

thrice the weight of Jäschke's, any illustrations of the interesting process of organic change whereby so many of the bristling consonants of the written speech have dropped out of hearing in the spoken dialects of the temperate central province, probably for physiological and climatic reasons.

Nevertheless, despite its many defects, it embodies a good deal of new material from the vernacular Tibetan lexicons which must prove suggestive to those engaged in Tibetan researches who are sufficiently advanced not to be misled by its serious mistakes.

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#### FINGER-PRINT IDENTIFICATION.

*Guide to Finger-print Identification.* By Henry Faulds, L.F.P.S., late Surgeon Superintendent of Tsukiji Hospital, Tokyo, Japan. Pp. viii+80. (Hanley: Wood, Mitchell and Co., Ltd., 1905.) Price 5s. net.

DR. FAULDS was for some years a medical officer in Japan, and a zealous and original investigator of finger-prints. He wrote an interesting letter about them in NATURE, October 28, 1880, dwelling upon the legal purposes to which they might be applied, and he appears to be the first person who published anything, *in print*, on this subject. However, his suggestions of introducing the use of finger-prints fell flat. The reason that they did not attract attention was presumably that he supported them by no convincing proofs of three elementary propositions on which the suitability of finger-prints for legal purposes depends. It was necessary to adduce strong evidence of the, long since vaguely alleged, permanence of those ridges on the bulbs of the fingers that print their distinctive lineations. It was necessary to adduce better evidence than opinions based on mere inspection, of the vast variety in the minute details of those markings, and finally, for purposes of criminal investigation, it was necessary to prove that a large collection could be classified with sufficient precision to enable the officials in charge of it to find out speedily whether a duplicate of any set of prints that might be submitted to them did or did not exist in the collection. Dr. Faulds had no part in establishing any one of these most important preliminaries.

But though his letter of 1880 was, as above mentioned, apparently the first *printed* communication on the subject, it appeared years after the first public and *official use* of finger-prints had been made by Sir William Herschel in India, to whom the credit of originality that Dr. Faulds desires to monopolise is far more justly due. Those who care to learn the facts at first hand should turn to NATURE, vol. xxii. p. 605, for Dr. Faulds's first letter, to vol. I., p. 518, for a second letter from him in reference to the Parliamentary Blue-book on the "Identification of Criminals," then just issued, and lastly to Sir Wm. Herschel's reply in vol. li., pp. 77-8, where the question of priority of dates is placed beyond doubt, by the reprint of the office copy of Sir William's "demiofficial" letter of August 15, 1877, to the then Inspector of Prisons in Bengal. This letter covers all

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that is important in Dr. Faulds's subsequent communication in 1880, and goes considerably further. The method introduced by Sir Wm. Herschel, tentatively at first as a safeguard against personation, had gradually been developed and tested, both in the jail and in the registering office, during a period of from ten to fifteen years before 1877, as stated in the above quoted letter to the Inspector of Prisons.

The failure of Sir Wm. Herschel's successor, and of others at that time in authority in Bengal, to continue the development of the system so happily begun, is greatly to be deplored, but it can be explained on the same grounds as those mentioned above in connection with Dr. Faulds. The writer of these remarks can testify to the occasional incredulity in the early 'nineties concerning the permanence of the ridges, for it happened to himself while staying at the house of a once distinguished physiologist who was the writer when young of an article on the skin in a first-class encyclopædia, to hear strong objections made to that opinion. His theoretical grounds were that the glands, the ducts of which pierce the ridges, would multiply with the growth of the hand, and it was not until the hands of the physiologist's own children had been examined by him through a lens, that he could be convinced that the lineations on a child's hand might be the same as when he grew up, but on a smaller scale.

The literature concerning finger-prints is becoming large. An excellent index to it will be found in a memoir by Otto Schlaginhaufen, just published (*Morphol. Jahrbuch*, Bd. xxxiii., H. 4, and Bd. xxxiv., H. 1., Leipzig). But even this is incomplete, for it takes no notice of Mr. Tabor's efforts in San Francisco to obtain the official registration of the finger-prints of the Chinese immigrants, whom it was found difficult to identify otherwise. This seems to have occurred at some time in the 'eighties, possibly before them, but dates are now wanting.

Dr. Faulds in his present volume recapitulates his old grievance with no less bitterness than formerly. He overstates the value of his own work, belittles that of others, and carps at evidence recently given in criminal cases. His book is not only biased and imperfect, but unfortunately it contains nothing new that is of value, so far as the writer of these remarks can judge, and much of what Dr. Faulds seems to consider new has long since been forestalled. It is a pity that he did not avail himself of the opportunity of writing a book up to date, for he can write well, and the photographic illustrations which his publisher has supplied are excellent. The experiences of other countries ought soon to be collated with those of England, in order to develop further the art of classifying large collections of finger-prints. In Argentina, for example, their use has wholly superseded Bertillonage, and one would like to know with what success. A bureau that can deal effectively with very many thousands of cases would require a staff of particularly intelligent officials, and the tradition of dealing in the same way with certain transitional forms that are of frequent occurrence. The more highly the art of

classifying, or as it might be phrased of "lexiconising," finger-prints is developed, the more wide will their use become. They ought to be especially valuable in checking desertions from the Army and Navy. But there may be moral objections to the use of finger-prints in these cases for, according to the present system of recruiting, many take refuge in the Army who are "wanted" by the police, and would strongly object to being finger-printed.

