

able image shall be sent to the far land of Bakhtan to cure the sick daughter of the king of that country. We read how an Egyptian statesman of the reign of Amenhetep III., Amenotes, son of Paapis, was deified by popular superstition after his death, and was eventually admitted to the pantheon. We see a half-comic kinematograph picture of a donkey driven by a fellah and accidentally kicking a half-buried pot, out of which falls the rich golden and silver treasure of Tûkh-el-Garmûs, now one of the "show pieces" of the Cairo Museum. We see the falling stones revealing the shrine in which stands the Hathor-cow of Deir-el-Bahari, once more greeting the light. We read an ancient Egyptian medical treatise and the philosophical dispute of an Egyptian with his own soul. So the pictures change swiftly, and the showman explains them with winged words.

The book is translated, on the whole, extremely well. There are, however, some faults in it. On p. 104, "l'impératrice Sabine" is translated "the Sabine Empress" (!) instead of "the Empress Sabina." This is dreadful, as is also "at Cyprus" on p. 51 for "in" Cyprus. One does not say "at England," though one has noticed "at Crete" in the newspapers lately. "Malgache chiefs" (p. 225) are, in English, Malagasy. But blemishes of this kind can be taken out in a second edition of the book, which, it is to be hoped, will appear in a few years' time with additions, and with one or two articles, which are somewhat out of date, such as that on "Archaic Egypt," omitted.

H. R. HALL.

A PIGMENTATION SURVEY OF SCOTLAND.¹

ALL interested in anthropology and sociology will welcome the recent increase of interest in and the renewal of extensive investigations into the physical characters of the population of the British Isles. The report by Mr. J. F. Tocher on the latest investigation, "A Pigmentation Survey of School Children in Scotland," carried out under the auspices of a committee of the Royal Society, is the most important that has appeared since the publication of Beddoe's "Races of Britain," which forms the basis of our knowledge of racial distribution in these islands. The general and local distribution of colour traits in the children has been accurately recorded, and the influence of various factors of race and environment determined.

The completion of this report is most timely in view of the survey of the school children of England and Wales now being undertaken under the Education Act of 1907. The Board of Education, in its circular, only requests information as to the stature and weight of the children, but it may be hoped that one result of the present publication may be the addition to the schedule of observations on the hair and eye colour, without which all evidences of race are lost and the whole investigation is rendered incomplete and possibly even misleading.

The Scotch survey was carried out by sending schedules and instructions to the masters in all the schools. These, fortunately, took the matter up so enthusiastically that returns comprising information as to some half-million children were sent in, for which they will receive the sincere thanks of all anthropologists, who are only too conscious that without the cooperation of the teachers no survey could be even attempted. The hair colours recognised were red,

¹ "Pigmentation Survey of School Children in Scotland." By J. F. Tocher. From *Biometrika*, a Journal for the Statistical Study of Biological Problems, vol. vi., Nos. 2 and 3. (Cambridge: University Press, n.d.)

fair, medium, dark, and jet black; the eye colours, pure blue, light, medium, and dark, so that the schedule closely resembled that used by Beddoe. It was found after many experiments that satisfactory lithographic reproductions of the standard colours could not be reproduced, so that the returns refer to descriptions, not actual matches of the hair and eyes. It has, however, been shown that classifications based on written descriptions agree sufficiently closely with those obtained by actually comparing each child with standard samples of hair and artificial eyes.

The schedules having been received, the actual proportion of children in each colour class in each locality was determined, the divergence from the figures for the whole of Scotland being noted. By somewhat elaborate calculations it was ascertained whether these divergences were such as might have occurred in a chance sample of the whole population or were significant of the action of definite factors affecting the local type of pigmentation.

