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London : George Bell, 1891.

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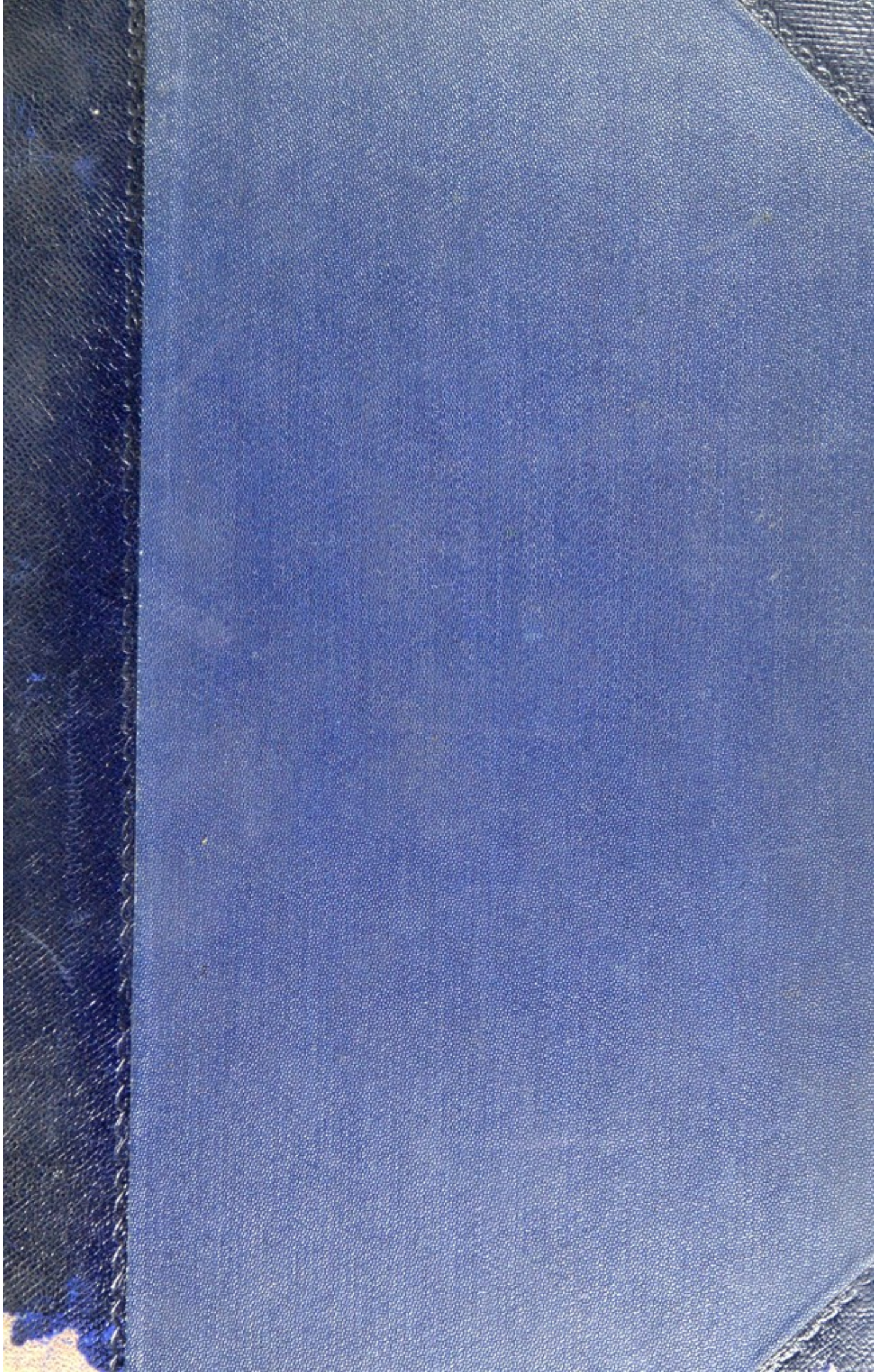
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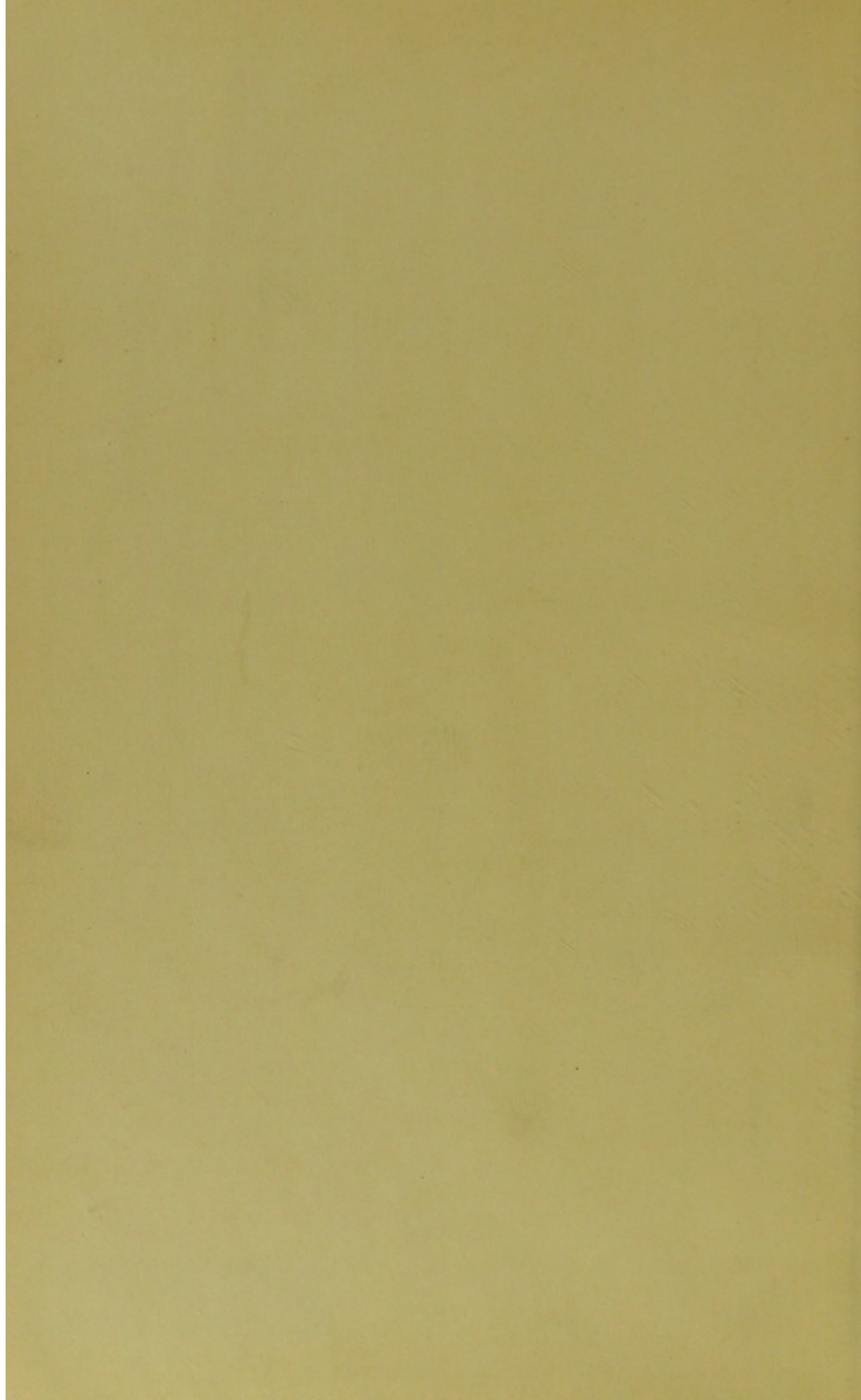


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PAPERS ON
PHYSICAL EDUCATION,

BY VARIOUS WRITERS.

COLLECTED AND EDITED BY C. ROBERTS, F.R.C.S.

FIRST SERIES.

LONDON :
GEORGE BELL & SONS, YORK STREET, COVENT GARDEN

1891.

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GEORGE HILL & SONS, YORK STREET, COVENT GARDEN

PHYSIQUE :

A JOURNAL OF PHYSICAL EDUCATION.

PREFACE.

ALTHOUGH these papers have been issued in a serial form under the above title, they have been written, selected and arranged with a view to their being of permanent value to the student and teacher of Physical Education, and to parents, school-masters and mistresses, medical men and others, who are responsible for the rearing and management of children. As little attention has been given to the scientific aspect of physical education in this country the serial form has been adopted as the one most likely to elicit the views of those who have given some attention to the subject, and by affording opportunities for discussion to create a wider interest in it. The Editor has been obliged to resort to foreign sources of information, many of which are not accessible to English readers, especially to American, French and German writers on gymnastics—a branch of physical education which has been much neglected in consequence of our national partiality for athletics and games.

The Editor has endeavoured to place the views of the advocates of the various so-called "systems" of physical training impartially before his readers, and to put them side by side for the greater convenience of comparison. The result will be, he hopes, to remove much of the prejudice which surrounds the subject, and to show that, from a physiological point of view, the differences are not so great as they seem. A study of Dr. Lagrange's paper on "Gymnastics in Elementary Schools," and Dr. Hartwell's paper on "The Nature of Physical Training, and the Best Means of Securing its Ends," will convince the unprejudiced reader that all the systems need revision, and that the tendency of such revision will be to merge them into one, as from a scientific point of view there can be only one system, although the details of its application must necessarily vary with the conditions of the individuals subjected to it. Such a system should define the games and exercises appropriate to children of different ages, as they are found in infant schools and kindergartens, elementary, secondary, and high-class schools; and it should draw a distinct line between the physical "education" of growing children and the physical "training" of adults.

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Journal of Physical Education

No. 1.

FEBRUARY, 1891.

VOL. I.

National Physique.

I.—OVERCROWDING IN TOWNS AND ITS REMEDIES.

By C. ROBERTS, F.R.C.S.

THE overcrowding of the population of the poorer parts of London and other large towns is admitted on all hands to be one of the most urgent social and sanitary problems of the day, and it will be useful to take a general survey of its incidence and the panaceas which are being put forward for its removal or prevention. The strenuous efforts, and to a certain extent the honourable rivalry of the London County Council, the Vestries, the Kyrle Society, the Public Gardens Association and the Commons Preservation Society in hunting out and preserving for the use of the public every patch of open space in London and its suburbs, is so praiseworthy that any criticism of their plans and mode of procedure may seem ungracious and superfluous; and the generous efforts which are being made by philanthropists and capitalists for the better housing of the working classes would seem to be still further above criticism. Nevertheless, it is well to temper zeal with discretion, and a looker-on who is in entire sympathy with all these agencies but not identified with their work, may detect flaws in it which escape the notice of the workers themselves. In its haste to secure open spaces the County Council, for instance, shows a lack of proportion and an ignorance of the requirements of the whole county of London, with its area of 77,400 acres, its 4,282,921 inhabitants, and its 486,056 inhabited houses. A few weeks ago the Council agreed to give £200 an acre for a pine wood situated on the extreme south-east boundary of the county at Plumstead, in a district which possesses only one house and six persons to the acre, and which is contiguous to a common already in the possession of the Council, and with the whole county of Kent behind it; and now it proposes to

spend £20,000 an acre on an overcrowded area in Bethnal Green which possesses 49 houses and 373 persons to the acre—not to provide an open space where one is most wanted, but to raise piles of so-called model dwellings which will eventually be occupied by a larger number of persons than exist on the ground at present. Thus we find the Council purchasing land at a considerable cost for an open space which is not wanted and which might well be used to relieve overcrowding in other parts of the county, and clearing away small houses in an already too crowded district to supply their places by still larger houses. Overcrowding cannot be remedied by any jugglery with bricks and mortar. To put one house on the top of another is to increase all the evils of overcrowding, and nothing short of a serious centrifugal dispersion of the people will be of real use in overcoming them.

DENSITY OF THE POPULATION OF LONDON.

A survey of the whole County of London shows that many popular delusions exist as to the density of the population in different districts, and that the efforts to secure open spaces and relieve overcrowding are not always directed to the proper quarters. To show this, I have prepared a table from such materials as I have been able to collect from various sources, but largely from the reports of the Medical Officers of Health of the vestries whose areas will probably correspond with future district councils.

I have placed at the head of the list the recently condemned insanitary area in Bethnal Green for the purpose of showing how the vestries stand with regard to it in respect to density of population. The first column shows the number of persons per acre; the second

Sanitary Districts of London. (London Vestries.)				Number of persons per acre.	Square yards per person.	Number of houses per acre.	Number of persons per house.	Rateable value in £ per house.	Death rate 1889.
1.	Bethnal Green condemned area	...	...	373	13	49	8	£22 (?)	40'0
2.	Holborn	...	...	222	22	20	11	£59	21'22
3.	St. Luke's	...	...	222	22	22	10	—	18'96
4.	Strand	...	...	220	22	19	12	£147	—
5.	St. George's, Southwark	...	...	206	24	—	—	—	—
6.	Shoreditch	...	...	195	25	25	8	£39	—
7.	St. George's-in-the-East	...	...	191	25	24	8	£43	25'8
8.	St. Giles-in-the-Fields...	...	...	185	26	16	11	—	19'9
9.	Clerkenwell	...	...	184	26	19	10	—	21'2
10.	St. James's, Westminster	...	...	184	27	19	9	—	18'51
11.	Whitechapel	...	...	176	27	20	9	—	20'4
12.	Newington	...	...	174	28	23	8	—	—
13.	Bethnal Green (whole district)	...	...	168	28	24	7	£22	20'67
14.	St. Saviour's, Southwark	...	...	141	34	17	8	£39	—
15.	Bermondsey	...	...	133	36	17	8	—	16'7
16.	Chelsea	...	...	126	38	16	8	£43	16'8
17.	Islington	...	...	108	45	13	8	£43	13'3
18.	Mile End Old Town	...	...	107	45	16	7	£30	18'0
19.	Limehouse	...	...	102	47	14	7	—	22'7
20.	St. Marylebone...	...	...	103	47	11	9	£83	18'2
21.	St. Olave's, Southwark	...	...	96	50	12	8	£45	—
22.	St. Pancras	...	...	94	51	11	9	£59	18'16
23.	Paddington	...	...	89	54	12	7	£91	14'2
24.	City of London...	...	...	80	60	18	4	£380	11'1
25.	St. George's, Hanover Square	...	...	78	62	9	8	£132	14'19
26.	Kensington	...	...	77	63	9	8	£83	13'5
27.	Westminster	...	...	74	66	8	10	£219	18'1
28.	Poplar	...	...	66	73	10	7	£33	17'0
29.	Lambeth	...	...	63	77	—	—	£37	17'5
30.	St. Martin's-in-the-Fields	...	...	61	79	6	10	£281	17'1
31.	Hackney	...	...	58	83	8	7	£38	13'6
32.	London, the whole of	...	...	55	88	6	8	—	17'4
33.	St. Giles, Camberwell...	...	...	51	95	9	6	£31	13'8
34.	Rotherhithe	...	...	48	101	6	8	—	17'1
35.	Hammersmith	...	...	46	105	6	7	—	16'1
36.	Greenwich	...	...	—	—	—	—	—	—
37.	Fulham	...	...	45	108	6	7	£34	16'77
38.	Woolwich	...	...	33	146	4	8	—	20'3
39.	Hampstead	...	...	27	180	4	7	£84	10'5
40.	Wandsworth	...	...	15	324	—	—	£45	14'76
41.	Lewisham	...	...	13	373	2	6	£48	—
42.	Plumstead	...	...	6	807	1	6	—	—

the number of square yards each person would possess if all the inhabitants were standing on the ground; the third the number of houses per acre; the fourth the number of persons per house; the fifth the average rateable value of some of the districts; and the sixth column gives the death-rate for the year 1889.* As it is nearly ten years since the last census was taken, and many changes have taken place in the population of some of the districts, especially in the out-lying ones, the figures must be accepted as approximatively correct. It is in their relation to each other rather than their absolute value that the interest of the figures lies, as they show which districts are most in need of attention from the County Council and

**En passant*, I may call attention to the fact that the Reports of the various Vestries are not kept on a uniform plan, and few of them contain all the information from which the table is constructed.

the Open Space Societies. The death-rates are probably of the least value, as they are influenced by many conditions which it is not convenient to enter into here.

I do not propose to analyse the table in detail, but a mere glance at it shows some of the most striking features relative to overcrowding of the population. The City, as might be expected, contains the smallest residential population in relation to the number of houses and their size and rateable value, but immediately outside the City boundaries, in the districts of Holborn, St. Luke's, the Strand, and the adjoining parishes of Southwark, the population is the densest in the whole of London, and the number of houses per acre and the number of inhabitants per house are among the greatest in the list. The houses are high, and the districts are commercial ones similar to the City, but

they must contain some very densely populated portions occupied by shopkeepers, artisans, and workpeople of both sexes employed chiefly on domestic manufactures. In the course of time these districts will probably become part of a "Greater City," and the residents a population of caretakers, but at present there is in the back streets and courts a condition of overcrowding greater than that of Bethnal Green or Whitechapel, and the sanitary surrounding must be worse, inasmuch as these districts are surrounded by the rest of London, and lie furthest from the open country, and it is among them more than anywhere else that open spaces are required.

AVAILABLE OPEN SPACES FOR THE CENTRAL DISTRICTS.

With the exception of the Thames Embankment and the Thames itself, this "Greater City" district possesses no open space of the nature of a park. It comprises, however, Lincoln's Inn Fields, The Foundling Hospital, and St. Luke's Lunatic Asylum with the adjoining Bunhill Fields burial ground and the Artillery ground, all of which might, and indeed ought to be, acquired for open spaces. The 200 lunatics and staff of St. Luke's Hospital would be happier, healthier and more cheaply provided for in the suburbs, and probably the only reason why St. Luke's Hospital is retained in the very heart of the most densely peopled part of the Metropolis, is the old one of letting things alone. There are also some almshouses near the hospital which might well be removed to Highgate or the neighbourhood of Epping Forest. A still stronger case may be made out for the removal of the Foundling Hospital to the Surrey Hills. It is astonishing how this institution, which is practically an orphan asylum and school, has so long escaped the notice of the advocates of the removal of the City schools to the country and the suburbs, like Charter House, St. Paul's, and shortly the boarding part of the Blue Coat School. The original plan of the founder of the Foundling Hospital was to draft off the children to country branches, and the large Quakers' School, at Ackworth, in Yorkshire, was built and used for some time as one of these branch establishments. The garden of the Foundling Hospital, which at present is one of the most dreary spots in London, would with the two disused burial grounds to the north and the two squares on the east and west of it make a good-sized park, in a district which is very

much in need of one, and the four or five hundred children would be much happier and healthier if they and their nurses and teachers were transferred to the country; and their social success in life would be more secure if the name of the institution were dropped as no longer consonant with our present views of charitable relief to neglected children, and they ceased to be the objects of curiosity to Sunday visitors. Lincoln's Inn Fields is situated in the midst of the most crowded parts of the Strand, Holborn, and St. Giles's, to the last of which parishes it belongs. Many attempts have been made to secure this large square for the use of the public, but they have all failed in consequence of the opposition of the residents, who must be for the most part a population of caretakers of the lawyers' offices. It is hardly possible that this dog-in-the-manger policy would prevail if the County Council were to make reasonable overtures for the purchase or rental of the square, which is probably what the residents want, as public opinion would be strongly on the side of the Council. By securing these places as open spaces there would be the additional advantage to the resident population of relieving it of about a thousand of its permanent inhabitants; and if the more permanent occupants of the workhouses were sent to the country also, the relief to the local population would be very great, and to the advantage of everyone concerned.

The second group of districts includes all those which stand on the table from Shoreditch to Bermondsey inclusive and surround the City on the east and south. This group is the home of the true Cockney, and is the favourite hunting ground of the philanthropist and the social reformer. The houses are little more than cottages if we may judge from the average rateable value, but they are crowded with residents. The people are chiefly indoor artisans following industrial occupations, small shopkeepers, working men and women, and costermongers, all of whom have a poor physique, little enterprise, and are tied hand and foot by local traditions and customs, poverty, and insanitary surroundings. On the map these districts form a weary desert of bricks and mortar with hardly a single green oasis in it, although the density of the population is less than in Holborn and St. Luke's. There is a small open space called the Poor's Land in Bethnal Green, which was left to trustees in the reign of William and Mary to be kept as an open space, but there is

some danger of its falling into the hands of the builder. Efforts are being made, however, by Miss Octavia Hill and others to prevent its misappropriation, and if it is saved the site of the private lunatic asylum which abuts on it should be secured also, the inmates of the institution being removed to an open and healthier suburb. There does not seem to be any other way of making open spaces in this dreary district except by slowly pulling down some of the numerous groups of cottages and leaving the cleared ground permanently open and compelling the residents to go further afield for house room. Slow clearings of this kind would not press so hardly on the working classes as the wholesale clearances for railways and other commercial purposes for which Cross' Acts so wisely provides, and though it might cause temporary congestions in the surrounding neighbourhoods, it would ultimately drive those whose work did not lie in the district to find homes in the open suburbs. Gangrene, whether of the individual or the multitude, requires prompt surgical treatment, and it is in the districts I have just discussed that the gangrenous spot of London is most apparent and requires prompt treatment.

The third group of vestries lying to the west and north of the "Greater City," extending between and including Chelsea and Paddington on the table, consist chiefly of the residences of the professional and commercial classes, and possess for the most part well built houses, wide streets, gardens and squares, and are in the happy position of having no history as far as our present inquiry is concerned, although they are not free from slums and consequent over-crowding. The last group of districts comprises the aristocratic and suburban districts from St. George's, Hanover Square, to Plumstead, which are sparsely populated and are well provided with parks, commons, and open spaces, and which therefore call for no further comment here.

AN IDEAL DENSITY OF URBAN POPULATION.

It would be difficult to lay down any definite rule as to the density of a town population which would be consistent with sound health; but judging from the figures of our tables and from what we know of Chelsea, Islington, St. Marylebone and St. Pancras, vestries containing sections of all classes of the population, and forming the third group of our classification, we may set down as a reasonable density,

one hundred persons to the acre, twelve houses to the acre, and eight persons to a house—a density which would allow about fifty square yards of ground surface to each person. At any rate these figures might be accepted, like the æsthete's teapot, as something for County Councils and vestries to live up to. It would simplify the operations of the various official and voluntary bodies interested in preventing overcrowding if they were to concentrate their attention on the districts which exceed this ideal density of population, and were to leave those which fall short of it a little more to their own devices. Sanitary science and the growing taste for artistic houses and natural surroundings are now so popular there is little risk that the dwellers in Mayfair and the suburban districts will fall into the error of overcrowding themselves as the central districts did when the country was still near them, and indeed, it is only in the direction of the suburbs, or beyond them, that relief for the overcrowding of the central districts can be looked for. The law has already fixed the height of buildings in London at ninety feet, and if a law were passed requiring the width of the street to be equal to the height of the houses forming it, overcrowding would be removed automatically as far as house construction is concerned.

If County Councils could obtain such a measure from Parliament, and in supervising the plans of all new building operations would keep the ideal of a density of one hundred persons to the acre, or fifty square yards of ground space to each resident, including, of course, the area of streets and open spaces in the estimate, they would be able, without causing much inconvenience to the people or the builder, to obtain one of the greatest sanitary reforms of our day, and one which is most urgent for the prevention of the deterioration of the health and *physique*, and consequently the energy and happiness of our ever overgrowing and overcrowding urban population. It is not a utopian or very unreasonable request that the whole of the population of London should be housed not worse than that of Islington, with its density of 108 persons to the acre, its eight persons to a house of the rateable value of £43 (the same as St. George's-in-the-East), and a death-rate of only 13·3 per thousand, the lowest mortality (with the exception of the non-residential City), of the whole of the London sanitary districts.

Workmen's houses might be constructed at a cheaper rate than the present houses in Islington, which are occupied chiefly by persons of the lower middle classes, whose wages are not much greater, but whose personal expenses are very much greater, than those of the artisan class. The rental per person in Islington is two shillings and a penny a week, and in Bethnal Green, which has twenty-four houses to the acre, and seven persons to a house, with the low rateable value of £22, and a third more people to the acre, the rental per person is one

shilling and a penny a week. The rental per acre in Islington is £559, and in Bethnal Green £528; but Bethnal Green provides for sixty more persons per acre than Islington. In these calculations I have assumed that the rateable value is the same as the rental, which of course is not the case, when there are many small tenements, and a larger rental is most probably derived from Bethnal Green than from Islington. I shall deal with the subject of workmen's dwellings in the next number of the Journal.

(To be continued.)

Physical Education.

PHYSICAL SPORTS OF THE ANCIENT WORLD.

A Lecture delivered before the Edinburgh Health Society.

By R. J. MACKENZIE, M.A.,
Rector of the Edinburgh Academy.

It is a common complaint against men of my profession, that they are so much occupied in instilling learning into others that they have no time to become learned themselves. You must not, therefore, expect from me to-night an exhaustive treatise with regard to the physical methods which were pursued in the ancient world. I shall content myself with offering to you, in a somewhat fragmentary fashion, the result of a few researches which I have made with regard to that ancient life which is so far from us in time, and yet so near to us in sentiment and civilization; and here and there I shall endeavour to point the moral as it seems to me to concern us to-day.

THE PERSIANS.

The first system of education of which we have any authentic account in ancient times is that of the Persian nobles. These great Aryans educated their sons in a very simple fashion—they taught them to ride, to shoot and to speak the truth. If we add to this, that they inculcated reverence to the king, I think you will see that we have here sketched an outline of education which, with a slight admixture of the three R's, would seem completely satisfactory to many a Tory sportsman nowadays.

THE SPARTANS.

But it is not from so simple a method as this that we have much to learn at the present time. I pass to the educational systems of the Greeks and Romans, which were very thoroughly developed; and, if

we take the Greeks first, as being the earliest in point of time, the natural state to which to direct our attention is that of Sparta. Now, before you can understand what physical education was in Sparta, you must understand what the Spartans were themselves. When we talk of the Spartans, we mean that small body of Dorian nobles who penetrated from the northern parts of Greece into the southern part, and there established themselves by force of arms in the midst of a population which hated them, and which vastly outnumbered them. The Spartans were a race of warriors, and consisted, for several centuries of the best period, of about 9,000 families. They were surrounded by about 30,000 Perioeci, or farmers who maintained them. In addition to these, there were about a quarter of a million of Helots, or slaves, who were a standing menace to the Spartans, and whom they frequently treated with the greatest cruelty. Now, in a state of this sort you may imagine how considerations of every kind must be sacrificed to one necessity—that of personal preservation; and thus we find that these Spartans, with a consummate ability, devoted their entire polity to the answering of this question—How can we turn out a race of soldiers so powerful as to be able to maintain their position amid this vast hostile population? The methods they took to maintain themselves are ascribed to the great legislator Lycurgus. Whether he was mythical or not does not much matter, but the system as it stands is one of

the marvels of history. When a Spartan infant was born, he was taken almost immediately before a board of examiners more formidable than any that can be found at the present day,—for they decided whether the infant was to live at all. If he was deformed, if he was sickly, or even if at the time he happened to be superfluous, the state refused to rear him. He was exposed in a cleft of Mount Taygetus, and there, after a few hours, left a world which had proved too hard for him. But suppose that the infant survived that anxious ordeal, he remained with his mother until he was about seven years of age. At the age of seven all home life for the Spartan ceased. He was handed over to a distinguished citizen, who was called the *paidonomos*, or as we should say, the schoolmaster, and his education began. All his meals were taken in public at the military messes, and the fare which was presented to him there was made scant and coarse in order that the boy might be stimulated to supplement it by hunting, or if hunting failed, by stealing. If he stole successfully, he was commended: the nimbleness which had been shown in peace would be most serviceable in war. If, on the other hand, he was detected, he was severely punished as being likely to turn out a clumsy soldier. The kind of training which the Spartans affected was a lean training. From time to time there were inspections of the youths, and those who were found to be too fat were severely flogged. There was, indeed, a good deal of flogging in the ancient state of Sparta. From time to time, in order to test their endurance, the boys were scourged before the altar of Artemis; and even as late as the days of Cicero, there were instances of boys who perished sooner than evince the smallest sensibility to the pain that was inflicted. Both winter and summer the boys wore the same garment—a kind of sleeveless tunic. They went commonly barefoot; and here is a very strange touch—from time to time the schoolmaster, that distinguished citizen of whom I spoke, stirred up fights among them to test their mettle. The *cestus*, however, a terrible instrument, which consisted of strips of leather wound round the arm for purposes of defence, and metal plates attached to the fist for purposes of attack, was not allowed to be practised within Spartan borders. The Spartans, being practical soldiers, abhorred the *cestus* as much as Gentle King Jamie the football of his day, when he pronounced it fitter to maim than

to make able the players thereof. But you must not think that the Spartans were at all disposed to be afraid of the perils necessary to create courage in youth. We hear of contests which took place in a small island called the *Platanistas*, one of which was seen by Cicero. The Spartan youths were arranged into two parties, and that party was adjudged to have won which thrust the other into the water. As soon as the signal was given a terrible scene ensued, for which you have a faint modern parallel in the “hallelujah hack” which some of you may have heard of as being practised in ancient days at Rugby. The young Spartans rushed at each other; they struck each other; they kicked each other; they throttled each other; and, indeed, their violence even went so far as to gouge out each other's eyes. It was thus that the ancient Spartans, feeling that courage was for them a prime necessity, developed it at the cost of no small brutality.

If we turn from the men to the women, Aristotle assures us that in his time they were not disciplined, and for this he gives us a rather humorous reason. He says that Lycurgus, the great legislator, had disciplined the men, but, when he tried to discipline the women, he failed. This is more or less in keeping with our modern experience of that sex. Like the old Parthian warriors, they subdue us though they seem to yield. However that may be, Plutarch and Xenophon assure us that in the best days of Sparta the women were subjected to physical training no less than the men. They ran, they wrestled, they even boxed in the best days of Sparta, and hence, as other Greeks tell us, they were proverbial for their beauty. The legislator Lycurgus supplies us with the motive:—“How can you expect a girl,” he says, “to have a fine family if she sits all day spinning and weaving at home? Such pursuits are only fit for slaves.” Thus the Spartans reared up a noble breed of women, making, as I have said, simply for that one object of turning out a race of men which should have no physical equals in Greece.

No sketch of physical education at Sparta would be complete which took no notice of the dance. The Spartans were famous for their splendid Pyrrhic dances, in which youths and maidens, or youths alone, danced in great numbers and with marvellous beauty to the music of the flute and of the voice. The dances to which I refer were not in the least like

many of our modern ballets. They were not in the least like those performances in which a female dancer in ridiculous and inadequate costume practises feats which are obviously difficult and which one wishes had been altogether impossible; but they were, as you may say, vast choruses in movement—a kind of poems in motion, full of the charm of “woven paces and of waving hands,” the effect of the whole depending upon the perfection with which each individual dancer performed his or her part. In fact, the dance of Sparta in its highest manifestation was a religious service, performed at the festival of Apollo, in which the perfection of concerted grace was exhibited upon a vast scale before an admiring concourse, which for that one occasion was permitted to gather from all parts of Greece. Before I leave the subject of Sparta, I would add this one observation, and I think it has a certain interest at the present time. The Spartan state gives the best example in history of the socialistic principle applied to a single purpose, viz., that of producing the noblest physique and the highest military prowess.

THE ATHENIANS.

If we pass from Sparta to Athens, we are at once in a very different atmosphere. The general results achieved at Athens are, of course, enormously greater than those that were attained at Sparta. They are gained also by absolutely different means—by leaving the individual perfect freedom to develop his individuality as he pleased. Now, just as in the case of Sparta, you cannot understand, I think, the ideas the Athenians had upon education, unless you clearly realise who these Athenians were. The Athenians of ancient history were mostly large slave owners, landed proprietors, men who owned mines, some of whom had trading vessels, some few of whom were chiefs of factories. Hand labour was entirely performed by slaves, and, upon the whole, we may describe them as a body of nobles and merchant princes who lived at leisure, supported by the labour of others. We are struck from the first with the same trait of what appears to us horrible cruelty in the exposure of their infants. Here, as well as at Sparta, even in the noblest families, if an infant was superfluous he was exposed, and it was but a small excuse for the parents that sometimes a master who wanted an extra slave, or perchance some kind-hearted person took

pity on the poor infant who had been thus left to perish. I would point out, however, that the problem of how to dispose of the superfluous has not by any means been settled in modern life. In ancient Greece they were cast away at the dawn of existence on the mountains. In modern London, as we have recently been assured, they are exposed at a later age upon the Thames embankment. But—to leave this somewhat grim consideration, and to pass to the education of the young Athenian—if money reached so far, a Spartan nurse was sought. A Spartan nurse brought up the child more hardily. She did not swathe up the limbs in bandages, but allowed them to develop by having free play. It seems certain that all the children's games which are commonly practised nowadays were well known to the Greeks. We have an account of Agesilaus, one of the Spartan kings, riding on a stick to amuse his little boy. We hear of a game called “brazen fly,” which was simply our blindman's buff. In the centre stood a boy saying, “I am hunting a brazen fly,” and the others standing round said, “You won't catch it.” They had the game of “prisoner's base,” which is simply, of course, an imitation of war; the game of “fool in the middle,” of “ducks and drakes.” Beans were used for marbles. They had tops; you hear of hoops. As a game for later life you have something not unlike football clearly referred to. It is not actually football, because the Greeks did not commonly wear boots, with the toes of which they could with impunity have kicked out freely at each other's shins; but it is a sort of handball, much the same as Rugby football, except that the players were not allowed to kick the ball, but were allowed to throw it forwards. The game of Lacrosse is also clearly described. We find a passage which tells us how the players had a stick which curved at one end, across which a net was stretched; that the ball was placed in the middle, and then the players rushed at it and carried it away, till one succeeded in throwing it over the goal. The familiar diversion, though it can scarcely be called a part of physical education, of tossing in the blanket, is of immemorial antiquity, and was practised in the time of the Greeks. The boys of Westminster School in London used to employ a line of the Roman poet Martial, when they tossed their schoolfellows:

“Ibis ab excusso—”

then came the preliminary heave—

“missus ad astra sago,”

and skywards the unfortunate urchin was sped. In addition to these pastimes the youthful Greeks walked upon stilts and played at leap-frog. The milder games were also to some extent played by the girls, but not at all with the same freedom as at Sparta; and it is to the Athenian girls more perhaps than to any others in Greece that the phrase of Tennyson may be applied—

“Dwarfs of the gynaeceum.”

But to return to the career of our young Athenian—at seven or thereabouts he went to school. When I say he went to school, I mean that he went probably for a year or two to the Palaestra, or physical school, first—the learning of letters came a good deal later. To the Palaestra, and afterwards to the A, B, C school, the *paidagogos*, or guardian, accompanied him, who, I am sorry to say, was in many cases, as Plutarch complains, the most disreputable and the most drunken of the slaves. Waiting for him in the Palaestra was the *Paidtribes*, or Trainer, under whose care his serious education began. To each of these Palaestras, or gymnasia, as we should call them, a stadium or racecourse of about two hundred yards was attached. That was the normal distance. A longer race was to the end of the stadium and back, about a quarter of a mile. The longest race that was run at Olympia was about two miles and three-quarters. The German professor who has unearthed these details for us, is astonished that any human being could contrive to run so long; but then, as we know, German professors are, as a rule, wholly unable to run—even for the train. We must remember this, however, that the races in Olympia were run in sand. Solon, in the *Anacharsis* of Lucian, is made to explain the theory of this. “It is much harder, he says, to run on sand than on grass; how then shall an enemy escape on the grassy plain from a runner who has practised running on sand?” The style of their running, however, was such that I do not think they would have caught a modern fugitive. You see pictures of them on old vases with their hands extended in spread-eagle fashion; and we actually hear that they encouraged themselves with loud shouts. Both these practices are commended by the German professor, but I think upon the whole we may say that none of these Greek runners, if existing now, would be likely to “break the records.”

The pursuit of wrestling was very largely followed. The Athenian and Spartan, and Greek athletes generally, wrestled naked in a place that was covered with mud,—the reason being that the falls were frequent and severe, and they were anxious that the wrestlers should be hurt as little as possible. Before wrestling, the young man smeared himself with oil. The Solon of the Dialogue gives a somewhat subtle explanation of this. “It is to fit men for military life,” he says. “It is extremely difficult to hold a man who is oiled. How then shall an enemy escape from a man who has been accustomed to grip an oiled antagonist?” The able barbarian, however, to whom Solon is talking, observes that the wrestlers at times give themselves a coating of sand. Solon is again ready with his explanation. “If one is coated with sand,” he says, “it is extremely difficult to escape. How then shall an enemy be able to hold a man who has practised escaping when coated with sand?” A truer explanation of this I take to be, that the oil and the sand together formed a kind of sand soap, as after the wrestling was over the wrestler scraped himself. A good many representations of this process have come down to us from ancient days. The wrestler scraped himself with a scraper, called a “*stleggis*,” and this was really a form of washing. You must remember that the water supply in ancient Greek cities was far from perfect, and that, although washing was the commonest thing in the world at Rome, it was by no means so common or so easy at Athens.

Jumping we hear of, but it was not much practised in Greece as now. As a rule, theirs was a standing jump, the jumper holding in his hand the *halteres* or weights. Solon explains this by the same theory, viz., that a man who can jump high with weights, can jump a prodigious distance without them. Then, again, we hear a great deal of boxing, but, unluckily for the credit of Greek pugilists, we find the boxer described as a man with crushed ears, and we find also that caps were used to protect the ears from injury. This clearly shows that the blows were of the circular or round arm kind, and I fancy that these Greek boxers would have rapidly gone down before a member of the modern prize-ring. I am not, however, quite sure of this, for the Greek practice admitted kicking as well as boxing, and I have been assured by one who knows well about such matters, that the

system of kicking, which you know is the national defence of the French, is a far more formidable method than that of boxing. The question has been tried in London, and I understand that an English boxer has no chance whatever with a French kicker. If, then, one of our modern pugilists was to meet a Greek boxer, I think we must revise our previous sentence, and consider that he would find him a very ugly customer.

One other contest I ought to mention, the Pentathlon, which contest consisted of five parts, viz., running, jumping, wrestling, throwing the quoit, and throwing the javelin. Many of you have no doubt seen representations of the famous statue of the Discobolus of Myron, who leans forward in the act of throwing the disc. Mr. Herbert Spencer tells us that that the

Discobolus leans forward too far, and that in another moment he must fall prone on his nose. When a modern utilitarian philosopher encounters an ancient Greek artist, I think he would be a rash man who should try to settle such a quarrel. Akin to the above sports was the Pancratium, which is admirably described in the *Æneid* of Virgil. It consisted of boxing and wrestling combined, and the boxing was often practised with the fist armed with the cestus. Into this I need not go. It was a horrible encounter. The exercise of rowing was not practised by free men. The Athenians considered it only fit for slaves. I must confess to a certain sympathy with this view. Rowing has always appeared to me an exercise to which one would gladly set one's enemy.

(To be continued.)

THE CLAIMS AND LIMITATIONS OF PHYSICAL EDUCATION IN SCHOOL.

An Address delivered at the Annual Meeting of the British Medical Association, held at Birmingham, 1890.

By ALFRED H. CARTER, M.D.LOND.,

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GENERAL CONSIDERATIONS.

THERE is, perhaps, no feature more characteristic of modern medicine and more to its credit than the prominent attention which is accorded to all matters and measures which aim at the prevention of disease; and by endeavouring to increase our knowledge of the principles which underlie educational methods, especially in regard to the healthy development of mind and body in the young, we are rendering good service to the cause of preventive medicine.

There are some general considerations to which reference must be made at the outset, and the first relates to the importance of enlightened public opinion with regard to education. There is one error of a fundamental kind which is especially common. It is to the effect that education is synonymous with intellectual training, and that intellectual training consists in acquiring information. Until the higher and truer idea of education is grasped as the co-ordinate and interdependent development of intellectual, moral, and physical faculty, we shall not get far on the road of educational reform. The error to which I refer is begotten by ignorance, nursed by prejudice, and ushered into vigorous

life under the patronage of those twin demons of modern civilization—unrestricted competition and payment by results. It is our duty as a profession to do what we can to enlighten public opinion on this matter, and not to lose sight of the fact—in any attempt we may make to improve education on its physical side, and to bring it into closer accord with those laws of Nature which it is our business to study—that the true object of education is to develop all those faculties which serve to raise the standard of individual and social life, and to bring them into symmetrical and harmonious relation with each other. If the hope is entertained of building up a science of education, the medical profession must combine with the profession of teaching, in order to direct investigation and to collect material essential to generalisation. Without such co-operation educational workers must continue to flounder in the morasses of empiricism, and be content to purchase relative safety at the cost of slow progress, or no progress at all.

OBJECT IN VIEW.

I would also allude to what appears to me to be another source of difficulty in

dealing authoritatively with the question of physical exercise and training in schools. It is want of agreement as to the object in view. Apart from the exercise of particular groups of muscles in the acquirement of strength and dexterity for special and restricted purposes (with which we are not at present concerned), it seems to me there are three different points of view from which the question may be considered—closely related, but necessary to be distinguished from each other:—

1. Physical exercise as a means of recreation and amusement.

2. As a means of raising the general standard of health by quickening the circulation, increasing the breathing capacity, promoting nutrition, and facilitating the elimination of waste products from the system.

3. As a means of education, in the sense of educating and developing faculty.

An exercise that is admirable as an amusement is not necessarily one which is best calculated to promote the general health; while an exercise, or set of exercises, which is unimpeachable from a hygienic point of view, may quite often be of little educational value. Each of these ends is both legitimate and desirable on its own merits, but it is doubtful whether there is any form of exercise which, at one and the same time, entirely meets all three requirements. There is one factor which specially marks off educational exercise from hygienic and recreative exercise, and that is the element of outside control. Exercise at work and exercise as play just differ in this important matter of control. Control is a necessary feature of all true educational work, and if physical exercise is to be included as a necessary part of a liberal education, it cannot be divorced from control. In my opinion much of the confusion which has crept into the literature of the subject arises from a failure to recognise and appreciate their distinctions.

PHYSICAL EXERCISE AS A MEANS OF EDUCATION.

While the general operation of physical exercise as a means of recreation and of promoting health is sufficiently apprehended for the purposes of our discussion here, it is necessary to dwell with a little more detail upon the operation of physical exercise as a means of education.

It is too much the habit to consider muscular exercise apart from the nervous system, with which it is in such intimate connection. The nervous centres not only

actuate the muscles, but muscular action reacts in a most important way upon the nervous centres. It increases the number and the size of their cell elements; it strengthens their power, and renders them more discriminative and responsive in their behaviour. Thus the first effect of exercise is to develop its motor faculty. But, further than this, every muscular action is attended with sensory impressions, which, by frequent repetition, are remembered and give rise to what are termed motor ideas. It is remarkable what a large number of elementary and fundamental conceptions depend upon motor ideation. Notions of weight, distance, size, and shape, for instance, would be impossible without previously acquired motor ideas. The accuracy with which such conceptions are formed must largely influence the accuracy of more complex mental conceptions into the formation of which they enter. As Sir J. Crichton Browne says:—“The muscles not only, by the locomotion which they make possible, enormously widen the field from which our sense impressions are gathered, but also, by the experiences which their own activities involve, expand our mental resources a thousandfold.” Although it may be objected that these remarks only concern the functions of a part of the brain, yet in an organ the parts and functions of which are so closely correlated, it is impossible to believe otherwise than that the physiological and developmental standard of the whole must be raised by the improvement of so large a part.

NECESSARY IN SCHOOLS.

