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the causes of such physical deterioration as does exist in certain cases; and (iii) to point out the means by which it can be most effectually diminished.

5. That the above Committee, after hearing evidence from a large number of witnesses, issued an extremely able report, in which they recommend, with reference to the first of the above-mentioned matters referred to them, that the Government should establish: (i) An anthropometric survey; (ii) a register of sickness; and (iii) an advisory council.

6. That the advantages of establishing a periodical anthropometric survey, a register of sickness, and an advisory committee may be summed up as follows:—

- (a) The measures proposed will enable the Government and the nation to know with certainty whether the physique of the population at large is improving or deteriorating, and, by comparison of the physique with the environment, to ascertain the influences which are bringing about the changes of physique.
- (b) They will supply data to the experts and to the representatives of Government departments on the advisory committee, which would thus be enabled to arrive at important decisions on which the Government might found legislative action.

7. Without a continuous physical record of the people we cannot tell with certainty whether physical deterioration is taking place nor what is its extent, nor can we determine the conditions which influence the physical development of the population. Until these conditions are determined no remedies can be applied intelligently.

8. It is estimated that the cost of an Anthropometric Survey will not be greater than that of the Geological Survey, which is at present supported by the State, and a survey of the geology of the country, however useful, cannot be of greater value to the State than a survey of the physique of the people themselves.

9. Italy has measured about 300,000 of her conscripts, Sweden has more recently measured 45,000 of her conscripts, and Germany is at present making arrangements to measure about 1,500,000 of her conscripts, but the survey recommended by your Lordship's Committee is much more complete than anything carried out or proposed by any other country.

10. We believe that the country which is the first to promote the scientific study and culture of the national physique will thereby obtain an immense advantage in the struggle to maintain and advance its position among the nations, and that no means which might contribute to so desirable an end should be neglected by the State.

YOUR MEMORIALISTS therefore pray that you will be pleased to establish, without delay, an Anthropometric Survey, a Register of Sickness, and an Advisory Council, as specified and recommended in the Report of your Lordship's Inter-Departmental Committee on Physical Deterioration, and, if legislation is necessary, to lay the matter before Parliament.

Anthropometry.

Anthropometric Identification: A New System of Classifying the Records. *By J. Gray, B.Sc.*

Gray.

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The chief difficulty in the anthropometric system of identification lies in the classification of the records. The method of classification must be such that when we have obtained the measurements of any individual we can tell with certainty, and with a small expenditure of time and labour, whether this individual has been previously entered in the register.

There would, of course, be no difficulty in doing this if repeated measurements of the same person by different measurers always gave exactly the same figures; but this is unfortunately not the case. If the measurers are not experts, there may be variations of 2 to 3 per cent. in values obtained for the same dimension.

The system of classification which I propose is to bring the card to be allocated always into the centre of the limits of a compartment. This is done by making the limits of a compartment movable instead of fixed, as in the Bertillon system.

To explain the nature of the system let us suppose that all the record cards in our register are arranged according to lengths, and that the maximum variation between two successive measurements of the same person is 4 mm. I take the head length of the individual to be tested (say 195), and form the length limits by adding on and subtracting 4 mm. The limits are thus 191 and 199. It is practically certain that the card of the tested individual will be in the bundle of cards between these two limits. This bundle is subdivided in the same way by means of the other dimensions. The final small group of cards will contain the card of the tested individual, if it is already in the register, and if it is not in the register that fact will be ascertained in every case by a single search.

In the actual carrying out of this system the labour will be greatly reduced by numbering the whole series of cards in the register and forming an index of the numbers on sheets of section paper. The numbers can thus be classified according to three dimensions simultaneously, and the number of cards in the final group may thus be reduced to a small fraction forthwith. The same process may be repeated on the final group with other dimensions if necessary.

The dimensions measured should be very slightly correlated.

But the effects of correlation as well as of inaccuracy of measurement may be almost completely counteracted by increasing the numbers of dimensions measured.

The present finger-print system in use at Scotland-Yard must have a greater margin of inaccuracy in classification than measurements of dimensions, because the finger-prints are classified on the type system, and there must always be a large number of crosses between the standard types, which lie within the margin of uncertainty.

Certain cases of mistaken identification which have recently occurred appear to indicate that this uncertainty about the finger-print system is by no means a negligible quantity.

J. GRAY.

New Guinea : Tatuing.

Haddon.

Tatuing at Hula, British New Guinea. By A. C. Haddon, Sc.D.,
F.R.S.

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Among the members of the Motu stock of British New Guinea it is customary for the women to be richly tatued, and, usually, for the men to be less so. The two photographs were taken by my colleague, the late Anthony Wilkin, to illustrate the method



FIG. 1..

of tatuing, *alo*, at Hula (or Bulaa), in the Central District. The designs to be tatued are first painted on the skin (Fig. 1) by means of a thin stick, such as the midrib of the leaflet of a coconut palm. They are then pricked in (Fig. 2) by tapping the tatuing needle with a small stick, *oa*, the knocking end of which is bound round with strips of banana leaf, *gi*; the handle of the hammer is called *kwari*. The tatuing-needle, *kini*, is a small portion of a branch from which a long-thorn projects. The paint is made from burnt resin, and it is mixed into paste in a small clay vessel which is