission of women as members of the University shows that there was a majority of 33 out of a poll of 405 among the resident teachers in the University in favour of their admission. The University professors also supported the proposal by 27 votes to 15.

Honorary degrees of LL.D. were awarded on Saturday to Sir Patrick Manson, G.C.M.G., and Dr. Albert Calmette, of the Pasteur Institute, Paris. Prof. J. Hjort, the oceanographer and marine biologist, was also given the honorary degree of Sc.D.

Mr. H. G. Carter has been appointed director of the Botanic Gardens.

LONDON.—The Prince of Wales has consented to attend the graduation dinner on the evening of May 5, on the afternoon of which day he will receive the honorary degrees of Master of Commerce and Doctor of Sciences, and will reply to the toast of "The New

Graduates." The Guildhall has been kindly placed at the disposal of the University for this purpose by the Lord Mayor and Corporation, and the Lord Mayor has accepted an invitation to be present.

Dr. Anne Louise McIlroy has been appointed to the University chair of obstetrics and gynaecology tenable at the London School of Medicine for Women.

Prof. J. P. Hill has been appointed to the University chair of embryology tenable at University College.

The degree of D.Sc. in botany has been conferred on Miss K. M. Curtis, an internal student of the Imperial College (Royal College of Science), for a thesis entitled "The Life-history and Cytology of *Synchytrium endobioticum* (Schilb.), Perc., the Cause of Wart Disease in Potato."

The Graham Legacy Committee has appointed Mr. V. R. Khanolkar to the Graham scholarship in pathology for two years from April 1, 1921. The value of the scholarship is 400*l.* a year. Since October last Mr. Khanolkar has been assistant bacteriologist in University College Hospital.

IN response to the recent appeal of the University of Edinburgh for 500,000*l.*, the sum of 200,000*l.* has now been subscribed.

MR. W. D. EGGAR will deliver a course of four lectures on Greek mathematics at Gresham College, Basinghall Street, E.C., on Tuesday to Friday, March 1-4, at 6 p.m. Admission will be free.

PROF. E. W. SCRIPTURE, formerly of Yale University, has been appointed to the faculty of the University of Hamburg for the summer semester. He will lecture on English philology and experimental phonetics. Two articles by Prof. Scripture on the nature of vowel sounds appeared in NATURE for January 13 and 20.

An election of Beit fellows for scientific research is to take place on or about July 15 next, and the latest date upon which applications can be received is April 19. Forms of application and information respecting the fellowships are obtainable by post from the Rector, Imperial College of Science and Technology, South Kensington, S.W.7.

IN connection with the 1920-40 Science Research Fund of Girton College, Cambridge, a fellowship of 300*l.* a year tenable for three years is being offered by the college for research in the mathematical, physical, and natural sciences. Particulars of the fellowship may be obtained from Miss Clover, Coleby, Grange Road, Cambridge, and applications for the fellowship will be received by her not later than March 31 next.

A COURSE of four public lectures on "The History of Plant Delineation" will be given in the lecture-room of the botany department of University College, London, on Wednesdays at 5 p.m., beginning on March 2. Dr. Charles Singer will deal with the art of the ancient empires and of the Dark and Middle Ages, and Dr. Agnes Arber with the period from the invention of printing to modern times. The lectures, which will be illustrated by lantern-slides, are open to the public without fee or ticket.

THE formal opening of l'Institut Français, Cromwell Gardens, S.W., will take place on Saturday, February 26, at 3 o'clock, under the presidency of his Excellency M. le Comte de Saint Aulaire, Ambassador of France. The Minister of Public Instruction, M. Léon Bérard, will represent the French Government. The English Board of Education and the