I will group what further remarks I wish to make round three questions:—

1. Is there a real demand in our schools for systematic physical training?

2. What are the principles which should guide us in the physical training of our children when at school?

3. How can these principles be best applied in practice?

1. With regard to the first question, all *à priori* considerations certainly point to an affirmative reply. The prevalent view, however, appears to be that it is the teacher's business to look after the interests of the mind, the parent's business to look after the moral interests, and the child's business to look after the interests of his own body—at any rate beyond a few elementary requirements, and unless he manifestly breaks down in the attempt. But, apart from this dangerous subdivision of important responsibilities between the

teacher who knows something of educational principles, the parent who knows less, and the child who knows nothing at all of them, what grounds are there, I would ask, for assuming that the careful discipline and studied control which all agree in considering necessary for the mind, and which most people consider necessary for the morals, should be altogether denied to the body? The ridiculous nature of such an assumption is obvious as soon as stated. If physical training and development require no special cultivation, they stand alone in this respect. I am quite familiar with the specious argument of many so-called practical people, that you come to do a thing right by doing it. If this method were applied to all branches of education, the latter half of a man's life would be exclusively devoted to unlearning the errors he had acquired during the previous half. All true friends of children would rather say:—"First learn to do a thing right, and go on doing it." Besides the argument of analogy, there are positive facts in support of organised physical training of the young in schools. We know, for instance, that a certain degree of physical integrity is a necessary antecedent of good mental work, and the formation of sound character. We know that physical integrity largely depends upon regular and systematic physical exercise, and (what is more to the point still) we know how often children break down in school life—at least for a time—from want of proper physical supervision, more in day schools than in boarding schools, and more often with girls than with boys.

I have tried to obtain information from several girls' schools in various parts of the country, and the mistresses of eighteen

schools have kindly responded to a series of questions put before them in a circular letter; but unfortunately the answers are given in such a form as to make any rigid comparison untrustworthy. But I will take, as a sample, one large, well-managed day school of over 200 middle-class girls, where some statistics have been very carefully kept. Over a period of six years no fewer than 10 per cent. of the total number of girls admitted during that time have been compelled to take one or more terms' leave of absence on account of general debility. No fewer than 13·3 per cent. of the removals during the same period were removed prematurely, avowedly on account of ill-health. The average number of daily absences is about 7 per cent., though it is true that some of them are due to infectious disease at home, and not of the scholars themselves. Of the present number in the school, as many as 28 per cent. have medical certificates exempting them from gymnastic exercise, and 10·25 per cent. of the total present number wear eye-glasses of some kind. Without making too much of these figures, there is abundant reason for concluding that many of these failures are from want of proper physical supervision, and at least they constitute a strong *prima facie* case for inquiry.

Lastly, if it be true that by careful physical training the health of the body may be improved and the mental capacity to some extent increased, and the moral character strengthened, surely in these days, when the struggle for existence is so keen that only the fittest survive, the subject of the physical education of the young is one that demands close attention.

(To be continued.)

FRENCH CANADIAN FAMILIES. — Our French fellow-subjects in Canada form a remarkable contrast to their cousins in France in the number of their families. In France the population is stationary or actually retrogressing, and the small growth in the population is due to foreigners and settlers. In French Canada the families are large—often very large—and we learn from a recent report of the Department of Agriculture that 1009 fathers have applied for the hundred acres of Crown land offered to every family of

twelve living children, and that 12,447 children altogether are represented by these applicants. A similar relation, but in the opposite direction, exists between the English at home and their cousins of English origin in the eastern states of America, so it is not the soil or climate, but the habits and customs of the different sections of the French and English people in Europe and in America which determine the difference of fertility of the two sections of the races.

A FRENCH VIEW OF ENGLISH ATHLETICS AND GAMES,

An Address delivered at a Conference on Physical Training, Boston, U.S.A., 1890.

By MONSIEUR PIERRE DE COUBERTIN,

Secretary of the French Educational Reform Association.

BEING commissioned by the French Government to visit the universities and colleges of the United States, not only with reference to the subject of physical training, but with reference to other branches, my duty is to present my report previous to any public statement on the subject. But I understand, from inquiries I have made, that the French Minister of Public Instruction is not here to-day, and I trust you will be kind enough not to let him know what I have been doing in Boston!

I was asked the other day what, in my opinion, American education was like. I answered that in some respects it looked like a battle-field where English and German ideas were fighting. While I fully acknowledge that from the physical point of view nothing can be said against the German system, I believe, on the other hand, that from the moral and social point of view no system, if so it can be called, stands higher than the English athletic sport system as understood and explained by the greatest of modern teachers, Thomas Arnold of Rugby. His principles are the ones on which was founded last year the French Educational Reform Association. I wish I could give you a detailed account of the work our Association is engaged in carrying out; it is no less than a general reform of secondary education. We leave aside the primary school question which our government has lately settled, as I believe, in the best way. In such schools a systematic course of physical training is needed, and the experiments that have been tried in France have proved so successful that there is no reason why we should try anything else. The German methods have now only to be developed in all our primary schools and made the general rule. We also leave aside higher education, for the simple reason that if we want to have well-trained men, who will enjoy manly games and sports, the best and quickest way to realize that wish is to train the boys who are to become the men, and to develop among them a strong taste for manly games.

We believe that the most important period in a boy's education is the one extending from his twelfth to his nineteenth year. During that period not only his brain, not only his body, but above all his *will* can be trained. His qualities as a citizen depend almost entirely on the lessons he receives at that early time of his life. I must state what kind of a citizen we need in France; I do not know that our ideal type is the same as yours, though I am inclined to think that the difference is not very great. We want free-minded, self-governing men, who will not look upon the State as a baby looks on its mother; who will not be afraid of having to make their own way through life. Such is the work that our Association has pointed out to French teachers as being the most important part of their duty. It involves practically what I should call the training for freedom.

Now, where is the ground on which such a training can take place? What is the freedom which a boy of fifteen can enjoy? Is it intellectual freedom? How can this be? I believe if a boy were left to his own impulses in that way, he would learn nothing at all. He would set aside Latin, Greek, history and mathematics, and be content with reading novels on rainy days. Is it moral freedom? I need not say what would come of that. His play is the only part of his life where he can enjoy freedom. Let him have the management of his own games, and so you will turn out a man fitted for social life, that is, as long as you consider society as a gathering of free men; some do not, and it is quite natural that they should have another aim in education. We do, and this is our aim.

Now, can the English system of free athletic sports be carried on together with a systematic course of gymnastics? I believe that to a certain extent it can, so long as you do not make that course compulsory, and it does not interfere with the management of the athletic clubs and societies.

I must draw your attention once more to the fact that I am not speaking of the public schools nor of the universities. I

need not say that I have been very much interested in what I have seen in this country, at Amherst, Harvard, Cornell and other places. The work done there must be good. Its usefulness is proved by the fact that such men as Dr. Hitchcock of Amherst, Dr. Sargent of Harvard, and Dr. Hartwell of the Johns Hopkins believe in it and carry it out themselves. I am only speaking of the schools where boys from twelve to nineteen are taught. Such are our French lyceums, colleges in England, and some recently founded schools in this country, as, for instance, Groton School, Lawrenceville, the Berkeley and others where Arnold's precepts are followed. Any one who has read Stanley's "Life and Correspondence of Arnold," or that charming book "Tom Brown's Schooldays," knows what kind of good Arnold has done for his country. But I did not realize how great had been the change till last year when Mr. Gladstone told me about the state of things when he was himself an Eton boy, sixty-five years ago. The moral standard was then very low. The boys had sport, but they turned it into brutality; hacking, fagging and mischief of all kinds went on every day. Masters and pupils looked on one another as strangers, if not as enemies. Then came Arnold; in five years' time Rugby was completely transformed, and the reform spread all through England. That was some fifty years ago; and if you study closely the political, social and moral events in England for the last fifty years, you will find, as I did with no little bewilderment, that the change was sudden and general in politics as well as in society. I wish I could give you more details,—I am writing a book on the subject,—but the only thing I will say is, that the educational reform carried out by Arnold and his followers has been one of the most im-

portant events in the life of the English people, and that it prepared the way for the bright period called the Victorian era, the chief characteristic being the wonderful influence of athletic sports on the moral and social qualities of boys.

In connection with the exhibition we had last summer a great number of congresses in Paris, so many indeed that the *Figaro* proposed to give a prize to the man who should not be a member of any congress, if such a man could be found. Among others we had one on Education, of which I had the honour to be the secretary. Early in January we issued a circular and sent it to the head-masters of English Colleges all over the world. Six thousand copies were sent, and we got a great many answers—from the Cape Colony, from Australia, from America, from English settlements in China, and from Canada—to the following questions: What are the games played in your school or university? If there are local plays, give the chief rules. How many hours do the boys play? a day? a week? What about riding horseback, fencing, military drill, rowing? Are they allowed to form athletic associations? Have they debating societies? Do you believe in athletics improving companionship? morality? work? temper? I added that detailed accounts, books, pamphlets, and school reports and papers would be accepted with gratitude, and we got so many that we were obliged to open a library to put them in.

This inquiry has showed us all over the world Englishmen, who perhaps knew very little about Arnold himself, were still holding to his views and ideas and believed them to be the best. A reform of the same kind we are now trying to introduce in France, according to the perhaps unchristian, but very practical principle: when you find your neighbour has something good, take it.

A TRAINING COLLEGE FOR TEACHERS OF PHYSICAL EDUCATION.

By THE EDITOR.

No satisfactory progress will be made with the physical education of the masses of our population until intelligent and well-educated persons adopt physical education as a career, and are able to acquire a fair knowledge of anatomy, physiology and personal hygiene, as well as submit to a prolonged training in phy-

sical exercises of all kinds. For this purpose it is necessary that we should possess a properly-endowed training college, situated in some central district where there are medical schools, and where competent teachers of physiology and hygiene can be obtained, the institution being planned and managed like our

existing training colleges for science and technical education.

An opportunity offers at the present moment, which may never occur again, of obtaining an endowment fund for a training college of this kind, and the advocates and friends of physical education should take immediate advantage of it. The case of a charitable trust (*re* Berridge, *Berridge v. Turner*) was brought before the Lords Justices of the Appeal Court on November 14th last, as to whether a bequest of £200,000 left by a testator "for the advancement and propagation of education in economic and sanitary science in Great Britain," was a good charitable gift. The Lords Justices Lindley, Bowen and Fry decided that it was a good charitable gift, and the court directed that a scheme concerning the legacy should be settled. The following are the particulars of the bequest as reported in the daily papers:

The testator was Richard Berridge, of Ballinahinch Castle, county Galway, Ireland, and of Knowle Hall, near Bridgwater, in the county of Somerset. He died in 1887, having by his will bequeathed the sum of £200,000 to his trustees upon certain trusts, and directed that such legacy should be paid exclusively out of such part of his personal estate as might by law be bequeathed for charitable purposes. He further directed that his trustees should stand possessed of the said legacy upon trust, to apply the same "for the advancement and propagation of education in economic and sanitary science in Great Britain;" and he declared that if he gave no further directions as to the manner in which this charitable gift was to be carried out, his trustees might settle a scheme for the purpose at their discretion, and if approved by the Attorney General for the time being, such scheme should be valid and binding in all respects. On the 15th February the matter came before Mr. Justice Stirling, who was of opinion that the legacy was a valid charitable bequest, and he accordingly ordered the trustees forthwith to prepare a scheme for the application thereof. Lord Justice Lindley was of opinion that the decision of Mr. Justice Stirling ought to be affirmed. He said the only way in which to account for this appeal being brought was the fact that a very large sum of money was involved. Not only was the matter covered by authority, but it was clearly a good charitable gift. There might, possibly, be something vague about a gift "for the advancement and propagation of education in economic and sanitary science," as had been argued; but the boundaries of every science were more or less vague. It was not so vague, however, as to prevent the court from directing a scheme concerning this legacy to be settled.

From the nature of the bequest it is obvious that the trustees of this truly

magnificent legacy will experience considerable difficulty in devising a scheme or schemes which will effect the wish of the testator, "to promote education in economic and sanitary science," and they will doubtlessly be glad to entertain any practicable scheme which may be submitted to them by persons who are acquainted with our national economic and sanitary requirements. It would be difficult to conceive any work or institution which would be more appropriate or more in accordance with the spirit of the testator's instructions than the organisation and improvement of physical education by the establishment of one or more training colleges for the education of teachers, and with a view to bringing this subject to the notice of the Berridge Bequest trustees we shall be glad to receive the names of persons who are favourable to it. We propose to submit the scheme in the form of the following petition, leaving the detail to be worked out when required.

"To the Trustees of the Berridge Bequest for the Advancement and Propagation of Education in Economic and Sanitary Science."

"We, the undersigned, beg to call your attention to the pressing need which exists for the establishment and endowment of a Training College for Teachers of Physical Education, and to urge upon you the desirability of devoting part of the fund at your disposal to the establishment of such a college on the lines of the Training Colleges for Science, Arts, and Technical Education at South Kensington, to be situated in some place where instruction in anatomy, physiology, and hygiene can be given by duly qualified teachers. We are of opinion that there is no economic or sanitary question of greater or more urgent importance at the present time than the physical education of children, especially in our large towns, since compulsory mental education has concentrated the children in school-rooms and deprived them of much of their physical freedom. No such establishment at present exists in Great Britain, although they are to be found in other countries like Sweden and Germany, and we are almost entirely dependent for the physical education of our children on drill-sergeants, professional gymnasts, and foreigners, who have had little or no education in physiology and hygiene, and who are not subject to scientific supervision or examination, nor to Governmental control."

Signatures to be attached to this petition will be received by C. Roberts, Esq., F.R.C.S., 63, Curzon Street, Mayfair, London, W., and T. C. Horsfall, Esq., Swancoe Park, near Macclesfield, Cheshire. If this plan for obtaining

the necessary funds for establishing a Training College for Teachers of Physical Education does not succeed, other methods will be adopted, and we shall be glad to receive any suggestions on the subject.

Editorial Notes.

THE Editor's object will be to provide a high-class journal which will deal with physical education in all its aspects, from nursery and kindergarten games to field sports, and as a medium of communication between students and teachers of all classes, but more especially between medical men and schoolmasters and mistresses, on questions relating to the cultivation and perfecting of all the physical faculties of the human body. It will not deal with diseases or their remedies, but physical deformities of the body due to vicious habits in school or elsewhere will receive attention. Personal hygiene will also be dealt with, but the larger questions which fall into the province of the sanitary engineer, such as drainage, water supply, &c., will be excluded, as they are already sufficiently dealt with by other journals. The education of the senses will form an important feature of the journal. The training of the eye and hand in what is called "Practical" and "Technical" education in this country, and "Slöjd" in Sweden; of the voice in stammering, speaking, and singing; and of the physical methods of teaching the Blind, the Deaf and Dumb, and the feeble-minded, will also fall within our province.

There is no word in our language which, like gardening for the cultivation of flowers and fruit, or farming for the rearing of cattle, is applicable to the cultivation of the physical nature of man, and we have therefore been obliged to adopt the title of Physical Education as the one which most nearly expresses our object, "PHYSIQUE" being used as a short and convenient title. The word gymnastics was used by the ancient Greeks to cover all the education, mental and physical, which they thought it necessary to impart to their children, but this word has become identified among us with a special kind of physical training, and covers only a part of the ground which we propose to occupy.

In France and Germany the higher schools for mental education, corresponding to our Public Schools, are called Gymnasias. The same objection applies to the word athletics, which, as commonly understood, applies only to a section of the subject we propose to discuss.

We think the time has arrived when the rivalry between the advocates of the different branches of physical training should be removed by a statement of the merits and special application of each branch to the ever-varying conditions of modern civilised life. There are probably few persons who will deny that our English athletic and field sports supply the highest form of physical training, but they are not applicable or available for all classes of children, or even for all the members of the same class; and the concentration of our population in towns, where sufficient space for athletics cannot be obtained, compels us to give more attention to gymnastics than we have hitherto done. We are as much behind other countries like Germany, Sweden, France, and America, in respect to gymnastic training as they are behind us in athletic exercises, and it is neither wise nor politic that this difference should continue to exist. The difference of opinion between the advocates of the two classes of exercises is one rather of sentiment than fact, as physiologically they are identical in character, and we hope, by a fair and impartial discussion of the whole subject, to make this obvious to all our readers.

A very wide feeling in favour of physical education has been growing up for many years past among all classes, and medical men and schoolmasters and mistresses are being appealed to for advice and guidance; but the medical men are too much absorbed in the investigation and treatment of disease, and school teachers in the preparation of their

pupils to pass mental examinations, to give serious heed to these appeals, and consequently both the healing and the teaching professions have come to look on physical education as lying outside their respective provinces. Thus, by the neglect of the profession which should define the principles and the profession which should put them into practice, physical education has been allowed to fall into the hands of the drill-sergeant and professional gymnast, who take a much too narrow and technical view of its aims and objects, and who are unable to agree among themselves as to the merits of their respective systems. This kind of passive indifference is by no means confined to the members of the medical and teaching professions, but is shared by parents, clergymen, trustees, governors, committee-men and other persons engaged in the management of children and schools. It will be one of the principal objects of this journal to urge the importance of physical training on the attention of all these classes of persons, and to make them alive to their responsibilities in relation to it.

There is no existing journal which deals with the science and art of physical education, and the subject receives but scant and casual notice in our numerous medical and educational journals, while the so-called sporting papers deal with it almost entirely from the point of view of prize contests. We have few books on the subject, and such as exist are for the most part of a technical character and suitable only for teachers of gymnastics. The recent publication of Lagrange's "Physiology of Bodily Exercise" forms a new era in the scientific study of physical education, and it cannot fail to give a great impetus to its further development. We possess some good books on Games and Sports, and two or three manuals of School Hygiene, but Personal Hygiene, which deals with the individual and his habits of life, food, sleep, bathing, clothing, exercise and the like, has not received as much attention as it deserves, and we shall endeavour to supply this deficiency.

"SCUTTLE" IN LANCASHIRE. — The magistrates of Manchester recently applied to the Home Secretary for help to put down a local kind of physical violence known as "scuttling," in which bodies of young persons, male and female, from fourteen to twenty-one years of age, belonging to one part of the city attack

similar bodies in adjacent parts with whom they have a real or fancied grievance. The opposing forces arm themselves with such weapons as belts, with large buckles to them, knives, pokers, stones, and the like, and turn out at times for a regular affray, and inflict serious injury on each other. They belong to the lowest type of the working classes, but are not criminals, and their fights cause considerable alarm to the people of the neighbourhood, and much damage to property is done. The Justices have been unable to put down "scuttling" under the existing Police Acts, and they asked the Home Secretary to procure legislation which would enable them to use corporal punishment—the "birch" up to a certain age, and the "cat" for the older offenders. The Home Secretary thought there would be great difficulty in passing a measure of this kind through Parliament, as there was a great aversion to flogging in the House, and there would be much difficulty in defining the offence of "scuttling." [The word should probably be "scuffling" which is the common expression in the North for a free fight, "scuttling" meaning to run away from such fights].

Before proceeding to extreme measures in putting down these quarrels—which, by the way, read like a parody on the mediæval quarrels of the Montague and the Capulet, and the Orsini and the Colonna—the people of Manchester would do well to try to find a more useful outlet for these outbreaks of physical energy of their youths and maidens. Outbursts of this kind of excitement are due to physical inaction and the unnatural restraints of town life, and are akin to the ghost dances of the Red Indians, the war dances of savage tribes, the running amock of the natives of India, the contortionising of the Mahomedan dervishes, and the antics of some Christian people nearer home. To paraphrase Lord Palmerston's *dictum* on sewage, "scuttling" is physical energy in the wrong place. If these excitable Lancashire lads and lasses were systematically drilled in schools or gymnasia, and the young men were allowed to let off their superfluous energy in athletics, boxing, wrestling, and outdoor sports—if, in short, they were allowed to "scuffle" with each other under proper restraint and rules—there would speedily be an end of "scuttling," and the recruiting sergeant would be in less straits to obtain his annual tale of recruits than he is at present, and the offenders would be saved from criminal associations.

Societies.

We shall be obliged to secretaries of societies if they will send us reports of meetings, papers, and discussions on anthropology, physique, physical education, &c.

THE NATIONAL HEALTH SOCIETY.

EXAMINATION OF TEACHERS OF PHYSICAL EDUCATION.

ACTING on the suggestion of some mistresses of girls' High Schools who have found great difficulty in obtaining well-educated and competent teachers of physical education, the National Health Society (53, Berners street, W.) has, under the guidance of a special committee, instituted an examination for young men and women who wish to devote themselves to this work, and we give the prospectus of the society below. The time has not yet arrived for persons who have been educated and trained in accordance with the regulations laid down to present themselves for examination, but the inquiries of the committee, and the result of a recent examination of a few candidates under a modified curriculum, show that suitable opportunities for acquiring the necessary knowledge, especially of anatomy, physiology and hygiene, and the whole of the necessary technical details of physical training do not exist in this country, and that it is to better and more scientific teaching, rather than to examinations, that we must direct our attention if we wish to possess an intelligent class of teachers of physical education for boys' and girls' schools. It is quite impossible that teachers of mental education, who are already overburdened with work, can add physical education to their other duties, as is sometimes urged, and the institution of a special class of teachers is absolutely necessary. But seeing how closely the preservation of the health is associated with and dependent on domestic economy and with some forms of technical education, the teaching and practice of these various subjects might well be combined in the same persons. The following are the regulations of the National Health Society:—

Diplomas of proficiency in the art and science of physical education are granted to such teachers of gymnastics, calisthenics, and physical exercises, as have fulfilled the necessary curriculum, and have passed the required examinations.

The Society hopes, by the institution of this diploma, to encourage the development of physical education in this country, to render such training precise, effectual, and scientific; to protect the public, on the one hand, from incompetent teachers, and to establish, on the other, the position of such instructors as are fully qualified. It is intended, moreover, that the work of such teachers should be devoted and restricted to the one legitimate object set forth in the diploma, viz., physical training, and that they should not undertake the treatment of deformity or disease by "movement cures," "remedial exercises," massage and the like.

The diploma will certify that the candidate has passed an examination in the art and science of physical education, has fulfilled the curriculum required by the Society, and is fully qualified to act as an Instructor of gymnastics, calisthenics and physical exercises generally.

Candidates for the diploma of the Society must produce evidence:—

- 1.—That they have reached the age of 20 years.
- 2.—That they have passed some recognised public examination in arts, such as the Oxford or Cambridge Senior or Junior Local, the College of Preceptors, the Matriculation examination of any University in Great Britain or Ireland, the Government Elementary Teachers' examination, &c.
- 3.—That for a period of not less than two years they have received personal, continued and systematic instruction in all practical matters relating to physical exercises in a recognised gymnasium or training school, and under the supervision of a recognised teacher have personally instructed for a period of not less than three months a class of pupils not less than ten in number.
- 4.—That they furnish a detailed synopsis of the exercises and drills with which they are familiar, and of the gymnastic apparatus of which they have personal acquaintance.

Candidates for the diploma of the Society will be required furthermore:—

- 1.—To pass an examination in the following subjects:—
 - I.—The elementary anatomy of the bones, joints and muscles.
 - II.—The physiology of bodily exercise.

III.—The practical details of physical training and the various appliances and exercises concerned therein.

The examination will be conducted both by written papers and by *viva voce*, and will be held twice in the year.

The following text books are recommended:—"Artistic Anatomy," by Matthias Duval; Huxley's "Elementary Physiology;" "Physiology of Bodily Exercise," by Lagrange; "Physical Education," by Maclaren; "Modern Gymnastic Exercises," by Alexander; "Swedish

Drill," by Melio; "Musical Drill," by Alexander; "A System of Free Gymnastics," by Sergeant-Major Sydney Noakes.

To satisfy the examiners as to their ability to conduct class instruction, candidates will be required to conduct a class in the presence of the examiners, and will be called upon to set the exercises themselves. In this connection regard will be paid to clearness of articulation, manner, physical fitness, &c. It would be of advantage if the candidate possessed some knowledge of music.

The Magazines.

HOW TO FOUND A FAMILY.

IN an article on "Family Stocks in a Democracy" in the *Forum*, Professor C. W. Eliot calls attention to the importance of good physique, physical occupation, and country life, in the evolution of a superior family stock, such as we in England call a "Country Family." The professor says:—"I ought to explain what I mean by good, or superior, family stocks. I certainly do not mean merely rich families. Some rich families are physically and morally superior; others are not. Obviously, in America, sudden and inordinate wealth makes it not easier, but harder, to bring up a family well. Neither do I have sole reference to professional or other soft-handed people who live in cities. On the contrary, such persons often lack the physical vigour which is essential to a good family stock. I have in mind sturdy, hard-working, capable, and trustworthy people, who are generally in comfortable circumstances, simply because their qualities are those which command reasonable material, as well as moral, success. I have in mind, for instance, a family whose members have multiplied and thriven in one New England village for 130 years, always industrious, well-to-do, and respected, but never rich or highly educated, working with their hands, holding town and county offices, leading in village enterprises, independent, upright, and robust. I have in mind the thousand family stocks which are represented by graduates, at intervals, for one hundred years or more, on the catalogues of Harvard and Yale colleges—families in which comfort, education, and good character have been transmitted, if riches or high place have not.

The men of a good family stock may be farmers, mechanics, professional men, merchants. But I consider that one kind of family ought specially to be multiplied and perpetuated—namely, the family in which gentle manners, cultivated tastes, and honourable sentiments are hereditary."

What are the means of perpetuating good family stock in a democracy?

The first is country life. All the vigorous aristocracies of past centuries lived in the country a large part of the year. "City life is changeful, noisy, exciting, and hurrying; country life is monotonous, leisurely, and calm. For young children particularly the necessary conditions of dense populations are unfavourable. Country breeding gives a vigour and an endurance which in the long run outweigh all city advantages, and enable the well-endowed country boys to outstrip their city-bred competitors.

"A very practical question, then, is how to resist, in the interest of the family, the tendency to live in cities and in large towns. For families in easy circumstances there is no better way than that which European experience has proved to be good—namely, the possession of two houses, one in the country and the other in the city, the first to be occupied for the larger part of the year. The next change for the better is the adoption of suburban life by great numbers of families, both poor and well-to-do, the heads of which must do their daily work in cities. An important advantage which country life has over city life is that it requires, permits, or encourages out-of-door occupa-

tions for men, women, and children. To offset the evil effects of indoor occupations, every city family which aspires to vigour and permanence should assiduously seek fresh air and out-of-door pleasures or occupations. All children in well-to-do families should be taught to walk long distances, to swim and to row, and to ride on horseback. Girls need these accomplishments as much as boys. If modern democratic families are to be perpetuated like ancient aristocratic families, they must live as robust and healthy lives. If the family occupations are not manual, the boys should learn to use some tools—the gardener's, carpenter's, turner's, blacksmith's, machinist's, founder's, or plumber's—and the girls should learn to cut out, sew, knit, and cook; and whether the family occupations are manual or not, out-of-door life should be cultivated to the utmost. Americans have not the skill of Europeans in availing themselves of

every chance to eat or work in the open air, under the shelter of a tree or of a vine-clad arbour. Neither the poorer sort nor the richer possesses this skill, or feels an irrepressible desire for such opportunities. One often sees, in the suburbs of our cities, large and costly houses placed in lots so small that there is hardly more room for out-of-door pleasure than in a city block.

"Next, a permanent family should have a permanent dwelling-place. The human mind can scarcely attribute dignity and social consideration to a family which lives in an hotel, or which moves into a new flat every 1st of May. In the country, however, things are much better."

Professor Eliot's advice is good as far as it goes, but he has overlooked the importance of the possession of land, and of field sports and military training in the evolution of our old-world aristocracies.

Reviews and Notices of Books.

HANDBOOK OF DEVELOPING EXERCISES.
By Dudley A. Sargent, A.M., M.D.,
*Director of the Hemenway Gymnasium,
Harvard University, Cambridge, Mass.* 84
illustrations. Cambridge, Mass., U.S.A.,
1889.

Dr. Sargent is well known in this country by his contributions on Physical Education in the illustrated American magazines, and he holds a foremost place as an authority on all branches of the subject in his own country. In the Handbook he has sent us, Dr. Sargent takes for granted what we very imperfectly recognise in this country—that the proper physical development of the body is a personal matter, and, in respect to adults at least, is to be studied and practised by individuals rather than in classes. Hence he has devised an ingenious arrangement of ropes, pulleys, and weights, for the development of every part of the muscular system. The plan is not new to us, as the late Mr. Proctor, in his book on "Strength," described various ways by which such apparatus could be extemporised in a bedroom; and Mr. Alexander, in one of his manuals, has figured a similar contrivance. But Dr. Sargent has displayed much more novelty, and a much greater variety of devices, than either of these authors. Thus we have a series of "Chest-weights," in four courses and forty-seven positions;

"Treadles," "Bridle," "Stirrup," "Travelling Parallels," "Short Inclined Plane," "Lifting Machine," "Chest Developer and Expander," "Travelling Bar," "Finger Machine," "Long Inclined Plane," "Giant Pulley," "High and Low Pulleys," &c.—a series of mechanical apparatus which are in many respects similar to Zander's but of simpler construction and easier of application. The author explains in his preface that the exercises are to be selected according to the pupil's needs. "Their intelligent application to personal needs depends entirely upon a thorough physical examination, and, when the condition of the individual has been thus ascertained, the necessary apparatus should be marked, and the weight, the number of times, and the rate of movement clearly indicated." It is obvious that Dr. Sargent intends his exercises to be carried out by the direction of, if not, indeed, under the immediate supervision of, a medical man, a condition which can be easily complied with in American University and College Gymnasias, as they are all under the supervision and direction of medical men.

The most useful parts of Dr. Sargent's Handbook for the general reader are the directions for exercise, diet, sleep, air, bathing, clothing and muscular exercise, and as a specimen of these we may give his directions on :

GENERAL EXERCISE.

In order to realize the best results from physical exercise, enter with earnestness and enthusiasm into whatever you undertake.

While choosing a place for exercise, bear in mind that the chief requisites are plenty of light and fresh air.

If you have been inactive for a long time, confine yourself for a day or two to the free movements without weights.

Gradually increase the time and amount of exercise, but do not continue it to exhaustion, and always end as gradually as you begin.

Do not keep the muscles on the stretch. Relaxation should follow contraction, or, in other words, rest should follow exercise. The best way to secure local rest is to use the muscles of some other part of the body by a change of position or apparatus.

Do not try to accomplish your best work at feats of agility or strength until your blood is circulating freely and you are thoroughly warmed and limbered up.

The muscles should not be compressed by tight clothing.

If the weather is cold, or if no opportunity for preliminary movement of the limbs is afforded, the muscles should be rubbed vigorously before putting them to a sudden strain, as in jumping, sprint running, &c.

Exercise daily and at regular times, if possible. Do not exercise within two hours after eating nor a half hour before.

If overheated or fatigued, a gentle rubbing-down with a Turkish towel will promote surface circulation and prevent taking cold.

Never reach the maximum of exercise (as indicated herein) until near the end of the season's training.

Reduce the time and amount of exercise gradually, allowing two weeks to elapse before going out of strict training.

At the end of six or eight months a complete change of work is advisable, alternating the regular system with other forms of exercise.

For the student, the professional and the business man, the best time for daily exercise is between the hours of 4 and 6 p.m.

The apparatus appears to be very popular in America, as it has already been adopted in upwards of 150 University, College, School and Club Gymnasias, and we hope that some enterprising manufacturer of gymnastic apparatus will give us an

opportunity of forming an opinion of it from practical experience in this country. The illustrations are excellent, both in respect to the attitudes of the figures and as woodcuts.

BOOKS AND PAMPHLETS RECEIVED.

The Management of Children, by A. Mother (London, J. and A. Churchill). First Principles of Education, The Use of Pictures in Schools, and Physical Training, by T. C. Horsfall (Manchester, J. E. Cornish). The Physique of the Soldier and his Physical Training, by Colonel G. M. Onslow (United Service Institution). An Address in School Hygiene, by Clement Dukes, M.D. (Cassell and Co.). Proceedings (fifth year) of the American Association for the Advancement of Physical Education (Ithaca, U.S.A., Andous and Church). The Physiology of Exercise, by E. M. Hartwell, M.D. (Boston, U.S.A., Cupples and Co.). A System of Physical Culture, by Carl Betz (Kansas City Presse, Mo., U.S.A.). Anthropometry and Physical Examination, by Jay W. Seaver, M.D. (New Haven, Conn., U.S.A.). Report of the Froebel Society for the Promotion of the Kindergarten System. Alcohol and Childhood, by Clement Dukes, M.D. (London, 9, Bridge Street, S.W.). The Gymnasium (Coop and Boms, Providence, R.I., U.S.A.). Nineteenth Annual Report of the Kansas City Public Schools. Catalogue of Standard Scientific Gymnastic Apparatus made by Narragansett Machine Company, Providence, R.I., U.S.A.). The Anthropometric Manual of Amherst College, U.S.A., by Drs. E. Hitchcock and H. H. Seeley. Report of the Committee on Physical Training, 1890 (Boston, U.S.A., Rockwell and Co.). Anthropometric Tables, Wellesley (Girls') College, U.S.A., by Lucile E. Hill and M. Anna Wood. A Study of Physical Measurements at Cornell University Gymnasium, by E. Hitchcock, Jun., Ithaca, N.Y., U.S.A. Report of Physical Training Conference, Boston, 1889 (George E. Ellis, Boston, U.S.A.). Stammering, by Dr. E. Blake (London, Harrison and Son).

NOTICE TO CORRESPONDENTS.

Communications, Books, &c., must be sent to the Editor of "Physique." Addressed and stamped envelopes must be enclosed when contributions are to be returned. Business letters must be addressed to the Publishers, Messrs. George Bell and Sons, York Street, Covent Garden, W.C.

Physical Education.

PHYSICAL SPORTS OF THE ANCIENT WORLD.

By R. J. MACKENZIE, M.A., *Rector of Edinburgh Academy.*

(Continued from page 9.)

ANCIENT training for the Athenian sports was at first conducted mainly on dry cheese, which one would imagine should give a runner a nimble and enduring temper; but Dromcus, the famous athlete, discovered that beef was better, and from that time forward the Greek athletes indulged largely in beef. In fact, in the intervals of vigorous exercise, they seem mostly to have been persons of congested livers, who spent a large part of the day in sleep. I fancy that most of Plato's disciples belonged to this class of persons. At all events I cannot otherwise explain his extraordinary recommendation, that, as physical education is necessary, and as it makes people extremely sleepy, boys from the age of eighteen to twenty should practise nothing but athletics, and from twenty onwards nothing but philosophy. I believe the true remedy would have been to cut down the beef and diminish the athletics. The disproportionate development of such athletes is mentioned by Socrates. He protests against those runners with their monstrous legs. I imagine these to have been due to their running on sand; for all athletes know that the best modern runners, at least for long distances, are often people with remarkably lean legs. He protests also against the big arms and shoulders of the professional boxer. Such disproportion was wholly antagonistic to the spirit of Athenian physical training, which had about it this distinctive mark, that it aimed not only at practical advantage—it aimed also at producing an ideal standard of beauty.

THE ROMANS.

Into the mind of a Roman, on the other hand, the notion of an ideal beauty never for one moment entered. Most of you have heard the well-known story about the Consul Mummius, who, when he was shipping art treasures from Greece to Rome, gave a strict order to the Roman soldiers, that whoever broke one of the statues must supply another of equal value in its place. There you have the true Roman temper. The Roman knew nothing of an ideal. He cared only for practical considerations. In the early days of Rome we hear of a great city

festival, the *Ludi maximi Romani*, and we learn that it was of Greek origin. Chariot racing then took place, as well as wrestling, boxing, and running, and a selected number of the Roman youths competed. The invincible objection of the Roman noble, however, to exhibit himself in public soon put an end to these primitive contests; by-and-by it was only freed-men and foreign gymnasts, riders, and boxers that competed. At length the ferocities of the gladiatorial exhibitions were introduced; and what chance had the old simple shows when confronted with such terrible rivalry? Yet, you must not imagine that the Romans were a sedentary people. Just as in modern times a short rule of health is to wear flannel next one's skin, and not to mix one's liquors, so the Roman rule of health was—every day take violent exercise, and every day immediately afterwards take a bath. That is the prescription for health which is given by the great physician Celsus, who was supreme in the days of Augustus. In the well-known satire in which the poet Horace describes his daily life, he says:—"When the sun is growing too hot, and warns me that I must go to bathe, then I quit the Campus Martius and the game of ball which I have been playing." Gymnastics and games, indeed, were common to all ages. Consuls, Generals who had enjoyed a triumph, even the Emperor himself, played habitually at ball. Augustus was commonly looked upon as a man of sedentary habits, but at the time of the Civil Wars he engaged daily in military exercises on horse and on foot. After that period he took to playing with the pila and the follis—two different kinds of games with the ball—and even as an old man he never gave up his rides and his constitucionals. Galen, the great foe in ancient times of professional athleticism, wrote a treatise, "*περὶ μικρᾶς σφαιρᾶς*"—which means, "concerning the little ball." There were three varieties of balls. One was called the Pila; that was the smallest. Another Paganica; that was the medium size. And the third was the Follis, a big inflated ball, more or less like the modern football. Commentators have tried in vain

to discover exactly what the corresponding games were. For all we know, they were the originals of tennis, or of rackets; but how exactly the games were played we are quite unable to determine. Nor should this surprise us. If the game of cricket, or even the simpler game of golf, were to be lost, I fancy the intelligent New Zealander of some distant century would ponder in vain over the nature of these noble sports. Allusions to the playing of the pila are very frequent. Martial in one of his epigrams makes the ball speak thus:—"If you can return me with your supple left hand I am yours. If not, duffer, give up the ball." The follis, I have said, was big like a football. It was struck with the fist or with the arm. Boxers, as you may see them now in some of the London gymnasia, used to practise upon a follis suspended between the rafters and the floor. Thus also gladiators, or even private citizens in want of exercise, would take a wicker-work shield and sword, and engage in fierce encounters with a post. Hence Martial says of a slothful person:—"You don't play pila or paganica or follis to prepare you for the bath, you don't take a wooden sword and fight the post." Again, a game called Harpaston is clearly described. Galen, who hated violent pastimes of every sort, tells us there was a great deal of "scragging" and pushing and violent work in it; and, so far as we can see, the Harpaston seems to have been exactly a football maul conducted upon old-fashioned methods.

The *halteres*, or springing weights, of which I spoke, were used for jumping. They were also used as dumb-bells. Seneca, describing a visit to Baiae, a kind of ancient Monaco, complains how impossible it was to sleep in the chamber he had hired above the baths, for the deep sighs of men below who were working heavy dumb-bells. The old controversy as to artificial exercise raged then as now. Thus Martial in another epigram: "Why waste your fine muscles on the foolish dumb-bells? Digging a trench in a vineyard is much better exercise." The gravity of Roman manners did not permit women to join in sports of this nature. But men, even the greatest men, joined freely. We are told—and it seems quite comical to us now—that the great Augustus, in taking the constitutionals to which I have already alluded, when he came to the end of the course, used to take a little run and a jump in order to get the benefit of the additional exercise. Old people, in

fact, did not give up their exercise even in old age—they rode, they drove, they walked. Thus the aged Marius, in order to show the Romans that he was still fit to hold military command, went daily to the Campus Martius and engaged in the exercise which there took place. I think it is very much in the same spirit that Mr. Gladstone so frequently delights us by cutting down trees. He is anxious to show us that he who can so cunningly hew a trunk may be safely trusted to carve a constitution. He has his ancient counterpart in this matter in that Spurrinna, of whom Pliny writes: "Every day he plays at ball long and vigorously. For by this means he makes war with old age."

In the preceding sketch I have tried to show you that exercise accompanied the Roman from the cradle to the grave, and now I have almost got to the end of my picture of ancient life. There is one comparison, however, to which I would direct your attention, and it is this. We Christians date our epoch from the birth of Christ—from the dawn, you may say, of religious life. The Romans dated their epoch from the foundation of the city—the dawn of political life; but the Greeks dated theirs from the first Olympiad, which was in the main a great athletic festival. I do not think that this is entirely a fortuitous circumstance. It is typical of the Greek view of education. So far as we can learn, the Spartans had little, if any, intellectual education. Isocrates, talking, I think, of a work of his own, says, "They will probably agree with me, that is to say, if anybody can read it out to them." The Athenians were, of course, very much better educated than their rivals; but as far as we can make out, they learned uncommonly little in their schools. They trusted to drink in intellectual education—as we say—through the pores. Living in Athens was of itself, to men of a gifted race, a liberal education. The splendid public shows that they witnessed in the theatres, the statues of Phidias that adorned the streets, the noble oratory of Pericles or Demosthenes—it was from these, and not so much from the schools, that they gained their wonderful intellectual power. But they were not content to leave the physical education of their boys to precarious methods such as these. They provided for it most carefully; they did not leave it to chance, because they were determined that Athens should not rear a race of tender and incapable persons.

ARE WE INFERIOR IN PHYSICAL EDUCATION TO THOSE GREEKS?

And here, I think, we may ask—Are we inferior in physical education to those Greeks? and I think the answer must be Yes and No. The sons of the wealthier classes who are sent to those English and Scottish schools which systematically attend to the physical education of their boys, receive a physical education which could not be beaten, perhaps which could not be matched, in the ancient world. If a boy plays in winter at football, if he practises running and jumping in spring, if in summer he plays cricket, if in the holidays he betakes himself to fishing and shooting, filling up the interstices of his exercise with golf and gymnastics and fives, I think we have here a system of physical education which combines all the best features of Greece and Rome. But while this is undoubtedly the case, it is perfectly evident that the class who benefit by this system, and who benefit in some cases at the cost of their intellectual training, are a class that is strictly limited, and that the vast bulk of our lads receive a physical education which is lamentably inferior to that of the youths of Greece and Rome. I think that in Scotland, in regard to this matter, we are specially to be blamed. It appears to me that the common theory of day-schools is greatly at fault. What the day-schools—not all, but most—practically say, is this, “Mind the lessons and the physique will look after itself.” Now, gentlemen, we live in a very crowded epoch—in a time when almost every hour of the day is full—and I think you may take it as absolutely certain that if you do not provide for an excellence in your system of education at school, that excellence will not be provided for. You know that this is the case with regard to the teaching of the Bible. Drop the teaching of the Bible at your schools, and you will find that not one boy in ten knows anything about it; and if this is true of an intellectual and moral matter—like the teaching of the Bible—I think it is vastly more true of physical education. The schoolmasters—a great many of them—say that exercise after school hours is a matter for the parent; but parents know very well that it is utterly impossible for them to provide means of exercise for their boys that will interest them and take them out into the open air. I think it will be one of the gains of the next thirty years that every good day-school, both in England and in Scotland—

for I do not think that in England the day-schools are in this matter at all in front of us—will consider it a part of its duty to make systematic provision for the physical education of its boys.

THE PHYSICAL EDUCATION OF GIRLS IS NEGLECTED.

That is one point, and here is another. I have shown you that in ancient Rome the education of the girls, both intellectual and physical, was mostly neglected—that in Athens the girls were very much secluded—that only in Sparta was it realised that the physical education of a girl is as important as that of a man. Now, ladies and gentlemen, I spend my life mainly in endeavouring to organise intellectual effort, in reading ancient works, in striving to impart intellectual stimulus and instruction, so that I am sure you will not suspect me of being indifferent to intellectual results; but what I want to say about girls' education is this, that, next to necessary moral culture, by far the most important part of a girl's education is physical education. It perfectly astonishes me, nowadays, to see the sacrifices of girls' health that parents are willing to make in order to gain for them accomplishments which, in the vast majority of cases, are absolutely unnecessary. A great many of the schools which girls frequent in large numbers, are thoroughly insanitary. By that I mean that the ventilation is not at all properly provided for—that the number of girls in the room is far too great, and that the hours at which the girls go to their lessons are so arranged that for a considerable part of the year they can get hardly any exercise in the light and in the open air. Now, am I not speaking the words of common-sense when I say that all the Italian and French and German, all the piano playing that ever was invented, will not compensate a girl for growing up with pallid cheeks and a hollow chest—will not compensate her for being made a martyr of dyspepsia, or contracting a tendency to consumption? I think parents should lay it most deeply to heart that they have a sacred charge with regard to the physical education of their girls, and that the neglect of this is the one neglect which cannot be atoned for in later life. If the schools ignore the matter, parents should insist on it. If the accommodation in schools is defective, so that their children have to breathe bad air, parents should insist that their children shall not breathe bad air. It is with them that the responsibility ultimately rests, to see that they do not let

their children lose what is, next to the blessings of religion and morals, their most precious heritage—the heritage of health and a sound constitution. For, in conclusion, I would point out this;—We men have to do in the course of our lives many things that are unhealthy. The factory must go on, the office-work must be got through, the bread-winner must win the bread; but, in many classes of society, there is no similar obligation on women, and, therefore, I think they should be, if I may say so, *the physical reservoirs of the race*, and that parents and schoolmasters should be most careful that they do not, in endeavouring to give extra accomplishments to our girls, weaken their physical constitutions. I do not think it is in the least

necessary, or in the least desirable, that girls should grow up ignoramuses. There is plenty of time to teach them to be intelligent, to be literary, or artistic, or scientific—to take an interest in the several things in which their educated brothers take an interest. But my point is this:—Parents ought to feel that the physical education of their girls is a thing of prime importance, and that a walk once a day for an hour—sometimes not even that—with the hands lying flaccid in a muff, and most of the muscles of the body from week's end to week's end never properly exercised at all, is not a kind of training which will turn out mothers that are likely to transmit the vigour of our ancient British manhood.

