

the case with women. Another important conclusion seems fairly well established, that improvements in communication do not, as might naturally be expected, tend to homogeneity of type; on the contrary, owing to selection centres or to some obscure influence of environment, all improvements in transport apparently tend to make the race more heterogeneous.

The part of the country in which dark hair specially prevails is the extreme west. "If," write the authors of the memoir, "we assume for reasons given above that the pigmentation of girls represents more nearly the pre-Norse inhabitants, this native type has crowded into the Isle of Skye and the opposite coasts of the mainland. If the Dalriadic Scots, who invaded Argyllshire in the fifth century, were a dark race, and the invaders who settled there were men only, that would account for the darkest region in the boys' map being in Argyllshire. The Hebrides have been so much affected by the Viking and Norse invasions from Scandinavia which have passed round the coast of Scotland that they have a much smaller percentage of dark type than the islands and mainland lying further east. The Isle of Lewis has a higher percentage of dark girls than boys, indicating the presence of a pre-Norse dark native population. The south-west corner of Scotland in both the boys' and girls' map is darker than the average; and since, in historical times, the Picts inhabited this region, this evidence points to the conclusion that the Picts were a dark race."

Such wide-reaching conclusions, in the present state of our knowledge, are obviously premature, and too much stress is laid upon pigmentation as a test of race. But the results of this imperfect investigation are sufficiently instructive to justify the demand for a national anthropometrical survey, which was pressed on the late Prime Minister by an influential deputation, the proceedings being reported in the same number of the journal.

#### ACOUSTIC OSCILLOGRAPHS.

AN interesting addition to the phonograph or the gramophone has been designed and made by Mr. Bowron, of 57 Edgware Road. It is well known that the action of a gramophone depends on a spiral line cut in the record disc. When this line is examined with a magnifying glass, it is seen to consist of numerous small oscillatory curves; as the disc rotates the needle that follows these curves actuates a diaphragm, and thus the sounds are reproduced. In other words, the curve cut on the disc is a graph of the various sounds produced by the instrument. Several years ago Prof. Ewing studied the analysis of vowel sounds by examining the corresponding curves cut on a phonograph record. Mr. Bowron has undertaken the task of reproducing on a large scale the curves to be found on a gramophone record: he has accomplished this by means of a small mirror, which is mounted so that it oscillates with the diaphragm of the instrument; a beam of light is reflected from this oscillating mirror and from another mirror which rotates uniformly, with the result that a luminous curve of about three feet amplitude can be thrown on a white screen, and so made visible to a large audience. The variations in this luminous curve can be watched while the corresponding sounds are heard; thus the nature of the oscillations produced in the course of a song or the performance of an orchestra can be most instructively studied.

It would, no doubt, be possible to obtain gramophone records of the various vowel sounds, and to study the corresponding oscillations in a similar manner. In teaching the elements of harmony, it would be interesting and instructive to project on a screen curves showing the characteristics of the various harmonious and dissonant intervals, while the corresponding sounds are rendered audible; and this also could be done by the aid of Mr. Bowron's invention.

Of course, for the curves to correspond exactly to the sounds, it is imperative that the oscillating mirror shall have a very small period of vibration—a period much smaller than that of any of the oscillations which it is necessary to reproduce. Hence the mirror and the mechanism by which it is actuated must be made as light as possible. Some difficulty has been found in obtaining an oscillating

mirror large enough to reflect sufficient light to produce curves visible to a large audience, and at the same time light enough to have a period as small as is required; but the progress already made indicates that complete success may ultimately be obtained.

Mr. Bowron has also adapted a Koenig's manometric flame to indicate the acoustic oscillations produced by a gramophone; were it not for the fact that the variations in the shape of the flame must be interpreted before the precise character of the oscillations can be known, this method would be the preferable one. Mr. Bowron's inventions are certain to be appreciated, not only as an educational aid, but also as affording an interesting spectacular display for public entertainments.

E. E.

#### UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

ST. ANDREWS.—In order to remove misapprehensions which have apparently arisen upon the subject, announcement is made that the University Court—the patrons of the Chandos chair of physiology in the United College, St. Andrews, now vacant—has resolved that the appointment should be open, and that the person to be elected should be the person deemed to be the best candidate, whatever may have been his previous sphere of work. The Court is not pledged to any one candidate, and the election is not a foregone conclusion.

CAMBRIDGE.—The election of a professor of biology will take place on Monday, June 8. Candidates are requested to communicate with the Vice-Chancellor on or before Saturday, May 30.

Mr. C. Shearer, of Trinity College, has been nominated to use the University table at Naples for five months from May 1, 1908.

The professor of botany gives notice that the botany school will be open for practical work during the long vacation. A practical course in elementary systematic botany (flowering plants) will be given in the elementary laboratory on Tuesdays and Saturdays at 9 a.m., beginning Tuesday, July 7. Fee, 1*l.* 1*s.* A series of botanical excursions will be arranged.

Prof. Larmor has been appointed a member of the board of electors to the professorship of chemistry until February 20, 1910, in succession to Lord Rayleigh, who has resigned his place on the board.

The general board of studies, acting on a memorandum received from the board of geographical studies, recommends a re-construction in the staff engaged in teaching geography in the University. It is proposed that the readership of geography, which becomes vacant in the Michaelmas term of this year, be suppressed, and to establish in its place three lectureships in geography. One of these lectureships will be on historic and economic geography, and will be in connection with the special board for history and archaeology. The second will be in regional and physical geography, and it is proposed to connect this with the special board for biology and geology. The third will be a lectureship of surveying and cartography in connection with the special board for mathematics. The salary of each of the first two mentioned lectureships will be 150*l.* per annum, and that of the last 50*l.* per annum. The last two named will be known as the Royal Geographical Society lectureships in their respective subjects. The council of the Royal Geographical Society has offered to contribute 200*l.* a year for three years to the geographical education fund. This offer the board recommends should be gratefully accepted. The University will pay a like sum to the same fund.

THE second annual conference of the Association of Teachers in Technical Institutions will be held in London at Whitsuntide, on June 6, 8, 9, and 10. The delegates will meet on Saturday, June 6, and in the evening there will be a *conversazione* at St. Bride's Institute, E.C. On Monday, June 8, the president, Mr. C. Harrap, will deliver an address, and there will be papers on:—(a) Group courses and continuation schools; (b) homework and tutorial classes; (c) commercialism, the schools, and the decorative arts; (d) modern education—the technical phase. On