A few words should be added concerning the ancient usage of finger-prints in China, Japan, and India for legal purposes. Good evidence as to this has at length been supplied by Minakata Kumagusu in two letters to NATURE, vol. li., pp. 199 and 274. It is clear that it was used to some extent, but there is nothing as yet to show that the impressions were made and scrutinised with anything like the precautions now considered to be essential to the good working of the system. Blurred finger-prints cannot be correctly deciphered except by a trained expert, using lenses and photographic magnification. Negative evidence is often of conspicuous value, such as should leave no reasonable doubt in the mind of the most stupid jurymen; but expert analysis and severe cross-examination are required when the prints to be compared are generically alike and when one of them is imperfect or blurred.

F. G.

#### EDUCATION AND PHYSIQUE.

*Mécanisme et Éducation des Mouvements.* By Prof. Georges Demyen. Pp. ii + 523; 565 figures. (Paris: Félix Alcan, 1904.) Price 9 francs.

THERE are few more important or more opportune considerations in connection with practical hygiene than those which are furnished by the subject-matter of the two books written by M. Demyen. The first of these books, a second edition of which appeared in 1903, is entitled "Les Bases scientifiques de l'Éducation physique"; this is now supplemented and given a direct practical bearing by the present work, which sets forth in some detail the technical aspects of the subject. As regards its general character the method of treatment remains distinctly scientific; but since the avowed aim of the author is to set forth the real advantages to be derived from bodily exercises conducted along proper lines, the scope of this later book is eminently educational, and thus it appeals to all those who take a broad view of education and its requirements. This appeal is accentuated by the mode of presentation, which is such as to render the extensive subject-matter intelligible to those who make no pretensions to special physiological knowledge.

It is true that the opening chapter deals of necessity with such physiological questions as the structure and functions of muscle, the mechanism of joints, and the capacity for movement which are allowed by the skeletal articulations; but these and other fundamental points of like nature are treated in a manner which, whilst in strict accord with the present state of scientific knowledge, is of such a character as to render these various topics easy of comprehension.

This introduction leads up to a most interesting analysis of the part played by the muscles in producing various well known body movements. In this stress is laid upon the comparatively modern discovery that any movement, for instance the flexion of a limb, is produced not only by the pulling force of those muscles which move it in the desired sense, the flexors, but also by the relaxation of those which oppose this movement, the extensors. It is this twofold muscular mechanism which permits of the movement being graduated so finely as regards both its extent and its force. Some illustrations of a striking character are given in support of this aspect of a volitional or secondary automatic movement.

For the majority of readers, the great interest of the book will probably lie in the interesting account which it gives of various familiar movements. These are all accompanied by numerous illustrations which are excellent for their purpose, and greatly enhance the attractiveness of the text. Many of these are spirited diagrammatic representations of the skeleton, the form of which in all manner of bodily postures is drawn with that piquancy and verve which constitute to English eyes the special charm of French draughtsmanship; humour cannot be expected in a letterpress which deals with subject-matter so technical and serious, but it is supplied by the illustrations, which give a humorous fillip to the work without detracting in the least from their undoubted service in helping the reader to follow the exposition.

The section which deals with the various forms of locomotion, walking, running, jumping, &c., is perhaps the most elaborate. The author is here on ground which he has studied minutely for many years. As chief of the laboratory at the physiological station in the Collège de France, he is able to set forth with authority the results of the elaborate and prolonged investigations initiated by Prof. Marey and carried on under his inspiring influence. It is probable that the summary of these investigations given by M. Demyen is the most valuable short exposition of this really difficult subject which has been published up to the present time. The lucidity of the author's style and treatment is conspicuous in this portion of the book, for the matter dealt with is not easily set forth in a way which admits of being readily understood, since it involves mathematical considerations which are apt to prove a stumbling block to physiological students.

But, as stated before, the description of the factors concerned in the production of familiar postures of the body and the side-issues which these raise, will for most readers probably prove the most attractive portion of the work. From standing, sitting, and lying down, the author proceeds to carrying loads, vaulting, kicking, throwing, swimming, rowing, cycling, horse-riding, dancing, singing, fencing, boxing, wrestling, and all the various bodily movements which are concerned in the various forms of athletic or industrial exercise. It would be impossible to give any detailed account of his treatment of these subjects, but it may be confidently stated that this treatment, whilst scientifically sound, is rendered