THE CLAIMS AND LIMITATIONS OF PHYSICAL EDUCATION IN SCHOOL.

By ALFRED H. CARTER, M.D. LOND., *Senior Physician, Queen's Hospital, Birmingham.*

(Continued from page 11.)

2. What are the principles which should guide us in the physical training of children? There is an initial difficulty which will be felt by everyone who attempts to answer this question fully, and that is, a dearth of ascertained facts on which to base conclusions; and until some system of systematic inquiry and inspection is introduced into the bulk of our schools, and statistics are carefully kept, this difficulty will continue. At the same time, our present knowledge enables us to indicate broadly some of the more important principles to be kept in view. First, we must remember that complete physical training should include both work and play; neither by itself can supply all that is wanted. The educational side of physical training necessitates careful organisation and control, and implies more or less close attention on the part of the pupil, while the hygienic side of physical exercise may be largely (but not entirely) left to the spontaneous instincts of children in outdoor games, &c. Proper physical training also presupposes proper physical care with regard to nutritious food, regular meals, suitable clothing, bathing, abundant supply of fresh air, and the like.

THE KINDERGARTEN SYSTEM.

From what has been previously said, it will have been gathered that physical development is a necessary antecedent of proper mental development, and as a

corollary of this fact, the younger the child the greater should be the relative proportion of physical to mental training.

The kindergarten system is based upon the recognition of this principle. By this system the child's mind is approached and trained exclusively by physical impressions, of such a kind as to create a real interest on the part of the child in his work, and to permit of indefinite variety. This is sound common sense, and no child should be troubled with abstract ideas of any kind until after seven years of age—the age at which the kindergarten system may be advantageously replaced by the ordinary system. From this age to puberty the time devoted to physical education relatively to strictly mental work should be large; it should be performed during school hours; that is to say, it should be regarded as a part of school work, and not as an addition to school work.

SEQUENCE OF EXERCISE.

A certain sequence of exercise is also necessary. The brain centres do not develop simultaneously, but arrive at maturity at different times, and in strict relation to physiological differentiation, from the simplest reflex act up to the highest operations of the will. Thus, the leg centres are developed earlier than the arm centres; those of the body of the limb earlier than those of the foot or hand respectively, and those of the limbs earlier

than those of the tongue and lips. In order to secure the best results, physical training should follow approximately the same order. For very young children regulated exercises of the limbs are sufficient, then (in order) exercises with dumb-bells and staves, exercises for the feet and hands (fencing, boxing, &c.), and finally skilled handiwork.

ACCURACY IN DETAILS.

Accuracy in details is a *sine quâ non* of thorough physical training. From the simplest movements up to those which are most complicated, the strictest attention should be paid to minute detail. Children should be made to recognise from the very earliest period that there is a right and a wrong way of doing everything, and to be satisfied with nothing short of the right way, which is the best way. This is only possible by analysing each exercise into its component parts, and by doing the exercise slowly in the first instance. Accuracy necessitates attention, and this implies in its turn complete subordination of the movement to the control of the will. The complete subordination of faculty to will sums up in a sentence the main object of education in all its branches. This is the leading principle of the Swedish system of school exercises, and is one of the reasons why it has been found so efficient for the purpose for which it is intended.

WORK AND NOT PLAY.

We see now that if this principle be observed, physical education means work and not play, and demands its inclusion in the regular curriculum of school work, subject to all the conditions and limitations which apply to work of all kinds.

Other things being equal, the educational and hygienic advantage of physical exercise is in direct proportion to the amount of work done, provided it is work of the right sort, and not carried to the length of undue fatigue. The amount of work is quite independent of difficulty in performance. A large amount of work well distributed over the body causes much less fatigue, and is attended with much less difficulty, than a far smaller amount demanded from only a few groups of small muscles.

GRADUATION OF EXERCISE.

Another principle admitting of wide application is judicious graduation of exercise—graduation in amount and complexity, and graduation as to age, to size, to health, and to sex. This is, perhaps,

one of the most difficult principles to observe, because of the imperfect state of our knowledge, and the small number of definitely ascertained facts to go upon. Graduation should be observed on each occasion the pupil is put through his work. To begin with, the exercises should always be simple and slow, and should be discontinued in the same way, the more difficult work occupying the middle of each exercise.

THE USE OF MUSIC.

A few words as to the use of music as an accompaniment to exercise. Some would absolutely exclude it as in the Swedish method, while others, again, would always have it. The truth, in my opinion, lies between the two. In regular and rhythmical exercises to which it can be adapted, such as marching, running, skipping, dumb-bell, staff, and club exercises, for instance, it is distinctly advantageous: it lessens the strain upon the mind by making the rhythm almost automatic, it makes the surroundings more bright and cheerful, and adds greatly to the interest. But in irregular exercises such as jumping, vaulting, &c., no one would dream of using music. It is with young and delicate children, and girls about the time of puberty, that music is so valuable, and it is just under these circumstances that the rhythmical exercises are the most desirable.

NOT REMEDIAL FOR OVERWORK.

Before passing on to answer the third and last question, I would protest against the very widespread misconception that physical exercise is the remedy for mental overwork. Statements are often made in public which would almost imply that the establishment of gymnasia in schools will provide a panacea for all the untoward effects of sustained mental work. The evils of a too sedentary life are undoubted, especially in the case of the young, and for such evils physical recreation and exercise constitute a certain remedy; but no scheme of physical exercise, however cleverly devised, will neutralise the dangers of mental overwork. The physiological laws which govern nervous and muscular work are essentially the same; there is the same wear and tear, the same demand for periodic rest and nutrition, the same laws of fatigue. It is in the last degree irrational to suppose that the muscles can be properly actuated by an exhausted brain.

(To be continued.)

School Hygiene.

NOTES OF A LECTURE ON "HEALTHY SCHOOLS," delivered in Gresham College.

By E. SYMES THOMPSON, M.D., F.R.C.P., *Gresham Professor of Medicine.*

IN the approaching International Congress of Hygiene, school sanitation seems likely to attract much notice, and it may be wise to draw attention to some of the questions awaiting solution. There seems good ground for hoping that under the Presidency of H.R.H. the Prince of Wales, the Sanitary Congress of 1891 may mark an era of improved health in our schools, and therefore a consequent higher level of physical power and intellectual well-being.

A legislature which forbids a man of science, save under vexatious restrictions, to inoculate a guinea-pig, allows a School Board to imprison children by hundreds in an atmosphere of sewer gas.

The managers of schools are not so much to blame as the schoolmasters and mistresses. Most of these have a languid circulation due to too sedentary a life, thus they feel the cold and close all windows and ventilators, and become so inured to close air and offensive smells that they cease to notice them. Notwithstanding the enormous cost of the school buildings, the value of adequate cubic space and floor space is frustrated by the action of the leaders. This must be met by providing for the uninterrupted interchange of air without draught. This must be secured irrespective of doors and windows. It is far better for the children to wear extra wraps in cold weather rather than to breathe air again and again which has been already contaminated.

The relation of the school system to health needs careful attention, and the direction of the public mind to the most crying defects is likely to prove of essential service. Let us trust that the facts, when collected, will not be buried in Blue Books, but be planted in a fertile soil and bring forth living fruit.

In the first place powers are needed for the compulsory inspection of school buildings as well as workmen's dwellings, and this before the plans are executed. We must not wait until a generation or two of scholars are killed off before taking the necessary steps. The compulsory notification of sickness will prove of great value in limiting the spread of infection in and by schools; to this end the schoolmaster and the district medical officer

should be in touch, and mutually aid each other.

As regards our great Public Schools, the Association of Medical Officers has done much by formulating rules regarding inspection, &c., to limit the spread of disease. The papers issued by this Association will surely aid the managers of schools of lower grade.

It must not be forgotten in arranging the dietary for school children that not only do they need food to replace that which is used up in the ordinary wear and tear of life, but the physical exertion in sports and the mental effort associated with intellectual development must make an exceptional demand on the forces of nutrition; add to these requirements of growth at a time when the body is (or should be) rapidly increasing, and it must be evident that an adequate and highly nutritious food is essential. In the lower class of boarding schools the parents make many complaints, but in our great public schools parents are apt to assume that the payment being high the food is at least sufficient. The boys are too loyal to their *Alma Mater* to find fault with the food, but when the sick boys come to the doctor for advice he is surprised to find that porridge and milk are regarded as extras, instead of being as they should be, an important and valuable part of regular school diet.

If we are to develop our children so as to make the most of their powers we must test them by the methods so skilfully arranged by Dr. Warner, detect signs of imperfect physical or mental development, and secure specially skilled and considerate teachers for those who will become criminal or imbecile if unwisely treated. The capacities and morbid tendencies of children may be, and ought to be, ascertained, and a careful discrimination must be exercised in subjecting them to school work.

It is useless to expect help from the children themselves. Children have a wonderful power of bearing very serious illness without complaint. It is no unusual thing to find a boy playing football when suffering from pleurisy, and cerebral affections may exist for weeks without attracting the attention of the

child. Therefore strict watchfulness should be exercised at boarding schools, and even at day schools, by those in charge of growing children, if we hope promptly to detect illness. A healthy childhood must ever be the vestibule to a vigorous manhood, and no care given to the details of school life is thrown away.

We hope in a future issue to give some details of Dr. Symes Thompson's lecture,

especially as regards the selection of schools in accordance with the hereditary or other tendencies of the child; the management of girls' schools and infant schools; the arrangement of dormitories, methods of physical education, selection of sports, &c. The tables showing the average height, weight, chest girth, and muscular power at various ages were highly appreciated by a large and sympathetic audience.

PROFESSIONALISM IN SPORTS AND ATHLETICS.

By THE REV. EDWIN PRICE, M.A.

IN a sermon on "Fight the good fight of faith" in St. Andrew's, Bishop Auckland, the Vicar put forth the following serious and necessary warning against the degradation of both games and players by the adoption of athletics as a means of gaining a living:—Who can fight the good fight of faith, when there is nothing occupying his mind but the pernicious elements of sport and gambling? If a man's thoughts are on the prowess of his dog—which is more to him at times than his wife and children—or if a whole community loses its better senses over football or any game, this "fight of faith" cannot be maintained. It is almost the great danger which is threatening not only ourselves, but the North of England.

During this last week we have actually seen in our town a meeting whose object was to form a "joint-stock company" to promote football in this place, and which in its result will draw away more and more of the young life of the place from the Christian ideal to that of the gross physical ideal of animal force, and that only. I have nothing to say—God knows it—against any honest manly recreation. On the contrary, one would encourage it in all ways, for men closely kept to work require this relaxation; but to turn this game into a profession—to make a serious business of what should be the relaxation of an hour—is to tempt men away from honest dignified labour, and finally to ruin them.

A little demi-god from twenty-five to thirty-five—when his strength and speed begin to abate the professional football player will be cast off—to take care of himself, and to curse the day he was ever tempted to such folly. His hand will have forgotten its cunning for his honourable trade, and when he would revert to the work of his trade he cannot do it.

And what does professionalism mean more? It means that men are hired to go and live in a place, not their own town, and paid for it for the sake of football; and the town will really be fighting its battles with hirelings. Is there any greater confession of weakness than this?

I have always understood that when in history we read of a nation hiring mercenaries to fight its battles instead of depending upon its own stout hearts, its spirit has well-nigh fled and death is not far off.

The lowest stage of manliness is reached in professionalism.

Men desire the vulgar sense of victory rather than the inspiring manful sense of struggle, which is a noble and a blessed thing in whatever sphere it is seen. This new departure will inoculate our parish with an evil poison which will drag down its spiritual life, and by the trust committed to me, among others, to look after the spiritual life of this place, I must warn every young man against it, and ask the elders not to countenance it by their presence.

In a very little time this increased evil will be in our midst. We shall have our streets filled, not as the promoters of this company imagine, with crowds making the business brisker, but with crowds bringing very bad influences with them; more gambling and more drink will be the only result, and we shall be answerable for the starving wives and children in the present and the future, who ought to be fed and clothed now upon the money passing away in gambling and other harmful pursuits.

This is no part of the Christian ideal at all; it is the very denial of it. These young people will be induced to imagine that the great of the world are the successful football players, and not as God sees them—

the pure, the humble, the self-sacrificing among us.

This is the grossest materialism, and must prevent spiritual growth among us, and the bettering of our race.

What is there in professionalism which

the amateur cannot equally show, of strength, pluck and determination? Nothing. I beseech you for the honour of your Lord's Kingdom, and the truest well-being of our town, to resist this at all points.

National Physique.

OVERCROWDING AND MODEL DWELLINGS.

By C. ROBERTS, F.R.C.S., &c.

It is customary to lay the blame for the overcrowding of the poorer classes in houses and rooms on the landlord or local authorities, while in truth it rests with the people themselves. The reason of this is not far to seek. To people who live from hand to mouth, present economies and conveniences which can be seen and felt are of greater importance than any prospective advantages, which must be taken on trust or on the recommendation of people who are not living under the same conditions as themselves. If we range the advantages and disadvantages side by side we shall see how strong are the inducements to overcrowding of the labouring and artizan classes, among whom the women have other than domestic occupations. Among the advantages are low rents from sub-letting; cheap food, which can be obtained ready cooked and in small quantities as required, thus saving larder, kitchen fires, and time for cooking; more warmth from huddling together, common fires, and a consequent saving in clothing both in price and quantity; greater facilities for obtaining light occupations and such as are suitable to persons in low conditions of health and feeble physique. In addition to all these personal advantages there are the collective advantages of congenial society, and some cheap amusements. Against these immediate and obvious advantages we have to place the disadvantages of low physique, impaired health, and some social discomforts dependent on impure air, bad light, and deficient exercise—disadvantages so obscure in their bearing on the individual that many well-educated persons have not yet learnt to estimate them at their proper value (witness the fashionable flats of Westminster), and which the labouring classes cannot be expected to recognise or feel much concern about. It is obvious, therefore, that overcrowding in towns must

be dealt with from without by the State, local authorities, and voluntary associations, by regulating the construction of dwellings and the restriction of the number of their occupants.

The ventilation of houses in the open country is for the most part horizontal; the winds sweep along the ground, and carry with them and disperse the contaminated air of human dwellings; but in towns the ventilation is chiefly perpendicular, the houses with their stairs and fireplaces are little better than huge chimneys, which collect the dirty air from the streets, basements, and leaking sewers, and pass it up from floor to floor until it finally emerges at the top of the house laden with the poisonous excretions of the inhabitants, and the waste products of combustion and trade refuse. Once outside the houses the air is cooled down, and being heavier than the atmosphere it falls down to the streets to pass through other houses again and again in a like manner, or to stagnate in the closed courts and recesses of buildings, which occupy about half the ground area of poorer districts of London. To secure natural ventilation in towns, and permit the winds to sweep freely through them, wide continuous streets or boulevards should be driven through the crowded districts in the direction of the prevailing winds, which in England are chiefly from west to east. The Thames, which covers an area of 2718 acres—nearly a thirtieth of the whole area of the Metropolis—has this general direction, and it is therefore a most important ventilator of London, performing the double function of permitting the free course of the west winds, and keeping a large area free from human habitations. The chief arteries—a most appropriate term for them—of the west end of London take this general west-to-east direction, but there are few such roads at the east end of the town.

It is not quite clear how far direct sunlight is useful to the human organism, but it is well known to possess a chemical effect on impurities of the atmosphere, and Dr. Koch, of whom we have heard so much lately, asserts that it destroys the bacillus of consumption, a disease which, beyond all others, results from overcrowding. Sunshine has certainly an important influence on the cheerfulness of the mind, and this in its turn acts favourably on the body; but it is in the use of artificial light, which results from the absence of sunlight in towns, that the chief evils of the absence of daylight arise. Not only is the sight injured by deficient light, but gas and other artificial lights poison the air and render it unfit for respiration.

The organic excretions of human beings are poisonous to themselves and others, and favour the spread of infectious diseases. Evils of this kind are largely increased by overcrowding in a perpendicular direction, as the statistics of the spread of this class of disease in "Model" dwellings show; the death-rate from infectious disease being greater in such buildings than in the general town population. Animal poisons not only contaminate the atmosphere, but the walls, furniture and clothing, and the evils are in inverse relation to the density of the population, and the difficulty of securing cleanliness of the air and the physical surroundings.

It is obvious that the raising of immense blocks of workmen's dwellings as a means of relieving overcrowding is not consistent with the laws of hygiene, nor are the results so far as the experiment has been tried, as satisfactory as has been expected, and before more schemes of the kind are carried out, the whole question should be officially inquired into by the central or local authorities. Buildings of this kind are not yet sufficiently numerous to interfere with each other's air and light, but they limit the supply of both to their occupants, and overshadow to a very serious extent the humbler structures around them. It is usual to parade the low death-rate of Model dwellings as evidence of their greater healthiness, but such death-rates are misleading, as these so-called "Model" dwellings are for the most part occupied by model dwellers. The tenants are selected in the first instance, and are chiefly young or middle-aged adults with small families, who are able to live well and pay rent regularly. The population of these buildings does not possess the same proportion of very young and of very

old persons as exists in the general population, and the sick and ailing are often wanting altogether. But even with these favourable conditions and improved structural and sanitary appliances, the death-rate is not beyond reproach. There are twenty-three "Model" dwellings in Whitechapel, which have a population, all told, of 9,429 persons, and as the number of rooms is 2,546, there are 3.7 persons to a room, or 7.4 persons to two rooms, which we may consider the family unit, the rest of Whitechapel having nine persons to each house, which consists probably of at least four or five rooms, showing a much greater density of population for the "Model" dwellings. The number of children in these dwellings is barely 1.5 to every two adults, while the normal proportion is about three to a family, so it is obvious that a great many of the residents are unmarried adults of the most healthy ages. Nevertheless the death-rate for 1889 is given by Dr. Loane, the Medical Officer of Health for Whitechapel, as 19.7 per thousand for the "Model" dwellings, and 20.4 per thousand for the whole district of Whitechapel and a higher death-rate than many of the overcrowded districts of the Metropolis. I have not been able to obtain the superficial area occupied by these twenty-three "Model" dwellings, but the density of the population in them must be greater than any other part of the East End, and it is no doubt much greater than it was intended to be when the buildings were planned and reared. Thus we find that overcrowding occurs in "Model" dwellings as well as in ordinary houses, and the evils resulting are greater and more difficult to cope with in consequence of the crowding being perpendicular, and the communication among the residents more intimate than in smaller houses. It would seem that nothing short of an extension of the Lodging House Act to all such buildings, and indeed to all houses in which lodgers are taken, would remedy this tendency of the poorer classes to crowd together, to their own physical and moral disadvantage and to the public danger.

These large buildings are exceedingly unfavourable for the exercise of their inmates, more especially of the women and children, who are their more permanent residents. It is, even to fairly strong persons, a great labour to climb up and down long flights of stone steps, and this, even if time were not an important consideration, would deter most persons of poor

physique from attempting it more frequently than was absolutely necessary, and the strain on the hearts of poorly-fed persons would be distressing and sometimes injurious; but it is sheer cruelty to set small children with their short legs to climb up and down steps which are constructed for adults. We have only to watch the children ascending these stairs to see what contortions of the body and limbs are necessary to enable them to climb them, and the risk of accidents when they play on the steps and landings is very great. Children living in the higher stories must suffer seriously from this impediment to their play, as few mothers would allow their young children to go so far from their sight and hearing, and could rarely find time to accompany them to the play-ground. The physical development of a child is very much in proportion to its physical vivacity, and its stuntedness to its physical passivity, and high houses are therefore a serious menace to the good physique and health of the rising generation.

From a social point of view these large blocks of workmen's dwellings are objectionable. A writer in the current *Quarterly Review*, referring to this aspect of the question, remarks that working men should have homes and houses of their own, and not live in barracks, and flats, and rooms. His wages are much better and food and clothing are cheaper, but in the matter of houses he is worse off than he was forty years ago. The London workman is practically homeless, and, indeed, is more at home in the public-house than with his family in the large barracks which we are rearing for him. When proper houses are provided then the public-house may be closed, till then it would be cruel to shut them up, although they are so costly. All this is true of the working man's physical as well as his moral wants, and it is to the construction of cottages rather than "Model" dwellings that we must look for the remedy.

CULTIVATION OF BODY AND MIND.

ARCHDEACON WILSON recently gave some good advice to young men on this subject, which is the more valuable as coming from a past head master of a large Public School (Clifton). I see (he said), that the aim of the Y.M.C.A. is "the religious, intellectual, social, and physical welfare of young men." Now, I am going to take these in reverse order, because I think the physical welfare has a great deal to do with the other three. The truth is, that my close observation of lads convinces me that we do not yet fully understand in England the very close relations of mind and body. We do not fully realise how much a powerful mind depends upon a healthy body. Of course there are exceptions, but, as a rule, a healthy, vigorous form, and a healthy mind and powerful intellect go together, and this must be repeated again and again, and more than ever now in our days of education. You must remember now that more than two-thirds of our population are living in large cities, and great cities are unhealthy from many reasons.

We are living in a thoroughly artificial way, and such a condition, which is opposed to health, must be met with artificial remedies. Some people say, "Well, our grandfathers and grandmothers never had gymnastics, and yet

they managed to live and enjoy life just as much as we do, although such a thing was not known in their days." Yes, that is quite true; but we must remember that our grandfathers and grandmothers did not live at the rate we are living at. They did not have the same need for gymnastics as we have. Look at the Athenian body and the Athenian mind. Were there ever such beautiful forms as we see in the Greek statues, and were there ever grander intellects than those of the old Athenians? There was the highest possible development of form among that nation, and also the very highest development of mind. An average Athenian citizen of the time of Pericles was as much superior to the average Englishman as the average Englishman is superior to a savage. If you take our own island, look at the Scotch, the Cornish, Yorkshiremen, and, we may say, Lancashire men also. They have contributed, and still do contribute, most to the intellectual advancement of our country, and they are the people who possess the tallest and most muscular forms in our island. Some years ago a Manchester doctor—Dr. Morgan—traced the same thing in the two universities. He traced every man's career of the two universities for ten years, and found that the boating men, the athletes, the

cricketers, &c., more than held their own against the others in the battle of life. This evening I have witnessed one of the most magnificent displays of gymnastics here that I have ever seen in my life. I have often seen a gymnasium team, but never a better lot of men than I have seen in this big hall to-night. You need not all go in for such perfection as you

witnessed here to-night, but even a little is good. If you would take only ten minutes a day at gymnastics I can tell you, from what I have seen, that it would be very beneficial to you. If you only take a little exercise when you get out of bed in a morning you will do yourself very great good; you will be stronger and better, and healthier men.

SOME PRINCIPLES ESSENTIAL IN THE DIRECTION OF PHYSICAL EDUCATION AND HYGIENE.

By DR. E. HITCHCOCK,

Professor of Hygiene and Physical Education at Amherst College.

PHYSICAL EDUCATION, as the term is understood in Amherst College, U.S.A., is such a cultivation of the powers and capabilities of the student as will enable him to maintain his bodily conditions in the best working order, while providing at the same time for the greatest efficiency of his intellectual and spiritual life. To promote this end, official directions should so control the student that he cannot seriously neglect his physical, with which are so closely interdependent his intellectual and moral interests. He must not be permitted to cultivate any other part of his nature at the expense of the physical, nor, on the other hand, any part of the physical at the expense of any other part.

Every student, immediately on entering college, is subjected to a thorough and searching anthropometric examination, and furnished with a systematic statement of his physical condition. To each are then given, by public lecture and private interview, certain theoretical and practical principles by which he may care intelligently for his own health. As early as possible in the course he receives instruction in human anatomy and physiology, illustrated by actual preparations of the human body and by papier maché models.

Every student of average health of body and condition of limbs is required to take, under the eye of a professor, teacher, or director, as often as four days in each week, a certain minimum amount of muscular exercise, of such nature as is adapted to a class of young men working together. The exertion demanded by this exercise is not violent, but only such as is rhythmic, steady, and adapted to secure free movements of the body and limbs. The results sought therein are elasticity,

vigour and suppleness, rather than great or prolonged muscular power.

Besides its provision for the simple and somewhat methodical movements required of the students by classes, the gymnasium is furnished with abundant fixed apparatus for bilateral use, and for the symmetrical development of all parts of the body; which apparatus is intended for voluntary use by the students. Also to a few men in the college a limited supply of heavy apparatus is accessible, though always to be used under more or less supervision from the director or trainer. With this special apparatus the director is able to prescribe exercises adapted to any individual whose bodily development is unequal or imperfect.

In addition to the above mentioned uses, the gymnasium is regarded as the place where play and amusement, not of a required, systematic or prescribed character, may be had and encouraged.

Athletic sports and contests are to be encouraged within limits. The physical examinations will reveal a few who ought under no consideration to enter a race, match game, or contest for a prize or record. For the great mass of the students, however, training in out-door sports is considered most desirable.

Every one is recommended also to be out of doors, in wind, storm or sunshine, engaged in some active exercise such as walking, running or riding, for at least one good hour each day. This is a supplement to the gymnasium, not a substitute for it; a well-lighted, well-heated, bath-furnished gymnasium, readily accessible the year round, is a *sine qua non* for the education of college students, whatever else they have in the way of physical training.

Experience has demonstrated the need

of having in charge of the department two medical men, who may be freely consulted on all matters of public and personal health, and in all ordinary accidents and disorders, though with no compulsion to the student as to treatment strictly medical. These physicians are expected in term time to know the physical condition of every student—a duty easily fulfilled, as they meet the student at his daily required exercise at the gymnasium, where

any physical weakness will certainly manifest itself.

A competitive class exhibition has proved itself an essential requisite for keeping up a high standard of class work. Amherst College believes, moreover, that the Department of Physical Education and Hygiene should stand on a footing of recognized equality with the other departments of the curriculum.

Notes of the Month.

CHILD MARRIAGES IN INDIA.—It is understood that the Indian Government intends to introduce legislation dealing with the question of infant marriages. In all probability, the limit of age at which cohabitation may begin will be raised from ten to twelve years. It is, of course, necessary to move with extreme caution in meddling with the ancient customs of the natives of India, and every small step in the right direction will be acceptable; but children of twelve years of age are no more fit to be married than those of ten, and if a change is made it should not stop short of the age of fourteen or fifteen. It is a popular belief that girls in hot climates attain to maturity and are marriageable at an earlier age than those who live in temperate climates, and this is supposed to be especially the case in India. But there is no evidence that girls attain their full growth earlier in India than in England, and marriage should not take place until the growth of the body is completed, which in females in this country is at the average age of eighteen years. It is no doubt largely due to the early marriages among the natives of India that the erroneous notion as to the earlier attainment of puberty in hot countries has prevailed. Child marriage in India has its origin in religious and social customs which have little to do with the physiological conditions of the parties to the contract, and the custom gives rise to the double evil of fostering a spurious form of sexual maturity and a degradation of the physique of the race. We possess ample evidence that puberty is attained later in the labouring class than in the well-to-do classes, and in Italy, a fairly warm climate, the contadine attain sexual maturity at the age of fifteen and a half years, while the better classes attain the same state a

year earlier—the same ages as in our colder country of England.

Mr. H. H. Risley, writing in *Blackwood's Magazine* on this subject, sums up his conclusions as follows:—

1. By the letter and the spirit of the Hindu Scriptures, a girl ought to go through the ceremony of marriage before she attains sexual maturity.

2. By the same authority a girl ought not to enter upon conjugal life until she attains sexual maturity (or in other words, a girl should marry before, but should not cohabit with her husband till after, puberty).

3. The custom of the Panjab is in keeping with the Hindu Scriptures; conjugal life commences after sexual maturity, and the *physique* of the people is magnificent.

4. The custom of the higher castes of Bengal is contrary to the teaching of the Hindu Scriptures; conjugal life commences before puberty, and the classes which follow this custom are inferior in *physique*, not only to the people of the Panjab, but also to those of Bengal of lower rank, who keep their girls at home until they are grown up.

If Mr. Risley's conclusions are correct, there ought not to be much difficulty in bringing about a reform in the marriage customs of India. There is a racial difference between the inhabitants of the Northern and Southern parts of India which would account for some difference in their physique; but there can be no doubt that a reform of the marriage customs in the direction indicated would do much to improve the wretched physique of the Bengali and other portions of the Hindu population of the Central and Southern parts of our Indian Empire.

SKATING.—The International Amateurs' Race for the Prince of Orange Cup was recently won by J. F. Donoghue, an American, the English champion, W. Loveday, being second. The course at Lingay Fen was one and a half miles, and the time of the final heat between Donoghue and Loveday was for the former 4 minutes 46 seconds, and for the latter 5 minutes and 8 seconds. The winner's performance is said to be the fastest on record. Donoghue has a most graceful style of skating, placing his hands behind his back after getting properly into his stride, and his shoulders coming forward with each stroke, instead of the arm movements of our Fen skaters. Donoghue's height is 5 feet 9½ inches, and his weight nearly 111st. 11lbs. (165lbs.), and his age was twenty in February last. His skates are of the Norwegian pattern, 18 inches in length, 1-16th of an inch thick where they touch the ice, and weigh about 2½lbs., including the boot to which the skate is made a fixture. James Smart, the English professional champion skater, covered the same course in 4 minutes 54 seconds the previous day. Donoghue is rather above

the average height and weight of both English and American University men of the age of 20 years. Dr. Hitchcock gives 5 feet 7¾ inches, and 136lbs. as the average for Amherst College men, while our English tables give 5 feet 9 inches and 152lbs. for our University men of the same age. Great weight for age is the most important feature in a trained skater as in a trained rower. Our observations show that strength bears a tolerably uniform relation to weight, but not to stature. It would be interesting to know the age, height and weight of Loveday and James Smart. Donoghue has been equally successful in all subsequent races he has contested in America and on the Continent.

SUICIDES AMONG GERMAN SCHOOL CHILDREN.—No less than 289 German school boys and girls committed suicide during the six years from 1883 to 1888. According to the official statistics which have just been published, the majority of the young suicides were pupils at Elementary schools. The following statistics are interesting, as showing as far as they could be ascertained by what motives the

Motive of Suicide.	High Schools.		Elementary Schools.	
	Boys.	Girls.	Boys.	Girls.
Nervousness before examinations, and after unsuccessful examinations	15	—	1	—
Reasons connected with attendance at school	5	—	8	1
On account of quarrels with parents and teachers	2	—	—	—
Fear of punishment	1	1	45	23
After ill-treatment at home	1	—	9	3
After thwarted ambitions... ..	11	—	7	1
Anger, obstinacy, &c.	2	—	6	—
Mental derangement	11	1	12	2
Physical defects	1	—	1	1
Religious mania	—	—	1	1
Unhappy love affairs	4	1	—	—
Moral depravity	1	—	5	1
Hypochondria	5	—	—	1
While playing	—	—	7	—
Other motives	3	—	2	—
Motives unknown	15	—	59	12
	77	3	163	46

children belonging to different social classes were actuated in committing suicide. The very much larger number of children in Elementary schools than in the High schools will account for the higher figures in the former class, and the large proportion of suicides from unknown motives reduces the value of the rest of the table. The large number of suicides attributed to fear of punishment is the

most remarkable feature of the table, and demonstrates a lack of physical courage and hardihood which we know nothing of in this country, even among our worst class of physical waifs.

THE CONGRESS OF HYGIENE FOR 1891.—A letter, signed by the Duke of Westminster, Sir Andrew Clark, Mr. Thomas Bryant, President of the Royal College of

Surgeons; the Earl of Ravensworth, President of the Royal Agricultural Society; Mr. Alfred Waterhouse, R.A., President of the Royal Institute of British Architects; Dr. F. J. Mouat, President of the Royal Statistical Society; Sir John Coode, President of the Institution of Civil Engineers; Sir James Paget, Sir Spencer Wells, and Sir Douglas Galton, has been issued, drawing attention to the seventh International Congress of Hygiene and Demography, which will be held this year in London. The Prince of Wales, as President, has signified his intention of opening it on Monday, the 10th August. The Congress is intended to promote the interchange of knowledge between those persons in different countries interested in the study of hygiene and demography. Among the subjects proposed for discussion are—The prevention of communicable diseases, the science of bacteriology in relation to communicable diseases; industrial questions, as, for instance, the regulation of industrial occupations from a health point of view, including the length of hours of labour and the influence of dwellings upon labour; the hygiene of infancy and childhood; the hygiene of houses and towns, including questions of width of streets, height of buildings, and disposal of the dead; and the duty of the Government towards the nation in regard to health, and the machinery necessary for exercising that duty, the laws for notification and isolation of disease; the status and education of medical officers of health and of sanitary inspectors. The Lord Mayor and Corporation of the City will receive the large number of foreign members who are expected to be present, and the discussions will be carried on in the meeting rooms of the learned societies in Burlington House. The honorary secretaries are Dr. W. H. Corfield and Dr. G. V. Poore, of 20, Hanover Square, W.

DANCING.—A ballet called "The Legend of the Dance" is being played at the Vienna Opera. It is an object-lesson in the history of dancing from heathen times to the present day, and includes every known national dance. Its scope extends from the dance of David before the Ark to the slow measures of the French and German Courts in the Middle Ages, and from the old Castilian dances to the Highland fling and the Irish jig. We hope Madame Kattie Lanner will give her attention to this subject and give us an

opportunity of seeing and studying the development of one of the most popular, graceful, and useful of physical exercises. It is not possible to draw a line between the lighter and more graceful forms of gymnastics and dancing except perhaps in the greater attraction the latter possesses for the female pupils.

ANTHROPOMETRY.—It has always been felt by those who have been engaged in physical education that some method of testing the results of the various physical exercises should be adopted. The Editor hopes that his experience as an investigator, for many years past, of the physical condition of all classes of our population by anthropometric and statistical methods will be useful in establishing such tests as may be easily applied in practice. Many new and important facts relative to the physical development of the body have resulted from recent investigations of this kind, which ought to be known to persons who are responsible for rearing and education of children. A knowledge of the physical faculties of the body as modified by nurture and other conditions of life, together with a knowledge of the laws of heredity, should form the foundation of scientific education. The physical perfection of the body from an æsthetic point of view is a subject of personal interest to every one, and is of special interest to the artist, whether as sculptor, painter or architect. All these subjects will receive attention in our pages, and our journal will thus be made to embrace the physical culture of the body in its sanitary, educational and æsthetic aspects.

PHYSICAL EDUCATION IN ELEMENTARY SCHOOLS.—Lord Meath has again introduced into the House of Lords the bill for the promotion of physical education which he failed to pass through Parliament last year. It proposes to impose on the school authorities for every elementary school in any populous towns the duty of making fit provision, to the satisfaction of the inspector, for the instruction and practice of all scholars of both sexes in physical education and exercises connected therewith. By "physical education" is meant any system of recognised physical exercises or drill (which may include swimming) which shall receive the approval of the Education Department and of the school authority. The "school authority" includes the School Board, school attend-

ance committee, school managers, and any other person or body of persons (corporate or unincorporate) having the management or control over an elementary school. The "populous town" to which the bill applies comprises the county of London and all such boroughs and urban sanitary districts as have a population exceeding 15,000 inhabitants. By way of inducement to make the Bill effectual, it is provided that no school or department of a school shall receive the higher of the two principal grants under Section 101 of the new code, or under any other code for the time being in force, unless the requisition of the Bill be complied with to the satisfaction of the inspector.

PUBLIC GYMNASIUMS.—A Bill, which has been read a second time in the House of Commons, enables urban authorities to provide gymnasiums, with all the apparatus ordinarily used therewith. The provisions of the Bill will not take effect until they have been adopted by resolution

of the urban authority after strict notice. There is power under the Baths and Wash-houses Acts to use a swimming bath as a gymnasium during the winter; but there is no power to use any building as a gymnasium unless it is a swimming bath provided under those Acts. The Bill requires gymnasiums to be open to the public free of charge for not less than two hours during five days in every week. Subject to this the urban authority may regulate the admission of the public either by classes or otherwise, and may charge for admission. They may also, for not more than two hours in each day, grant the exclusive use of their gymnasium to any person or body of persons for the purpose of gymnastic exercises on any terms. The expenses under the Bill are not to exceed the amount produced by a half-penny in the pound rate for a museum, and the same amount for a gymnasium. The Bill does not apply to Scotland, Ireland, or the administrative county of London.

Societies.

TECHNICAL EDUCATION.

THE NATIONAL ASSOCIATION FOR THE PROMOTION OF TECHNICAL AND SECONDARY EDUCATION.

As the teaching of industrial occupations to children must necessarily involve them in a considerable amount of bodily activity, technical education will become one of the most useful forms of physical education, and will take the place of some of the artificial forms at present employed. The National Association for the Promotion of Technical and Secondary Education (14, Dean's Yard, Westminster), of which the Marquess of Hartington is president, recently held a conference with representatives of various County Councils with a view to inducing the Councils to apply the money they received last year under the Local Taxation Act. In opening the conference the president explained the objects of the Association, which was founded three or four years ago. "By technical instruction we mean," said his lordship, "instruction which has a direct bearing upon the industrial and commercial pursuits of the community, and which will have the practical effect of increasing the efficiency of labour in every branch of industry and commerce.

By technical instruction in elementary schools we have in view a better training than that which now exists, so that it may have a direct bearing upon the future occupation of the scholars. As to the technical education in secondary schools, we have had in view either the provision of new schools where the existing supply is deficient, the provision of new classes for technical instruction where such do not exist, or the addition, in the case of old schools, of the provision of a scientific or practical side.

"These having been the objects of the association, we may claim to have already met with some considerable success. We have been the means of a great deal of local effort and support; we have been enabled to give some assistance to those engaged in the same work; we have succeeded in attracting a considerable amount of public attention to the subject; and, I think, we may lay claim to having been able to render some assistance to the Government itself in seconding the exertions which for a long series of years have been carried on by the Science and Art Department.

"Last year, principally through the exertions of some of the members of the

Council of this Association, an Act was passed through Parliament, which for the first time enabled local rates to be raised for the purpose of instituting or aiding technical instruction in certain local areas. This year a further great step in advance has been made. A large sum, exceeding £740,000, raised from the public revenue, has been placed at the disposal of the counties and local authorities for such purposes as they may think best. It may be devoted to the improvement of technical education, either in whole or in part. It is very desirable that we should ascertain what are the prospects of a permanence of the grant. If this grant should be applied to the establishment of important educational work which would be beneficial to the whole community, it becomes almost morally certain that it would be incumbent upon any Government not to deprive the local authorities of the grant. We are, therefore, justified in suggesting to local authorities that it would be a shortsighted economy to apply the grant solely to the reduction of the local taxation. The best way of securing the fund will be to see that it is used for the purpose for which it was originally granted, by stimulating existing institutions in the work they are now doing by adding a scientific and practical side to schools, and providing new schools where such do not now exist."

No formal motions were adopted, as several members of the conference felt they could not commit their County Councils to definite resolutions. In the course of the discussion Sir W. Hart Dyke assured the Association of his willingness to support them, and Mr. Mundella hoped the result of the meeting would be to insure the continuance of the grant in favour of technical education.

The general results hitherto attained, so far as the information of the Association goes, which is probably incomplete, may be summarised as follows:—English County Councils which have voted money to education under the new Act, 11; County Councils which have appointed committees to consider the question, 22; total counties moving in the matter, 33 out of 49.

This result has been attained during the short period of four months since the passing of the new Act, during the first half of which time hardly any County Councils were sitting. The figures for County Boroughs are as follows:—English County Boroughs working the Technical Instruction Act, 17; County Boroughs

allotting the new fund for education, but not rating themselves, 1; other County Boroughs considering the application of the new fund for education, 9; total County Boroughs moving in the matter, 27 out of 59; other districts in England working the Technical Instruction Act, 19. The general result gives a total of 47 local authorities as yet assisting technical education in England. This is exclusive of the Welsh Counties and County Boroughs which, broadly speaking, may be said to be devoting almost the whole of the new fund to the purposes of education.

The total number is likely to be very largely increased when it becomes generally known that there is every reason to believe that the grant, or at least so much as is applied to education, will be renewed in the future.

FEEBLE-MINDED, EPILEPTIC, DEFORMED, AND CRIPPLED.

THE CHARITY ORGANISATION SOCIETY has formed a committee to investigate the mental and physical condition of the class of children whom schoolmasters have hitherto been content to call "fools" and "dunces," with a view to their better education and training. The following is a statement of their grounds for the inquiry:—

May we draw the attention of your readers [of the *Times*] to the needs of some classes of afflicted persons, for whom little special provision has been made, and ask help towards carrying out a careful investigation of their number and conditions?

There is a large class of persons which the word "feeble-minded" may well describe, who are often in distress and often lapse into destitution and degradation, and for whom at present it is usually extremely difficult to make any charitable or other proper provision. They cannot be termed "imbecile," nor can they be dealt with under the Idiots Act of 1886. Rather are they in childhood the "backward" or "mentally dull" pupils of the school, whose backwardness or dulness is the result of physical causes; and later in life they become, if they are fortunate, the dependents of kind-hearted people, or more frequently the habitual inmates of workhouses, from which they go out from time to time, often to their lasting harm and mischief, and in the case of girls and young women not infrequently to their disgrace and ruin.

The question of trying to prevent this "feeble-mindedness" by a better care of children and of making for feeble-minded and destitute adults some provision that may at least preserve them from mischief, has been considered by several societies. The Metropolitan Association for Befriending Young Servants has frequently had to cope with the difficulty in cases of District School and other girls under their charge. The National Vigilance Society has through its preventive committee made inquiry of the number of "feeble-minded" girls and women in workhouses and infirmaries. Their returns, which, though incomplete, are useful, show that they received replies from 203 boards of guardians; that during the year 1889 715 "weak-minded" women passed through 105 workhouses, and that at 56 workhouses it was stated that the approximate number of such women who were leading immoral lives was 366. The Reformatory and Refuge Union has had the question brought specially before it by resolutions passed at the recent conference of managers of reformatory and industrial schools at Glasgow; and the council of the Charity Organization Society has also more than once in the course of the past year or two considered the difficulty of dealing with cases of this kind, as well as with cases of epileptics, crippled and deformed persons.

Official bodies have also had the question before them. It was at a rather late stage in their inquiry referred to the Royal Commission on "the Blind, Deaf and Dumb," &c., and they, without treating it in any great detail, came to the conclusion—

"That with regard to 'feeble-minded' children, they should be separated from ordinary scholars in public elementary schools, in order that they may receive special instruction, and that the attention of school authorities be particularly directed towards this object."

