

EYESIGHT AND TYPOGRAPHY.¹

THIS report of the British Association Committee on the influence of school-books upon eyesight is full of interest. Its value depends chiefly upon the report of the oculist subcommittee, which was composed of Messrs. Priestley Smith, H. Eason and N. Bishop Harman. Advice upon the technical and trade aspects of printing was given by competent experts.

The subcommittee's report is valuable from the immediate point of view of school-books and also from the point of view of the reading of printed matter in general. Considering the enormous importance of reading and writing to the general public and the large place they occupy in daily life, it is remarkable that so little attention has hitherto been devoted to the physiological and hygienic features of the subject. It would have been a gracious act for the subcommittee to have expressed its indebtedness to the researches of Javal, an indebtedness which is unmistakable. With few exceptions the report recommends the principles advocated by Javal, and the authors have, perhaps wisely, refrained from any experimental researches on their own account. The subject is full of complications, physiological and psychological, and the recommendations made are as good as can be expected in the present state of knowledge.

At the outset of the section on the hygienic requirements the right note is struck in emphasising the fact that the reader recognises whole words and phrases at a glance. This statement expresses the essential difficulty of the scientific investigation and regulation of printing. Too much stress cannot be laid upon the fact that the canons of *visibility* of individual letters do not apply directly to the far more complex problem of the *legibility* of letter groups in words and phrases. It is rightly pointed out that the upper half of a word or letter is usually more important for perception than the lower half. We would emphasise the point more strongly. It is the fundamental factor in legibility, as is easily proved by reading with the lower half of the line covered by a card. Hence we think that the suggestion made to give more distinctive character to the lower half of a larger proportion of letters is unsound.

The general evolution in the shapes of printed letters has been in the direction of increasing the predominant features of the upper halves, so that more letters extend above the line than below, the extension above the line has increased, whilst that below has been curtailed, and so on. These tendencies are in favour of legibility and should not in our opinion be tampered with. For the same reason we are astonished at the statement that "uncial Greek may be recommended as being easy to read (see supplement)." The supplement gives two examples, one in 12-point Porson Greek,

the other in uncial Greek on long primer body. A glance suffices to show that the former is much more legible.

Owing to the complexity of the correlation of the physiological and psychological factors in reading, such details as the best dimensions of letters and spacing, length of lines and their separation, and so on, are at present matters of compromise. The committee does not give any explicit scientific reasons for the faith that it has, but the typographical table and the rules laid down are eminently sensible. The small type used in Bibles and prayer-books is more than a matter of regret; we should like to have seen it more severely condemned. The remarks on the thorny question of atlases are very good.

We hope that this report will have a widespread influence. It contains much sound advice not only for those who deal in school-books but for all authors and publishers.

INVESTIGATION OF ATMOSPHERIC POLLUTION.

THE Committee for the Investigation of Atmospheric Pollution, appointed at the International Smoke Abatement Conference and Exhibition held in London last March, has held three meetings in London and has just published what may be regarded as an interim report.

This report states that after careful consideration of all the various methods that have been suggested or tried for measurement of the impurities of the atmosphere, that employed for *The Lancet* investigation of the soot and dust-fall of London in 1910 has been selected as the simplest, and the one most likely to yield satisfactory results under the conditions which will govern the observations that are to be made. The method is based upon the use of an apparatus resembling an enlarged rain-gauge, with a catchment area of 4 sq. ft. This gauge receives all the dust and soot that falls by its own weight or is carried down by the rainfall during the period of its exposure, and on examination of the water which collects in the bottle attached to the apparatus, the amount of total suspended matter, tarry oils, soot, &c., can be determined.

A circular letter has been sent out by the committee to all the more important city and local authorities in the United Kingdom, asking for their cooperation in the application of this method of observation in the districts over which they have administrative powers. This circular has met with a most gratifying response. The authorities of a large number of important cities have already signified their intention of commencing observations on the lines suggested by the committee, and many other authorities are only waiting for further details before promising their support to the movement and cooperation in the work. Birmingham, Bradford, Leicester and Newcastle are the most important of the cities that have definitely promised their support; but there is no doubt that Glasgow, Liverpool,

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Manchester and London will join in these observations.

The new movement initiated by the committee for studying and recording the character of the soot-fall in various industrial centres of the United Kingdom is, therefore, meeting with considerable support; and there is little doubt that the observations and records will prove of decided value to all interested in the progress of smoke abatement.