The Orkney and Shetland Islands, Lewis, eastern Caithness, the eastern boundaries of the Highlands, Lothian, and the Border counties contain a significantly fair child population. A significant excess of dark hair characterises the Highlands, Galloway, and the city of Glasgow. Jet-black hair is found in excess in the Highlands. Brown or medium hair is the feature of all densely populated areas. Red hair is only in excess among the populace to the north of the Grampians and to the east of the Caledonian Canal. The author points out that it is significant that this area should have been the home of the opponents of Agricola described by Tacitus as rufous. The fair-haired districts correspond to the areas occupied by the Scandinavian or Nordic race, and present another northern feature in the significant excess of pure blue eyes.

The characters of the Gaelic-speaking population were specially investigated, with the result that an excess of dark and jet-black hair was found. A large proportion of blue eyes was also discovered, possibly in part explained by intermixture of non-British elements now speaking Gaelic.

Glasgow was found to present such divergences from the general population as to require a special study. In no division of the city was there an excess of fair hair; medium hair was present in excess throughout the city and to a less extent in the suburban areas. Dark and black hair was found with unusual frequency in the Gorbals and Tradeston districts. Dark and medium eyes were significantly more prevalent in the more densely populated districts. Glasgow thus agrees with London and most Continental cities.

Tocher shows that three factors may be concerned in this selection. The darkening of the hair with age might take place earlier among fair-haired city children, and the process might be more intense. For this there is at present no evidence. The medium class might be the more fertile. The author shows that the number of births per family is greater than the average in areas characterised by an excess of medium hair and eyes, while it is below the average in areas in which fair hair and blue eyes are in excess.

Lastly, the excess of medium traits might be due to blending. The offspring of parents, one fair, the other dark, tend to present hair colours in the proportion of one fair, one dark, and two medium, which corresponds with the numbers found in densely populated areas. In the case of eye colours such blending does not seem to occur, so that the excess of dark and medium eyes in towns can only be explained by the preponderance of these colours among the poorer

and more fertile classes. The divergence in colour traits noticed in Glasgow is in part due to the presence of a considerable non-Scottish element.

Dark traits seem to be associated with imbecility, blindness, and deafness, because these defects are significantly more frequent in Gaelic-speaking districts than in Scotland as a whole. This is perhaps explained, as the author suggests, by the greater emigration of the fittest members of the community from the west than from the rest of the country. The author distinguishes five racial types:—The Scandinavian or Germanic type, with fair hair and blue eyes; the dark European type, with dark hair and dark eyes, which he subdivides into Mediterranean and Danish; the Scoto-Keltic type, with dark hair and blue eyes; the essentially Scotch type, with medium hair and eyes; and the Caledonian type, with red hair. The Scoto-Keltic, Scotch, and Caledonian types are probably crosses, while the Danish type may probably on further investigation be shown to have affinities to the Alpine race.

After showing that the pigmentation in Scotland is intermediate between that of northern and southern Europe, Tocher adds that even in southern Germany the hair is lighter than in Scotland. This will seem inconceivable to those who have worked in the two countries, while the figures quoted in support of this statement suggest the existence of some misconception of the limits of the terms fair and dark as used by different observers. The author has compared his results with those of Fürst in Sweden and Ammon in Baden, using the headings Fair, Red, Medium, and Dark as equivalent to Blond, Roth, Braun, and Schwarz, regarding Medium as Braun. The Continental use of the term Schwarz is practically identical with Black as used by Beddoe, who differs from Tocher in including therein the very darkest browns, only recognisable as browns in a very good light. This in a large measure accounts for the low proportion of dark hair attributed to Sweden. A further difficulty has arisen in comparing the Swedish Blond with the Scotch Fair. The "Blond" class was constructed by Fürst out of a combination of two others, "Gelb" and "Cendré." While the lighter members of the latter class might be included in the Fair division of Tocher, the darker members overstep the upper limits of his Medium division. Fürst, in his monograph on Swedish hair and eye colour, contrasting his results with those obtained by Sören Hansen and Westergaard from Danish children, compares his Braun class with the Dunkel class of the latter authors, and his Blond with their Hell and Mittel classes combined. Sören Hansen's divisions, Roth, Hell, Mittel, Dunkel, and Schwarz, are practically identical with those of Tocher.