Probably the most important return on the subject submitted to the Commission was the report (then only partially complete) of a statistical inquiry as to the physical condition of the child-population made by Dr. Shuttleworth, Dr. Hack Tuke, Dr. Francis Warner, Dr. Fletcher Beach, and others in connection with a committee of the British Medical Association. This report shows that there were amongst the 3,931 pupils in ten public elementary schools 31 "exceptional" children, or 78 per cent. ("22 boys in 1,944=1.13 per cent., nine girls in 1,987=.45 per

cent."); and a further analysis will shortly be prepared contrasting the condition of these children with that of children in special schools of various kinds. The difficulty of "feeble-mindedness" was one that the teachers themselves recognised, and they presented to the investigators for examination 40 children (15 boys and 25 girls) as having mental peculiarities or defects. It should be added that some of Her Majesty's Poor Law inspectors in the metropolitan area have recently been considering whether, in connection with the district schools, better arrangements could not be made for the classification and education of "feeble-minded" children, and that several members of the London School Board have recognised the great importance of the question.

Having, then, before them this very clear evidence, both of the practical importance of the subject and of the need of further information in regard to it, the council of the Charity Organisation Society have appointed a special committee, consisting of persons who have had special experience of these cases, either from the medical or from the charitable point of view.

This committee propose to arrange that two investigations should take place under the supervision and with the personal assistance of medical men who have made a special study of this subject; one in regard to children in public elementary and other schools, one in regard to inmates of workhouses and other institutions. They will, it is hoped, in making this investigation, receive the support and assistance of the several public authorities concerned in the management of the schools and other institutions. And those who are charged with the work of inquiry will observe most carefully all the conditions which may prevent its proving either troublesome to managers or teachers, or vexatious to the afflicted themselves. In the course of it information will be obtained in regard to epileptic, crippled and deformed adults and children,

15, Buckingham Street, Strand, W.C.

THE NATIONAL SOCIETY FOR THE PREVENTION OF CRUELTY TO CHILDREN.—Since the formation of the Society, and chiefly from the passing of our Prevention of Cruelty to Children Act, eighteen months ago, it has investigated 9,703 complaints of cruelty—viz., 1,332 of general ill-treatment, 1,664 of assault, 4,137 of neglect and starvation, 285 of

abandonment, 1,382 of begging and exposure, 515 of cruel immorality, and 388 of other wrongs. These cases have involved the welfare of as many as 19,083 children, the larger proportion of them mere babies, unable to protect themselves from the cruelties practised upon them by unfeeling parents. For a large proportion of these, parents have been made to provide more food and clothes, and to give them reasonable treatment, while to the few whose parents were utterly callous we have been able under the new Act to give new homes, either with relations or in Institutions. The work is not confined to the sorrowing children of the Metropolis,

for in sixty other centres of population our inspectors are at work. More agents are urgently needed, as four-fifths of the country still remain untouched. The work is necessarily a costly one, and the expenditure at the present time is at the rate of fifteen hundred pounds a year. Proceedings in Courts which have obtained the conviction of 1,348 persons have cost upwards of six thousand, besides the necessary inspectors' expenses, which amount to about the same sum. The office expenses, on the other hand, are less than eight hundred and fifty pounds. Central Office of the Society, 7 Harpur Street, Bloomsbury, W.C.

The Magazines.

FOOTBALL ACCIDENTS.

A writer in *Baily's Magazine*, who is evidently well up in all the details of the game of football as played at the present day, discusses this subject in a very temperate and impartial spirit, and we give some extracts from the article, which will allay the not unreasonable anxiety of many parents.

"Football, as a popular sport, has a history of barely twenty winters. The Rugby Union was founded in 1871, at which date the Football Association already had a membership of fifty clubs (including schools). A few years previously the game was pretty nearly confined to the Public Schools and Universities. But at the present time football is the favourite winter Saturday afternoon recreation, not only of the great majority of school boys, but of the working men of Yorkshire and Lancashire, and almost the entire youth of Scotland. In the absence of accurate statistics it is impossible to calculate the proportion of accidents to players, but no one can seriously deny that this proportion is much smaller now than fifteen years ago. There would be an outcry, indeed, if the casualties—like the players—had multiplied a hundredfold.

"If there is any one point clear in the whole controversy it is that much has been done by reforms in the rules to make football more scientific and less a matter of brute force. One of the first alterations effected in the old Rugby School game by the Rugby Union was the prohibition of "hacking" and tripping—two danger-

ous practices which had been the delight of Tom Brown's predecessors for untold generations. Within ten years or so "mauls"—with the exception of the maul-in-goal, which still exists, but is not often seen—were abolished, and with them disappeared the chief sources of serious and fatal hurts. "Charging" has been reduced to a minimum, and rough play of all kinds have been heavily penalised. In the Association code—originally framed with a special view to avoiding the risks of the old rough-and-tumble football—there has been less scope for amendment, but from time to time various harmful tricks, such as "ducking," jumping at an opponent, and promiscuous charging from behind have been declared penal. Absolute power has been given at both games to the referee—an official unknown to our fathers—to punish questionable tactics.

. . . . There is some reason to fear that men who play for their livelihood, or under the artificial stimulus of prizes, or even of the applause of thousands of spectators, are apt to become indifferent to their antagonist's safety and to avail themselves of shady means of winning their matches. The man who tries to make up in zeal and pluck what he lacks in neatness and knowledge of the game is dangerous to his antagonists, and still more to himself.

"If we are right in our estimate of the causes of such accidents as are, humanly speaking, avoidable, it will not be difficult to infer the means of avoiding them. The laws both of the Rugby Union and of the Football Association admit of little alteration without the sacrifice of all the most

interesting principles of the play. It would be easy, however, and advisable to get rid of mauls-in-goal, though they are not practically as dangerous as they appear to the onlooker. The chief remaining blots on the Association game are charging behind—which is still legal under certain circumstances, and is always dangerous—and jumping to head the ball. Nothing would be lost by the prohibition of both these manœuvres. In fine, it is the writer's firm conviction that football is not in its essential nature to be classed as a pre-eminently dangerous amusement; but that it will compare favourably with many, if not most, of the outdoor sports which are in vogue in this country. It can certainly not be denied that the game itself is much milder than in the days

when sound shins were a reproach to their possessor, as implying a deficiency of pluck; and when the only restrictions on "hacking" were that it might not be inflicted on the thighs or body of a victim, and that the latter might not be held and hacked at the same time, unless he obstinately refused to loose his hold of the ball."

[The comparison between football played by men and schoolboys, even in the earlier days of the Rugby game, must not be carried too far, as schoolboys do not possess the strength and weight to do each other serious bodily harm, and their bones are less liable to break than those of grown men from falls in the field.—*Ed. P.*]

Reviews and Notices of Books.

SUGGESTIONS TO MOTHERS ON THE MANAGEMENT OF THEIR CHILDREN. By a Mother. 2nd edition. London: J. and A. Churchill. 1889.

This book labours under the double disadvantage of a too familiar title and anonymous authorship. The title suggests that it may be a pamphlet or essay, whereas it is a handsome volume of nearly 700 pages, and a veritable encyclopædia on all matters relating to the management of children. The volume is dedicated by permission to Sir Andrew Clark, the President of the Royal College of Physicians, and is revised by a physician, but it is a domestic and not a medical treatise on the subject of child management. The author, who is a mother, and as far as we can gather is neither a lady doctor nor a lady nurse, takes her text from Herbert Spencer's *Education*. The text is too long to give here, but we may give the following as the most important parts of it: "Is it not monstrous that the fate of a new generation should be left to the chances of unreasoning custom, impulse, fancy, joined with the suggestions of ignorant nurses, and the prejudicial council of grandmothers? Regarded from any but a conventional point of view, the fact seems strange, that while the raising of first-rate bullocks is an occupation on which educated men willingly bestow much time and thought, the bringing up of fine human beings is an occupation tacitly voted unworthy of their attention. Mothers who have been taught little but

languages, music, and accomplishments, aided by nurses full of antiquated prejudices, are held competent regulators of the food, clothing, and exercise of children."

The volume deals with feeding, repose, fresh air and exercise, sea-air, water, the minor ailments of children and home remedies, care of the hair, teeth, eyes, and nails, and education. There is much useful advice given at first-hand, which is written in a pleasant sympathetic manner, and there is also given in support of the author's views an immense amount of quotations from the writings of our leading medical authorities on the hygiene of childhood. Perhaps the most remarkable and useful feature of the book is the extensive acquaintance the author possesses of the standard and current literature of the subjects she treats of, few pages being without foot notes, giving the "chapter and verse" of the publications of her authorities, and many pages have three or four such references. The book thus becomes a useful work of reference for young medical men and nurses as well as mothers, as it enables them to go back to the original sources of information; but on the other hand, it may be a disadvantage to some young mothers for whom the book is specially intended, as leaving too much to their judgment, which is liable to be warped by their maternal anxieties and fears at times when wise guidance is most required. The book is one to be read at leisure by young mothers as a part

of their domestic education, and though it possesses a good index, we fear it is too full of matter to be easily consulted on emergencies. The advice given again and again throughout the book that "when in doubt send for the doctor," might with advantage be placed at the head of the index. Some of the questions discussed trench so closely on the province of the medical man that their appearance in the book may suggest to the young mothers of the strong-minded type, that they are matters for domestic treatment. Considering the amount of attention which has been given to the subject of mental education, we think it would have been well if this portion of the book had been omitted, and its place taken by some instructions in physical education. Every young mother should know something of the kindergarten and other forms of physical training, but no reference to these subjects is to be found in the index, nor does the chapter on "Air and exercise" touch on them. This is an omission which can easily be remedied in the next edition.

The information in the book is quite up to date, and numerous subjects which are daily discussed in the newspapers, such as the spread of disease by milk, adulteration of foods, &c., are explained in a way which

it is impossible to find elsewhere except in professional works. It is a perfect mine of information, and a most instructive and readable volume, and it will be a most useful addition to the school matron's and mother's library.

BOOKS, PAMPHLETS, &c. RECEIVED.

Indian Clubs and how to use Them, a new and complete method for learning to wield light and heavy clubs, &c., 218 illustrations, by E. Ferdinand Lemaire, sq. 8vo. (Iliffe and Son, Ludgate Circus, 1889.) Stammering: its treatment, by B. Beasley. Means needed for Improving the Condition of the Lower Classes in Towns, by T. C. Horsfall. Drill and Physical Exercises taught in the Board Training Classes. Tables of Swedish Gymnastic Exercises, taught in Board Training Classes, School Board of London (Chas. Straker and Sons, London). Prospectus of the National Union of Physical Training Teachers, A. Alexander, Hon. Sec., Liverpool Gymnasium. Handbook of Exercises for Alexander's "Health Exerciser" (Geo. Philip and Son, London). Syllabus of Lectures on Domestic and Personal Hygiene, by Owen Lankester, M.R.C.S., National Health Society, Berners Street, London.

Correspondence.

The Editor does not hold himself responsible for the opinions of Correspondents. No notice can be taken of anonymous communications.

A TRAINING COLLEGE.

SIR,—It may interest you to know that we are establishing a North of England Physical Training College at Southport on the lines you advocate in the last number of *PHYSIQUE*. The Gymnasium will be built on the most approved principles, and will be fitted up, in addition to English makers of apparatus, by an American firm—the Narragansett Company—and will include Dr. Dudley Sargent's machines referred to in the review of his "Handbook of Developmental Exercises" in *PHYSIQUE*. The staff will include teachers of anatomy, physiology, and hygiene, who will conduct classes and give lectures to students, and all the systems of physical exercises will be taught; monthly health lectures by eminent professors will be held, to which the general public will be admitted. The college, which will be in a very pleasant and healthy neighbourhood, a few minutes' walk from the sea and about

three-quarters of an hour from Liverpool, Manchester, and Preston, will be opened this summer.

A. ALEXANDER, F.R.G.S.,
Hon. Sec. National Union of Physical
Training Teachers.

PRIVATE GYMNASIUM.

SIR,—I should be obliged if any of your readers could tell me what are the most suitable fittings for a private gymnasium—say a good-sized bath-room or dressing-room. The apparatus should be suitable for the use of a single person, but adjustable to the requirements of persons of both sexes and of different ages. W. H. W.

NOTICE TO CORRESPONDENTS.

Communications, Books, &c., must be sent to the Editor of "*PHYSIQUE*." Addressed and stamped envelopes must be enclosed when contributions are to be returned. Business letters must be addressed to the Publishers, Messrs. George Bell and Sons, York Street, Covent Garden, W.C.

Physical Education.

GAMES AND ATHLETICS IN PUBLIC AND PRIVATE BOARDING SCHOOLS.*

By CLEMENT DUKES, M.D.LOND., M.R.C.P.LOND.,

Physician to Rugby School, and Senior Physician to Rugby Hospital.

TWENTY years' experience as physician to one of our largest and most renowned Public Schools, as well as to several large and small private schools, comprising boys from nine to nineteen years of age, has made me interested in, and somewhat cognisant of, the claims and limitations of physical education in schools.

In our well-to-do private and public boarding schools for boys the claims are, to a large extent, recognised and enforced, but, even yet, to my mind, not sufficiently so, for there are still many of the younger boys for whom games are not arranged, or for whom there is not room to play every day, and who are consequently too often allowed to excuse themselves from games altogether.

IT IS REQUISITE TO SEPARATE SMALL PLAYERS FROM THE BIG ONES.

I am not surprised at small boys shutting out of games where they have to take part in them with boys much older and bigger than themselves: for example, what can a small boy do in a game of football, except spoil the game and get unnecessarily knocked about, where half the players are twice his size and weight: and how can a small boy enjoy, or even play at, cricket, where the bowler is practically a grown man, who bowls swiftly, and the batsman hits with the force attained by skill?

It is requisite to separate these small players from the big ones—to size them, in fact—if they are to play with enjoyment, with credit, and without risk to themselves. It must also never be forgotten that if big boys are to excel in games, more attention must be given to the little boys when they first enter a school. No boy can excel in games if they are not organised and enforced until he becomes a big boy; it is then too late, yet this is the rule. I would, therefore, urge that it is the games of the small boys which should be most carefully arranged by the school authorities, for the moment they have mastered the drudgery and begin to excel, they are keen to play; whereas, if they are allowed to shirk

games during their early schooldays, they will never take the trouble to get over the drudgery and learn the game, and thus loafers are bred.

LOAFERS.

I regret to say that my profession is accountable for a further goodly number of boys who are, without sufficient reason, forbidden to play. Parents are able to find too many doctors ready to acquiesce in their wishes, these acquiescing doctors little realising the vast amount of harm they do to the individual boy, and the extent to which they afflict the school on which they land this unfortunate specimen of English boyhood. Moreover, it is wholly unnecessary, for, by a little tact on the part of the doctor, the mother's prejudice could be overcome to the infinite gain of her son.

BOYS MUST PLAY AS WELL AS WORK.

If boys are to be happy at school, they must play as well as work. It is necessary for their health, their growth, their character, and the well-being of the school. It may be taken for granted that a loafer is an undesirable individual; bad himself, he corrupts others, for no boy is satisfied with being vicious alone. I would, therefore, suggest for the earnest consideration of school authorities the advisability of handling this question firmly but considerately, and insist:—

1. That no boy shall be admitted into a public school who cannot take his part in the school games, as such boys are unsuited for school life.

2. That no certificate of exemption from games will be acceptable to the school authorities except that of their own medical adviser alone, who knows the capacity of boys, and the nature of the games in which they are expected to participate. The parents, of course, having the right to claim a consultation between their own and the school medical adviser.

3. That for the few boys who should not, for medical or surgical reasons, be permitted to join in games, well organised

* A paper read at the meeting of the British Medical Association at Birmingham, 1890.

exercise should be arranged, as I shall presently describe.

4. That in the event of school authorities still consenting to admit all comers, those who do not join in the games should be handed over to the drill-sergeant for their necessary daily exercise. If there is one remedy which could more than another exterminate the loafer from our schools; it is the daily routine carried out by the drill-sergeant.

Why parents desire to send a boy to a public school, and then, by their own whim and the aid of their doctor, forbid him to take part in what is one of the main virtues of public school life, I cannot understand. Do not think that I speak too strongly on this point, for these boys are the curse of schools; and I grieve to say they are foisted on schools too often by the aid of my professional brethren, who little know the evil that their too easily obtained certificate inflicts, not only on the boy for life, but also on his unfortunate school-fellows.

PHYSICAL AND MENTAL ADVANTAGES OF BOYS' GAMES.

It should be borne in mind that boys' games are not only essential for the healthy action of the whole body—mind and body—but also for the development of their character. For they tend to develop good temper, self-reliance, self-control, endurance, courage under difficulties and with odds against them, pluck, quick action and rapid judgment—qualities necessary for success in the battle of life, and which have often proved the best part of school education in their after-career.

It seems scarcely to be believed that parents are to be found who are so unwise as to seek by their own whim to prevent their sons attaining these features of school life, being content with the mere rudiments of languages, mathematics and science, and casting aside as worthless the development of the body and the character. Fortunately, these parents are few, but these few should not be permitted to contaminate the whole of school life simply to please themselves.

Our great schools of England render far more in their education than this; for they are capable of influencing for good or bad the whole character of a boy by means of the comradeship of his school-fellows and the salutary influence of his masters in out-of-school hours. Whether it shall be good or bad depends largely upon school games. He is wanting in

discretion who will attempt to conduct a school of several hundred highly-fed, well-bred boys, at the time of life when their animal instinct is strongest, without insisting that they shall one and all take vigorous daily exercise.

PARENTS' OBJECTIONS TO SCHOOL GAMES.

One of the reasons why some parents object to their sons joining in school games is the "funk" of the boy himself, which every parent should try to stamp out of him by making him participate in them. Another reason, from the parents' side, arises from the mistaken notion that so many accidents attend boys' games. This is incorrect. Boys are always more or less subject to accidents from "the nature of the animal." But quite as many, if not more, accidents arise from skylarking and by-play than from well-organised games. The retort to this remark will be: Will you venture to assert that there are not numerous, and even severe accidents, resulting from football? If twenty years' experience at the very birthplace of this much-abused game, played three and four times every week in winter—and very warm games sometimes, owing to the rivalry between houses for the glory of being "cock house"—counts for anything, it ought to make parents and doctors consider the matter more thoughtfully. I have never had one serious accident from football—no accident more severe than I have had from cricket, house runs, steeple-chases, swimming bath, gymnasium, and, above all, by-play. If the game were always played by boys the outcry against football must cease. I am not now upholding it as a man's game; it is here that the severe accidents arise. I will even go further, and say that counting the number playing at football at any one time, the percentage of accidents (at schools, I am alluding to) would be little, if any, higher than those occurring during any other game with an equal number playing at the time, or during "boshing" and "scrummaging" amongst a similar number of boys.

I would, therefore, earnestly appeal to my professional brethren to assist the authorities of our schools in carrying out what is so essential for their welfare, and to be more reluctant in giving certificates to parents exempting their sons from school games, and never to give one except after the fullest examination of the boy, together with a careful consideration of his family history.

PHYSICAL EXAMINATION OF BOYS ON
ADMISSION TO SCHOOLS.

But while I have spoken thus strongly on the subject of all boys, with few exceptions, joining in school games, I hold equally forcibly that every individual child on his entrance to a public school should be as carefully and as thoroughly examined as if it were for life assurance. He is mentally examined to ascertain what he is capable of in his work; and I maintain that he should be equally carefully examined physically, so that his physical education may be thoughtfully organised and regulated, and, I would further add, enforced, for his physical education is of equal importance to his mental education.

I fully recognise that, if this be not carefully carried out, children may suffer in consequence; though I am bound to add that, in my experience, the cases where harm has resulted from even indiscriminate, unregulated, and unwise exercise are exceedingly rare; but I would insist that no such cases should be permitted to occur.

Where harm has resulted, in almost all cases it has arisen, not in the delicate, but in the strong, from imprudent and severe exercise being suddenly taken after a period of comparative idleness, and without any prior training, it having been forgotten that all exercise should be gradual in its increase. When not in constant daily use, the muscles become flabby and wanting in vigour, the heart included. The lungs also lose their elasticity. If overtried suddenly, something must "give" somewhere; unused muscles cannot bear sudden spurts. Occasionally I have seen the deleterious effects of exercise being undertaken by those physically unfit for it; were all boys medically examined on their entrance to their schools this could not have happened.

Severe brain work precludes much bodily exercise, and severe bodily exercise prevents great mental work; but the best work is done with a reasonable proportion of each.

BOYS WHO SHOULD NOT BE PERMITTED TO
JOIN IN ALL THE SCHOOL GAMES.

It is beyond all question certain that if this medical examination were efficiently carried out, there would be found a certain number of boys—few, I admit, who

should not be permitted to join in all the school games as at present constituted. For instance, those boys with a phthisical history; those who have recently had a severe or prolonged illness; those who have grown beyond their strength; those with a physical defect or deformity; and, last, but not least, those who have heart disease, and who require care.

SUITABLE EXERCISE SHOULD BE
ARRANGED.

For the few boys, therefore, who would join in school games if they could, but who, from inherent delicacy, disease, or deformity, should not be permitted to do so, a systematic school organisation of suitable exercise should be arranged, such as gardening, carpentry, gymnastic exercises, drilling, music, art, drawing, and field excursions in botany, natural history and geology. It could be done; it ought to be done; and it must be done. There never can be any excuse for lounging and idleness. These boys need their exercise as much as—nay, more than—the strongest and most robust. If it were more effectively carried out they would have a better chance of developing into a strong and healthy manhood. They should not be excused exercise appropriate to their capacity. I would therefore urge the following points in connection with the limitations of exercise:—

1. The careful physical examination of all children when they first enter a school. In this way only can the healthy be safely compelled to play.

2. The proper apportionment of exercise subsequent to this examination, in order that the physically weak, diseased, or deformed may only take that exercise which is suitable for them. In this way only should the unfit be excused from the ordinary school games.

3. The medical control of all severe exercise, so that the boy who is physically fit to undertake the exercise shall not be permitted to do so without prior and suitable training for his prolonged exertion.

It is these cases where, in my experience, the greatest harm results, and which bring games into opprobrium. Boys who think that because they have won a race by rowing or running in one season they can do the same in the next without fresh training are sure to overstrain and injure themselves.

THE GERMAN SYSTEM OF GYMNASTICS.*

BY H. METZNER, *Principal of the School of the New York Turnverein.*

THE desire to improve or to attain a higher standard in culture and civilisation, natural to almost every human being, is the cause of all education, its aim is the perfection of mankind, and its means are the gradual development of all faculties, mental and physical, by instruction, example, and exercise.

Education should therefore strive to avoid a partial or one-sided development by preferring either body or mind at the expense of the other, or to strain any one faculty to great proficiency and thus destroy and disturb the harmonious activity and co-operation of both mind and body.

This maxim, however old and often demonstrated, has not yet gained that public recognition which is necessary to secure its practical application in the schools of this country.

As gymnastic exercises, we denote all bodily exercises and movements produced by the controllable muscles with consciousness and intention, for the purpose of developing all bodily faculties in an agreeable manner, and at the same time of bringing out all those qualities which are the natural result of health and strength; namely, courage, self-reliance, and joyfulness.

A gymnastic system we may call the scientific combination of the gymnastic exercises, based on physiological laws, their classification, and the instruction of their practical application.

A method is the application suiting the different wants as to sex, age, bodily condition, and health.

The system is based upon the knowledge of the human body, its divers organs, their relative functions, and of the laws of anatomy and physiology. The method is the result of practical experience.

The German system has been diligently built up during almost a century by men of science, especially physicians, physiologists, and pedagogues of high reputation. It is in practical use since that time, and is to-day in vogue in many European countries, in a more or less modified form. In the army, as military gymnastics; in the education of the youth, as school gymnastics; in the halls of the German turners, as popular gymnastics. It is practised in classes by hundreds at the same time, as well as by single individuals as home exercises. It embraces all the dif-

ferent branches of gymnastics: exercises with apparatus, light gymnastics or calisthenics, and also all those exercises known as out-door sports, as running, leaping, jumping, throwing the stone and the use of all hand-apparatus, as wands, dumbbells, and clubs.

The German system has three marked features:

I. It aims at general physical culture, and not at the culture of one special branch. Therefore it declines the development of a certain organ or faculty at the expense of others. In regard to this we may call attention to the fact that all who have gone through a regular course of exercises in accord with this system have been thoroughly developed. The contests among the turners are thus arranged, that exercises in all the different branches must be performed. This is also the case when testing scholars in regard to their proficiency. The numbers gained, added together, decide the grade of development. The strife for specialities is even not permitted, and a partial or one-sided development is therefore unknown. Yet this does not prevent individual skill and inclination from bringing about a greater result in a certain branch; this result, however, is not gained by a loss or lack in any other branch.

II. It allows, or rather induces, the exercises in classes. The classes are selected by a careful investigation as to strength, ability, age, &c., and for that reason it suits as well those who practise merely for physical development as those who aim at a proficiency of a higher grade. The exercises in classes are a source of endless pleasure, refreshment of mind, and joyfulness not only to children, but even to adults. They are furthermore an inducement for promotion and the ambitious desire to keep step with other scholars. They act as a stimulant for greater exertion. It is an undeniable truth that all those who have continually practised in a German gymnasium, or in a school in which the German system of gymnastics had been introduced, acknowledge that the hours spent there count among the happiest of their childhood or manhood. The variety and great number of exercises of the German system and their scientific arrangement allow new and

* A Paper read at the Physical Training Conference, Boston, 1889.

indefinite combinations. The teacher can always select a certain number of exercises suitable for his class which are as agreeable as instructive and interesting to every one of the classmates. Not only the body, but also the mind is kept in a wholesome and refreshing activity which will keep away all weariness and tediousness.

III. The instruction begins with the most simple and easy movements and proceeds gradually to a higher degree. All fear of danger or harm to the body is *a priori* excluded. The apparatus used in school practice is not at all complicated or expensive. A number of climbing-poles, ladders, and some light apparatus for the high and long leap are sufficient. They may even be omitted altogether if the necessary room for such could not be provided for. In this case, however, we cannot call the training a complete one, as the aim of training is not only the achievement of a development of muscles, limbs, and organs, but also the achievement of courage and self-reliance. It is a fact that many a man or woman could have avoided danger or saved their lives had they been courageous or resolute enough to risk a leap or to take hold of a ladder in a moment of need.

The great variety of useful exercises that may be made with the above-named apparatus, together with the utilization of the almost endless variety of simple and complicated free exercises, with or without the common hand-apparatus, as wands, dumb-bells, clubs, &c., which may be executed in the schoolroom, bring about as satisfactory results as any other system. In addition to this we may proudly assert that its *scientific* and educational value has met with approval wherever it was allowed a fair trial. The German system is not in vogue only in the halls of the turners and in their schools. It has already gained its ground in some of the colleges and athletic clubs, in private and in public schools.

The German system does not claim to have any special exercise of its own, or to be the sole proprietor of any, that no other system may also produce; no. But it may properly claim that it has correctly and practically arranged the gymnastic material for the use of any one who seeks health, strength, or refreshment of mind and body.

In the German gymnasias and schools the lessons begin regularly with a series of free and order exercises. Every scholar has to participate in them. The rhythmical order in which they are produced calls forth absolute attention, and allows no backwardness. They impress on each a feeling of responsibility toward his associates. The mistakes or errors, or an insufficient execution of any one, injures the good impression of the whole, and thus tends to greater carefulness and prevents negligence on the part of the scholar.

Class exercises on apparatus follow the free exercises. A change of apparatus takes place, and then the lesson ends with some exercises left to individual inclination. The latter, however, are limited to a short time according to the ability of the scholars, or may be prohibited altogether to beginners. Thus under the eye and control of the teacher a scene of activity and liveliness is exhibited, which the educator will look upon with satisfaction and delight.

In consideration of the above-stated facts a careful examination and a fair trial of the German system of gymnastics, free of all prejudice, may properly be demanded when the question is practically to be decided which of the different systems is best to be adopted in the programme of our public schools. The German system has not been influenced by any other. Neither this paper, which states but a few points of merit of the German system, nor a short exhibition of exercises by scholars is sufficient to show the educational value of it.

THE TRAINING OF TEACHERS OF GYMNASTICS IN GERMANY.

By EDWARD MUSSEY HARTWELL, PH.D., M.D.

THE teachers of gymnastics in Germany are specially trained for their duties. They are not, as is too often the case in England and America, retired drill-sergeants, broken-down athletes, or merely enthusiastic gymnasts. There are, it is said, more than 1,000 teachers in Berlin alone who are competent to give instruc-

tion in turning. According to the regulations now in force, in order to be installed as a teacher of turning in a Prussian school, one must first pass a satisfactory examination and secure a certificate of fitness; such certificates must be obtained at Berlin, and from one of two sources, viz., the *Königliche Turnlehrerbildungsanstalt*,

or the *Turnlehrer Prüfungs Kommission*. The latter is simply an examining board, originally established in 1867, which holds examinations for male candidates annually in February, and for female candidates in the spring and autumn of each year.

The *Turnlehrerbildungsanstalt* holds two examinations yearly, one at the end of its winter course of instruction for male teachers, the other at the end of its spring and summer course for female teachers. Those who take the examinations set by the *Kommission* are mostly teachers who have attended courses in turning at a normal school, or have received special training in classes formed for the purpose by the educational authorities of one of the provincial cities; some are university students who look forward to a teacher's career.

The examinations of the board of examiners of teachers of turning (*Turnlehrer Prüfungs Kommission*) are conducted by a board consisting of the principal teachers belonging to the *Turnlehrerbildungsanstalt* and other teachers of turning named by the Minister of Education. The board seldom exceeds five in the number of its members. The teacher of anatomy in the *Bildungsanstalt* takes part in the examination of male candidates, and a female teacher of turning is always a member of the board when women are examined. The candidates are of three classes:—(a) Those who have already been found competent to be installed as teachers in the schools; (b) students who have completed five semesters at a university; (c) persons of sufficient age (twenty years in the case of men, eighteen years in that of women), not teachers, who have had a good school education.

EXAMINATIONS.

The examinations are both theoretical and practical. The theoretical examinations are both written and oral. The written examination consists in the preparation, within a limited time and without the assistance of books or persons, of a thesis on such questions relating to school gymnastics as the examiners may select. The candidate is examined orally on his knowledge in relation to the most important points in the history of turning, particularly of school turning; in the literature and technical language of turning; on the kinds of exercise adapted to pupils of different ages and states of proficiency; on the principles involved in the construction and use of the various

gymnastic appliances; on human anatomy, physiology and hygiene, and their relation to gymnastics; and on the means of rendering first aid to the injured. In the practical examination the candidate is required to show what degree of expertness he possesses in the exercises made use of in school turning.

THE ROYAL INSTITUTE FOR TRAINING TEACHERS OF GYMNASTICS IN BERLIN.

This institution, known as the civil section of the *Centralturanstalt* till 1877, dates from 1851. Since the separation of the military and civil sections in 1877, the latter has been known as the *Königliche Turnlehrerbildungsanstalt*. Prof. Dr. Carl Euler, who, though not the titular "director" of the *Bildungsanstalt*, actually directs its daily affairs, is a highly accomplished teacher, and one of the best known German writers on turning. He has occupied his present position as the chief normal teacher of turning in Prussia since the year 1860, when he was called from *Schulpforta* to take charge of the civil section of the *Centralturanstalt*, of which Rothstein was then the head. Messrs. Euler and Eckler not only conduct most of the theoretical courses in the *Bildungsanstalt* (with the exception of the course in anatomy and physiology), but they are also charged with the inspection, as regards turning, of the schools in all the provinces of Prussia. The number of assistant teachers in the *Bildungsanstalt* varies with the number of pupils from year to year. The winter course for men begins in October of each year, and lasts six months; the course for women begins at the close of the Easter vacation and continues for three months.

Since 1879 the institute has occupied a building of its own at 229, *Friedrichsstrasse*. This building is a model one of its kind. It consists of a main building two stories high, with an L one story high. On the first floor there are, besides several reception rooms and the living rooms of the janitor, three rooms appropriately fitted for gymnastic exercises. One in the main building is for the use of girls and women, and is 65 feet long, 32.5 feet wide, and 17.8 feet high; another, for the use of school children belonging to the model classes, is 81.25 feet by 40.6 feet; and the third, for the use of males, is 91 feet by 47.7 feet. The principal rooms on the second floor in the main building are the waiting and cloak rooms, a large office, two lecture rooms, a museum containing a collection of models of

a great variety of gymnastic appliances, and a library.

The examinations of the Turnlehrer Prüfungs Kommission are held in the rooms of the Bildungsanstalt.

Courses of lectures are given in anatomy, physiology, and dietetics; on first aid to the injured; on the history of bodily exercises and the science and methods of turning; and on the construction and use of apparatus. The practical instruction comprises lessons and practice in free gymnastics; exercises with "hand apparatus"—dumb bells, wands, and the like; exercises on the heavy gymnastic appliances; fencing and sword-play, and swimming. The pupils of the institute are required to conduct classes in gymnastics, under the supervision of their in-

structors, in several of the city schools. As might be expected, numerous systematic works in the forms of handbooks and manuals on all branches of turning have been published.

The systems of school turning in the other states of the German Empire do not differ very widely or essentially from that in vogue in Prussia. Each of the principal states, too, maintains a Turnlehrerbildungsanstalt. There is one at Dresden, for the Kingdom of Saxony, which dates from 1850; that at Stuttgart, for the Kingdom of Württemberg, was founded in 1862; that for the Grand Duchy of Baden, at Karlsruhe, was established in 1869; and the one at Munich, for the Kingdom of Bavaria, was opened in 1872.

THE CHIEF CHARACTERISTICS OF THE SWEDISH SYSTEM OF GYMNASTICS.*

By NILS POSSE, M.G.

THE Swedish system of gymnastics, devised by P. H. Ling in the beginning of this century, was already at its birth founded upon the laws of nature and upon the laws of the human organism. *Since the days of Ling the system has been much perfected and improved by Ling's followers, who have made it keep even pace with the progress in those sciences upon which it is based.* For that reason the system is not altogether as antiquated as some of its antagonists would fain have the uninitiated think.

First let us consider how the exercises are selected.

The exercises are chosen according to their *gymnastic value*, which quality depends on how the movement combines the utmost effect on the body with simplicity and beauty of performance. Only such exercises are used whose local and general effects are fairly well known and proved to be needed by the body. Not only the needs of the individual, but his abilities as well are to be taken into consideration; and for that reason the teacher must know how to vary the exercises according to the degree of physical culture possessed by the pupil. The movement should have its developing effects in a short time; it should be simple so that every pupil can do it fairly well; and it should have beauty of execution according to each one's ability.

In order to supply the needs of the or-

ganism and to develop the body harmoniously, the exercises have to overcome a great many tendencies to faulty growth or bad posture; and the *greater or less value* of a movement depends on its power to counteract or correct these tendencies. It naturally follows that the system uses no exercises which would encourage such faults. If an exercise gives rise to faulty posture it is discarded, or at least postponed till some future day when it can be correctly executed.

In accordance with the physiological truth that the first, greatest, and most extensive effect of exercise is on the respiratory organs, and that hence, during exercise, these organs must be allowed perfect freedom of motion, the Swedish method disapproves of and discards all movements which compress the chest, or which in any way interfere with free respiration; and the greatest attention is given to the proper development of the chest. In recognition of the fact that to be truly strong, a man must know how to breathe well, much prominence has been given to "respiratory" exercises. "Breathe!" "Don't hold your breath!" are common exhortations in gymnasiums where this method is used.

In judging of the effects of an exercise, we think the least of the muscular development produced; for, the effect of *all* general exercise is to develop muscle, and this aim is reached without especially

* A paper read at the Physical Training Conference, Boston, 1889.

working for it. But we think all the more of the effects produced on nerves, vessels, &c., for the results in this direction can be vastly changed by varying the movements. In other words, the exercises have been made to harmonize with the laws of physiology.

Measuring a man's strength we compare the man to himself; we do not say that a man is strong because he can hold so much air, or because he can lift so many pounds, or because he can jump so high. But when he possesses a healthy, well-balanced and well-proportioned body, which his will has under good control, then he possesses physical culture, even though in the eyes of some he may seem weak as compared to others. It is this health, symmetry, and harmony we aim at in selecting the exercises.

Movements are never chosen "because they look so pretty;" for *educational gymnastics do not aim at beauty of performance*. When gymnastics do have such an aim they are called "æsthetical," and these have but little effect towards physical development. And yet we claim that when a movement is well done it is graceful as well. Some persons mistake a languid manner of motion for grace, and hence claim that the Swedish exercises "are too jerky to be graceful." It is to be remembered that all gymnastic movements are not slow, nor do they have an even velocity; there are some that can and always should be done with great and accelerating speed, and you can move quickly and yet do it gracefully. By making the component motions of movements like the arm-extensions merge into each other in a "graceful" manner, the effect of the movements is completely lost. On the other hand, if exercises like leg-elevations, backward-flexions of the trunk, &c., are done in a "jerky" manner, these movements are incorrectly executed and have lost their best effects.

Our second point for consideration is the regularity of method.

In order that gymnastics be systematic there must be progression. In the Swedish method this is adhered to very strictly, so that the exercises, beginning by the very simplest, gradually become stronger and more complicated. So closely has the effect of movements on the human organism been studied, that the slightest change of position—even the turning of a hand—has its recognised influence in the progression; and it is here that the system de-

mands the most from the teacher: without a good knowledge in this direction he becomes worse than useless. No movement is attempted unless the previous ones of *the same kind* have been thoroughly practised; and no exercise is used whose commencing position has not already been practised sufficiently to guarantee its correctness; for, if the commencing position is faulty, the movement cannot be rightly executed.

The Swedish method does not disapprove of chest-weights dumb-bells, and allied forms of apparatus; but through years of constant practice it leads up to them, claiming that before increasing the weight by external means, you should make a progression by prolonging the lever of the weight already present. So, for instance, a backward-flexion of the trunk with the arms extended upward and the hands holding weights must necessarily be preceded by the same movement without the weights, and that by a flexion with the hands fixed behind the neck, and still earlier with the hand on the hips, &c.

In a like manner *the method prepares the way for æsthetical gymnastics, for fencing, military drill, and other forms of applied gymnastics*, yet insisting that educational gymnastics form the basis of all these. This is reasonable; for unless you have learned to control the involuntary co-ordination of motion, which is the cause of "faults" in gymnastics, you will hardly be able to produce the great voluntary co-ordination required in all forms of advanced gymnastics.

Now, when you are to put this progression into practice, you will not feel as if groping in the dark; for, in this method, the movements have been thoroughly systematized and included under distinctive headings, where there is no more a jumble, but where the rules of progression can be well carried through by a teacher familiar with the theory of gymnastics. After years of practical investigation it was found that if, in every lesson, the exercises followed each other in a certain, comparatively unchanging order, the movements could be made stronger; they could be given more duration; ill results could be completely prevented; and hence the good effects became all the more pronounced. For that reason all movements were divided into classes, and this order was made the basis for the classification. All the exercises can be included under the various headings; and within each class—with infinite variety—the exercises

grow gradually stronger as the pupils develop.

This classification will be found not only to contain exercises filling the needs of the organism, but to correspond to physiological principles as well.

[We give the heads of the classification only, as the details are too technical, and not pertinent to our present object.]

(1) *Introductions.* (2) *Arch-flexions.* (3) *Heaving-movements.* (4) *Balance-movements.* (5) *Shoulder-blade-movements.* (6) *Abdominal exercises.* (7) *Lateral trunk-movements.* (8) *Slow leg-movements.* (9) *Jumping and vaulting.* (10). *Respiratory exercises.*

To this daily curriculum various additions are often made, such as to bring in one more shoulder-blade-movement, when needed; or another heaving-movement; or an abdominal exercise; or to leave the last one entirely out for children, and so on—as the teacher may decide.

In addition to the free-standing movements, each class contains numberless exercises on apparatus, and supplies a sufficient number to form a progression from early infancy to well-developed manhood—through all the grades in school and college, and in after-life as well.

The third point in the Swedish system is in the method of applying the exercises.

The movements are applied to words of command, this being the only method enabling the pupil to concentrate his mind on one thing at a time, that thing being his own movement. This is in accordance with the definition of gymnastic movement, which tells us that, unless a movement is done with full volition, it ceases to be gymnastic. In those methods which use imitation, memorizing, &c., the movements become mechanical, the pupil dividing his attention between himself and something outside him, *i.e.* they cease to be gymnastic. Objections have been raised to using words of command, because "it is too tiresome," "too soldier-like," &c. To this we can answer, that to get the full recreation and rest out of exercise we should put our whole mind into it, this being much less tiresome than to exercise while we think of something else. On the one hand we have the theory of some antagonists, that gymnastics without music do not give enough recreation especially to children, because there is not enough exhilaration in such exercises; on the other hand we have the statement of some children and others who have tried gymnastics to music as well as to words of command, the children saying that

there is "much more fun" in the latter, and the adults that there is "much more to them." As for the second objection, we claim that discipline is necessary not only for a soldier but for everybody, if we are to have any control whatsoever over ourselves; and hence discipline should form a part of everybody's education. Words of command have other advantages. They teach the pupil to think quickly; to act as quickly and to do a thing in the shortest possible time. This is no little gain in the present age of hurry and competition. Besides, the use of commands enables the teacher always to keep his class "in hand;" it becomes easier for him not only to teach, but to correct as well.

The Swedish method disapproves utterly of the use of music, for the very simple reason that but few gymnastic movements are rhythmical, and cannot be made to be so without sacrificing the movement. On the other hand, every gymnastic movement has a rhythm of its own, which, however, distinctly differs from the rhythm of music. If music were to be used, its rhythm would have to change at every motion, and I doubt if any player, even a Rubinstein, would be able to make it do so. Take, for instance, such a movement as "preparation to jumping" (consisting of 1. Heel-elevation. 2. Knee-flexion. 3. Knee-extension. 4. Lowering of the heels); the first motion is exceedingly quick; the second moderately quick; the third comparatively slow; and the fourth still slower. Now, where is the music to fit such a movement?

Besides, when exercising to music, the pupil will be found to pay more attention to the rhythm of the music than to the form of the movement (if we presume that the latter could be made rhythmical), and we get the same result as in all cases where work is done with divided attention—one of the things has to be sacrificed for the other.

From the above it will be seen that the system is *rational*, since it seeks a reason for everything that it uses or adopts: it makes theory and practice harmonize. But it is *practical* as well; for it does not rely on elaborate apparatus for existence, since the exercises, not the apparatus, constitute the system. The movements can be taken anywhere where there is sufficient floor-space to stand on and sufficient oxygen in the air. On the other hand, though the system prefers its own apparatus, the exercises can be most

easily adapted to apparatus belonging to other systems, or to such simple means as ordinary chairs and desks, or other furniture. *Though apparatus is desirable, it is not absolutely necessary for good physical development, especially in gymnastics for children.*

Before closing, I take occasion to warn

you against confounding Swedish Educational Gymnastics with Medical Gymnastics, commonly known as "Swedish Movement Cure"; although based on the same principles, *the two are entirely different, not only as to their purposes, but in the exercises used as well.*

THE CLAIMS AND LIMITATIONS OF PHYSICAL EDUCATION IN SCHOOL.

By ALFRED H. CARTER, M.D.LOND., *Senior Physician, Queen's Hospital, Birmingham.*

(Continued from page 25.)

3. How can the principles I have laid down in my former paper be best applied in practice? The first thought which strikes me is the importance—nay, the imperative necessity—of learning much more about the material with which we have to deal in schools—namely, the children themselves. This is obviously harder to get at in day schools than in boarding schools, and it is just in day schools that the want of more information is most keenly felt. The kind of information which is wanted is, in the first instance, a much more detailed account of a child's physical antecedents and condition at the time of entering school.

A REGISTER SHOULD BE KEPT.

A register should be kept of the complete vital and physical history of each child while at school, especially rate of growth and increase in weight, illnesses, accidents, and any peculiarities noticed by teachers. It would be impossible to over-estimate the advantage of such statistics to the science, not only of physical education, but of education in general. The kind of register which is required would not occupy more than ten minutes a day in order to keep it up, if the work were properly organised.

A TRAINED MEDICAL OFFICER.