Dr. W. N. Shaw, F.R.S., director of the Meteorological Office, is chairman of the committee; and its hon. secretary is Dr. J. S. Owens, 47 Victoria Street, S.W., from whom any further particulars regarding the work of the committee can be obtained.

LORD CRAWFORD, F.R.S.

AS announced with regret last week, James Ludovic Lindsay, the twenty-sixth Earl of Crawford, died on January 31. Born at St. Germain-en-Laye on July 28, 1847, he was educated at Eton and Trinity College, Cambridge, and for a short time served as lieutenant in the Grenadier Guards, but his early developed scientific tastes led him to resign the service and devote himself to astronomy and bibliography.

As Lord Lindsay he first became known to readers of NATURE by his organisation of an expedition to observe the total eclipse of the sun near Cadiz on December 21, 1870, and by the establishment, soon afterwards, of his observatory at Dun Echt, Aberdeenshire. Its astronomical equipment was far in advance of any other observatory in Scotland and second only to that of Greenwich in the United Kingdom, for it contained a fine 15-inch equatorial refractor by Grubb with many improvements on former designs, a transit circle of 8-in. aperture by Troughton and Simms, a fine heliometer by Repsold of 4-in. aperture, a 6-in. equatorial refractor by T. Cooke and Sons of York, two reflecting telescopes with silver-on-glass mirrors of 12-in. aperture, both equatorially mounted, a Foucault siderostat by Eichens of Paris, with 16-in. mirror by M. Martin, a 40-ft. photographic lens by Dallmeyer (to be used to photograph the transit of Venus), a 12-in. altazimuth by Troughton and Simms, and a large collection of smaller astronomical and physical apparatus, including the largest electro-magnet then in existence.

Simultaneously with the erection of this observatory (1871-1874) Lord Lindsay was organising an expedition to Mauritius for the purpose of observing the transit of Venus in December, 1874, and there are those who remember the astonishment and interest with which astronomers first read in the Monthly Notices of the Royal Astronomical Society for November, 1873, of the scope and extent of these preparations. The very important results of that expedition are published by him in vols. ii. and iii. of the Dun Echt Observatory Publications. They not only include determinations of the longitudes of Alexandria,

Suez, Aden, Seychelles, Reunion and Mauritius, but also an experimental determination of the solar parallax by heliometer observations of the minor planet Juno. This latter series of observations was probably the most important result of all the many costly transit of Venus expeditions, for it proved conclusively that the heliometer method of observing minor planets was capable of determining the solar parallax with a precision and certainty that is unattainable by the historic method of the transit of Venus.

On his return to England Lord Lindsay, in addition to his duties as Member of Parliament for Wigan, continued to perfect the equipment of his observatory, and made researches on the spectra of stars, planets and comets—adding at the same time continually new treasures to his splendid astronomical library.

He also instituted, under the able editorship of Dr. Ralph Copeland (who was in charge of his observatory from 1876 to 1889), the valuable series of Dun Echt circulars, by which early intimation of astronomical discoveries was communicated to astronomers.

On the death, in 1880, of his generous and highly cultured father, the twenty-fifth Earl of Crawford, he succeeded to the earldom. The many responsibilities and occupations which then crowded upon him prevented him from taking much farther part in active astronomical research, and although his interest in it never abated, he thereafter left the work of the observatory almost entirely in the hands of Dr. Copeland.

For some years previous to the retirement of Prof. Piazz Smyth, in 1888, from the post of Astronomer Royal for Scotland, the question of reorganising the Edinburgh Observatory had been under consideration—and it had even been proposed to hand it over to the University. But this was prevented by Lord Crawford's timely action and noble generosity. He offered the whole of the beautiful instrumental equipment of his observatory and its splendid astronomical library to the nation on the sole condition that the Edinburgh Observatory, thus enriched, should be maintained as a royal observatory. This offer was finally accepted and Dr. Copeland was appointed to the vacant offices of Astronomer Royal for Scotland and professor of astronomy in the University of Edinburgh in January, 1889. The great national observatory on Blackford Hill, which owes its existence to the generous action above described, was formally opened in April, 1806, by Lord Balfour of Burleigh in the presence of Lord Crawford.

Our limits of space render it impossible to do justice to the varied activities of Lord Crawford's life; we have therefore confined attention to the side of his career by which his name will chiefly be remembered in the scientific world, although the narrative conveys but little idea of his mental grasp and breadth of view. He had an inborn genius for mechanics and engineering, a love of science in every form, and a passion for travel; and he inherited from his father the love of all things