When Blond—that is, Gelb+Cendré or Hell+Mittel—is regarded as equivalent to Fair, Braun to Medium, and Schwarz to Dark+Black, the Scottish results naturally show a different distribution from that obtaining in the rest of Europe.

The real comparative tables give the percentage distribution of hair colours as:—

Sweden (adult males)	Denmark (children)	Scotland (boys)	Baden (adult males)
Gelb ... 23.3	Hell ... 41.8	Fair ... 24.9	Blond ... 41.6
Cendré... 52.0	Mittel ... 40.9	Medium. 43.3	Braun ... 38.7
Braun ... 21.6	Dunkel... 13.0	Dark ... 25.0	Schwarz. 18.0
Schwarz. 0.8	Schwarz. 1.4	Jet-black. 1.2	Roth ... 1.7
Roth ... 2.3	Roth ... 2.9	Red ... 5.5	

The distribution in Scotland, then, agrees with that of Europe, and falls into position between Sweden and south Germany. The fact that the data cannot be directly compared points out the urgent need for

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an international nomenclature, or at least for international standards and authorised translations.

One of the most interesting features of the present survey is that it tends to show that the population of Scotland might have been derived from original blond and brunet elements in approximately equal proportions which are gradually blending to form a distinctive Scottish type.

Further details and correlations are promised by the author for some subsequent publication, and will be anxiously awaited, since, for completeness of detail and thoroughness of statistical investigation, the present memoir is unequalled. It is to be hoped now that the chance exists that the results of a similar survey may in time be available for England and Wales.

THE NEW WIRELESS TELEGRAPH STATION.

AS mentioned in our notes columns of December 17, the new wireless telegraph station at Bolt Head, South Devon, was opened by the Postmaster-General on December 11. This station is the first belonging to the Post Office to be opened for a regular service of communication with ships at sea, and has telegraphic connection with Exeter, through which town all messages will be transmitted. In accordance with the provision of the International Radio-telegraphic Convention of 1906, the station will establish public communication with all vessels carrying wireless telegraphic apparatus irrespective of the system of wireless telegraphy which they may have installed. The range of the station is 250 miles, though it is not anticipated that the general working range required will exceed about 100 miles. The cost of communication is expected to average about 8*d.* per word, made up of a shore charge of 3½*d.* and a ship charge of 4*d.*, and the usual ½*d.* per word for the ordinary land rate.

The station is fitted with apparatus on the Marconi system. The aerial, which is 160 feet high, consists of two central conductors and four arms radiating to small poles placed around the main mast, thus being of what is now known as the "Umbrella" type. Power is obtained from a 3-kw. alternator supplying current at 100 volts 50 cycles, which is transformed up to 15,000 to 20,000 volts. The alternator is coupled to a direct-current machine, which can be run either as a motor, or as a generator driven by an 8-h.p. oil engine when it is required to charge the cells, in which case current can at the same time be taken from the alternator. The battery is also used for the lighting of the building. The signalling is effected by a key in the generator circuit which controls a magnetic key which only allows the alternator circuit to be open when the current is at zero, as is now usual with wireless telegraphic work where the power is supplied by an alternator in order to avoid sparking at the contacts of the signalling key. The sparking gap is of the standard Marconi type, and can be varied in length from 2 mm. to 8 mm.; it is completely enclosed in order to deaden the noise of the sparking.

The receiving apparatus consists of a Marconi magnetic receiver, which gives telephonic signals in the usual way, and a coherer circuit for calling up, which is disconnected when receiving signals on the magnetic receiver. The coherer circuit can also be used in connection with a Morse inker to record messages when the operator is not present.

The normal wave-length is 600 metres, but this can be varied, and apparatus is provided to enable the