It would be necessary that the work should be done, or, at least supervised by a trained medical officer. Every school of any importance should have such an officer, who would not only superintend the keeping up of the school register, but who would be available for advice in all matters concerning the sanitation of the school and the health of the scholars. Some mistresses, while admitting this, insist that the medical officers in girls' schools should be women. I see not the slightest objection in this, but an advantage, provided always you can secure some woman with the necessary training,

but, failing this, I cannot see why the sentiment of a few passengers should arrest the whole progress of the educational coach. Let such people exercise their undoubted right to get out and walk.

ANTICIPATED DIFFICULTIES.

No men have done more to supply us with information on which our present views of physical education are based than the medical officers attached to some of our large Public Schools. I may mention especially the name of Dr. Clement Dukes, who has rendered yeoman's service to the cause. Every responsible school governor with whom I have spoken on the subject readily admits the reasonableness of the proposal, and would be willing to move in the matter but for certain anticipated difficulties. Even with regard to girls' schools, where one would suppose there might be special difficulty, I find that, of eighteen who have reported to me on the subject, sixteen were in favour of the proposal in principle but for the same difficulties. What are these difficulties and from what quarter are they anticipated?

1. From parents—who, owing to ignorance of educational requirements, desire to treat their children themselves or to have their own doctors, and resent interference.

2. From doctors—owing to personal disagreement between the family attendant and the school medical officer—differences of opinion, and difficulty in avoiding fads.

3. From teachers, "who would not like to do only that amount of work which is consistent with the highest possible state of physical health," and on account of waste of time.

4. From school governors, on the ground of expense.

Please to remember that all these diffi-

culties as I state them are copied from written reports made to me by able ladies in charge of girls' schools or colleges and from my notes of conversations with school governors. It is instructive to observe that with the exception of expense, each difficulty rests on sentiment rather than reason, and surely, in a matter the principle of which is so generally approved by teachers and doctors alike, ignorance and sentiment ought not to be allowed to stand long in the way. If the large public foundation schools, like our own King Edward's Schools, would move, the smaller schools would follow before long.

EXERCISES TO BE CARRIED OUT IN SCHOOLS.

But to return to the practical question as to the exercises to be carried out in schools, the following points occur to me :

1. No education to be given in the case of children under 7, except that which is based upon physical impressions and general physical training, such as in the kindergarten system.

2. Boys and girls, from 7 to 14: free exercises, light dumb-bell or stave exercises, alternating with drill, marching and wheeling for not less than half an hour daily, to be included in school hours. The exercises to be properly graded for age, and to be accompanied with music where

possible. No compulsory gymnastics. Active outdoor games to be encouraged in every possible way, and any noticeable abstentions to be brought under the notice of a medical officer for inquiry.

3. Boys over 14: at least one hour daily in school hours to be spent in some kind of controlled physical training which by preference should be varied. For instance, four days might be occupied with drill (preferably with light rifles, or something of the kind, and with music), dumb-bells, clubs, and jumping, graded gymnastics, and one hour in a workshop at some skilled handiwork. On the other two days a week (half holidays) boys should be compelled to join in the school outdoor sports (football or cricket), or to get permission to exchange for some other approved exercise in substitution.

4. For girls over 14, more attention should be paid to free exercises, setting up exercises, marching and wheeling, light dumb-bells and staves, aiming chiefly at precision and grace, under the best possible hygienic conditions. Music is very desirable when it is possible. In all cases special costumes should be worn. Gymnastics should be strictly graded under medical advice.

In all cases small squads are preferable to large ones, as admitting of a more strict regulation of exercises.

THE FRENCH VIEW OF PHYSICAL EDUCATION.

By THE COMMISSION appointed to revise the Regulations relating to the Teaching of Gymnastics.

PHYSICAL education has been held in high honour among civilised nations in all ages. In these days of feverish activity, severe mental labour and increase of sedentary occupations, it is important as almost the only means of preserving the bodily health. In a country like France, condemned, perhaps, for a long time to come to a continuous armed watch, it becomes a patriotic and sacred necessity. Finally, in schools where the child's attention is required by so many different kinds of instruction, and his bodily activity is restrained in so many ways, physical education is the remedy indicated against overwork, and the corrective to intellectual labour which many find excessive, while it is at the same time the safest foundation of all healthy and manly education. It is for these reasons that the Legislature has given to it an equal place in its scheme of instruc-

tion with intellectual and moral education.

Two methods contend for the honour of meeting this necessity for a strong physical education. One of them, which may be called the classical method, prefers gymnastics properly so-called, which consist in systematised movements and exercises with apparatus. The other, really older, and which, after having fallen into disuse among us, has lately again found strong advocates, extols the advantages of free games and exercises of strength and skill carried on in the open air.

Each of these methods has its advantages; but neither of them, used alone, is sufficient to attain the object aimed at, namely, the harmonious development, in view of practical usefulness, of the whole physical and moral energies of man. With its complicated apparatus and exercises

difficult to perform, degenerating into so many useless feats of strength, with its monotonous lessons, its long rests so badly filled up, and the efforts of attention which it enforces on the pupils, gymnastics, such as they are taught now-a-days in most of our schools, make a toil of a pleasure, and a barren fatigue of an effort which should produce useful results. It is merely another lesson added to the others, and the pupil derives neither pleasure nor profit from it.

On the other hand, it would be a mistake to believe that free games can completely take the place of gymnastics properly carried out. If they possess the incomparable advantage of being played in the open air, while they excite the eagerness and emulation of the pupils, provoke their initiative, and accustom them to rapid and energetic action, they have the inconvenience of being incompatible with the inclemency of the seasons, and require a good deal of time and elbowroom. Nay, more, the free games are often deficient in the quantity and quality of execution.

They are insufficient, for in playing games certain muscular actions are repeated a great many times, while others of equal importance are not used at all, or very incompletely. Moreover, in free games each pupil cultivates spontaneously his own natural faculties; he follows his tastes, and setting himself to excel in those games to which he is specially adapted, he neglects others. It happens even that in such games the boldest and most vigorous boys get all the benefit of these exercises, while the

weaker and less determined either hold entirely aloof, or make efforts which are beyond their strength, and so become even dangerous to themselves.

In free games the movements are also wanting in the quality of their execution; for, not being clearly defined beforehand, they cannot be corrected at every moment by the master. They are hurried, and necessarily disorderly. The pupil is neglectful in his attitudes and movements; he walks, runs, jumps at his own will, without husbanding his strength or making the best use of it. He loses the advantages which a methodical instruction in gymnastics would give him, in obliging him to train his movements in a well planned and progressive manner. Free games, in short, are an excellent complement to gymnastics properly so-called; but alone they cannot give complete results either from the point of view of the education of movements or practical utility.

The same thing holds good with manual labour, which, notwithstanding its unquestionable usefulness, cannot take the place of a real gymnastic lesson. Every kind of manual labour is, in reality, a specialization of certain movements, and it is well known that a prolonged repetition of the same muscular actions may in the long run become the cause of deformity.

The truth is found, as is nearly always the case, between the two systems, and the solution of the problem consists in borrowing from each of them the best it has to give, in combining them, and passing over whatever may be superfluous or arbitrary in each of them.

National Physique.

PHYSICAL TESTS IN COMPETITIVE EXAMINATIONS.

A Paper read at the Society of Arts.

By FRANCIS GALTON, F.R.S.

MR. GALTON said that the public were imperfectly informed of a matter that ought to interest many homes whence candidates would shortly proceed to compete for Government appointments, while a few notes of alarm had been sounded relative to his suggestions, chiefly, as it seemed to him, through misconception. He would begin with a platitude that was also a truism—namely, that in selecting candidates to fill posts for which

physical efficiency was desirable, it was proper that physical qualifications should be taken into account, supposing always that the existing system of study was not affected. High physical powers were advantageous in certain active professions, or at least in some of their branches, and it was for those only that their recognition as subjects of examination was proposed. It was intended to be supplementary to the existing system, and not to displace

any portion of it. He was only concerned with faculties that were untouched by the present literary examinations. His object was to show that feasible and trustworthy tests existed, and to explain that if they were applied tentatively and on a small scale, with the avowed intention of reconsidering the whole matter after a few years' experience, very considerable improvements of method were likely to follow.

It would prevent one large class of objections from obtruding and distracting the attention, if he first disclaimed all intention of proposing athletic competitions. What he proposed was to test, not the most that candidates could do after a severe course of training, but their natural capabilities. One of the proposals was that the medical man who conducted the pass examination should, in addition to his present duties, assign marks to each candidate according to his opinion of the physical efficiency of the candidate after examining him. The practice was common of inspecting the candidates for adventurous services before making a final selection. It was certainly sometimes, and, he believed, always followed, in picking out the best men for such special work as Arctic and other exploration. Indeed, it would be preposterous to neglect so obvious a precaution against gross mistakes.

THE PHYSICAL TESTS AVAILABLE.

He would next speak of the physical tests that were at present available, and afterwards of the way in which a system of marks might be founded upon them. So far as these particular tests were concerned, no latitude was left for uncertainty of judgment. They were definite measures, made with standard instruments. The uncertainty was confined to the value of the deductions to be drawn from them. They were as follows:—(1) Stature; (2) a few other linear measures, sufficient to show whether the principal dimensions of the body were or were not well proportioned; these included the span of the arms, the height above the seat of the chair when sitting, and the length of neck; (3) weight; (4) strength of grasp; (5) breathing capacity; (6) quickness of response to a signal by sound; (7) quickness of muscular action; (8) simple tests of vision; (9) simple tests of hearing. The length of time requisite to make a set of these measures was less than a quarter of an hour. He had caused many thousand sets to be taken that were more extensive

than these, and which severally occupied little more than that time. The total cost of the process, including superintendence, registration, and bookwork, need not, under judicious management, exceed six-pence per head.

THEIR PRACTICAL APPLICATION.

The question was, What to do with the measures after they had got them? How were they to be utilized as a basis for assigning a just allotment of marks? The real difficulty lay in these details, and not in accepting the general principle of the proposed examination. Later on he should describe the safest guidance for drawing up a scheme of marks, but it was hardly available now. It would be attained after trying that tentative and provisional system that was asked for. There were three groups of faculties that must be dealt with differently. The more highly a man was gifted with the five following faculties, the better it would be for him in such posts as they were considering:—Absolute strength, quickness of response, swiftness of muscular action, keenness of vision, keenness of hearing. These faculties were also fairly independent of one another. It followed that they might with propriety mark the candidates according to their measured achievement. Again, it was a rough-and-ready practice arbitrarily to fix two limits in each case. Those who fell beneath the lowest limit were to obtain no marks at all. Those who exceeded the highest were to obtain a certain *maximum* of them; for simplicity of illustration he would say ten. Then an achievement half-way between the limits counted as five, and others proportionately. This was by no means an ideally exact way, but it was good enough for their present purposes. In arbitrarily fixing the limits, they must be guided by some reasonable idea, and the one he should suggest was to take, either exactly or approximately, the lines that respectively cut off the lowest 5 per cent. and the highest 5 per cent. of men of the same age and social *status* as the candidates. The *maximum* number of marks to be allotted to each of the five faculties he had mentioned would have to be arbitrarily determined, according to some common-sense view of the whole case.

USE OF PRINTED TABLES.

A second class of qualities had to be estimated relatively to one of the others, not independently or separately,

like those just described. At least three faculties fell within this group—namely, strength and swiftness, considered from a fresh point of view, and breathing capacity. Here the examiner would probably work with printed tables, in each of which the measures of one faculty would be arranged along the top at the heads of successive columns, and those of the related faculty down the side at the beginnings of successive lines. The marks and the age correction would be read off in the square where the appropriate column and line crossed each other. The strength of a race-horse relatively to his weight was greater than that of the cart-horse. It was easy to express the value of this fraction. Strength was supposed always to be measured in the same units—say, in the number of pounds weight that the grasp could resist. Weight was also supposed to be always measured in the same units—say in pounds also. Then the fraction they wanted had the units of strength for the numerator, and units of weight for the denominator, which was easily turned into an ordinary decimal. Then, just as in the first method, they found two limits of value. Those whose record fell beneath the lower limit received no marks at all; those who rose above the upper received the *maximum*. Swiftness should also be treated relatively to weight, though not as a fraction, but as a product. The units of swiftness had to be multiplied into the units of strength to measure the momentum of a blow or of a rush. Lung capacity had to be treated on parallel lines to strength. As regards symmetry, he had little of his own to say

that was worth saying. The normal proportions of the body were pretty well known in the different races, and it was presumable that a wide departure from them in any direction was prejudicial. Stature was another instance of the same sort. It was largely dependent on race, but in each race there was a normal value. Moderate departures from the normal were not important, but wide ones were, whether in excess or deficiency.

OBJECTIONS RAISED.

It would be well to answer objections that had been brought against the proposal generally. The two objections that had been most frequently urged were merely blows in the air, struck wide of the scheme, as it would be easy to show. The first was that certain great commanders and strategists had a poor physique, and would have been excluded by the proposed tests from the professions in which they afterwards distinguished themselves. The reply was that the proposed plan did not peremptorily exclude anybody on the ground of poor physique. There existed already a very salutary medical pass examination that excluded youths who appeared to be distinctly unfitted for active service; but the new and additional proposal merely asked that a candidate who was below par in bodily powers should be above par in mental powers as a counterpoise. The second objection was that these tests took no account at all of the important quality of energy, which included pluck, strong will and endurance. He fully granted it, but half a loaf was better than no bread. The proposed tests told them something useful that was disregarded before.

Notes of the Month.

ENGLISH, GERMAN, AND SWEDISH "SYSTEMS" OF PHYSICAL EDUCATION.—We place before our readers this month three articles on the so-called systems of physical education in vogue in this country, to allow of an examination of their relative merits, and to remove, as far as possible, the prejudices which exist for and against them—prejudices which are chiefly due to ignorance of the details of each method, and of the common physiological basis on which all systems of physical education must necessarily rest. We do not wish to save our readers the trouble of deciding for themselves, but we may point out that

there is a fundamental difference between our English system of games and athletics and gymnastics—English or otherwise.

Games and sports favour the healthy development of the body, and fit it for future usefulness by an unconscious method; we take advantage of the natural instincts of children for play, and regulate and restrain them by forming rules of the games, and appointing judges or umpires to see that the rules are observed. A boy's physical development is promoted by the physical exercise which the games require, and his mental and moral discipline by the self control which

the rules enforce. Thus, he is not under the constant influence of another mind, nor does he lean on a teacher for instruction and guidance, as in the case of gymnastics. In games the physical development is unconscious—we might almost say, automatic—but in gymnastics it is conscious, and the boy is for the most part, a creature of the will of his teacher. This dependence of the pupil on the teacher of gymnastics is fully recognised, and it would seem that the respective merits claimed by the advocates of the German and Swedish systems turn on the amount of this external control—the Swedish teachers claiming a greater personal control than the German teachers over their pupils, and consequently as they believe, a higher state of efficiency. The physiologist whose thoughts are directed to the physical results of the two systems as explained by Mr. H. Metzner and Mr. Nils Posse will probably not be much influenced by the mere practical details which they lay down, and when he is told that a child may not use apparatus until after *years* of preliminary training, he will conclude that boys now-a-days are not made of the stuff they were when he was a boy, and pity them accordingly. The English and the French are fortunate in not having formulated "systems" of gymnastics, but have kept an open mind on the subject, and appropriated the best features of other systems. It is very interesting to note that the Germans lay no claim to special apparatus or exercises; that the Swedes are not the slaves of an antiquated system devised by Ling at the beginning of the century, but have modified it with the advance of physiological science, and that their educational gymnastics are quite distinct from the "Movement Cure" with which Ling's name is chiefly associated in this country. We see in these admissions (which we have printed in italics in the articles) a flexibility both of systems and of the minds of teachers which promises well for the future amalgamations of the various systems into one based on sound physiology and free from pedagogic prejudices. It must be noted that Dr. Dukes' article is chiefly directed to pointing out the defects of school games, while the other articles were written in praise of the respective systems of gymnastics with a view to their adoption in the common schools in Boston, U.S.A.

We must specially direct the attention of those interested in the training and

examination of teachers of physical education to Dr. Hartwell's account of the Training Institutes and Boards of Examination in Germany, as it is a Training College of this kind we stand so much in need of in this country, and the establishment of which has been strongly advocated in a previous number of *PHYSIQUE*.

INTERNATIONAL GYMNASTIC FETES.—It is proposed to hold at Stockholm, from the 15th to the 19th of May next, an international gymnastic *fête*, the object of which will be to bring about, by means of a display of gymnastic exercises, a comparison of the systems of physical exercises adopted in the different countries of Europe. The organising committee hope to obtain a reduction in price for travelling by railway and steamboat on the occasion, and to offer free lodgings to foreign gymnasts who take part in the *fête*. The patron, the Prince Royal of Sweden, is very desirous that English gymnasts should be represented. A similar international gymnastic *fête* will most probably be held in London during the sitting of the International Congress of Hygiene from August 10th to the 14th of the present year.

THE BISHOP OF LONDON ON RECREATION IN SCHOOLS.—At the opening of a recreation room at the Whitelands Training College for female teachers the Bishop of London (a past head master of Rugby School) said he was glad to be present in that recreation room, in connection with a college which had done such good service in the past, and would, he had no doubt, in the future. There were few institutions rendered better service than the training colleges of England. The opening of that room was the recognition of a wider view of education which would grow as time went on, and permeate the education of the whole people in the future. It would come to be felt that education was something larger and deeper than merely an instruction of the intellect such as could be obtained from the ordinary teaching and lectures given in an institution of that kind. They recognised more and more that true education laid hold of the whole being, and for the purposes of true education it was not only necessary to have time for lessons, but also time for pleasure. He did not deny that he sometimes felt that too much time was devoted to recreation. At Rugby he used to think

that the game of football received more attention from the boys than the preparation of their lessons; but no one could have charge of education without recognizing that recreation in its proper place and proportion was as good a thing as any other part of school life, and was really a part of education. For instance, he used to think when watching the games in the Close at Rugby that football was itself excellent practice in controlling the temper, for it was a very difficult and very valuable thing to be able to keep one's temper when one's shins were very hardly kicked. Still more was it important that a woman should always have her temper under control. That tended more to the cheerfulness and blessedness of life than anything else they could learn, and they could learn it better in that recreation room than in all their Principal's lectures. The test of true recreation was that it should send them back to their work more cheerful, and more happy in the doing of that work. While recreation did that, they might depend upon it it was good for them, and he would ever pray that such recreation might be found in the room which had that day been opened at White-lands.

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LORD WOLSELEY ON NATIONAL PHYSIQUE.—Lord Wolseley distributed the medals at a gymnastic competition in the Leinster Hall, Dublin. He said that he took a deep interest in everything appertaining to athletics, gymnastics, and physical exercises generally, for he believed a great deal depended on men's muscular power, bodily strength, and healthy physical endurance. He regarded the subject as far more important than people of the present day generally seemed to think. The methods of to-day were to cram the head with knowledge, and let the body take care of itself, making men as it were tadpoles, all head and no body. He had seen such men. All he could say was that he would rather belong to a nation where the men were of fine physique, with broad, strong chests, splendid arms and legs, and good muscles, than to people with abnormally developed heads, wearing spectacles, and having poor bodies. He was sure his hearers were all proud to belong to this glorious Empire. They were constantly sending the Queen's armies over various parts of the globe, and was it not a matter of vast importance to have these strong, healthy men?

Every day it was being more essential to look after the interests of the physical development of their people. It should be recollected that the young men belonging to colleges, schools, clubs, and gymnasiums of the present day would be the fathers of the coming generation, and he could not but feel regret that this question of physical development was so much lost sight of. There was one circumstance, however, which he noticed with very great pleasure, and that was that in connection with this gymnasium special classes were being opened for ladies. He regarded that as a step in the right direction, as such a training was as necessary for girls as for boys. It was proposed to make physical exercises and training a necessary part of education in England, and he hoped that that would be carried out, and that the day would soon come when all schools, both for males and females, would pay attention to this most necessary portion of the training of youth. Let physical and mental studies go hand in hand, for in his opinion strength of mind and strength of body should proceed *pari passu*.

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THE EDUCATION OF BLIND AND DEAF CHILDREN.—Under this Bill it will be the duty of School Boards, or the School Attendance Committees, to enable blind or deaf children resident in their district to obtain such education in some school or institution for the time being certified by the Education Department as suitable for the purpose. With the consent of the Education Department any School Board will be empowered to contribute towards, or itself undertake, the establishment or maintenance of an institution for the blind and deaf. Where the Board do not undertake the provision they may contribute, for the scholars of their own district, towards their expenses at any certified existing institution; and may make arrangement for the boarding out of blind and deaf children. The usual conscience clauses respecting religious instruction are contained in the Bill, and provision is made for the Department superseding a Board or Committee in default. Blind and deaf children are respectively defined as "too blind to read the ordinary school books used by children," and "too deaf to be taught in a class of hearing children in an elementary school." The Bill is a Government measure, having been introduced in the House

of Lords by the Lord President of the Council.

MR. CHAMBERLAIN ON POPULAR RECREATION.—At the opening of the Birmingham Exhibition Hall and Winter Gardens, Mr. Chamberlain said he believed the provision of rational and innocent recreation was one of the most important factors in the well-being of a great community, and its necessity was probably more apparent now, under modern conditions, than ever before. When the working man had to work twelve hours a day every day in the week, he had not much time for recreation; but now the tendency was all in the direction of more holidays and shorter hours. In his own recollection they had got half holidays and bank holidays established, and twelve hours' work had shortened to ten, then nine, and now it was claimed that eight hours should be the normal day's labour. For himself, he sympathised with this change; but it was a task not unworthy of a philanthropist or statesman to see that the time thus gained for recreation was spent in such a way as to keep the body and mind in perfect health, and to make the intervals of work still more fruitful. He had a certain amount of sympathy with the old Roman Emperors and the rulers of some modern States, who thought it not beneath them to cater for the amusement of the people. In this country there had been established a principle that the State shall do nothing that the individual can do for himself. He rejoiced in the spread of the means of innocent recreation, and was glad to see the hold that volunteering had upon the young men of the population. He liked to see the development of athletics in all forms, whether in football, cycling, cricket, or whatever direction the taste might take. Not less did he applaud the provision of intellectual amusement and recreation. By such a provision of what, after all, was the best rest of human beings, the rest which consisted of change of occupation, they might do something to relieve the monotony of working-day life.

HORSE-EXERCISE FOR SCHOOL GIRLS.—Among the many methods to give girls physical exercise during their school days, the one which is the most popular and enjoyable is riding on horseback. So usual has this become in all higher-grade day

schools that "riding lessons" are included among the extra subjects to be taught as part of the regular education for those whose circumstances enable them to bear the somewhat heavy cost. We (*The Lancet*) should be glad to see it even more widely introduced, for unquestionably no exercise can surpass that of riding, both as physical training and an exhilarating recreation. Certain preliminary precautions ought not to be neglected; the horse should be easy in action, well trained, and such as is generally understood under the term of a "good hack;" free in movement, light in mouth, and exempt from vice and irritability. The animal provided, attention should next be directed to the side saddle, which should be of the approved pattern, to enable the seat of the rider to be straight and firm, which are the first conditions to ensure lightness of hand. One day's lesson should be in riding on the near side, the next on the off side, for the double object of giving greater ease and freedom of movement in the saddle and bringing opposite sets of muscles into action, thereby keeping the shoulders level. One who possesses exquisite skill and grace in horsemanship in addition to all else that should be most admired in women has supplied us with the following notes on her training in horsemanship, than which there can be no better guide to girls aspiring to be like her:—"I think to ensure a straight, firm seat on horseback for a lady, it is advisable to learn from the beginning as a child to ride on both sides alternately. This is easily done by having a saddle made with two flaps, and a movable third pommel, which can be shifted from side to side, and of course there must be two pommels fixed. My sister and I always rode on both sides when children, and could ride nearly as well on the off as the near side. It stands to reason it must be better for a growing girl not to be always in one position, and it also leads to a stiff, crooked seat, and a tendency to hang over the near or off side, as the case may be, which, however well a woman may ride, makes her look stiff and ungainly in the saddle. Perfect ease and a straight firm seat, so as to look as if the horse and rider were one, can I feel sure, only be got at by riding as a beginner on both sides. The reins are held in the left hand, whichever side the rider may sit, and riding on the off side tends to bring up the left shoulder, so as to make a perfectly square seat, which is the object aimed at in a woman's seat. I only

wish I had gone on riding on the off side as it would be of the greatest comfort to horses to shift the weight from one side to the other. Of course, later on it would be advisable to have two saddles, as the one with two flaps and a movable third pommel would be very heavy and ungainly to look at. I had three lines which were told me when a very small child, and I have endeavoured to keep them always before me :—

“Heads and hearts up,
Hands and heels down,
And the elbows close to the side.”

TOES DEGENERATING.—Herr Pfitzner, a German scientist, concludes that the small toe in man is in course of degeneration, and that without apparent adaption to external mechanical influences. It is well known that while thumbs and great toes are two-jointed, the other fingers and toes are generally three-jointed. In many human skeletons, however, the small toe is found to be two-jointed, the middle and end phalanges being fused into one piece, though still distinguishable. This variety occurs in about 36 per cent. of cases, and, as a rule, in both toes simultaneously; and there are more instances among women (41.5 per cent.) than among men (31.0 per cent.). One naturally thinks of shoe-pressure causing union of two bones originally separate. But it appears that in children, from birth to the seventh year, and in embryos from the fifth month, the fusion occurs about as often as in adults. Further, the material of examination was

not from a class of people who wear tight shoes. Processes of reduction are also observed in the connected muscular system. The question arises: Has the tendency reached its limit, or have we merely the first act of a total degeneration of the fifth toe? The author inclines to the latter view, but desires an extension of these researches among peoples who do not wear shoes or sandals, or have only of late begun to wear them. In living persons it is not difficult to determine, by stretching and bending, whether the small toe is two or three-jointed; and in this way adequate data might be had for determining any percentage differences in occurrence of the old and new form of different races; also for investigating the inheritance of acquired characters, members of several successive generations being examined.

THE LATE SIR EDWIN CHADWICK.—Sir Edwin Chadwick was a great advocate for the half-time system of education as it is carried on in the manufacturing districts. He believed it was the best method for carrying on physical, technical and mental education simultaneously, and a few years ago he laid his views on the subject before the Society of Arts. In his will he has left a trust fund for the advancement of sanitary science, and among other things he suggests the offer of a silver medal to the school teacher showing the best mental results of the half-time principle, and a gold medal for district school managers obtaining the best results in subjects named.

Societies.

NATIONAL PHYSICAL RECREATION SOCIETY.

ESTABLISHED for the Promotion of Physical Recreation among the working classes. Facilities for physical recreation among the working classes have long been a recognised want, and wherever presented have been greatly appreciated. In several of our large towns voluntary teachers from existing gymnasia have, during the past two years, given gratuitous instruction to large numbers of youths and men, principally in the lower districts of the city, to their evident delight and enjoyment. The beneficial

results of this work are obvious, not only from the physical benefits derived, but as a powerful moral agency and counteraction to many evil influences. The difficulty of obtaining the loan of rooms and suitable apparatus, through lack of organised responsibility, has somewhat retarded what would otherwise have been a most successful movement. With the object of remedying this, and of extending the movement over the United Kingdom, a national society has been formed, having for its aim the following objects, viz:—

1. To assist the working classes in

obtaining especially during the winter months, physical recreation consisting of musical drill, vocal marching, calisthenics, gymnastics, and other healthful games and exercises.

2. To organise and obtain honorary instruction from existing public gymnasia.

3. To hire or obtain the loan of suitable halls for recreative purposes during the winter months.

4. To assist, by small grants, in providing suitable apparatus.

5. To encourage a taste for physical recreation, and promote the physical development of the people by issuing a National Challenge Shield for competition between the various affiliated public gymnasia, and also Local Challenge Shields for competition among the voluntary classes in each affiliated district.

6. To encourage legislation in the direction of providing systematic physical recreation in the Public Elementary School Board system.

Although the N.P.R.S. has only been in existence four years it has made steady and useful progress. The affiliation of thirty-five large Gymnasium and Recreation classes conclusively prove that the Society has met a long needed want.

The call upon the Society for Honorary Instructors in London, Liverpool and other large towns is so heavy that the Honorary District Secretaries are unable to keep pace with the demand, clearly

demonstrating the urgent need for such an unique Society—a Society which being national should receive national support.

The fête at the Agricultural Hall, to a large extent removed the prejudice against physical education and recreation for girls, and in this direction the Society is anxious to increase its labour. Hundreds of factory girls, orphans, &c., have received voluntary tuition from the teachers of the Society, and there are thousands of poor city-pent girls who would gladly embrace a few hours physical recreation during the winter months did the Society but possess sufficient funds to more fully carry out its objects.

The Society has this year sent out Honorary Instructors to nearly two hundred recreation classes for men, boys and girls in the poor districts of London, and in some of the large provincial towns, to the great physical and moral improvement of those instructed.

It is estimated that the affiliated district recreation classes represent 40,000 associates who are receiving free instruction in physical education, horizontal bars, parallel bars, rings, vaulting horses, rope climbing and elastic ladders being the apparatus principally used; while dumb-bells, bar-bells, Indian clubs, running maze and musical drill are all highly appreciated by both girls and lads.—*Northumberland Chambers, Charing Cross, London.*

Reviews and Notices of Books.

MANUAL OF DRILL AND PHYSICAL EXERCISES, with or without dumb-bells or music. By Thomas Chesterton, *Instructor of Physical Exercises to the London School Board.* 150 illustrations. 2s. 6d. Gale and Polden, Chatham. 1891.

This is an excellent manual of elementary gymnastics. It has long been felt by both teachers and students of physical education that an alphabet and primer of the art was wanted, and Mr. Chesterton seems to have had this object in view in the compilation and arrangement of his Manual. He makes no pretensions to expounding a "system," but gives a careful selection of exercises suitable for the training of both children and adults from the various systems practised at home and abroad. The physical exer-

cises taught to the whole of the British Army, Navy, Volunteers and Native Indian Army have been incorporated in the work, and they are carried out in the schools of the London School Board under the author's personal direction. The book is divided into two parts—"drill" and "physical exercises;" and there is an introductory chapter on "The influence of physical exercises on the human body" (which, however, is too technical and condensed for popular use), and a syllabus of drill and exercises for each standard in elementary schools. The drill is that of the English Army. There is some heart-burning among the teachers in the London Board Schools in consequence of the introduction into some of the schools of the Swedish drill,

which differs in both the words of command and practice from that which they have all been familiar with from childhood, and which the children may require later in life if they enter the army or volunteers. As drill, which is the mere marshalling of children preparatory to exercise in class, is almost valueless as an "exercise" from a physiological point of view, and seeing that many of our elementary school children will become soldiers and volunteers it seems desirable from a national point of view, as well as of convenience to an already overworked class of school teachers, that our national drill should be retained or adopted in schools of all classes and degrees; and that the labour of learning a new system of drill should fall on the professional teachers of gymnastics, and not on the school masters. The exercises given by Mr. Chesterton are what are commonly called "free" and "extension" exercises, and are suitable alike for boys and girls. It is a teacher's manual, but it is so simply and well arranged and so admirably illustrated by figures of boys and girls engraved from photographs, that any intelligent person might master the details in a few hours.

We are not so much interested in the exercises as in the intelligence and skill of the teachers of them, and there are many excellent precepts laid down in this book which show that in this respect our English teachers are quite abreast of those of other countries. The following extracts will serve to illustrate this point:—"Each group of exercises, and, in a great measure, each exercise, leads to those in advance of it, so that every effort is not only beneficial to the pupils, but assists them to perform the movements which are required for the perfect execution of those more advanced. This must be clearly understood by the teacher and observed by him as the fundamental principle of the system." "When proficiency [in the preliminary exercises] is attained, dumb-bells may be used, and the work apportioned to each pupil according to his strength. . . . Without dumb-bells the pupils will have nothing in prospect beyond the attainment of precision in executing what may appear to them a lifeless, and in many instances, an effortless system of exercises, devoid of any element which would make them interesting and entertaining." The chief abuse and cause of failure of gymnastics arises from the hurry and impatience of pupils

to push on from one exercise to another before they have properly mastered the preceding one, and the greatest need for watchfulness on the part of the teacher is to keep this spirit within due bounds. Mr. Chesterton very properly avoids any attempts to introduce "movement cures" and other fads which so seriously interfere with the usefulness and popularity of educational gymnastics.

BOOKS, PAMPHLETS, &C., RECEIVED.

Manuel d'Exercices Gymnastiques et de Jeux Scholaires. Ministère de l'Instruction Publique et des Beaux-Arts. Numerous illustrations. Hachette and Co., Paris, 1891.

Manual of Drill and Physical Exercises, with or without dumb-bells or music. By Thomas Chesterton, Instructor of Physical Exercises to the London School Board. 150 illustrations. 2s. 6d. Gale and Polden, Chatham, 1891.

The Science and Art of Training, a Handbook for Athletes. By Henry Hoole, M.D. (Lond.) Trübner and Co., London, 1888.

Papers on the Pure Oral Instruction of the Deaf and Dumb, by William Van Praagh. 2s, 1882-86, 11, Fitzroy Square, London, *Relation of Athletic Sports to Public Health,* by Henry Hoole, M.D. (Lond.), 1s, Renshaw, London, 1891. Eighth Annual Report of the Metropolitan Public Gardens Association: Office, 83, Lancaster Gate, W., 1890. Report of the National Physical Recreation Society, 1891: Office, Northumberland Chambers, Charing Cross. Sixteenth Annual Report of the Froebel Society (1891): Office, 12, Buckingham Street, W.C. Report of Association for the Oral Instruction of the Deaf and Dumb, 1889: Office, 11, Fitzroy Square, W. Sixth Annual Report of the National Footpath Preservation Society, 1891: Office, 42, Essex Street, Strand, W.C. Forty-sixth Report of the Central Young Men's Christian Association, 1890: Office, Exeter Hall, Strand, W.C.

NOTICE TO CORRESPONDENTS.

Communications, Books, &c., must be sent to the Editor of "PHYSIQUE." Addressed and stamped envelopes must be enclosed when contributions are to be returned. Business letters must be addressed to the Publishers, Messrs. George Bell and Sons, York Street, Covent Garden, W.C.

Physical Education.

NATIONAL PHYSICAL EDUCATION.

A Speech delivered in the French Chamber of Deputies.

By DR. BLATIN.

At the moment in which the questions relating to Public Instruction are about to be brought before you, I should like to call the attention of the Chamber and the Government to one side of our national education which is still profoundly neglected, in spite of the timid efforts which have been made during the last few years. I wish to speak of physical education.

I should like to show you, in a few words, how the most elementary principles of the hygiene of childhood, and the laws which govern the development of young organisms still remain unrecognised by our methods of education; how far the cultivation of the body, which is the indispensable corollary of the cultivation of the mind, deserves your attention as much from the point of view of the health of individuals as from that of the perfecting of our race, and even the future of the French nation; and how necessary it is to drive into the minds of those on whom devolves the public instruction, as well as of the masters of our teaching body, a knowledge of the essential conditions of this training which is capable of giving such fruitful results with so little effort, if only it be intelligently and methodically directed. Finally I hope to make you feel that there is no time to be lost in this direction, and that if Parliament and the Government do not work together to take energetic measures, we shall see shortly the aggravation of an evil which afflicts a large proportion of French childhood, and concerning which voices of more authority and ability than mine have already raised the alarm and aroused the attention of public opinion.

Every advance of science, every victory won in the domain of intelligence, one may say every perfection introduced into our modern civilization, has added, as its immediate result, another load to the programme of our public teaching, and, in consequence, has diminished the time and means hitherto devoted to the free development of our children's powers. The progressive extension of intellectual culture has brought about, as a natural counterpoise, a no less progressive neglect of physical culture, and the more the minds have been overtired the more have

the bodies been allowed to become feeble. It is demanded that our young people from their entry into life should have a smattering of all things, and human knowledge is now-a-days so extended that the brains of the rising generation are becoming less and less capable of acquiring notions, even the most circumscribed, of every one of these things. They have reached, nay, even overstepped the limit beyond which this forced assimilation of so many scientific and literary ideas become, in reality, a danger to the future of civilized races. The result (in the majority of our young people) of this high pressure education is an almost complete inaptitude for bodily exercises, and a veritable contempt for the physical qualities which they no longer possess; of which they do not, in the midst of our perfected civilization, recognise the immediate necessity; and which, consequently, has no longer any charm in their eyes. This observation does not apply solely to our young student classes, but unhappily it applies only too well to our labouring classes.

In these days, as you know, machines execute automatically the work formerly confided to human hands; the business of the workman is reduced to a function, always the same, strictly limited in the muscular movements which it brings into play, in such a fashion that the worker of to-day passes the greater part of his day in a monotony of attitude and, it must be allowed, an inactivity of brain as injurious to his mind as to his body. It cannot but be admitted that in all classes of society, our modern civilization has a tendency to weaken the body. This tendency happens to be particularly favoured by a special physiological condition to which I invite your full attention, and which applies perhaps more especially to the French nation. Since the beginning of the century the frequent wars which have destroyed the vast riches heaped up by peaceful labour, have in like manner destroyed millions of men, young, in good health, handsome, chosen from the *élite* of the nation, who have been cut down in the morning of their lives, before being able to found a family. It is thus that, too often, the duty of per-

petuating the race has been confided to those rejected by the conscription, to those in fact who in consequence of low stature, feeble constitution and physical infirmities had been excused from military service, and who were the least fitted to secure vigour and good health to future generations. Thus there has been a sort of selection the wrong way, which must occupy the attention of the most serious minds, and which has struck a heavy blow at our race.

Well, all the mischief which has been done for many years, and all which is now being done, may be repaired if we are willing to unite in an energetic effort, and, above all, if the University will clearly understand the need which exists for entering resolutely on the road of the reforms which we ask for. No one, indeed, less than the University has the right to ignore the powerful influence exerted by physical education on the development of the human race; for it is from her that we have learned how this physical education made ancient Greece such as we know her to have been, that is to say, resplendent in strength and beauty, in intelligence and wit. It is this which gave to the Romans the energy necessary for the conquest of the world, and it must doubtless to-day teach our children that in this physical education the Prussians have found again, after three-quarters of a century, the qualities of discipline and physical resistance in which they were wanting at Jéna.

The body, even better than the mind, lends itself in a marvellous way to perfecting and to education, and this malleability is shown in a striking manner in those proceedings of modern zootechny which fashion to their own taste, as it were, our domestic animals. It is in this wise that, equipped with physical education as is the sculptor with his chisel, the successors of Bakewell (that Bakewell who has been so justly styled "the Michael-Angelo of the flesh") are able to carve among animal types, to adjust, to suppress, to change, or throw back the proportions, and to create from all pieces (so as to adapt it to certain ends) a new animal which bears thus, better than a monument of stone, the indelible imprint of the genius of man. I do not wish to say that we ought, or that we are able to obtain among our children, with physical education, the rapidity and complexity of the results obtained among animals. I am well aware that we cannot

apply to our fellow-men that completeness of powerful modifying agents which is made use of with respect to animals, and which, making us masters in a manner of their organisms, has allowed us even to create species never dreamed of by nature; but with the sole modifying power which remains to us, with muscular exercise intelligently applied to our children, we may obtain, more slowly perhaps, but not less surely, all the results we desire. By muscular exercise the most debilitated natures are transformed, and the organism profoundly modified; one can break, so to speak, the chain of vicious heredities, and so prepare new generations which shall possess, more than our own, those qualities of resistance and self-reliance, which are after all the basis of the prosperity and independence of nations.

When one is thoroughly imbued with the certain general ideas which I have endeavoured to develop as briefly as possible before you, and one wishes to examine in what manner our French University understands this physical education which both history and science designate to it as a necessity of the first importance, one is compelled to admit that our methods of education fail completely to recognise all the principles of the hygiene of childhood. Our school children are condemned every day to four hours of classwork and eight hours of study, that is to say to twelve hours of forced intellectual labour, of unnatural immobility, of confinement, of hurtful attitudes in a close and unhealthy atmosphere. There remain to these wretched children two hours and-a-half a day, not only for recreation, to relax their fatigued limbs by monotonous attitudes, but also for eating, for receiving visits and for taking lessons in the arts called those of pleasure. I do not hesitate to say that there is not a single free man who would be willing to submit to such a régime for three months; for there is no man accustomed to intellectual work and who, in consequence, is better able than a child to bear the burden of brain work, who does not know that one cannot, with impunity, demand of the human brain more than from eight to nine hours of daily toil. Here, then, are twelve hours of hard intellectual labour which you impose on our young students, and in order to arrive at this overdriving which crushes them, you are obliged to take the greater part of the six or seven hours which should be absolutely necessary for the maintenance of their health and the

development of their physical powers. The University will not yet understand—and this is the reproach I bring against it—that in elementary teaching, that is to say, in early youth, its business is not to turn out *savants*; it has solely to lay in a stock of brain tools for our young people, so that when they have got through their classes they may easily acquire the special forms of knowledge which will be necessary for them in life.

Everyone, now-a-days, is acquainted with the long sad list of school diseases which attack more and more the unhappy victims of our teachers' errors. But I wish to recall here the fact that the greater number of these ailments, these functional atrophies of greater or less gravity, are due not only to intellectual overdriving properly so-called, but above all to this confinement, this unnatural immobility, this absolute want of bodily exercises, to this sedentariness (in a word) to which we condemn our children. These ailments are transmitted from father to son, are aggravated by heredity, and so it happens that we see produced anæmic and neuropathic classes who are incapable of maintaining the vigour and robustness of the French race.

In what fashion does our University apply the obligatory teaching of gymnastics which has been imposed upon her by legislative enactments? Twice a week, and for one hour at each time, the pupils are taken to the gymnasium, in groups of twenty-five or thirty, under the direction of a single teacher. There, I have seen it many a time, each pupil awaits his turn of exercise, in the state of immobility imposed upon him by discipline. You can make the calculation for yourselves; each pupil has thus the opportunity of exercising his muscles for nearly five minutes or even less on each occasion. Five minutes for each turn, ten minutes in a week, forty minutes in a month! That is the time you devote to a physical cultivation which should deserve to be well done several hours a day. Would it be possible more openly to violate the spirit, if not the letter of the law which makes the teaching of gymnastics compulsory in all the schools of the public? Very well then, on this point I call for the immediate intervention of the Government and the University. It is necessary that our pupils should be taken to the gymnasium every day, and twice a day would be better than once; the gymnasium is as essential for them as the dining-hall or the dormi-

tory. It is indispensable that they should meet there a sufficient number of masters to enable them to be divided into small groups, and that each pupil should so be able to usefully exercise his muscles during the greater part of the time.

This reform must be carried out quickly, and it is easier to do it because it need entail no additional expense; it can be done without costing one penny, without appointing a new official, in a word without creating new offices. You have only to go to your young ushers, your class-masters; you will not require from them extra hours, for you will of necessity take the time for gymnastic exercises from the hours of study which are already too long. Your ushers will find therein, for they themselves are young, an excellent opportunity for exercising their own muscles, which certainly suffer in like manner from their sedentary existence. In this way they will become useful aids to the teachers of gymnastics, whose special competency they are not required to equal, since they need only secure the repetition of the exercises which have been demonstrated, by overlooking and caring for them. Associated in this manner with the teaching of gymnastics they will spread the taste for bodily exercises among our children, while teaching them that they will find in them not only the maintenance of health, but also suppleness, strength, agility, and even the beauty of which every man should be proud.

It is necessary also, as I believe, to extend more widely the knowledge of the other bodily exercises which are not only beneficial to the health, but also are an excellent preparation for the military service which we have made compulsory for all. We must increase the number of walks outside the towns, in the open air, with as much liberty as possible, and, above all, with a different costume to that still worn by your students, an unhygienic clothing, antagonistic to freedom of motion, and which for some years past has been considered so unfitted for soldiers that it has been taken away from them. Finally, I return to my statement that it is the teaching of Gymnastics proper on which you must insist, for Gymnastics possess this incomparable superiority to all the other exercises of the body, that they are the only method of physical culture; they alone comprehend a collection of exercises which enable them to control each division of

the muscular apparatus; they alone are able to put into action a definite physiological group so as to carry out in it special indications; they alone, in a word, are able to graduate muscular effort and to vary it within the widest limits; they measure it, they proportion it (so to speak) with marvellous precision, and therefore they are equally beneficial to the feeblest natures and the most vigorous constitutions.

I fully appreciate all the difficulties likely to be encountered in the realisation of these reforms demanded by me and by public opinion with me Undoubtedly considerable resistance will come from the teaching body Parliament can do much, it can in fact do all it wishes to do. You have passed laws for limiting the work of children in factories; but if that is necessary, Parliament has also the power of limiting the work in teaching establishments, which are sometimes such as might be classed among the most unhealthy and insalubrious.

Parliament may pass a law clearly determining the *maximum* number of hours which may be devoted to intellectual culture, and at the same time the *minimum* which may be given to the maintenance and development of the health and strength of our children.

I need hardly say that the physical education of girls is of equal importance with that of boys, from the point of view of the interests of the country, and that all I have said about them applies equally to the others. One may see here and there the same mistakes, the same irrational direction given to public teaching. It is desired in these days, reasonably enough, that the teaching of women should be raised to the same level as that of men; that the wife should be able to share the intellectual life of her husband, as she shares his material life; and that she should become the first and best teacher of her children; this is as it should be. But it is too often forgotten that, if the Scriptures in a poetic transport have im-

agined the legend (as ingenious as it is charming) of the woman sprung from the flesh of the man, it is precisely the contrary which happens in real life, and that in consequence it is our duty to secure robust mothers who may be able to bring forth and nourish vigorous children.

I think I have shown you fully (at too great length perhaps) the necessity of starting energetically on the road of the reforms which I ask for; the necessity for the University to pay attention to this physical culture which hitherto it has so utterly neglected. On the day in which the University shall be found started on this road, its work will be complete; for on that day she will prepare for us valiant souls, with vigorous bodies and lusty arms. She will teach our children that surprise comes only to the careless, and oppression to the weak; she will teach them at the same time to be neither careless nor weak. In 1813—and I take pleasure in closing my speech with this example—when the apostle of Prussian regeneration, by means of the teaching of gymnastics, the illustrious Jahn, was passing with his pupils under the Brandenburg Gate, robbed of its car of Victory, it was his habit roughly to ask one among them: "What are you thinking about?" And if the young man to whom he spoke replied amiss, he gave him a slap on the cheek saying, "Remember that you are the son of a conquered man, and that your first duty, when you have reached manhood, will be to go to Paris in search of the car of Victory, taken away from the Brandenburg Gate by the French."

I would, then, that our University, under the inspiration sometimes of the words and example of the illustrious Prussian patriot, should repeat to our children that they, too, are sons of vanquished men, and that if ever again the country should be in danger, it is only by a rational and patriotic system of education, begun from to-day, that they can hope to remain conquerors there where their fathers fell.

AQUATIC SPORTS AND PASTIMES.

By W. P. M. BLACK, B.L.

IT is the object of the writer, himself an enthusiastic lover of the water, to point out to persons in search of exercise or recreation some of the grounds upon which aquatic sports and pastimes may

claim a share of their attention. It is a mistake to think that accidents are more frequent on water than on land; though, if they were, it would be no wonder, when we take into account the very large

number of people who venture on the water without being able to swim. If five-sixths of those who exercise and amuse themselves upon the land were never to learn to walk, the comparison between the number of water and land accidents might then be fair. If people would only take things in their natural order and learn to swim before they attempt to bathe, row, or sail, the number of accidents on the water would be much smaller. The chief danger then would be from cramp, which is almost always the result of carelessness. The writer was only once the victim of that painful affection, and that was on one occasion when he so far forgot himself as to go into the water immediately after a meal.

What at once strikes every one who thinks about the matter as a good point about aquatics is their great utility to those who have a fair knowledge of them. In a country like ours, which is entirely surrounded by water, there are few of us who at some time or other, by an accident, may not be put in peril of our lives and dependent for our safety upon our knowledge of swimming. How many wrecks, or other aquatic casualties, for instance—have occurred so close to land that a very slight knowledge of swimming might have enabled most of those who perished to get ashore in safety. And even, in the case of wrecks occurring far from land the possession of a knowledge of swimming, sailing, and rowing will enable a man to keep afloat till he can be picked up; to lend the crew a hand in launching and managing the boats; or, if that help is not needed, will enable him to preserve his self-possession and be ready for any emergency—a quality of no small value under such circumstances. Moreover, the possession of a knowledge of these arts puts it in our power to render help to fellow-mortals in danger. Should an aquatic disaster occur near where we happen to be, it will enable us to assist in saving passengers and crew, especially when the wreck is the result of other causes than a severe storm, though even in such cases amateurs have rendered valuable aid in manning the life-boats. Then in the many seaside accidents into which foolish temerity or recklessness bring ignorant people, the sailor, rower, or swimmer may be often the means of preserving life and preventing much misery. When a friend meets with an accident on land, we are capable of rendering him little help. But should he go overboard

when rowing or sailing, or take cramp, or get exhausted when swimming, we are able to plunge in and extricate him at once from his difficulty and danger. No need to stand helplessly by as in the case of a land accident, muttering pityingly, "Poor fellow! I wish I could do something to relieve you."

We hear a great deal now-a-days of the prevalence of short sight among school-children. To what is this to be attributed save to the perpetual poring over books which this age of competitive examinations entails? To enable a child to acquire a long range of vision, his eyesight must be trained from his earliest years with that end in view. He must have frequent opportunities of letting his vision range over a wide expanse in search of distant objects. The schoolboy, whose whole time is divided between books and land games, has little chance of averting by his play the ill effects of study upon the eyesight. The youth, however, who can make the water his playground can hardly fail to have good eyesight. Swimming and rowing may not contribute much towards this end; but sailing, which generally leads us a considerable distance from our starting point, necessitates a wider range of vision than occupations in schools and playgrounds, and favours the development of free sight. There is perhaps but one land pastime whereby the vision is trained in a similar way, and that is rifle-shooting; but even in this the fact of the object discerned being always of the same character, at known distances, and those distances rarely exceeding a thousand yards, renders rifle-shooting inferior to sailing as a means of preserving the eyesight.

Besides the health and good spirits which result from the practice of games, when not overdone, there are other incidental benefits. It has often been noticed—and a moment's reflection will convince anyone of the truth of it—that all athletic exercises influence the mind as well as the body; that hand-in-hand with the increase of physical dexterity and muscular strength which result from their practice there goes a mental or a moral training which, though the learner may not be conscious of it, he cannot fail to receive. Self-control, promptitude, and resourcefulness seem the common indirect result of all the forms of athletic exercise, such as football and cricket, which we may term games; while sports, such as rowing and cycling, which can be practised alone, do

not, as a rule, afford much indirect training of this sort. Swimming, however, affords a training in two very desirable moral qualities, viz:—self-reliance and presence of mind. Of course some people naturally possess these qualities to a greater extent than others; but all may improve them by training. Intrepidity is not so much a matter of nature as some people suppose, and all may be trained to be as cool and self-possessed in the midst of danger as any man, save a few outstanding heroes. The fact that among fishermen, miners, firemen, and others who are continually exposed to danger so many acts of heroism are performed, does not prove that they are naturally braver than other men, but only that their actions are the result of the training their special work affords them. It is the soldier who has frequently “smelt powder” upon whom we can put most dependence when the fight waxes fiercest.

When a learner begins to practise the art of swimming, he does so in shallow water; and for a long time after he has learned the art, he does not trust himself into water where he could not at any moment touch the bottom if he wished. This state continues for a longer or shorter period according to the amount of self-reliance and presence of mind which the swimmer naturally possesses, and in almost every case it continues long after he is perfectly able to swim in deep water with safety. The writer, who learned to swim in a swimming-bath, remembers how, long after he was able to swim from ten to fifteen breadths of the bath in shallow water, he could not make up his mind to swim from end to end of the bath across the deep water, although the length of the bath was only a little over three times its breadth. Gradually, however, the swimmer, although he knows perfectly well that his remaining on the surface of the water depends entirely upon his own efforts, gets more and more confident until he feels as much at home in the water as he does on land, and thinks no more of the fact that he must keep moving, or at least—in the case of what is in technical strictness called “floating”—keep in a certain position, than he thinks on land of the continual adjustments of muscles necessary to keep his body upright: in fact the one is performed almost as automatically as the other. Along with the development of self-reliance goes the development of presence of mind. When the swimmer begins to attempt to cross deep water he

feels that unless he retains his presence of mind he must inevitably sink through the mental paralysis produced by panic. He braces his mind up for the effort, which is perhaps but the crossing of a few yards of deep water. He continues day after day to increase the length of time during which this special tension of mind has to be kept up, until, just as his muscles get so trained that he can go a great distance without fatigue, so he becomes capable of retaining his presence of mind for any length of time without effort. Even after he has reached this stage, should he find himself in any awkward predicament, his presence of mind is apt to fail; but in the case of the practised swimmer who has got accustomed to meet sudden shocks, the mind still retains its equilibrium in positions that would be fatal to that of a less trained man.

To show how much self-reliance and presence of mind come into play in swimming, it may be mentioned that many even comparatively good swimmers have lost their lives through suddenly losing confidence in themselves when at a distance from land. They had gone out too far, perhaps, and looking at the distance between them and the shore, and thinking that they had not strength left to return, distrust seized upon them, they lost their presence of mind and sank. One of the best living authorities on the subject of swimming gives it as his opinion, founded upon thirty years' experience, that this is the cause of more swimming accidents than cramp and weeds, which he believes are often mistakenly blamed for accidents of which they were not the cause. Lest peradventure this statement should be recalled to his destruction when in a like perilous position by any reader who is also a swimmer, let us quote, parenthetically, a passage from one of the same gentleman's books which, if remembered at such a moment, will probably result in the swimmer's pulling himself together and getting ashore in safety. “We have ourselves,” he says, “gone out to swimmers in this position, *who without any further assistance than kindly words of encouragement, have yet been able to reach the point from which they started*, and who have afterwards informed us that without such encouragement they would certainly have gone down.”

There is another element of character which swimming develops, but only in the case of those who are specially expert. When a swimmer has learned the proper

mode of saving a drowning person—and until then he should not attempt a rescue—he is continually on the outlook for some one to save, not alone from a longing to benefit his fellow men, but also from a desire to exercise his newly acquired powers. Probably he has not long to wait, and before much time has elapsed he may have saved some one from a "watery grave." This cannot fail to tell upon his character; and just as the training which walking the wards of a hospital or visiting sickbeds, is the cause of that beautiful character—that gentleness, that cheerfulness in the face of depressing influences, that thoughtfulness for others—which we find with few exceptions in the case of clergymen, phy-

sicians and nurses, so such efforts to save the lives of others must have a corresponding effect upon swimmers.

Further arguments might be advanced—notably from a sanitary point of view—but enough has surely been said to recommend the water as a playground to all in search of exercise or recreation. To the strict utilitarian who insists upon knowing what is the use of everything before he will have anything to do with it; to the man who would desire never to see a fellow man in pain and be unable at once to relieve him; to the shortsighted youth while yet his eyes are pliable; to the boy deficient in physical courage, to all these we say—Make the water your playground and you will get the desire of your heart.

THE PURE ORAL INSTRUCTION OF DEAF MUTES.*

BY WILLIAM VAN PRAAGH.

THE lecturer referred to children and adults suffering from incurable deafness, who have to find their solace in educational treatment. He stated that the subject of his lecture was not a new one, particularly to members of the medical profession, who from the very first date of his public introduction of the work into this country have stood at his side and gallantly helped the cause.

The instruction of the deaf was by no means old. Aristotle looked upon them as idiots, and it was only within the later centuries that their rights had been recognised. The earliest record in England of a deaf mute being taught was in the year 700, when it is said that the then Archbishop of York, commonly called St. John de Beverley, instructed an adult mute in the Christian religion. Nothing more was heard in this country until 1648, when a book by John Bulwer was published in London, entitled "Philocophus, or the Deaf and Dumb Man's Friend," and soon afterwards John Wallis, Professor of Mathematics at the University of Oxford, and with him William Holder, Canon of Ely and St. Paul's, devoted themselves to the education of the deaf and dumb by a certain system of lip-reading, which was described by Wallis in a letter to Robert Boyle. Wallis corresponded with Dr. Amman, a medical gentleman who devoted himself to the education of the deaf in 1690.

Amman was a Swiss residing in Amsterdam, where he published in 1692 his book called "Surdus Loquens," which has since been translated into several languages. All the existing accounts of teaching the deaf in various countries were isolated efforts on the part of a few individuals, but no connected action was taken until the Abbé de l'Épée opened his Institution in Paris. De l'Épée was born in Versailles in 1712. He was the founder of the French system. Hérnicke, the founder of the German system was born at Nauschutz, near Weissenfels, in 1725. The lecturer would not follow the progress of the rival systems. In this country the French system and a combined system were in vogue until his own work began in 1867. The pure oral System was generally followed on the Continent, even in France, and was now making its way in America. We were certainly on the road to witness its general adoption. Since 1867, and more particularly since 1871, the oral instruction of deaf mutes had been brought prominently before the English public, both by the Association for the Oral Instruction of the Deaf and Dumb, and lately by other societies which had followed in its steps. The International Conferences had fully established its superiority, and it was very gratifying to notice that the late Royal Commission in the main recommended its adoption.

*Abstract of a lecture delivered at the Central Throat, Ear and Nose Hospital, Gray's Inn Road, London.

Whatever was done it might be hoped that legislation would eventually enable England to compete with foreign countries and to give her afflicted children, one and all, the most liberal and useful education.

The term deaf and dumb was unfortunate, as embodying and repeating the error that the affliction was twofold. This was not so. The organ of hearing was wanting, not so the organs of speech, which merely lack the means of exercise. According to the Census of 1881, there were in the United Kingdom 19,518 deaf mutes, in a total population of 35,023,639, thus making one in every 1,794 persons born. The Census was not very correct; the lecturer hoped that the approaching one would be more so. It was curious to notice that all over the world the number of males born deaf and dumb was considerably above that of females similarly afflicted, and it was strange that in the case of sufferers from defects of speech the same was applicable.

A deaf and so-called dumb person was best defined as a human being who, either on account of total or partial deafness, could not learn to speak without instruction. In the true sense of the word he could not be called absolutely dumb, if it were understood by the term inability to utter a sound. The deaf had voice but no speech. Articulate speech was simply a modification and modulation of the natural voice possessed by every human being. The arbitrary arrangement of natural sounds which was called this or that language was acquired by a slow process of imitation, and of that process the deaf were deprived by the want of hearing.

Was the want of hearing the only cause of dumbness? Certainly not. Dumbness in its various degrees was traceable to idiocy and various abnormalities of the mind, but as the lecturer referred to the deaf only, he dealt simply and strictly with *dumbness* the result of deafness. Deafness was either congenital or acquired, and both classes were again divisible into the totally deaf, and the partially deaf—the latter being again sub-divided into five classes—(a) those who perceive the human voice when it is used close to the ear without being able, however, to distinguish the separate sounds; (b) those who could distinguish the vowels when they were loudly pronounced in the ear; (c) those who understood (but with difficulty) some words known to them when they were clearly pronounced in the ear;

(d) those who, without effort, understood all that was clearly pronounced in their ear; and finally (e) those who could hear a raised voice.

In many cases it was difficult to decide whether a child was congenitally deaf or not, the parents, mothers in particular, being extremely reticent on the matter. In other instances it was not difficult to trace the history of the case, the antecedents of the parents, &c., which guided one in coming to some conclusion. Accidental deafness was mostly the result of diseases, headed by scarlet fever, followed by measles, whooping-cough, &c., to which ought to be added falls, frights, blows, loud noises, sudden noises, &c.; while injudicious treatment by nurses played by no means a minor part. Instruments for cleansing the ears in the hands of an inexperienced nurse became dangerous weapons.

A child becoming deaf from illness or any other cause should at once be taken in hand and taught to read from the lips; it could then be talked to, its education continued, and it would retain its speech. Therefore, immediately it was clearly ascertained that a child of sufficient age had lost or was losing his hearing, he ought to be sent at once to a school for the deaf on the Pure Oral System, for it was really astonishing how very quickly a child would forget to speak, and how immense were the disadvantages caused by a few months' delay.

The lecturer then proceeded to give an outline of the German or Pure Oral System of teaching Deaf Mutes. He stated that every hearing person learned to use articulate speech by imitation. The young child's powers of observation were kept in healthy action by those surrounding him, who called his attention to various persons and objects, repeating their names hundreds of times. The child received the "sound" impressions, and by dint of the constant repetitions learned to recognise various objects by hearing them named repeatedly by the same sounds, associated in his mind the words with the objects, imitated these words, and finally spoke. The deaf child should be treated as a hearing child, his friends should always speak to him regardless of being understood or not, and above all should never indulge him or neglect him.

A certain amount of natural sign language was acquired by every deaf child, hearing people also used a certain amount of gesture in their speech, and the deaf

child gained this natural habit of pointing for things he required, so to say, from nature. In olden times teachers developed those signs, and taught deaf children by means of natural and artificial signs and the manual alphabet. This system was called the French or Manual System, which was generally in vogue in our country until the commencement of his work in 1867, but since then, chiefly through the exertions of the Association for the Oral Instruction of the Deaf and Dumb, the system had been introduced which was the subject of his lecture. He went on to define the difference between natural and artificial signs. Natural signs were understood by everyone, without being taught. Artificial signs were only recognizable by the initiated. The German or Pure Oral System taught the deaf child to speak *viva voce*, to lip-read what others said, and to receive instruction by means of spoken language *exclusively*. In short, it learnt speech by means of speech. Signs were most rigidly excluded, as any attempt to combine the Pure Oral with other systems would produce unsatisfactory results. There was a third, the combined system, which tried to unite the two named, but which made use of signs for conveying instruction and taught articulation as an accomplishment. Combined systems, were particularly to be condemned, as no adequate results could be obtained by them. In order to teach a deaf child to speak lip-reading must be his only vehicle for language. If he could convey what he wished for by signs, and if signs were used to convey knowledge to him, he had an additional but inferior vehicle for language, and he would not easily attain such perfection of seeing power as to enable him to acquire lip-reading.

There was another system, the Aural, which made use of any remaining power of hearing to convey knowledge by means of hearing trumpets, &c. The use of ear trumpets and other appliances in schools for the deaf ought never to be adopted with the view of curing the deafness, which would be impossible; but, where sufficient hearing power existed, to enable the pupil by means of it to improve hearing, intonation and pronunciation. The hearing power must not be lost through want of use, as even a particle of hearing was an assistance in obtaining a natural voice. These exercises were taken with this special aim, but no hearing must be used for conveying a knowledge of language,

since the teaching of lip-reading required the utmost care and attention. The clear understanding of what was said was of as great, if not of greater, value than speech. He therefore rejected the principles of the Aural System also—another kind of combined system.

The Royal Commissioners very wisely embodied the following recommendation in their official Report Recommendation No. 6—"That in all schools and institutions the general health, hearing and sight of deaf children should be periodically inspected by a medical practitioner, and that those possessing some hearing capacity should be carefully and frequently examined so as to *test and improve* their hearing, pronunciation and intonation by mechanical means, such as ear trumpets."

The lecturer then went on to give some details of practical work. Every sound articulated produced vibration of the face and throat, as well as of the lips. The deaf were trained to watch carefully all these movements, and so, to read on the lips and face the words that were uttered by the speaker. The sight became thus a substitute for hearing; this was called lip-reading. He stated as his opinion that lip-reading stood foremost in the deaf child's education, as upon it depended his quickness to understand, and his readiness to pick up new words and fresh conversation. He illustrated this by saying that our hearing children learnt foreign languages, and were well up in the language until the day arrived when they were introduced to a native, when they were unable to understand or to reply. This arose not from a want of knowledge of the foreign language, but simply from a want of familiarity with the sounds produced by a foreigner—in fact a want of hearing—and this would be the case with deaf children if not fully expert in lip-reading. Sight was of the greatest possible assistance to hearing at all times. Why did we wish to face the speaker at places of worship or at places of amusement? Because we heard better.

Lip-reading was also of immense advantage to adults who had lost their hearing, or were becoming incurably deaf. It was self-evident that to adults who were in full possession of speech and language lip-reading was of a different nature to the lip-reading taught to little deaf children. The length of time required to initiate an adult into the power of hearing with the eyes depended entirely upon the age, sight, intelligence, and home circumstances

of the patient. Sound could be felt, as well as heard and seen, and the sense of touch was used in teaching deaf children to speak. Defective-breathing was, as a rule, the cause of defective articulation; therefore, it was essential a deaf child should be taught to breathe properly. The deaf child was taught speech, like a hearing child, *by imitation*. It stood to reason that those who were intrusted with the early instruction must have a thorough anatomical knowledge, of the various organs of speech. Every care must be taken from the outset that the sounds produced were clear, sweet, and pleasant, and from the very commencement of the instruction the pupil must be taught to control his voice, to raise it or to lower it, *ad libitum*. By way of illustration—one of the earliest lessons—the child's mouth must be on a level with the teacher's, the face of the teacher being placed in such a position that full light falls upon it. The child was made to effect an expiration; this was done firstly by his imitating the teacher, and secondly by the latter exerting at the same time a little pressure on the epigastrium of the child. The child was shown the position of the mouth required for the pronunciation of the vowel sound *â*, as pronounced in the word *far*. The tongue was put flat by means of a spatula, or better still the teacher's finger, and the child imitated the vibration which he feels at the larynx of his teacher. Of course at first the sounds might be loud and inharmonious, and required to be modulated. By placing the hand of the child on his (the teacher's) throat, and by placing the child's hand on his own throat, he would draw its attention to the different vibrations at the larynx when the voice was lowered or raised. When once the pure *â* sound was obtained by modifications of the mouth cavity the other vowels and semi-vowels and diphthongs were easily acquired. The process followed, was:—the teacher pronounced a sound which the child imitated, that was: *he spoke*, and learnt to recognise it when spoken—that was: *he lip-read*; he also associated the sound with the letters he read, and imitated them on the blackboard, the slate, or paper—that was: *he wrote*. To deaf and so-called dumb children, speaking, lip-reading, reading, and writing were all taught simultaneously. The method of teaching hearing children reading and writing might be done by using lithographed type in the first instance, as teachers of the deaf did. He said it would occupy too much time to

describe exactly how every sound and combination of sound was taught; it sufficed to say that no time was lost in combining vowels with consonants so as to form monosyllables, the meanings of which could be illustrated either by showing the objects themselves, or by pictures.

The lecturer then proceeded to the acquisition of language. The true characteristic of the German or Pure Oral System was the natural way by which it taught language. It was often said, when articulation and lip-reading were taught in a school, that the Pure Oral System was in vogue there. This was not necessarily true. It was only when lip-reading and speech were the exclusive means by which the children received instruction that the Pure Oral System was used. The intuitive system of teaching language was used—the simple words were formed into simple sentences—the simple sentences into compound ones, and so by degrees more advanced lessons were reached. The children's vocabularies increased day by day, their mental powers developed, and after some time they were able to receive instruction in all the branches of a sound education, and were eventually able to express themselves both orally and in writing on every subject. Speech must be used as exclusively to a deaf child as to one who could hear, so as to force him to practise lip-reading. As soon as he could express any want by speech, the natural sign, which had been previously indispensable, must be rigorously discarded, for any attempt to combine this system with any other would produce unsatisfactory results.

The best way of teaching a deaf child was to follow the Pure oral System:—

1. Because it emancipated the Deaf Mute by giving him the noble and great gift of speech.
2. Because it developed the power of understanding what others say.
3. Because it taught language in the natural way.
4. Because it extended his means of acquiring knowledge, since everyone whom he saw talking and who conversed with him became a teacher, whilst at the same time it destroyed his isolation and made him better fitted to mix with society.

He gave it as his opinion that all classes of deaf children could be taught on this system except those who were blind or idiots. The course of instruction ought to be not less than eight years, the

two first of which were spent in what may be called the preparatory or infant school for the deaf. Although the instruction in speaking, lip-reading, reading and writing continued during the whole of the eight years, it must not be forgotten that geography, history, arithmetic, &c., &c., were taught at the same time. Everything was done by means of spoken language, the child receiving its lessons in lip-reading whilst being taught all the ordinary subjects.

The Pure Oral System could be followed both in boarding and day schools. He advocated most strongly that the deaf should not be removed from their homes, but be allowed to mix with the hearing and speaking world as much as possible. Even in the case of the pauper class the boarding-out system could be applied, as it was done on the Continent, the school authorities sharing the expenses either with parents, the Education Department or the Poor Law Guardians; the persons taking charge of such children being under the control of the principal or head master of the school.

The lecturer concluded by inviting the

audience to convince themselves of the practical results of the Pure Oral System by coming to see the work done in the Association's Normal School and Training College for Teachers at 11, Fitzroy Square. The Association was established in 1871 by the late Baroness Mayer de Rothschild and friends, with a view of propagating the true principles of the Pure Oral System, to maintain a Training College for Teachers (for both ladies and gentlemen), and a School for Deaf and Dumb Children of all denominations and classes. A public lesson was given at 11, Fitzroy Square every Wednesday afternoon at 3 o'clock precisely (except during vacations), and visitors were always welcome both then and on any other day by appointment. Mr. Van Praagh himself could be consulted daily between 11 and 12.

At the conclusion of the lecture the lecturer introduced some teachers from Fitzroy Square, who gave some practical illustrations of the work with their pupils in various stages of instruction. He also introduced some of his adult pupils.

National Physique.

A CENTRAL PHYSICAL EXAMINATION BOARD.

By A. ST. CLAIR BUXTON, *Assistant Surgeon to the Western Ophthalmic Hospital.*

WITH a keen appreciation of the value of accurate anthropometric examinations, it has always been my hope that I may live to see the establishment of a Central Physical Examination Board under State control. I have been opposed by many and various arguments when speaking on this subject, but I remain unconvinced of the impracticability of the scheme, and I realize more fully every day the truth of the old saying "Science is measurement."

I feel that an institution of this kind would prove not only exceedingly useful to employers—be they private individuals, commercial societies, or Government representatives—on account of the actual uniformity, impartiality and completeness of the examination, but also in time highly popular with candidates presenting themselves before the Board. And this is not all. The work in the laboratory at South Kensington, useful as it is in collecting anthropometric data, would sink into comparative insignificance by the

side of the enormous mass of statistical evidence which would be collected by a State Board. Moreover, the statistics thus collected would be in themselves of greater value than those at present obtained, for the simple reason that the physical career, so to speak, of a large proportion of the individuals tested would remain for years under observation. In a relatively short space of time we should be in a position to assert very positively the fitness or unfitness of individuals having certain *indices* for various vocations.

No doubt the opposition on the part of many existing Medical Boards to the creation of a central body, which would practically extinguish all others, would be strong and prolonged. But we must not forget that the same kind of opposition was raised when it was first proposed to supersede certain forms of hand-labour by steam power, and coach traffic by rail. Few, however, will be bold enough to

deny the advantages that have been brought about by these improvements. Old ideas, however deeply rooted, must ever give way in time to improved methods. Evolution sweeps everything before it. All tends to exactness in this age of scientific progress. May not the fusion of medical and surgical licensing bodies be looked upon as an instance of this?

Another evidence of scientific progress is to be found in the fact that some of the oldest medical boards replace antiquated and inaccurate tests by more recent and more exact ones. Not many years ago Sir Joseph Fayrer, President of the Medical Board of the India Office, felt dissatisfied with the sight tests then in vogue in his Department, and accordingly, with the assistance of Mr. Macnamara, Mr. Couper, and Brigade-Surgeon H. Caley, he formulated a new set of rules for the ophthalmological examination of candidates for posts under the Indian Government. This was decidedly a step in the right direction. Very soon after this useful anthropometric reform had been effected at the India Office the military authorities discovered that *their* vision tests were so vague that a candidate's admission or rejection was, under certain circumstances, left to a great extent to the taste and fancy of the military surgeon in charge. Hard and fast regulations were here again laid down—with a minimum of latitude—and now, if a candidate is passed who is not up to the proper standard the fault must lie at the door of the examiners. And yet, notwithstanding this, men with well marked visual defects have got into Woolwich! How is this?

Even admitting for the sake of argument—merely for the sake of argument—that military medical examining Boards are always composed of men thoroughly well up in all modern methods of conducting physical examinations, I yet doubt very much whether sufficient time is allowed for carrying them out fairly—even though the needful apparatus be at hand (which I am inclined to question).

At the Admiralty candidates were formerly tested for colour-blindness by means of coloured pieces of paper, I believe. Holmgren's wools are infinitely superior to coloured paper, but even the wools, as has been recently shown, are insufficient to detect colour-blindness in some cases when light is transmitted to the candidate by means of coloured glasses (representing night signals). To meet

this point, which I had myself observed, I invented the "Telechrome," of which I designed a special form for naval purposes. This instrument has been adopted with excellent results in the Medical Department of the Admiralty, where it has now been in use for many months. Here, again, is a little step in the right direction. But what we want is not only the substitution of new plans for old ones, but the employment of *all* new methods of arriving at reliable results. Everything that is measurable should be measured, and as little as possible left to the "discretion of the examiner." It is time enough to grant discretionary powers when dealing with immeasurable quantities.

All things considered, I think it is not unreasonable to conclude that the great objection to any radical change would be not so much on the score of the introduction of novel and supplementary procedures as to their centralisation into a single Board, or at most into three Boards—one for each division of the Kingdom. This, for the sake of uniformity, I hold is essential to success.

I cannot delude myself into the belief that the Government would be willing to play for so high a stake, or, as it might be put, do anything so rash. Convincing proof of the efficacy of such a system of examination must first be furnished. To attain this end is the difficulty; and the Government will probably intimate its perfect satisfaction with the existing system in reply to any appeal made on behalf of the proposed reconstruction.

If, however, a complete examining Board (a provisional Board, be it understood) were selected, and the whole scheme fully explained to the authorities, it might be possible to induce them to sanction the employment of this Board to conduct one of the many medical pass examinations required before admission to some of the government services. Of course the selected Board would be under scrutiny of the Medical Board it replaced, and would thus be judged, perhaps not too impartially. But it would be something to have tried the experiment, which should go a long way to prove that the tests are neither too stiff nor below the proper standard, and that they are not of an unreasonable character.

Now for the examination itself. I do not propose to consider the minute details of each test, but merely to indicate in a general way the various portions into

which I would divide it. Nor is it to be inferred that I consider it necessary that every candidate, in order to establish a claim to admission ("Pass"), should make full marks in each section. Much would depend on the nature of the appointment he was seeking, and for some branches of the public service he might even not be required to make any marks at all in some of the parts.

But assuming that we are dealing, say, with a candidate for a gentleman-cadetship at Woolwich, it would be advisable perhaps that he should be required to score a minimum number of marks in *all* parts, and perhaps as much as 80 per cent. in *some* parts, and to make a grand total of 50 per cent. of the possible maximum. This question, however, is one that must be left for further consideration. I propose that the course of examination should be composed of six sections, as follows:—

SECTION I.

AGE, WEIGHTS AND MEASURES.—Age, Height, Weight, Chest girths, Waist girths, Limb girths, Cranial measurements, Lung capacity, Length of Back, Length of Neck, Length of Limbs, Arch of Feet, General Symmetry, Development.

SECTION II.

HEALTH OF VISCERA, &c.—Heart, arterial system (*cardiograph, sphygmograph, auscultation*), venous system, varicosity. Lungs (*auscultation, percussion, fremitus, vocal resonance, &c.*). Liver, Kidneys (*urine tests*). Spine, mobility of joints.

SECTION III.

STRENGTH.—Power of grasp, Resisting power of Flexors and Extensors of Arm, Forearm, Thigh and Leg. Power of pulling.

SECTION IV.

HEARING.—Rapidly of response to sound. Acuity of hearing (*otoscope, tuning fork, &c.*).

SECTION V.

VISION.—Acuity of Vision (*Distant Types and Astigmatism Fan*). Colour vision. (*Holmgren's Wools and Telechrome*). Range of Accommodation (*Jaeger's near Types*). Estimation of Errors of Refraction (*Retinoscopy and trial lenses*). Examination of Fundus (*ophthalmoscope*). Relative size of Pupils. Convergence, &c., Field of Vision (*Perimeter*).

SECTION VI.

NEUROLOGY.—Various Reflexes, Ankle and Wrist Clonus, Electrical response and Excitability, &c.

I do not pretend that the foregoing syllabus exhausts the subject, nor do I presume so far as to say that the tests I have mentioned are absolutely the best ones. At most I have given a rough sketch, the various points of which can be rubbed out or intensified, but which indicates the general plan on which I would base the working of the Board which forms the subject of this article.

In the hands of experts—say two in each section—the time required to examine 100 candidates would not be very great, while the tabulated results would be extremely valuable for future reference.

Lastly, if such a laboratory were opened under the auspices of the Government, and formed the only portal (medically speaking) to its services, its work would be very great, but its application to the demands of others than those seeking Government posts—say railway officials, candidates for life assurance, &c.—would increase the work enormously and, I have little doubt that the Board might be made almost, if not entirely, self-supporting.

Notes of the Month.

NATIONAL PHYSICAL EDUCATION.—As Lord Meath's Bill for making physical education compulsory in our elementary schools is now before Parliament and the country, we have printed on another page Dr. Blatin's speech in the French Chamber of Deputies in support of a similar measure. Dr. Blatin's speech possesses two notable features: it puts the subject forward in a clear, logical form, and in

language which can be understood by the people it concerns; it also warns us against possible failure in enforcing such a measure if it becomes law. Compulsory physical education has been in existence in France for many years past, but Dr. Blatin tells us how the University—the educational authority entrusted with its execution—has failed in its duties in this respect. Five minutes a day out of twelve hours devoted

to hard intellectual work is the amount of physical education which the French schoolmasters think adequate to the wants of their pupils. We in England, as far as our town schools are concerned, are not much better off. We have, it is true, shorter hours for intellectual work, but for the most part we have no physical education at all. The chief features of Lord Meath's Bill are given in *PHYSIQUE*, No. 2 (March), page 34, from which it will be seen that the school boards and school managers will be the authorities for carrying out its provisions and not the school masters who, as victims to the sedentary and unhealthy habits of school life themselves, cannot be expected to take a proper interest in physical education.

ATTENTION TO HEALTH IN UNIVERSITIES.—Lord Dufferin, in his address as Lord Rector of the University of St. Andrew's, among much good advice on various educational subjects referred to the need for attending to the health.

A topic (he said), to which I wish to direct your attention, though perhaps you will smile at me for doing so, is the necessity of attending to your health, and consequently of acquiring some knowledge of the principles of hygiene. It has always been a marvel to me how the youths of England ever attain manhood, so inconceivably silly are the things that schoolboys are perpetually doing through simple ignorance. But grown men at our Universities are equally careless, and ruin their constitutions, cripple themselves for life, and destroy their nervous system through neglect of the commonest rules. Reading men are those who most signally err in this particular, for while the athletes on the river or in the cricket field follow the severest regimen in order to keep their bodies fit for the impending exertion, the students live upon tea, neglect their exercise, disdain fresh air, and sit up till any hour in the morning; and yet any doctor will tell you that our mental functions, our memories, our attention, our powers of continuous application are even more dependent for their vigour and vitality on the general condition of our health than is the play of our muscles. Moreover, there is nothing more extraordinary than the trifling character of the circumstances which will tilt the balance of our bodily condition in the direction of health or disease, or how insignificant are the precautions which prove sufficient to maintain our minds clear, cheerful, and elastic,

and to render the exercise of our faculties a delight and a triumph, instead of leaving us to labour in an atmosphere of inertness and despondency. But, on the other hand, as youth is always prone to exaggeration, you must be on your guard against allowing a reasonable solicitude about your health to degenerate into the worst of tyrannies—that of hypochondria.

Nor ought we to be less careful of what I may call the hygiene of our souls, or rather of our nervous system, for it is an undoubted fact that, as men grow up from youth to manhood, there is developed within their frames a certain nervous effervescence which, unless wisely and manfully controlled, results either in physical excess or else in various forms of hysteria which sometimes take the shape of religious melancholy or of extravagant or factitious religious enthusiasm, which only too often proves not only unreal and evanescent, but the herald of a pernicious reaction. Remember, therefore, that the healthiness and robustness of your nerves and mental fibre are as worthy of cultivation as those of your corporeal faculties. In this way you will keep your characters free from those morbid, sentimental, and vicious growths which leave a human being neither man nor woman.

DEAF AND DUMB AND BLIND PAUPERS.—The Government has not lost much time in acting on the recommendation of the recently issued Report of the Royal Commission on the General Condition of the Blind, the Deaf and Dumb and Idiots. All the Poor Law Board inspectors have received special instructions to visit every workhouse and infirmary with a view of ascertaining how many deaf, dumb and blind inmates are maintained there, and how they are cared for. Special directions are given to the inspectors to see that, as far as possible, this class of inmates are provided with suitable means of recreation, and it is suggested that where possible they should receive technical training in some branch of industry. The Board is said to be of the opinion that in this matter the whole of the Boards of Guardians throughout the country should co-operate, so as to board out the blind and deaf and dumb inmates in suitable institutions, and thus, by bringing them together, do what little is possible to render their lives easier and less monotonous. Our readers will learn from the Rev. F. W. G. Gilby's letter what is being

done in the direction of physical training and recreation among the better class of deaf and dumb connected with public institutions.

THE LONDON WATER SUPPLY.—There is a growing anxiety in many quarters as to the adequacy of the present sources of water supply of London, and ambitious engineering schemes are being put forward—former proposals revived and new ones proposed—to bring a large supply of water from distant sources, such as the Cumberland lakes, the valleys of North Wales and Exmoor, districts which are thinly populated and where the annual rainfall is three or four times greater than that of the Thames Valley, from which our chief supply is taken. Not only do these schemes involve an enormous expenditure of money, but great engineering difficulties, which, if carried out, would disfigure a very large portion of our beautiful country. We could not look for the picturesque effect which the Roman aqueducts produce on the Campagna, and a monotonous stretch of aqueduct 150 or 200 miles in length across our comparatively level country would be as wearisome as a railway embankment, of which we have already too many. Engineers are no respecters of scenery, and they must not be allowed to have this matter all their own way. There is no reason, indeed, why these vast works should be adopted in their entirety. The water at present taken from the Thames is fairly good, and can be, and will be, improved as the drainage of the towns standing on its banks is properly diverted, and there is no reason therefore why we should not continue to draw our water from the river. All that is necessary is to increase the quantity of water in the Thames by increasing the area of the watershed, by connecting it with others, or by storing some of the winter and spring rainfalls for summer and autumn use, by damming the valley of its tributaries in some such manner as the Brent is dammed at Hendon for canal purposes.

By forming reservoirs, such as are proposed in North Wales and connecting them with the upper Thames, instead of bringing the water direct to London at a high level, an ample supply of water could be obtained and much of the expense and most of the ugliness of the entire schemes avoided. A slight lowering of the weirs would enable the present bed of the river to accommodate a large increase of water, and there would

be a quickening of the current until the extra water was taken up by the Water Companies, and the lower reaches would have their due supply. Nor would this gain in economy and picturesqueness be at the expense of the purity or healthiness of the water supplied. All our surface supplies of water contain organic impurities and this organic matter is destroyed or rendered inert by oxidation, by free oxygen given off in a very active state by aquatic plants; by absorption from the atmosphere, and by aeration by the movement of the water by winds, by trickling over rocky beds, and by tumbling over weirs. Water pipes and conduits afford none of these methods of purification, and with reasonable care in excluding sewage the water from the Welsh mountains could be brought to London in a purer condition down the open valley of the Thames than in the most perfectly constructed engineering works. The canals which connect the upper reaches of the Thames with the western coast drain off no doubt a considerable quantity of water which should run Londonwards, and some economy might be possible in this direction; but it is probably only by largely increasing its volumes either in area or rate of flow that the Thames can be made to head the ever-increasing drain which is being made on it.

THE PROPOSED FACTORY LEGISLATION.

—There are several bills before Parliament whose chief object is to meet the abuses of the "sweating" system as it exists in workshops rather than factories. Incidentally and on the instigation chiefly of the Lancashire cotton spinners, an effort has been made to do away with the medical examination of children before employment, but this has been defeated on very obvious grounds. It is quite possible that the present system of appointing factory surgeons is not the best which could be devised, but some check must be kept on ignorant parents and employers in this matter. The question of raising the age of half-time children from ten to twelve, or eleven as seems probable, has attracted a good deal of attention, and it is hardly likely that the bill will become law unless a change to a higher age is made; but a change which is still more required, if the physical interests of factory children are being legislated for, is the raising of the age of full-timers of both sexes to sixteen or even seventeen years. There is no period of life (except that of infancy) at which the growth and physical and mental

development of boys and girls undergo so many and such rapid changes as at about the age of fourteen or fifteen years. The growth is greatest and some of the most important functions of the body first assert themselves at this period, and it is at these ages that good or bad *physique* of an individual is chiefly determined, and when, therefore, both physical and mental constraint are most irksome, and if unwisely pressed, injurious. It is a remarkable fact that the growth of the labouring classes is slower—more retarded—and puberty is attained a year later among them than among the non-labouring classes, and there is nothing to account for the difference except the difference of physical occupations. Agents which retard growth will, if carried to extremes, stop it, and there can be no doubt that the lower *physique* of our labouring population is due to the too early and hard labour imposed on the growing members of it about the age of fourteen or fifteen years.

THE METROPOLITAN PUBLIC GARDENS ASSOCIATION (83, *Lancaster Gate, W.*)—Its objects are to provide public gardens and playgrounds in crowded parts of London; to plant trees and place seats in thoroughfares; to preserve existing open spaces; to encourage and assist the formation of public gymnasia, &c.

Since the formation of the Association in 1882 about 200 separate undertakings have been carried to a successful issue, including the laying-out, with seats, trees, flowers, fountains, &c., of one park, 31 public gardens and 8 playgrounds; the opening, on Saturdays, of 11 School Board playgrounds; the planting of trees in 20 small churchyards and 14 thoroughfares; the placing of seats in 13 streets; assistance given, by grants of money or seats, towards the laying-out of 29 public recreation-grounds; grants given to 17 public gymnasia; and successful negotiations carried on for the preservation, opening, &c., of 33 open spaces.

BANSTEAD DOWNS, SURREY.—A scheme has been drawn up for placing Banstead Downs and Heath, Burgh Heath, and Park Downs, near the Epsom racecourse, under a body of conservators, as provided by the Metropolitan Commons Preservation Act. The waste lands in question lie some 500 or 600 feet above the sea-level, and the invigorating breezes on them render them especially suitable for the

purposes of the health and recreation of the working classes: They are admirably adapted for various games, for which they are already used to a certain extent, but it is believed that under proper regulations they would be more extensively used for the purposes of recreation. The proposal is being supported by the Hon. Francis Baring, who is a large land-holder in the district, and it will be submitted to the Board of Agriculture for consideration.

THE LONDON VEGETARIAN SOCIETY.—The annual meeting of this Society was held in the Library of the Memorial Hall, when Mr. A. F. Hills occupied the chair. Miss May Yates, the secretary, read the third annual report, which congratulated the members on the progress made in society by their principles.

“A wide-spread demand,” said the report, “for English-grown fruits and vegetables might well prove a remedy for the acknowledged evils of congested City life by summoning people back again into the gardens and orchards of the country.”

MITCHAM COMMON.—The Assistant-Commissioner of the Board of Agriculture has concluded his inquiry into the scheme for the protection of Mitcham Common and other open spaces in the neighbourhood. Under this scheme it is proposed to place the common and other lands mentioned in the hands of twelve conservators representing Mitcham, Croydon, Beddington, and Wallington. The area of these open spaces is about 600 acres. The scheme has been strongly opposed by, among others, the lords of the manor of Biggin, Tamworth, and Mitcham, who claim the freehold of the soil and value their rights at £30,000. In the event of the Board sanctioning this scheme it will be subject to the approval of Parliament before it can become operative.

SWIMMING-BATHS FOR BOARD SCHOOLS.—The following discussion and estimates of cost will be useful to school managers contemplating the construction of baths. Swimming is such a useful art, both from a sanitary and practical point of view, that it should be included with other practical arts under the head of “Technical Education,” and baths should be constructed like workshops, &c., out of funds voted for that purpose.

At a recent meeting of the London School Board, Mr. White moved, “That it be an instruction to the Works Com-

mittee to provide swimming-bath accommodation in the planning and construction of all future schools of the Board." He pointed out that the Education Department sanctioned the teaching of swimming, which was an important part of physical education; and it was the duty of the Board to provide bath accommodation. With regard to the cost of the baths, one measuring 50ft. by 25ft., ranging in depth from 2ft. 9in. to 5ft. 6in., capable of holding 30,000 gallons of water, would cost from £1,400 to £1,500. There would be, of course, the cost of the water to be paid for, and some arrangement would have to be made with the caretaker for looking after them. Mr. Winnett mentioned that the several parishes in the Metropolis had already erected forty swimming baths, many of them having cost £40,000 each. The cost of water was 6d. per thousand

gallons; and, if changed twice a week, that alone would cost £60 a year. The Rev. J. J. Coxhead said no account had been taken of the cost of the instructors—because, of course such people would have to be appointed. General Sims said that at the Westminster baths they had to pay about £1,500 a year for maintenance. Professor Gladstone thought to encourage bathing was one thing, but to provide baths was a question of a most doubtful and most costly character. Prebendary Eyton hoped to see the day when swimming would be taught generally in the Board Schools. Mr. Collins thought the proposition to add baths to all future Board Schools was a very small matter indeed. Some members of the Board seemed to think that the proposition meant the building of baths for all the schools, which was not in the proposition at all.

The Magazines.

PHYSIQUE AS A FACTOR IN ECONOMICS.—In a review of Professor Marshall's "Principles of Economics" in the current number of the *Edinburgh Review*, the importance of the physical condition of man as a factor in the production of wealth is thus referred to. It is a lecture on applied hygiene, and teaches that "wealth" is capitalised health:—The chief point which attracts our notice is the increasing importance of man himself in economic discussions. The human element is becoming every year a more important factor in every problem. Ricardo, rather than Adam Smith, is responsible for the creation of what has been called economic man. But even Adam Smith had asserted that selfishness is the main motor of mankind.

This doctrine of selfishness, on which the earliest economists founded their teachings, assumed a much more definite shape among Adam Smith's successors. Man was regarded as "a constant quantity" in every problem. . . . Even in the infancy of the science, however, inconvenience resulted from this assumption. It exposes economists to the reproof that they ignored the better qualities of human nature, and that their work was directed to the increase of wealth and not to the improvement of man.

"Is then wealth everything, and man nothing?" asked Sismondi. The younger and greater Mill showed how much he was

influenced by the views which prompted Sismondi's question, by styling his best known work "Principles of Political Economy, with some of their Applications to Social Philosophy;" and to quote Professor Marshall's language, "he made in it no attempt to mark off by a rigid line those reasonings which assume that man's sole motive is the pursuit of wealth from those which do not."

The increasing importance of man in economic study, however, has never been emphasised so clearly as in Professor Marshall's pages. It is hardly too much to say that the moral of his book seems to be that the economist should labour to promote, not the common wealth, but the common weal. "All wealth" he says, "consists of desirable things, or, as we may call them, commodities or goods." Goods, again, are external and internal, personal and material. Material goods, consisting of useful material things, or the right to derive benefits from material things, like water, air, and climate, are all external. Personal goods, on the contrary, are both external and internal: external personal goods including the services of others; internal personal goods consisting of a man's own qualities and faculties.

Thus, at the very outset of the treatise, we are introduced to the conclusion that a man's ability is part of his wealth, and that the greater his capacity the greater his wealth. It follows, from reasoning of

this kind, that it is the interest of the State to promote the capacity or the education of the workman; and that political economy, in addition to inquiring into the causes which lead to the aggregation of capital *should investigate the circumstances which increase the efficiency of man.*

"General ability"—a term which in Professor Marshall's pages denotes "those faculties and that general knowledge and intelligence which are in varying degrees the common property of all the higher grades of industry . . . depends largely on the surroundings of childhood and youth." Thus home and home influence become important factors in economics, and the education of the people is regarded not only as a national duty, but a national investment. The wages which the mother can earn when she goes out to work "are of far less importance for the health and happiness of her family than the more material services she could have rendered if she had stayed at home." "The most valuable of all capital is that invested in human beings; and of that capital the most precious part is the result of the care and influence of the mother, so long as she retains her tender and unselfish instincts, and has not been hardened by the strain and stress of unfeminine work."

Home influence and good educational opportunities are only two of the causes which make for wealth. That country is the most prosperous whose people increase most rapidly and display the greatest vigour; and vigour, which biology teaches us, is inherited, is promoted by good air, good food, good water, [good exercise]

and good dwellings. The aggregation of people in towns, however, is not favourable to the production of vigorous children, and Professor Marshall is so profoundly convinced of the evils inseparable from town life, that he says that "money spent on reducing the cost of living in large towns by building workmen's houses at a loss or in other ways is likely to do almost as much harm as good, and sometimes even more." "There is perhaps no better use of public and private money than in providing public parks and playgrounds in large cities, in contracting with railways to increase the number of the workmen's trains run by them, and in helping those of the working classes who are willing to leave the large towns to do so, and take their industries with them."—Thus Professor Marshall feels so strongly the evils of town life that he advocates the expenditure of public money to enable the artisans to escape from the town to the country, and the enactment of sanitary laws and regulations, with the express object of reducing the congested populations of great cities, and of preventing any further immigrations into them; and these laws he regards as specially desirable, because they will tend to raise the rate of wages, for good wages are as important as good air and sanitary regulations.

Various circumstances induce Professor Marshall to believe that, in this respect, the working classes as a whole are steadily improving their position. He looks forward to the future with hope, and writes occasionally with the enthusiasm of an optimist.

Reviews and Notices of Books, Pamphlets, &c.

SCIENTIFIC MEASUREMENT OF CHILDREN.

By Rev. H. A. Soames, M.A., F.L.S., a paper read before the Bromley Naturalists' Society. L. Upcott Gill, London, 1891.

LOCAL Scientific Societies are useful for encouraging local investigations, but they are often also the graves of much excellent work, and Mr. Soames has done well to publish his interesting and useful paper in a separate form. Mr. Soames is a schoolmaster, and has taken advantage of his connection with children to study the development of their bodies concurrently with that of their minds. He advocates the use of the measuring rod,

the tape, and the weighing machine instead of "the kind of measurement that is carried on in many families when the height of the children is marked on the wall or behind a door;" and he points out many useful indications for feeding and management of children based on his own observations. "Very few people know what height a child should be at a certain age, or, what is of more importance, what weight a child should be for a certain height nor do they know where to look for the information," and he supplies tables constructed from his own measurements, and from Dr. Roberts' book on Anthropometry. Mr. Soames thinks that the weights of

children should be taken without the clothes, and his weights are of this kind; but when we are dealing with very large numbers of persons for the purpose of defining the chief physical characters of a nation or a race, it is impossible, for obvious reasons, to have the clothes removed. The weight of the clothes in relation to the stature and weight of the body is a pretty constant quantity for each age and sex, and is the same for fat or spare subjects, and its inclusion does not invalidate the results of comparisons made between one class and another. When, however, individuals or small groups are dealt with, it is certainly desirable to omit the weight of the clothes as recommended by the writer and indeed by all the writers on the science of anthropometry. Mr. Soames makes other measurements than those referred to, and we think he would find the sitting height (*i.e.*, the height from the seat of a chair to the top of the head) a better measurement for ascertaining the relative length of the trunk and lower limbs than the one which he adopts. The pioneers of the science of anthropometry must feel considerable satisfaction with this fresh proof of the value of their labours, and persons entering on similar work will find Mr. Soames' pamphlet a useful guide to the practical side of the question.

THE RELATION OF ATHLETIC SPORTS TO PUBLIC HEALTH. By Henry Hoole, M.D.Lond. Renshaw, London, 1891.

This pamphlet is for the most part a protest against the growing tendency to "professionalism" in athletics. In his preface the writer very justly remarks that "the spiritual welfare of the people cannot in this country be regarded as neglected. But in the interest of their bodily culture, no skilled advisers and no trained councillors are provided by rich endowment from State or from individuals. Like many other matters appertaining to the physical well-being of the community, the use and abuse of outdoor recreation falls to the almost unsupported consideration of medical men; and they, rightly or wrongly, are often accused of thinking more of the restoration of the public health than of its preservation." The pamphlet consists of two parts—"The Evolution of Skilled Muscular Exercise" and "Modern Athleticism,"—the former being a sketch of the origin and uses of muscular training in all ages, but dealing too lightly, we think, with the impedi-

ments which have stood in its way; the latter dwelling, perhaps a little too heavily, on the abuses of athletics at the present day. Athletics have become a profitable trade to both their public promoters and actors and there is ground for apprehension that their original objects are being lost sight of. "An enormous amount of capital has been sunk, and is being sunk, in sporting journals, in the manufacture of sporting goods, and institutions." The unprejudiced reader of sporting papers "is greeted with lithographed portraits not only of leading athletes, but youths of ninth or tenth rank. Biographies of the latter relate the successes and the trivial events of their short life." Valuable prizes, medals, and money are given at public displays which are more than repaid by "gate-money." Rivalry between clubs "leads to salaried posts being found for skilled members, prominent players are enticed from opposition clubs, and promising beginners, irrespective of their young age and want of stamina are effusively welcomed." For all these and many other reasons, Dr. Hoole thinks that a good deal of mischief is being done both to the *physique*, health, and morals of many young men where nothing but good should be looked for. It is very necessary that warnings of this kind should be given to all classes, but especially to our town-born and city-bred young men, who have not the time for proper training, or who do not possess the inherent stamina to enter into contests with men who devote most of their time to such pursuits and make a profession of them.

Numerous warnings of this kind have already been given in our pages against the abuse of athletics. Mr. Mackenzie, in his article on "The Sports of the Ancient World," told us how in Greece gymnasts became mere animals, eating excessive quantities of beef and sleeping away the time which was not actually required for their exercises; and how the exercise-loving Romans were obliged to abandon athletics to persons who made a profession and a public exhibition of them. This tendency to abuse has not escaped the notice of men of our own times, and the Rev. E. Price's condemnation of professionalism in football, published in the second number of *PHYSIQUE*, is now supported by a physician who has made the science and art of training for athletics a special study. On the other hand, Dr. Hoole says some very encouraging things relative to the favourable changes which

have affected the physical exercises of girls and women in this country, but he thinks there is room for still greater changes, as girls are fortunately not subject to the craze for prize competitions like their brothers. He makes the following suggestions to counteract the evils he complains of:—"Let there be no great discrepancy in the ages of your active members; abolish competitions for challenge cups for youths under twenty years

of age; do not favour any eccentric departures from legitimate pastimes; let your prizes approach in simplicity and cost the olive garland of the Greeks; and in the interest of sport, make more rigid the line of demarcation between amateur and professional athleticism. To the latter relegate costly prizes, gold and silver medals, championships, the making and breaking of records, erratic diversions, and the furtherance of the sporting industries."

Correspondence.

PHYSICAL TRAINING FOR THE DEAF AND DUMB.

DEAR MR. EDITOR,—In your April number I see that the deaf and dumb are twice mentioned, once in connection with recent Government proposals for their better mental education, and a book from Mr. Van Praagh is acknowledged. May I be allowed to draw the attention of your readers to the great need of special physical education for these afflicted people? Owing to the very partial or non-use of the speaking powers, the lungs of those who do not speak show a predisposition to pulmonary affections. There has hitherto been no united scientific effort towards establishing a special course of physical education for these people. I am no doctor, and shall be glad of advice from any quarter, but I imagine that the usual light dumb-bell mass drill, followed by bar-bell and club exercises must be most beneficial; these we employ regularly, though we only possess the dumb-bells here at St. Saviour's. As lately as last October we began to agitate for a gymnasium for the deaf at St. Saviour's Church, 419, Oxford Street, and bought a horizontal bar and parallel of worthless make; our next step, it should have been the first, was to consult Mr. Eugene Sully, of Exeter Hall Gymnasium, who has kindly acted as our teacher and adviser ever since. We are now in possession of two or three good pieces of apparatus, and our mutes so improved between November and January, that a team of eight went down to Bourne-mouth in February to contend in the second round for the two hundred guinea Challenge Shield under the National Physical Recreation Society rules. Of course they were well beaten, but the mutes proved themselves worthy of the grant of a twenty-two guinea Challenge Shield for themselves, which the Council of the N.P.R.S. have most generously voted, to be annually disputed for under

N.P.R.S. rules. The rules seem to be very scientifically arranged, and I commend them for general consideration. There are competitions on the horizontal bar, in high jumping and in rope-climbing. In these three branches of activity room is found for the development of all, or nearly all the muscles. The back, perhaps, specially, as well as the chest on the bar, the lower quarters in the jumping and the upper quarters in rope-climbing. Under many rules the body is unequally exercised, an inordinate strain being laid upon certain limbs. I appeal to readers of *PHYSIQUE* to work for the establishment of gymnasia for the deaf and dumb in all large towns, and to the heads of Deaf Mute Institutions to secure better physical education for their inmates. Man is not merely a thinking and moral, but also a corporeal agent, and we are bound to do our duty by the body if we would be perfect men and women. I have lately been asked to act as an Hon. Sec. for the Deaf Mute Branch just formed of the N.P.R.S., and shall be pleased to receive affiliations and fees from Deaf Mute Gymnastic Societies, so that we may have competitions for our handsome Challenge Shield, and a more combined and extended system of training. Our season is just closing, but I shall be only too glad to show any readers our gymnasium or discuss the subject. Funds will of course be wanted for this in all parts of the Kingdom.

F. W. G. GILBY,

Chaplain to the Deaf and Dumb.

419, Oxford Street, W.

NOTICE TO CORRESPONDENTS.

Communications, Books, &c., must be sent to the Editor of *PHYSIQUE*. Addressed and stamped envelopes must be enclosed when contributions are to be returned. Business letters must be addressed to the Publishers, Messrs. George Bell and Sons, York Street, Covent Garden, W.C.

Physical Education.

PHYSICAL DEVELOPMENT.

By GODFREY W. HAMBLETON, L.K.Q.C.P.I.,

President of the Polytechnic Physical Development Society.

GREAT interest has, I am happy to state, been taken in the results already obtained by the Polytechnic Physical Development Society. Their publication at the Leeds Meeting of the British Association has caused enquiries for further information to be addressed to us from all parts of the kingdom, the continent, India, Africa and America. I mention this because it shows that the public are beginning to realize that the physique is something more than a matter of great interest to scientific observers, that it is, in fact, a subject of practical importance to each one of us, and that the time is ripe for the formation of an organization to deal with it as a science and an art.

It is, doubtless, pretty generally known that, broadly speaking, the difference in the physique of man in the highest centres of civilization and that of man in a savage—or, to be more accurate, in a lower state of civilization—is, with the exception of parts of the brain, greatly in the favour of the latter; that is to say, we have obtained the advantages of civilization, with the above exception, at the expense of the body, and inasmuch as we are continuously making further advances in knowledge, and applying that knowledge in the ordinary routine of daily life, the tendency of this progress still is to the further detriment of the body. This is not an agreeable fact to contemplate, and the reminder that the "fittest" will survive neither affords us compensation for the injury nor points out the means by which it may be obviated; for the class of the fittest for the circumstances of a generation ago is not the class of the fittest for the circumstances of to-day, and the class of the fittest for the circumstances of to-day will not be the class of the fittest for the circumstances of the next generation. Hence this most important question arises, How can we obtain for civilized man a physique *equal* at least to that of man in a lower state of civilization, and make the further advances of knowledge tend to the advantage of the body? The answer to this question, I shall show, lies in the ascertainment of the effects of the conditions of our habits and surroundings upon the

body, and the application of that knowledge to our own protection and advantage.

Nearly twenty years ago I commenced the investigation of this subject, and the results of that research I laid before the British Association in 1886-87. Then I showed that the size and shape of the chest varied as I varied the conditions to which it was subjected. For example, when I submitted a chest to conditions that tended to develop it, that chest increased in size and its form or type changed accordingly. When I submitted a chest to conditions that tended to decrease it that chest decreased in size and changed its form or type accordingly. I ascertained that those results were absolutely invariable, and could be carried out within such wide limits that on the one extreme they embraced the class of the non-survivors, through consumption, and on the other the finest physique of the class of the survivors or fittest. I pointed out the fact that we had an example of one type of chest forming a series of types that have varied precisely as the conditions to which it was subjected have varied. At birth the male child of all classes has the same type of chest, but at maturity he has that of the class to which he belongs. We have the same relationship between conditions and type; on the one hand, in those who use wind instruments, or who by their occupations require to greatly use their lungs; and on the other, in those who spend a great portion of their time in a stooping position or who compress their chests either by the instrument they use in their work or by a corset. The great development of the muscles of the trained athlete and the wasted muscles of the paralytic are due to the conditions of their use and disuse respectively. We know that the head has been altered in shape by direct pressure, and that the greater size and the more complicated arrangement of the brain of an European to that of an aborigine of Australia is produced by the greater mental training of the former. The difference between the hands and fingers of a pianist and those of a man accustomed to lift heavy weights is pro-

duced by the conditions of their occupations. Upon the presence and absence respectively of shoes depends the difference in the size and shape of the foot of a Chinese lady and that of a woman in the uncivilized state. The colour and thickness of the skin varies according to the conditions to which it is subjected, and there is the same relationship between the size and shape of each part of the body and the conditions to which it is subjected. Therefore, the type of man after birth is solely produced by the conditions to which he is subjected. Hence the formation of race by man's continuance under the same conditions, and its subsequent division into subraces and families by his migrations into new conditions and the minor differences therein. Hence also the difference between the same species of animals under the conditions of nature and of domestication, between the products of the same seeds when sown in different localities, between the same plants when placed under different conditions, and the return of man, animal or plant to former types when they are subjected to the conditions that produce that type.

It would be difficult to over-estimate the immense importance of the facts just briefly referred to. They prove to us beyond the possibility of a doubt that man is what his habits and surroundings make him, that he is a member of the class of the survivors or fittest because the conditions, as a whole, of his habits and surroundings are favourable to him, that he is a member of the class of the non-survivors, those who prematurely disappear, because the conditions as a whole of his habits and surroundings are unfavourable to him, and that he can so order his habits and surroundings that they shall tend to his advantage. A great work and a great future lies straight before us. *We have to ascertain the tendencies of all the conditions to which our bodies are subjected by our habits and environment in order to apply that knowledge to our own protection and advantage.* And that is the sphere of true physical development.

An important step towards the attainment of this great object has been taken by the formation of a Society to apply the principles of physical development in the ordinary routine of daily life. Some twenty-five members joined at the first meeting of the Polytechnic Physical Development Society. Now, thanks to the courteous and cordial co-operation of Mr.

J. E. K. Studd and the authorities, upwards of three hundred members have entered their names on the books, and when the Society is better known and the great benefits it does confer are recognised, I do not doubt that number will be considerably increased. At Leeds I gave the results obtained by a hundred members. The average increase of their chest girth was $1\frac{3}{4}$ inches. I divided them into three classes, the average increase of the chest girth of the third class being $1\frac{1}{4}$ inches, that of the second class being $2\frac{1}{2}$ inches, and the first class $3\frac{3}{8}$ inches. There has been a considerable increase in the range of movement of the chest, the average then being, I think, $4\frac{1}{2}$ inches. Hutchinson's standard of vital capacity has been greatly exceeded, and in the power of inspiration and of expiration the majority belonged to or exceeded his "remarkable" and "very extraordinary" classes. At the subsequent examination for the Society's gold medals the first medallist had obtained an increase of the chest girth of $6\frac{1}{2}$ inches, the second an increase of 5 inches, and the third $4\frac{3}{8}$ inches. The Society's medals for the best physique were awarded to members who had exceeded Brent's "medium" standard by 3.67 inches, 2.42 inches, and 3.32 inches, and twenty certificates were given to those who had obtained and exceeded that standard. I am glad to say that increase continues. We have just held our second general annual meeting, and I find the average increase of the chest girth of 100 members is now 2 inches, that of the third class being $1\frac{3}{8}$, the second $2\frac{1}{4}$, and the first $3\frac{5}{8}$. That increase has taken place in small as well as in large chests, whether the men were tall or short, under or over twenty-one years of age, and with or without previous gymnastic training. Our members are engaged from eight to twelve or fourteen hours daily in over fifty different trades and occupations, amongst them being clerks, compositors, printers, watchmakers, carpenters, engineers, drapers, warehousemen, &c. The variations in the chest girth and vital capacity that have taken place are most instructive. I have frequently noted a large decrease when the members were training too much in the gymnasium, or engaged in extra work, stock taking, cycling, and when they neglected to follow the directions given them. In fact, the increase or decrease observed has been in direct relationship with a corresponding change in the conditions of their habits

or surroundings. It is satisfactory to note that the number of chest girths of from 38 to 40 inches and upwards is steadily increasing. We have also many members who have nearly attained Brent's "medium" standard, which is 5.40 inches above the average of the artizan class, and 3.17 inches above that of the most favoured class. The importance of these facts will be seen when it is borne in mind that this is a new Society, carrying new principles into practice, that its members are placed under more or less unfavourable conditions, that it is purely voluntary, and that its members leave us when they leave the Institution.

Perhaps the best way to explain the practical work of the Society is to describe what happens to a new member on joining it. He is placed in an erect position, his shoulders are brought well back, and his clothing so loosened over the whole of the chest that it permits full and free movement. I find in nearly every case the clothing is from one to two inches or more too tight. Then he is shown the simple movements that are necessary to throw the weight of the shoulders on the spine, he is taught to inhale and exhale deeply through the nose, and to use the spirometer and manometer. We explain to him that the conditions of his habits and surroundings tend either to his injury or to his advantage. He is told to avoid those that tend to act injuriously, and where that is not possible or practicable, to ascertain their amount and to counteract their effects and to place himself under those that tend to his advantage. We request his careful attention to these conditions, and deal first with those that have to be avoided. The habit of stooping, positions that cramp or impede the full and free movement of the chest, or a faulty carriage of the body are very injurious. Habits that tend to the disuse of the muscles or to their excessive use are to be avoided. Breathing through the mouth, or breathing air that has a temperature much above that of the external air, or that is impure, or that contains dust, is very injurious. Wearing tight-fitting or too heavy clothes, braces, corsets, or shoes with high heels and narrow toes, tends to impede the full and free movement of the body and is injurious. And whatever of his habits or surroundings tends to act injuriously or to produce such acts must be avoided. We tell him to acquire the *habit* of holding the body erect, the shoulders back,

and the chest well forward; to breathe through the nose, and to take deep inspirations followed by full expirations several times daily; to develop the muscles, especially of the chest, by gymnastic exercise on Ling's system; to go in for the daily tub or swimming; and to have the clothes made quite loose at full inspiration, and to see that they do not impede either by their weight or shape the free movement of the body. We advise him to live in rooms that are in free and direct communication with the external air night and day, summer and winter, and to take care that their temperature is not too high; to spend as much time as possible daily in the open air, and to maintain the temperature by muscular exercise. We point out to him that walking is a most healthy exercise, and that broad toes and low heels tend to promote it. We tell him to practise singing and to take advantage of some form or other of athletics whenever the opportunity presents itself. And whatever of his habits or surroundings tends to his advantage or to produce acts having that tendency must be adopted.

We are all of us at times subjected to unfavourable conditions that we cannot, under present circumstances, avoid. For example, it would be difficult to be present at any public meeting in a large building without having to inhale both impure and overheated air. But when we have obtained a certain amount of physical development, a few deep inspirations followed by full expirations in the open air will be sufficient to counteract that. Again, the occupation or business in which we may be engaged may necessitate a somewhat cramped position of the chest, but on leaving a trained man will soon obtain compensation for that by holding the body erect and taking proper breathing exercise. The main point is to ascertain our unavoidable injurious conditions, and to arrange the other conditions so that *the tendency of the whole* is decidedly in our favour, and it will take a well-developed man—and by that I mean a man having a physique between Brent's *medium* and *maximum* standards—but little time and trouble to accomplish that. These directions are very simple, easy to carry out, and in one form or other are within the power of each one of us. But they effect a complete change in the conditions to which the body is subjected, and to make that change with safety it must be slowly, gradually, and uninterruptedly effected.

I will now point out some cases in which physical development is urgently required, and where its adoption will render an immense public service. Take the case presented by the army. Considerable attention has recently been directed to the large amount of inferior physique that is present in the ranks. On the 1st January, 1889, the army numbered 202,761 men, but of these there were 82,979 whose chest girth was *under* 36 inches—that is, from 31 inches up to 36 inches—and only 16,324 who had a chest girth of 39 inches and upwards. Now on Brent's "medium" standard there ought to have been none under 36 inches, and 67,236 ought to have had a girth of 36 inches and upwards. There is, however, another mode of showing the presence of this inferior physique, and that is by the great liability of the army to disease under ordinary circumstances. During the year 1888 there were 193,233 admitted into hospital, 1,845 died, 2,078 were sent home as invalids, 2,776 were discharged as invalids, and 10,715·97 were constantly non-effective from sickness. It is obvious that had the men been of good physique, and subjected to fairly good conditions, there would not have been anything like this serious amount of sickness, invaliding and death. Why should not these men be placed in a position to successfully compete with the unfavourable conditions of their surroundings by the introduction of physical development?

A reference to the tables in the Supplement to the Registrar-General's Report, showing the comparative mortality of those engaged in different trades and occupations, will show the necessity for the diffusion of the knowledge of physical development amongst those engaged therein. Life assurance and sick benefit societies would not only considerably add to their incomes and increase their

stability by the recognition of this relationship between conditions and type, but they would also by that very act become powerful agents in the promotion of national physique and public health. The introduction of physical development as a necessary part of the education of children is urgently and imperatively demanded. They have a splendid type of chest at birth, the proportion of chest girth to height being a little above Brent's "maximum" standard, but under the present system of bringing up children, they are, from the moment of birth right through the whole course of modern education, submitted to unfavourable conditions, so that for a height of 51·84 inches there is a chest girth of 26·10 inches, instead of one of 35·18 inches, or a loss in about ten years of nearly nine inches. Here you have the best standard of chest girth. Is it too much to ask that the conditions of the child's surroundings, as a whole, shall be so arranged that it may be retained? Look at the poor, puny chests we meet with everywhere, and at the Reports of the Registrar-General, and then we shall see the grave responsibility that lies upon us for producing such a change and permitting it to continue.

The cases just noted evidently require the introduction of physical development, but where shall we find a man, a woman, or a child in civilised countries upon whom its adoption would not confer a great benefit? We are here face to face with a work so great that it will require all the intelligence, the energy, the influence, and the means of a well-organised body to accomplish it. The workers are here, an important section of the public is ready to co-operate, and the time for action has come. Why should we not have a National Association to meet this great national want?

PHYSIOLOGY OF THE FEET WITH REFERENCE TO PHYSICAL EDUCATION.

By T. S. ELLIS, *Consulting Surgeon to the Gloucester Infirmary, &c.*

THE full efficiency of the organs of the body is developed by the exercise of their functions. So, too, in the body, as a whole, the form is developed by exercise of that which is its principal function—movement. The body which freely moves, even though the motions may not be of the kind best adapted to develop it, is not likely to be badly-formed. The principal

movement of the foot is that of rising to tiptoe, from the position of the *plantigrade* animal walking on the sole, or *planta*, to that of the *digitigrade* animal walking on its toes, or *digits*. In this transition we have an illustration of another important principle—that the agency which effects the movement supports the structure. The muscles, which by their action move,

in their action sustain. The bones which form the foot are bound together by bands of fibrous tissue or ligaments; some of them being of special strength in order to sustain the weight of the body resting upon the arch which is, or should be, the form of the body of the foot. But these ligaments have, under continued tension, a disposition to yield. They must be somewhat yielding in order to give elasticity. This is an inevitable disadvantage; now for the compensation.

Let a foot with a crescentic line painted on the inner side be placed in the worst possible position for sustaining the arch—turned outwards with the weight of the body upon it, as in fig. 1. It will be seen that the line tends to become straight. Now let the subject spring to tip-toe. The line becomes curved as in fig. 2. The body is raised,



FIG. 1.

not altogether by the calf muscles acting on the heel; the muscles of the calf acting on the toes also come into action and draw the ankles, round which they turn, towards the toes as points fixed on the ground. The figures are reproduced from photographs. Thus the foot is supported by the free movement of it. But to habitually place any part of the body in one position, especially if it be done in opposition to resistance—such as is here afforded by the weight of the body—is to give it a tendency to maintain that position. The main principles of physical education, as I understand them, are based on that law. If this be true, then habitual springing to tip-toe ought to increase the arch of the foot—to increase the hollow beneath. And so it does. The tendons of those muscles of the leg which act on the toes are to the arch of the foot as bow-strings to a bow. To tighten them is to increase

the convexity of the bow. Or, if the ligaments which bind together the bones of the foot be regarded as braces to a roof, these are relieved by action of the muscles on the tendons beneath, acting as tie-rods to the roof above. Clearly, then, tip-toe movements should play a large part in any exercises designed to develop the feet.

Here I should point out that the *great toe*, a special development of the first *digit*, is peculiar to man. The muscle of the calf acting on it is equal to that common to all the others. It should be particularly noted, too, that, unlike the other toes, it does not move directly upwards and downwards. In rest the great toe inclines upwards and outwards, over the others. In vigorous action it moves downwards and inwards, away from the



FIG. 2.

others. If the foot is to have the free exercise of its functions necessary to its perfection, this particular movement of the great toe must have free play. There must be no impediment either by median-pointed boots or even by median-pointed socks or stockings.

Free movement of the foot being necessary to maintain its structure, maintenance of the body in the erect position without movement is obviously prejudicial. To what extent this is so will, however, much depend on position in standing. I hold that when it has to be done for prolonged periods it should be done as an act, not as a mere sinking into a position of such ease as can be attained. I am sure that the four-square position, as I have called it (fig. 3), is the right one. Here four points, equidistant, are found in the centres of the heels and in the broad part of each foot in front.

For reasons which would require too much space to set forth here—they are to be found at length elsewhere*—I object to the military position. This, as shown in fig. 4, does not give the same stability within a limited area as that given in fig. 3. The question which of the two is the better is one of great importance, if only from a military point of view. For, as we are told, the efficiency of an army depends largely on its marching power, this must depend on the condition of the feet, and this, as I insist, will follow from the mode of using them. Figs. 5 and 6 give, in walking, the positions corresponding to figs. 3 and 4 when stationary.

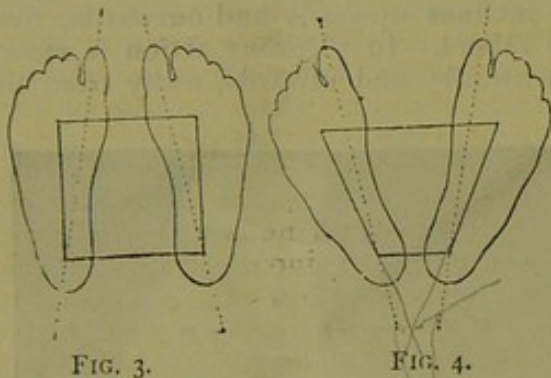


FIG. 3.

FIG. 4.

I have noticed with satisfaction that in the new drill in the army for "Physical Training" the tip-toe movement is freely used. This drill is, however, prescribed for the soldier "in order to expand his chest and develop his muscles." It does not appear to have been specially designed to develop the form and strength of the feet. They afford, however, as I have for many years contended, a specially favourable field for Physical Education, regarded as a means for inducing, by proper use, strength of structure and beauty of form. For the satisfactory training of the feet a radical change in the manner of standing and marching is imperative. The military position (an angle of forty-five degrees, (fig. 4 and fig. 6) must be abandoned. If in this I could be proved to be wrong then I should feel bound to admit that no reliance could be placed on any view I hold as to the *physiology* of the feet. My reasons I will briefly summarize.

In the four-square position (fig. 5) the foot falls on the ground in the position in which it naturally hangs as being that in which nothing in its structure is at all strained. It is, on reaching the ground,

in the position adapted for the muscles of the leg to draw from the toes, as a fixed point, on the leg, as a moving one, and so carry it and the body over it towards the point where the next foot is to fall, which, in turn, is ready, to go through the same movement.

In the military position (fig. 6) the foot has to be held in position ready to be placed; there are no *foot-falls*. The muscles on the front of the leg, acting from the toes, draw the body in a direction away to the left and, therefore, it has to be swung round so that the other foot can, in turn, be placed in position: then the body is drawn in a direction away to the right.

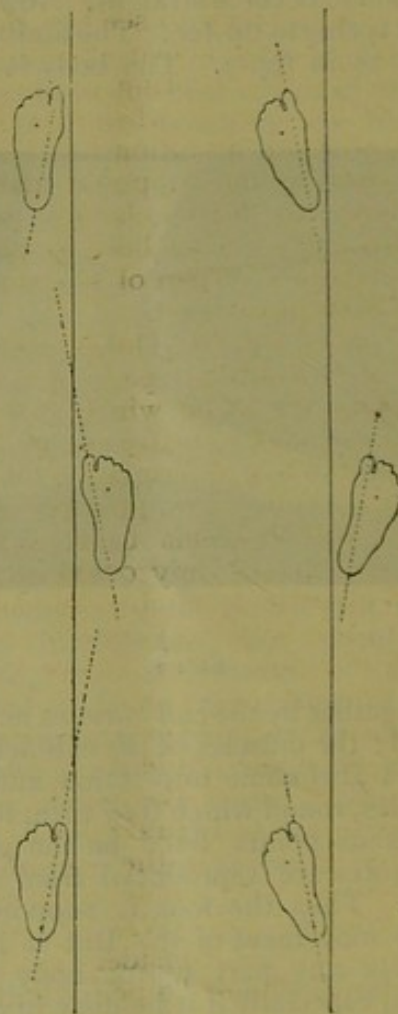


FIG. 5.

FIG. 6.

In the four-square position it is much more easy to bring the great toe to the ground in time to help in securing good foot-hold. This is most important as a means of preventing any tendency to slip and so of avoiding that "bane of marching armies"—foot-sores.

In the military position it is difficult to avoid bringing the heel first to the ground and so to use the foot as a rocker, as a

* "The Human Foot, its Form, Structure, Functions and Clothing" (Churchill).

mere block at the end of the leg. The full and free movement given by springing suddenly and sharply upwards is much more likely to take place when the toes are firmly planted on the ground in the first part of the step.

It is admitted that cases of flat-foot occur in the army. I hold that promising young men ought not to be rejected as recruits because they are slightly affected.

That it should ever come on after enlistment is enough to condemn any system of using the feet, and is a sufficient reason for careful study of their structure and functions. How far the new Physical drill might be improved—having regard to its particular object, that of expanding the chest—is a question on which I will offer some remarks at a future time.

NATURAL HISTORY IN PUBLIC SCHOOLS.

By the REV. T. A. PRESTON, M.A.

Late President of the Marlborough College Natural History Society.

It is extraordinary to see how games at school are held up above everything else as the means for securing physical exercise; and the more so when it is borne in mind how much attention has been paid of late years to the supposed inability of some boys to learn classics, so that "Modern Sides" have been started, and a most elaborate system of science teaching has been introduced.

In a paper by Dr. Dukes, printed in No. 3 of *PHYSIQUE*, page 41, various suggestions are made which, *if they could be carried out*, would greatly reduce, or even remove, some few of the glaring anomalies connected with "compulsory games." But the author seems to consider that games and games only ought to be the form of exercise for public school boys, and until this happy (?) state is obtained, those few unfortunates whose physical powers prevent them joining in the games, should have "suitable exercise" arranged for them, such as "gardening," &c.

Now here is one of the serious blots of the system so loudly praised. For what was considered to be the special benefit to be derived from public school training in former days? Was it not that a boy was taught to consider that he had a *responsibility* imposed upon him, both in and out of school, especially that of employing his time properly? That he had a work to do, and provided he did that work properly, he might work as and how he liked? That he learned habits of self-dependence? That honour was to be the great point in his character? No doubt such high ideals were not always attained, and so Arnold and others of our best public schoolmasters encouraged (but not enforced) games, and introduced other sources of interest among the boys, so that the desire for "loafing," so properly

deplored, might be lessened, or done away with. Most boys do not care to loaf, some few are naturally loafers, and about them I hope to say a few words later on.

But what is the case under the new arrangement? From the moment a boy gets out of bed, till he lays himself down there again, he is incessantly under rule. Every moment of his time is cut out for him. If he wishes to take a walk, he has to "ask leave." The boy has no responsibility as regards his time, he has no self-reliance, he has no means of practising trust and honour in those small details where they are so valuable; his whole routine is to learn his lessons at appointed times and to obey others, even sometimes those below him in the school. Public school training, as now coming into vogue, is a *very* different thing from what it was formerly.

But as regards the games themselves. I say it most unhesitatingly (for I speak from experience) that such a plan as that advocated is *bad*; it ruins the *games* when a lot of boys, who do not care for them, are compelled to join; it ruins the *boys*, for they will not work more than they can possibly help; and it debases the *games*, as it turns them into methods of punishment.

And again, is not Dr. Dukes practically debasing "gardening, gymnastics," &c., by the plan he proposes? He prevents any but the physically weak and deformed from such pursuits, and the natural consequence will be that not only would a boy, who follows any one of them, at once be marked out as a deformity, unsuited for public school life, but his occupation would be looked down upon as only fitted for such deformities.

As regards Dr. Dukes' suggestions, what standard can he make for separating the "big" from the "little" boys? Surely

he ought to be aware that neither masters nor boys would tolerate such a constant shifting as he proposes; there is a very rough-and-ready method of settling such matters, which would seriously interfere with any plan such as that proposed.

But why should there be only this arrangement? If boys are mentally varied, surely they are not less so physically. Has Dr. Dukes never met with a boy to whom sitting still for ten minutes was absolute purgatory? Such a boy might enjoy a game of football, but certainly not one of cricket. These boys are not physically weak, but the bent of their minds is on something else. Such a boy, asked to desert after his Sunday dinner, will thankfully put his orange or apple in his pocket and be allowed to go out for a walk, rather than sit down even till he has eaten it in the room. This kind of boy is by no means uncommon, and some that I have known, from being the veriest plagues when they first came to school, have turned out to be the most trustworthy and energetic, *solely* from having their energies turned in a right direction, but *not* by cricket. Loafers are *bred* by the plan proposed; they do not care for games; they do as little as they can, and, when the opportunity occurs, they will idle away their time.

To come more particularly to the point which I wish to advocate—that of the study of Natural History in schools—I certainly do not wish to have it *forced* upon a boy, and my remarks will be confined to this subject alone, merely because the general principles which I here advocate can be applied to any other of the “alternatives” which ought always to be found in every large school.

On what grounds does Dr. Dukes make “gardening, carpentry, gymnastic exercises, drilling, music, art, drawing, and field excursions in botany, natural history and geology” only fit for boys who, from “inherent delicacy, disease or deformity,” are unable to join in the games? From the way in which these various exercises and occupations are classed together they might be considered to be unfitted for manly, strong boys. One who studies music or natural history is, forsooth, from the very fact of such a consideration, at once stamped as a feeble, diseased mortal, whilst a boy who plays games (and he only) has “good-temper, self-reliance, self-control, endurance, courage under difficulties and with odds against him, pluck, quick action and rapid judgment,

qualities necessary for success in the battle of life, and which have proved the best part of school education in their after career.”

Without in any way wishing to run down the use of games for such purposes, I most unhesitatingly say that (1) these qualities are *only* obtained by those who enter heartily into them; occasionally a boy gets turned from a loafer to a cricketer, but that is only under unusual circumstances. (2) That such qualities are not obtained only by games; other pursuits can do the same things equally well. (3) That, long as the list is, they do not supply all that a boy may require in after life; and (4) above all that they sadly fail when, in after life, professional duties or enfeebled health prevent the man from being able to follow them up, and he is thrown upon his own resources of mind for employment. Surely the time spent at school should be so spent as to fit the future man for *all* conditions of life, and fortify him from being lost when he has to encounter particular states of life.

With respect to (1), it merely needs to spend an afternoon in the playing field, when all the boys are at “play;” if a spectator does not see bad temper, want of control, and laziness in a good many places, also squabbling and disgust, the playing field must be a very different place to what it was a few years ago.

Has Dr. Dukes never seen boys out for a field excursion? If he has not, he will perhaps be surprised to hear that a vast deal *more* exercise is taken on these occasions than is ever taken at cricket. But with those who are keen naturalists the mere exercise taken in any one day (not in an excursion) is often such that it might almost be said to require moderating. I have no hesitation in saying that, if exercise alone is to be considered, a field naturalist will take far more than any one at games.

But there are other and far more important considerations why this particular subject should be encouraged. Do our explorers and men of science—the Livingstones and the Darwins and Wallaces—get that taste for travel, that keen insight, those powers of body for climbing and encountering difficulties; or do our sportsmen derive their powers from the cricket field or from football? I unhesitatingly answer—No. Cricket and football, no doubt, help to make good *soldiers*, where obedience, activity in certain lines and a quick eye, are useful, but an explorer

wants more than these, and these other qualifications are most certainly secured by the encouragement of the study of natural history in the field. If, then, it is deemed so essential to form most distinct "schools" for mental subjects, it is surely no less needful to separate the out-of-school employments of the boys.

Dr. Dukes apparently considers that such employments (except "games") must be beneath the consideration of those who have passed the medical examination on entering the school. Would not climbing be a more useful accomplishment for a sailor than being able to bat well? How many cricketers really have the power of running any distance? The few (and they are but few) who can bat well may have a very considerable amount of running, but how many are there who go in for an innings and are bowled out before five minutes have elapsed? And then they sit down for some hours whilst the rest of their side take their turns. I do not by any means wish to run down cricket and football—they will always be the popular games at school—but to make all boys fag at them will not secure the end which Dr. Dukes has in view; whereas the training which boys get from them is by no means so well suited for the majority of future employments as some of the other branches of recreation; whilst, on the other hand, natural history (with which alone I am dealing) will give more exercise, stimulate more interest and intelligence, increase keenness of sight, and cultivate patience and endurance in a far greater degree, and so be far more useful to the future man than any amount of cricket and football.

I have hitherto spoken only of the mere physical exercise to be obtained from the pursuit of natural history, in connection with its collateral training, merely to show that it is by no means to be despised as a method of training boys. By all means let them play games, if they prefer to do so; but when Dr. Dukes wants to make *all* boys, during their whole school course, spend their time out of school on games and only games, it will be advisable to point out how utterly warped a boy's tastes and desires become by such a process. In the first place, a boy's thoughts are made to run on nothing else but scores, bowling averages, and good catches—interesting enough, no doubt, to those who care for such things, but intolerable to those who do not, and absolutely useless in an intellectual point of view. What

good do such things do when the boy leaves school? What can be more deplorable than the case of a man, who was noted for his skill in games at school, confessing that he was so utterly miserable when by himself in the wilds of Australia because he could not find anything to do, surrounded though he was with a wealth of vegetation and any amount of geology spread before him, that he was obliged, when not riding, to fill a bucket with water and talk to the reflection of his face in the surface! And this is no solitary case of the inutility of games in after life. I cannot recall a single instance where a noted cricketer ever made use of his mental powers for scientific purposes (though I would fain hope that some may be found), but *numbers* of others who, though not shining or even caring for cricket, have been of great service to science. Compare the man referred to above with the officers of one of H.M. ships, each of whom had a "hobby." No sooner did the ship stop at a port long enough for the crew to land than all who could be spared were off, each after his speciality, and all helping one another. Would they have taken such exercise had they been but cricketers at school? The keenness of their love for their pursuits added tenfold to the pleasure of the run ashore, and undoubtedly made them take far more exercise than had they had a good long game of cricket. It must not be forgotten that the utility of a man's life must depend upon what he does for others as well as for himself, and it is nothing less than deplorable to see how much energy and how many opportunities of adding to science are lost, solely because boys are forced to stick in the playing field and are driven to think of nothing else but what has only a passing interest.

But if it is asked what plans would be suggested for boys at school, so as to make all take the proper amount of exercise, I would suggest the following:—

(1) Games should be made as attractive as possible, so that if a boy joins in them he should take an interest in them. They should certainly not be made compulsory.

(2) For those who do not wish to play, they should be made to state in what way they mean to employ their play time. Such boys will not be many in number if the games are made a pleasure. If a boy selects natural history, it will be very easy to see that he has been out a proper time, and that, without seeming in any way to act as police.

(3) For those who wish to loaf, the alternative should be a sharp drill or some exercises, which should take the place of, and, if possible, make games or other outdoor exercise preferred to them.

(4) Many boys *wish* to play games, but are very bad hands at them and want encouragement. Have separate games for these, under the supervision of a master, who would take care that all were able to have a fair chance and so gain confidence. This has been carried on for many years at the school with which I am acquainted, so that the suggestion, strange as it may seem, is really not so.

The real cause why "games" are left

to boys, and the most hulking boy placed as policeman over his companions, however much above them in the school they may be, is, I fear, what may be called laziness on the part of those in authority. They do not want to act as "police," and yet want to know that all the boys are under control, and so leave the whole matter to "captains," who, in many cases, act the part of despots, especially if they want to "pay out" anyone. An old captain of the eleven, on coming back as a master, could not help remarking to me, after he had been a little time at the school, "Cricket, I find, is nothing but slavery."

COMPARATIVE STUDY OF MEASUREMENTS OF MALE AND FEMALE STUDENTS AT AMHERST, MOUNT HOLYOKE, AND WELLESLEY COLLEGES, U.S.A.

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WHEN working for a result, we are much more successful if we can get it in more ways than one. The Department of Physical Education in Amherst College has been looking for an anthropometric college standard for about twenty-five years. To this end thousands of student measurements have been made and tabulated, and published from time to time as a supplement to Gymnastic Exhibition Programmes. About thirty of these statements have been thus issued, which were preliminary to, and have aided in the preparation of the following table. We want to learn what are the physical data of the typical or ideal college student, and to do this we know of no better way than to observe every student whom we can lay our hands upon, put our measuring appliances upon, and secure all the measures which show the proportions of the "average" or the "mean" student. And from this standpoint we must, by labour and study, find out how much proper cultivation and healthy work can better this present average condition: find out how much and how fast we can *further develop the present student average body.*

The past history of the human race shows us that we have been led forwards and upwards by the influences which have been conceived and partially developed in the Universities and Colleges—the world over. And if the intellectual and spiritual forces are found there, may we not expect that the body, the earthly partner of the soul, will be fairly represented by these

men. For as the College fills its ranks from all grades of society, from what other source can we get a more general or comprehensive group to work upon, or gain an idea of a more fair representation of our universal physical man, than from this source? Therefore we offer as the most desirable materials for this purpose, the young men of our colleges, who have attained their majority in age, and are mainly of American origin. And for the results of this paper we bring the measurements of about 2,000 students of Amherst College of the average age of twenty-one years and one month in the table.

The first column of the table gives the observations of 2,000 students as showing the AVERAGE MEASUREMENTS of the items designated. And by an average we mean the sum of all the measurements under each item divided by the number of the men observed, or as better expressed: "an average is obtained by dividing the sum of the values observed, by the number of observations."

But an average result is not entirely satisfactory. It does not assure us of the future since it is so much modified by the extreme values, those very large or very small. So that a more reliable method is the use of the DOCTRINE OF MEANS—the second column—rather than that of averages. And to quote again, "a mean is the value at which the largest number of observations occur, and it is obtained by arranging the men"—measures—"in groups, and noting the value of the group which

contains the largest number of individuals."* Thus for this student study 2,086 individual measurements were separated into groups made by the variation of a few millimeters each, and the group containing the largest number is the record of the table. And while in any study averages and means always approach very nearly to each other, yet the central value, the real object sought for, is much more reliable if obtained through the doctrine of means rather than that of averages, because the result is not affected by extreme or exceptional cases.

To know the *measurements of the men who are of the average age of all who are observed*, will certainly give additional light on the proportions of the physical pattern which we are to work from. The third column gives the average measures of 326 college men who were between twenty-one and twenty-two years of age.

There are thus presented here three distinct methods to help to determine the pattern of the College Student. To these in due time it is hoped a percentile table may be added.

COMPARISON OF MALE AND FEMALE STUDENTS.

It is the purpose in the three last columns of the table to make a comparative study of the male and female figure as made from the examination of New England college students. The measurements from which the deductions are made, are the averages for five freshman years, compiled from statistics of about five hundred individuals, each, at Amherst, Mount Holyoke, and Wellesley Colleges, between 1884-1889. It is true that they are not data taken from fully developed manhood and womanhood, since the average age of each sex is approximately nineteen years, and yet they seem to show that at this stage of the development of the human body, such conditions as will appear are true.

The stature of man is influenced by climate, occupation, surrounding circumstances, &c.; races having their own distinctive characteristics. Likewise, different classes in the same race are distinguished from each other but not in so marked a degree.

Many of the fundamental differences in regard to figure, which distinguish the male from the female, are established by common experience and scientific investi-

gation; on these points our observation only corroborates such knowledge. For instance, in all the tests of strength, man is naturally the stronger as he is superior in the capacity of lungs. Such well known facts regarding the breadth of hips and waist are too well established to need any more than a passing confirmation.

Take first the matter of weight. One naturally supposes that the male weighs proportionately more than the female; but such is not the case. The figures declare an almost exact correspondence, each weighing 1.9 pounds for every inch of height.

The fact that the girth of the female thigh actually exceeds that of the male, is doubtless due not to the muscular development but to the presence of fat. An interesting fact is brought to light in comparing the girth and breadth of head and also of the neck. The difference per cent. in girth of the head in favour of the male is only .007, while the difference in breadth is .045. This would seem to show that the antero-posterior diameter in woman is longer proportionally than the transverse diameter. This is more markedly evident in the neck, which shows a difference of .077 in girth and of .166 in breadth. That is, a woman's head and neck are more oval in shape than the man's.

Considering next the height from pubes to sternum and figuring in this case from total height as a basis, it appears that the male is over 7 per cent. taller than the female, but in length of trunk he exceeds her by 11 per cent. The same is true as regards the distance between the pubes and navel, the male being 12 per cent. longer here than the female and only 7 per cent. taller. This conclusion is contrary to the usual theory that woman has a proportionally longer trunk than man. In the length of the lower limbs there is a difference of 9 per cent. in favour of the male; but in the length of the head and neck the female actually exceeds the male by .009 per cent. So the difference lies here rather than in the length of trunk, or lower limbs.

Humphrey, in comparing the human figure with that of the lower animals, says that "in man the segments nearer the trunk are comparatively lengthy; the more distal ones being comparatively short. Thus the thigh and arm are respectively longer than the leg and forearm," and "that the greater proportionate length of the thigh is one of the characteristics of the human

* See Roberts's "Anthropometry" pp. 18-25 and 69.

TABLE OF MEASUREMENTS OF MALE AND FEMALE STUDENTS.

	AMHERST COLLEGE MALE STUDENTS						AMHERST, HOLYOKE, AND WELLESLEY COLLEGES STUDENTS.				Difference between Male and Female of the Age of 19 years.	
	"Averages" of 2000 Students of the Average Age of 21 years, 1 month.		"Means" of 2086 Students of the Average Age of 21 years, 1 month.		"Averages" of 326 Students 21-22 years old.		"Averages" of 500 Males of the Average Age of 19 years.		"Averages" of 500 Females of the Average Age of 19 years.			
	Metric System.	English System.	Metric.	English.	Metric.	English.	Metric System.	English System.	Metric.	English.		English.
WEIGHT—												
Without Clothes ...	a61.2	d134.9	64.0	141.1	63.1	138.8	60.7	133.8	55.2	121.6	11.2	
HEIGHT—												
Standing ...	1725	67.9	1720	67.7	1726	67.9	1727	67.9	1591	62.6	5.3	
Sternum ...	1410	55.5	1410	55.5	1407	55.3	1415	56.	1276	50.2	5.8	
Navel ...	1030	40.6	1023	40.3	1025	40.4	1037	40.8	937	36.8	4.	
Pubes ...	860	33.9	860	33.9	864	34.0	862	33.9	784	30.8	3.1	
Knee ...	476	18.7	480	18.9	477	18.7	476	18.7	422	16.6	2.1	
Sitting ...	903	35.5	910	35.8	903	35.5	898	35.3	825	32.4	2.9	
GIRTH—												
Head ...	572	22.5	570	22.4	572	22.5	565	22.2	561	22.	.2	
Neck ...	349	13.8	350	13.8	356	14.0	350	13.7	323	12.7	1.	
Chest repose ...	880	34.6	880	35.6	892	35.1	870	34.2	750	29.5	4.7	
Chest full ...	927	36.5	925	36.4	933	36.7	924	36.3	801	31.5	4.8	
Belly ...	724	28.5	720	28.3	725	28.5	729	28.7	662	26.	2.7	
Hips ...	893	35.1	890	35.0	898	35.3	887	34.9	846	33.3	1.6	
Right Thigh ...	517	20.3	515	20.3	521	20.5	501	19.7	531	20.9	-1.2	
Left Thigh ...	512	20.1	510	20.1	519	20.4	503	19.8	531	20.9	-1.1	
Right Knee ...	361	14.2	360	14.2	359	14.2	359	14.1	353	13.8	.3	
Left Knee ...	359	14.1	360	14.2	358	14.1	358	14.1	351	13.8	.3	
Right Calf ...	359	14.1	359	14.1	350	13.8	344	13.5	337	13.2	.3	
Left Calf ...	349	13.8	350	13.8	348	13.7	343	13.4	336	13.2	.2	
Right Instep ...	245	9.6	240	9.4	244	9.6	245	9.6	214	8.4	1.2	
Left Instep ...	242	9.5	240	9.4	243	9.6	243	9.5	212	8.3	1.2	
Upper Right Arm ...	257	10.1	260	10.2	264	10.3	255	10.	248	9.7	.3	
Upper Right Arm Contracted ...	295	11.6	295	11.6	301	11.8	291	11.4	255	10.	1.4	
Upper Left Arm ...	253	9.9	250	9.8	259	10.2	249	9.8	244	9.6	.2	
Right Elbow ...	251	9.8	250	9.8	253	9.9	249	9.8	219	8.6	1.2	
Left Elbow ...	247	9.7	250	9.8	249	9.8	244	9.6	219	8.6	1.	
Right Forearm ...	267	10.5	270	10.6	266	10.5	260	10.2	218	8.6	1.6	
Left Forearm ...	261	10.2	260	10.2	259	10.2	254	10.	216	8.5	1.5	
Right Wrist ...	166	6.5	165	6.5	166	6.5	165	6.4	147	5.7	.7	
Left Wrist ...	165	6.5	165	6.5	165	6.5	164	6.4	146	5.7	.7	
BREADTH—												
Head ...	155	6.1	154	6.1	155	6.1	154	6.0	147	5.8	.2	
Neck ...	108	4.2	110	4.3	109	4.3	108	4.2	90	3.5	.7	
Shoulders ...	430	16.9	430	16.9	431	16.9	431	16.9	364	14.3	2.6	
Nipples ...	198	7.8	200	7.9	200	7.9	193	7.6	188	7.4	.2	
Waist ...	250	9.8	250	9.8	256	10.1	249	9.8	210	8.2	1.6	
Hips ...	323	12.7	320	12.6	327	12.9	326	12.8	318	12.5	.3	
Right Shoulder to Elbow ...	373	14.7	370	14.6	374	14.7	373	14.6	335	13.2	1.4	
Left Shoulder to Elbow ...	371	14.6	370	14.6	374	14.7	371	14.6	334	13.1	1.5	
Right Elbow to Tip of Finger ...	461	18.1	460	18.1	462	18.1	462	18.1	421	16.6	1.5	
Left Elbow to Tip of Finger ...	459	18.1	460	18.1	459	18.1	459	18.0	418	16.4	1.6	
LENGTH—												
Right Foot ...	260	10.2	260	10.2	261	10.2	261	10.2	229	9.0	1.2	
Left Foot ...	259	10.2	260	10.2	260	10.2	260	10.2	229	9.0	1.2	
STRETCH OF ARMS ...	1780	70.1	1770	69.7	1794	70.6	1787	70.3	1603	63.1	7.2	
HORIZONTAL LENGTH ...	1732	68.2	1730	68.1	1738	68.4	...	...	...	...	...
STRENGTH—												
Lungs ...	a1.5	d3.30	1.2	2.64	1.41	3.10	...	...	...	...	...
Back ...	a1.37	d3.02	1.50	3.30	1.46	3.21	126.2	278.	49.1	108	170	
Chest dip ...	b6.0	b8.0	4	4	7.3	7.3	...	...	...	...	...
Chest pull up ...	b9.0	b9.0	10	10	10.2	10.2	...	...	...	...	...
Legs ...	a1.66	d3.65	1.75	3.85	1.72	3.78	152.8	336.8	67.8	149.4	187.4	
Right Forearm ...	a41.5	d91	40	88.2	41.5	91.3	38.7	85.3	22.0	48.4	36.9	
Left Forearm ...	a38.1	d84	37	81.6	39.5	86.9	35.46	78.3	19.2	42.3	36.	
Capacity of Lungs ...	c3.77	e230	3.90	238	4.23	250	4.12	251.4	2.39	145.8	105.6	

a—Kilos. b—Units c—Litres. d—Pounds. e—Cubic Inches. All others, Millimetres, and Inches and tenths.

figure." The result of this is, he says, "that strength is sacrificed to celerity and nicety of movement, as well as to a ready subservience to the will."

Leaving the lower kingdom and making the same comparison between the sexes of the human race it appears that the female follows out this same evolutionary progression to a greater proportionate degree than the male. Perhaps it was because she had the advantage of being last introduced, but more likely to give her the greater celerity and grace of movement. The male is nearly 12 per cent. longer in the leg than the female and only 6 per cent. in the thigh. In the upper extremities, however, the measurements almost correspond, there being only 1 per cent. difference in favour of the male.

Such are some of the most apparent suggestions presented by these tables. But they are here offered to any persons who may desire to examine them more minutely, or give a different or more searching study to them.

I am indebted to the kindness of Miss Lucile E. Hill and M. Anna Wood of Wellesley, and Dr. Mary Cotton of Mount Holyoke, for the measurements of their colleges.

OUTLINE OF THE METHOD OF CONDUCTING ANTHROPOMETRIC EXAMINATIONS AT AMHERST COLLEGE.

The object has been to ascertain what is the ideal physical standard which a student may have in mind, and if he be found to be more or less at variance with this ideal, to know what this deficiency or excess is, and how to approach it to the standard. The work in this direction has been of making many measurements, tests, and examinations of the bodily form and functions, based both upon external shape and appearance, and a careful physiological diagnosis of internal and organic functions, including some of the sense organs. And this examination is more exact and minute than that required in the regular army of the United States.

One of the first things is to find out as much as possible of the early history of the young man—his ancestry and hereditary environment. Also, how his body may have been belated (or dwarfed), non- or imperfectly developed by disease, accidents, or ignorance of the common laws of health; and then give advice how to remedy as far as possible these deficiencies. This advice is in the form of general directions about health, and growth, and

by special instructions how to use the apparatus and appliances which are in the Pratt (College) Gymnasium, for promoting normal development and growth. The method of these examinations is a system adopted by the American Association for the Advancement of Physical Education at their annual meeting in November, 1886, in Brooklyn, New York.

It does not seem to be in place here to introduce this system in detail, but rather to present an exact copy of the records in the table to be found at the end of this article.

As already stated, the attempt is to find the ideal physical man, or a pattern to imitate or copy. But in spite of all the models, types, and patterns invented by artists and anatomists in the past, there seems to be nothing serviceable or practicable to a young man, as it is offered to him up to the present time. In other words, he asks what are his proportions, tests of strength, capacities and prospects. This we endeavour to help him to find out, and work upon as he goes on in his college course.

We have now established from our, about 8,000, measurements, some tables, or numerical data, from which we have ascertained what is and has been the average or mean physical condition of our students for the past thirty years. From this type we are able to tell each young man as he comes before us for examination what is his relation to this mean or average. Then if he be found below this average in some or all of his measurements, to prescribe and advise him how he can at least try to come up to the standard. And the *datum* or basis for this comparison is not age or weight, but the *stature or bodily height and the correspondingly appropriate proportions of the whole body.*

All of these measurements have been tabulated according to the varying heights of our students. They are arranged in a series which is practically a set of twenty-four tables of heights, each table varying from the other by a difference of one centimeter, or nearly half an inch of height. Hence as soon as we have the height of the man we know in which table to class him, and are able to give him all his other proportions.

The number of items observed is more than fifty. These, as will be seen, include weight, stature, many girth measurements, tests of strength, lung capacity, condition of heart and lungs, eyes and ears, colour of hair and eyes, and colour

sense. Each examination is made in a warm and quiet room, with the subject unclothed; where and when the examiner, who is a physician, spends about half an hour in using scales, tapes, rods, calipers, stethoscope, eye and ear tests, plumb line, dynamometers, palpation and percussion, till he feels quite certain of the palpable and evident physical defects or excellencies of the student before him. At the same time every observation is recorded in one of the blank ledgers of the department. Also the student is given a small book, in which is placed his own statistics in manuscript by the side of the column of printed averages and means of his own height, as stated above.

This examination is made three times during the college course of four years. At the first examination—freshman year—a few only reach the average standard, but at the second and third this number greatly increases, and at the final examination a few exceed the average.

The question naturally arises: Do many of the early comers need and receive special treatment, advice or suggestions as to how they may improve their physique? To this it may be said that the number is a very small one, much less than it is in the elementary schools or Young Men's Christian Associations, as college men, to begin with, are a selected lot. Perhaps to about one

in five or six it is found desirable to make suggestions and frequently follow up this advice for several months.

The following is a copy of the register in use at Amherst College.

HISTORY AND STATISTICS OF

Number,
Name,
Date,
Age,
Birthplace,
Nationality of {
Father,
Mother,
Paternal Grandfather,
" Grandmother,
Maternal Grandfather,
" Grandmother,
Father died of
Mother died of
Hereditary Conditions,
Accidents,
Diseases,
Condition of Thorax,
" Eyes,
" Ears,
Use of Tobacco.

[For the measurements see the table on page 92. These measurements are equally applicable to English as to American students of the same class and age, as it has been found, by a very large number of observations made independently in England and America, that the general physique of the two peoples is identical. —ED., PHYSIQUE].

SCHOOL GAMES.

IN the new manual of gymnastics* recently issued by the French Government and drawn up in conformity with the recommendations of the commission appointed to revise the method of teaching gymnastics in primary and secondary schools in France, a section is devoted to "School Games," a subject which finds no place in the previous manuals. This attempt to make games a part of school training is inspired by admiration of the English and Belgian systems of games in school. The commission do us too much credit in this respect, for with the exception of cricket and football, and one or two other ball games, we are in as hopeless and helpless a condition with regard to children's games in school as the French themselves. It is a trite saying on plat-

forms that our children have forgotten how to play, and it is certainly true that the games which survive, other than those referred to, are played in a slipshod manner, and without observing the strict rules of the games. We stand much in need of a revival of our old children's games on the same grounds as the French, and it will be useful and instructive to us to know the results of their investigations and recommendations on the subject. The following is the introduction to the section on school games:—

Games represent a form of gymnastic exercise which supplies two hygienic wants equally felt by the scholar, namely, the demand for exercise and pleasure.

In all games are found these two elements, recreation and exercise, but they are combined in very different proportions. Some games are above all amusing and do not call for any great expenditure of

* *Manuel D'Exercices Gymnastiques et de Jeux Scolaires.* Hachette. Paris, 1891.

strength; these may therefore be called more specially *recreative games*. Certain other games, while being more or less recreative, call for muscular efforts of sufficient intensity to assimilate them, from the point of view of expenditure of strength, to the other exercises of the gymnasium, and thus they merit the name of *gymnastic games*.

Beyond this classification, based on the character of the game, there is another, more artificial, which depends upon the manner of their application: certain games require (for their practice) a large space (of ground), and cannot be carried on in a covered place, nor in a small enclosure such as a play-ground; they can only be carried on in the open air, and therefore the name *open air games*, which is generally given to them, rightly belongs to them. For certain other games a smaller space suffices, and their execution is possible either in a courtyard or in a covered hall; it is proper to group them under the name of *indoor games* because they can be carried on without going outside the school.

Finally, we must take account also, in the classification of games, of the sex of the children, and distinguish the games of boys from those of girls. The games of girls will naturally be of a character to call for less violent muscular efforts, and be better adapted in their form to feminine habits and to certain social proprieties.

These classifications have no absolute line of demarcation. Many exercises have a mixed character, and may be ranked in one category or another according to the strength, the age, or the energy of the players. A certain game which might be simply a recreation for big lads will represent, perhaps, an amount of muscular movement sufficient to class it among the gymnastic games when it is a question of its being practised by small boys or girls. It may also happen, that by the aid of certain unimportant modifications, an open air game may be adapted without much difficulty to a court of moderate size, and so may accidentally become an indoor game.

With all these reservations, the following lists will be found sufficient to guide the choice of the master in meeting the demands for exercises which he must satisfy.

The games, although easier in general than the other gymnastic exercises, require a methodical apprenticeship, without which they cannot be completely

efficacious either from the point of view of hygiene or education.

The master must teach, direct, and overlook them quite as much as the other *combined gymnastic exercises*, with this difference, however, that in the combined exercises all the movements are carried out at the word of command, while in the games the scholar retains a certain individual initiative and responsibility on which will depend the gain or loss of the game.

In the larger games the master will take the part of umpire, which will give him the opportunity, while settling disputes between the players, of pointing out to each, after the game, the mistakes he has made.

I.—RECREATIVE GAMES.

These games can all be practised either in a courtyard or even in a covered hall quite as well as in the open air.

NOTE.—These games are enumerated in order, counting the greater or less expenditure of force which they demand, in such a way that the first are purely recreative, while those which end the series are more akin to the gymnastic games. The selection of the master will be guided after this indication according to the age and strength of the children under his care.

For Boys.

Hide the Bung.
Knucklebones.
Marbles.
Hot Cockles.
Top.
Cup and Ball.
Quoits.
Ninepins.
Seesaw Swing.
Hide and Seek.
Le chat-perché.
Tipcat.

For Girls.

Pigeon Fly.
Knucklebones.
Paul Pry.
Hide the Bung.
Hot Cockles.
Hide and Seek.
Cup and Ball.

There are many other recreative games which it would take too long to enumerate; and the master can make his selection from them, giving the preference to those which belong to the local customs of the district in which his school is situated. In this way the dying out of many national games, whose disappearance would be very regrettable, will be prevented.

II.—GYMNASTIC GAMES.

All these games require a certain expenditure of force, but there are great differences between them from the point of view of the greater or less amount of muscular energy which must be put

forth in order to practise them. For this reason they must not be applied indifferently to all children.

Big boys can play at all the games; for the small boys the following must be taken into account.

INDOOR GAMES.

For Boys.

Under seven years.

Round about the Mulberry Bush.

Hunt the Slipper.

The Hoop.

Catch who Catch can.

Skipping rope.

Puss in the Corner.

From seven to eleven years.

Cross Catch.

Prison Bars.

Bowling Jack.

Pigeon Fly (modified).

Jugglers' games.

Running with a Burden.

Stilts.

Prisoners.

Cat and Mouse.

The Wolf.

Mother Garuche.

The Sparrowhawk.

La balle en posture.

Rounders.

From eleven to thirteen years.

La belle Cavalière

Le Gouret ou la Truie.

La Crosse au but.

Baseball.

The Javelin.

Archery.

OPEN AIR GAMES.

This list only includes games for playing which require a very large space of ground. Of course all the other games, which have been described as *indoor games*,

can be played *out of doors* when the opportunity occurs.

For Boys.

La paume au Tam-bourin.

La Grande Thèque (ou Balle au Camp).

Le Mail (ou Balle à la Crosse).

Above fifteen years.

La longue Paume.

La Barette (ou Football).

Le Ballon français.

Le Paume au filet (ou lawn tennis).

Le rallye-paper.

For Girls.

La paume au Tam-bourin.

Le Mail (ou balle à la Crosse).

Le Croquet.

Above fifteen years.

La Paume au filet (ou lawn tennis).

The greater number of these games are popular in France, and too well known to require a detailed description. Some of them have fallen into disuse, or are peculiar only to certain districts, and it is necessary to recall their rules, or to make them known in the departments in which they are not habitually practised.

Most of these games are identical with the neglected or forgotten children's games in England, although the names differ in some of them. We should be glad if some of our readers who are familiar with our children's games would furnish us with lists similar to the above. There is considerable danger that cricket and football for boys, and lawn tennis for girls—games which require some skill and strength, and a very large space of ground to play them properly, and at best admit of only a comparatively small number of players—are edging out of our playgrounds many equally useful, if less skilful games, especially those played by young children. In England we are not likely at the present day to draw such fine distinctions between the games for boys and for girls as the French make. Girls are better players of games as they are better dancers, than boys, and if they cannot play boys' games with boys they can play many of them and enjoy them among themselves.

Notes of the Month.

BOARDING OUT OF PAUPER CHILDREN.—The annual meeting of this Association was recently held at the Mansion House. The report of the Committee stated that

the number of children which are boarded out was very small. In July, 1890, the total number of children in receipt of outdoor relief was 31,157 in England and Wales,

of whom 7,000 were brought up in district schools and only, 4,549 were boarded out. The erection of huge district schools was deprecated as "saddling future and possibly wiser generations than our own, not only with a system of which they may not approve, but with expenditure out of all proportion to the excellence of any one system." Lord Cranbrook, in moving the adoption of the report, said that children were now protected both by the law and a watchful public in a way which had not existed before. The authorities in this country always seemed to want to connect themselves with enormous buildings, than which there was no greater mistake in the world. There were 31,000 children dependent on the workhouse for their existence. They, poor things, had done no wrong, although their parents might have done. Why, therefore, should they be dissociated from the better class of people in the country? Lord Norton said that the method adopted by the Association for dealing with pauper children was far better for the children and much more economical, because, whereas in district schools they were maintained at an annual cost of £15, one payment of the same sum was sufficient to board out each child. The Rev. J. W. Horsley spoke of the great advantages which children possessed when brought up in small homes over those brought up in large buildings.

The objections to isolating and educating pauper children in large barracks apply equally to a large number of children brought up in charity schools who are generally of a higher social class, but who are ground into a uniform stratum of humanity similar to the pauper class by uniformity of dress, diet, and occupation, and are equally excluded from outdoor sympathies and interests until they are turned out of their respective institutions almost as helpless and ignorant of the world as when they were admitted. The Association, which is doing so much for pauper children, might well extend its operations to many of these institutions.

"MODEL" WORKMEN'S DWELLINGS.—We have in a former number of *PHYSIQUE* called attention the overcrowding and other sanitary defects of the huge blocks of dwellings which are being raised at the East End. The following extract from a report on the sanitary condition of Shoreditch, issued by Government, shows to what an extent the abuses and dangers of these structures may be carried. Mr. D.

C. Nichols and Dr. E. Seaton visited many of the so-called "model blocks" of dwellings built on the flat system. To say that some of these model blocks are built without due regard to sanitary requirements would be a misuse of language. The fact is, they are built in gross violation of the very first principles of sanitation. They found buildings on the flat system over forty feet high and less than twenty feet apart, containing large numbers of separate tenements approached by dark corridors. The waterclosets abut on the corridors, and are without direct light or proper ventilation. The dwellings thus approached contain rooms, many of which can never be penetrated by the rays of the sun. These dark gloomy habitations are, in the opinion of the commissioners, far more likely to become a source of danger to the public health than are even the worst of the dilapidated cottages to which public attention has been drawn.

PRINCESS BEATRICE occupied the chair at the annual meeting of the Children's Country Holidays Fund, of which she is President. Lord Kilmarnock said during the year they had sent 23,771 children of the poor into the country for a fortnight. They had now 545 different centres in villages within about fifty miles of London, to which these children were sent. They had over a thousand voluntary helpers to look after the little ones. The parents exhibited their interest in the movement by contributing £5,245. The Post Office had collected £147, and the Dulwich High School £150. The Grocers' and Goldsmiths' Companies had each given £100. Lord Carrington said he would like to see all the societies which were working for the same ends join hands.

THE final competition in gymnastics and jumping for the National Challenge Shield, valued at 200 guineas, in connection with the National Physical Recreation Society, took place recently in Exeter Hall gymnasium. The two teams taking part in the final competition were the Liverpool Y.M.C.A. Gymnasium and the Newport (Mon.) Junior Conservative Gymnasium. In addition to the Challenge Shield, the Society offered for competition nine 25 guinea "Milton" Shields, and a similar number of bronze shields. The contests included performances on the horizontal bar, rope climbing, and the high jump.

The Judges declared the Liverpool team the winners of the Challenge Shield by ten points. The Princess Louise distributed the prizes to the successful competitors.

THE Rev. W. Walker, D.D., read a paper at the meeting of Masters of Preparatory Schools at Cambridge on "Public School Methods in Games," &c., in which

he urged the importance of introducing gymnastics, cricket, football, &c., into private schools, with debating and reading societies for long evenings, so as to make private schools thoroughly successful, and bring them up to the level of those that were labelled "public schools." The physical and moral advantages were undoubted, and he had found that parents did not object to pay for them.

Societies.

THE NATIONAL FOOTPATH PRESERVATION SOCIETY.



WALKING will always form the chief physical exercise for English men and women, especially after the age of thirty, and it is as walkers much more than the players of games that we are distinguished from, and esteemed by, all other nations. Of the natural or instinctive forms of physical exercise running is the best, and this is, or ought to be, the chief feature of outdoor games. Next to running comes jumping and skipping, the latter an exercise especially suitable for girls, but alas! on account of the modern degeneracy of shoe leather it is often forbidden them. (Cannot some of the shoemakers who show so much ingenuity in providing foot-gear for sportsmen and mountaineers invent a good skipping shoe or slipper?) But walking is the most generally applicable form of exercise, and, with due regard to age and constitution, to the sizing and pacing of walkers, so to speak, it can be made a good substitute for the more youthful forms of exercises.

It behoves us, therefore, to look well to the walkers' chief exercise grounds, our country footpaths, and to help and en-

courage the numerous societies whose object is to preserve them. Chief among them is "The National Footpath Preservation Society" (42, Essex Street, Strand, London), with which are associated in different parts of the country no less than forty-five corporation and other local authorities, twenty-five Natural History Societies, sixteen Footpath Associations and the National Cyclists' Union. We take the following from the prospectus of the Central Society:—

1. This Society is formed for the preservation of ancient Foot and Bridle Paths, and ALL OTHER RIGHTS OF WAY BY LAND AND WATER, fishing, Vacant spaces, as Village Greens, Roadside slips of land, &c. It may be remarked that, had such a Society been established fifty years ago, a considerable number of Footpaths (which are as much highways as roads) would have been saved to the public.

2. Public footpaths intersect the country in every direction. They are of the utmost use, and afford an unfailing source of healthy recreation and innocent enjoyment to all sections of the community: young and old, rich and poor, are alike interested in their preservation, and yet we know that such public ways have, in innumerable cases, been stopped with impunity. It is, therefore, of the greatest importance that the existence of these rights of way should not be left to chance, or to the casual efforts of individuals, but that they should be fixed on such a basis as would secure them against attacks.

3. With this object in view, a central Society has been established in London, which it is hoped will be the nucleus of a number of branch Societies extending

over the country. The success which hitherto has attended the operations of individual encroachers has been due to the collective weakness and want of cohesion in the public, and there is no question that the formation of an organisation as above suggested would make it most difficult for any individual, however influential, to deprive a united public of its rights. It is hoped that in every district public-spirited men will be found willing to take up this important matter. The Secretary of the London Society issues information and rules to all persons anxious to start local Societies, such as have already been formed at Henley, Birmingham, Kendal, Lancaster, Cardiff, West Kent, Keswick, Bromley, Carlisle, Scarborough, Leicester, Bristol, Shrewsbury, Wirrall District, Godalming, Ackworth, West Wycombe, &c. Where no Local Society exists, the cause would be greatly advanced by individuals becoming members of the central Society, and giving information of any interference with public rights in their neighbourhood.

4. Scarcely a week elapses but newspapers report attempts to close footpaths, encroachments, &c.; doubtless many cases are not reported. Attempts to impair or extinguish public rights frequently

lead to illegal acts on the part of the people; a society such as this will render riotous proceedings unnecessary.

5. The members of this Society use all efforts to prevent trespassing and injury to crops through which public paths may lead.

Among the supporters of the Society are:—The Duke of Westminster, Lord Ribblesdale, Duke of Fife, Lord Claud J. Hamilton, Sir Julian Goldsmid, M.P., Sir Frederick Milner, Lord Randolph Churchill, M.P., Marquis of Tweeddale, Sir Charles Tennant, Earl Compton, M.P., L.C.C., Marquis of Hartington, M.P., Sir Henry James, M.P., Earl of Onslow, Lord Brassey, Lord Tennyson, G. J. Goschen, Esq., M.P., Bishop of Lichfield, Viscount Sherbrooke, the Archbishop of Canterbury, Samuel Hope Morley, Esq., Baron Henry De Worms, M.P., Edward North Buxton, Esq., J.P., Sir Lyon Playfair, M.P., Viscount Cross, Earl of Strafford, Viscount Lewisham, M.P., Sir Robert N. Fowler, M.P., Sydney Buxton, Esq., M.P., Cyril Flower, Esq., M.P., Henry Chaplin, Esq., M.P., Lord Hillingdon, Lord Edmund Fitzmaurice, Lady Hobhouse, Benjamin L. Cohen, Esq., L.C.C., Sir Frederick Leighton, &c.

Reviews of Books, Pamphlets, &c.

ANTHROPOMETRY AND PHYSICAL EXAMINATION. By Jay W. Seaver, M.D. Tuttle, Morehouse and Taylor, New Haven, Conn. 127 pp. 1890.

Whatever may be said of the relative superiority of British over American medical training, the palm must be awarded to our transatlantic cousins for their "go-aheadness" in matters of physical education.

The manual now under consideration is a very elaborate exposition of the means employed both for discovering the requirements of each individual, and of the best methods of carrying out the indications of physical treatment.

In his introductory remarks Dr. Seaver tells us that the decline of vitality in large towns in America is very great on account of "the rapid development of complicated systems of business in the scramble for sudden wealth." This has led to the presence of an excess of nervous diseases and premature breaking down of the

people. He points out the necessity—artificial though it may be—of finding some increase of vitality, and suggests the formation of athletic clubs and gymnasiums where young people may be trained and exercised. But in order that these may be beneficial he insists on the various exercises being carefully selected and applied to suitable subjects. "A gymnasium," he says, "like a drug store, is full of good things if intelligently used, but full of evil if taken indiscriminately."

To judge correctly "the dose" required for each individual we must first learn what is his physical peculiarity and condition, and we must from time to time inquire into the effect of the treatment on the pupil. The director must know what material he would mould and develop, and he must again examine to see if the results of his treatment are satisfactory or such as he expected, and hence the need of a record of the past condition. "A statement of a size or strength in black figures

is worth a dozen 'opinions.' We can cordially endorse Dr. Seaver's words, and entirely agree with him on the importance of making a most careful examination before advising the pupil as to the best form of muscular exercise for his particular case. A comparison of "existing conditions" with "past conditions" is of course most advisable.

Dr. Seaver dwells upon the wonderful effects of properly-applied gymnastics, and mentions some startling results obtained after the careful drilling of certain awkward and clumsy boys. We have only to look at some of our own raw recruits and at some of the young soldiers who have been drilled a few weeks to see the force of Dr. Seaver's observation. The round-backed, narrow-chested, slouching, head-hanging loafer becomes a smart, well set-up, active man. The health improves visibly, the strength increases rapidly, the man is no longer the same being.

Dr. Seaver quotes the Hon. Thos. G. Sherman, who writes: ". . . My very lack of training in physical labour has led me to observe the great value which it has not merely with reference to bodily health and strength, but for the very purpose of enlarging the *mental faculties*."

That physical training should be begun early in life is obvious. It is while the bones, muscles, ligaments, &c., are *growing* that they can best be trained—and training in this sense means not only development, but development in the right direction. A physical examination—very searching in its character, not only a cursory enquiry into general health and strength—should be made before the course of education is begun. It should determine the precise condition of the heart, lungs, spine, muscles, skin, eyes and ears. In this way many a case of incipient disease would be detected and the child might be saved for a useful member of society. We agree entirely with Dr. Seaver on these points, but we must beg to differ from him when he tells us that a beginner (not a medical man) with very little training would be competent to carry out the details of such physical examination as he advocates. We hold that a good knowledge of anatomy and physiology, to say nothing of the special departments of medical science, are essential in an examiner. Indeed, it might be difficult to find many individuals who would possess the requisite knowledge in each branch of the profession, and it might

be safer to divide physical examinations into parts or sections, each one of which would be in the charge of an expert.

Dr. Seaver goes on to say: "It may not be the province of the State to see that each child has medical care, but so long as the State takes a child from home for five hours out of the day, it is bound to see that no physical harm comes to the child in that time; and, if education is for public policy or utility, the care that will produce the best citizen is the care that is demanded."

Undoubtedly. How much better could the time that is at present spent in teaching the offspring of the artizan how to play the piano be employed in making a man of him physically! Music and other arts are accomplishments we admire. Are they useful to the persons who have to earn their bread by the sweat of their brow? That is the question.

Physical education, leading as it would to an admiration for true beauty of form and symmetry, would help to eradicate from the minds of those who were taught to take an interest in their own development a false standard of beauty, and give them an intelligent basis of judgment of their own shape. The absurdities in fashion, so common in the present age, would gradually become modified by rational principles; and the ill effects of chest and waist constriction, of high-heeled boots, and voluminous skirts, would speedily and sensibly diminish.

Dr. Seaver describes the instruments which he employs in carrying out his examination. They are simple both in construction and working. He also appends various tables, intended for recording physical conditions.

On the whole, Dr. Seaver's work is an excellent one, and the woodcuts are useful in illustrating the methods of applying the tests. The book is well got up and is printed on good paper. We are happy to recommend it heartily to all who are interested in the subject with which its author deals in so exhaustive a manner.

NOTICE TO CORRESPONDENTS.

Communications, Books, &c., must be sent to the Editor of *PHYSIQUE*. Addressed and stamped envelopes must be enclosed when contributions are to be returned. Business letters must be addressed to the Publishers, Messrs. George Bell and Sons, York Street, Covent Garden, W.C.

Athletics.

ARE WE IN DANGER OF ALLOWING ATHLETICS TO OCCUPY TOO PROMINENT A POSITION IN OUR SCHOOLS?

By Rev. Canon FOWLER, M.A., F.L.S., *Head Master of Lincoln Grammar School.*

AT a meeting of the Head Masters' Association, held at Bedford on June 10th, under the presidency of Dr. Percival, I brought forward the following motion:—"That this Association, while in no way wishing to discourage athletics, or to undervalue their influence as a necessary part of school training, believes that there is a strong and growing tendency in many quarters to unduly magnify their importance, and that this tendency requires serious consideration on the part of all persons interested in higher education." The feeling of the meeting was that in large boarding schools such a tendency did exist, but in public day schools, especially in large towns, the difficulty was to induce the authorities and the boys to give proper attention to physical education. In deference to this feeling I withdrew my motion.

A short account of the proceedings appeared in the *Standard*, and the editor of *PHYSIQUE* has done me the honour of asking me to publish my views on the question of athletics in his Journal. I must, however, begin by saying that I feel considerable diffidence in complying with his request, for I introduced my motion simply to raise a discussion upon a burning question, somewhat after the fashion of a mediæval *advocatus diaboli*, and, as I have always been a strong supporter of athletics, I do not like in any way to seem to speak against them; in fact, I stultified myself to a certain extent at the Bedford meeting by admitting that I felt greater pleasure when I got my cap at Rugby for football than I did when I got a scholarship at Oxford. I hope, therefore, that those who feel most inclined to resent my remarks will at all events give me the credit of a desire to put the matter in a fair light and excuse any seeming inconsistencies.

As may be gathered from the way in which my motion was received, the question separates itself by a hard-and-fast line into two divisions: on the one hand, as affecting the public boarding schools and the Universities; and on the other, as affecting the public day schools. In the former athletics are in danger of

being thought too much of; in the latter they are in danger of being neglected. These two divisions must be kept quite distinct, but it is with the former that we have chiefly to deal in this article.

Now it cannot be gainsaid that in certain quarters, whether rightly or wrongly, there is a growing feeling that athletics are being overdone at the public boarding schools (commonly called the Public Schools) and at the Universities, and that in these days of ever-increasing competition they are becoming a serious danger to a large number of boys and young men who have their living to get, or at all events their start in life to make, by their brains, and who yet entirely, or, at any rate, to a great extent, neglect the cultivation of their brains for the cultivation of their bodies. Far be it from anyone who cares for the true welfare of boys to undervalue athletics. Nothing is more important for a boy of average health, both morally and physically, than that he should take a part in school games. Above all things a "loafer" is objectionable. Without dwelling on any such hackneyed quotation as the saying of the Duke of Wellington that the battle of Waterloo was won on the playing-fields of Eton, we must all be ready to agree that it is in great measure our general system of moral and physical education that has made England what it is; that it is on our cricket and football fields that those qualities have been developed which keep us at the head of the colonising powers of the world. There is no better training for a boy to be found than in an English Public School or University. Let the athletics swamp the work altogether before we exchange such a training for the effeminacy of a French Lycée or the beer-drinking and sham duelling of a German University. But for all this it is quite possible to have too much of a good thing, and there certainly seems to be a tendency in the present day, at the Universities, at the Public Schools, and even at the Preparatory Schools, to unduly magnify the importance of athletics, and to allow them to usurp, over and above the time rightly assigned to them, an un-

due proportion of the time which ought to be given up to work, but which is more and more encroached upon by the exigencies of matches and of the various duties required of those who have the enviable fortune of having attained to a high position in cricket or football or rowing.

I have mentioned the case of the preparatory schools; I may add here, that I had a case in point brought before me a few days ago, when a Lincolnshire vicar, whose son is at such a school, complained to me rather bitterly that his boy (aged ten) was entirely given up to athletics, and seemed to think nothing of his work, and that if things went on as now he didn't know what would become of him when he was older, as he had to get his own living entirely. He had just had a letter from him as follows:—“Dear Father,—I got 17 in the second innings yesterday, Your affectionate son, H.” This is by no means an isolated case. No one wishes to keep a boy of ten from games, but parents do wish their sons, when they pay high fees for them, to learn *something*, and when it comes to preparatory school head masters, in certain cases, looking out especially for assistant masters who have been in the University Eight or Eleven or Football Team, this cannot but react upon the boys, and cause them to believe that athletics are everything and work a secondary consideration; and if they are thus brought up in their early years, what is likely to be the case when they pass on to the great public schools.

Of course there are a large number of sons of wealthy parents who are sent to school, and afterwards to the University, with no other object than to get the training which their fathers have had before them, and which they are sensible enough to see is the best preparation for life that they can give them. If these devote the chief part of their time to athletics so much the better. They are the class, the monied class, who form the very worst of the “loafers”; but we must remember that a very large proportion of public school boys, and a still greater proportion of University men, are sent to school or to college at a considerable sacrifice on the part of their parents, and that hard work is an absolute necessity for them, and, whatever anyone may say, downright hard steady work, and the performance of all the duties required from a member of a University eight or eleven or of a school eleven or football team, are, except

in very rare cases, quite incompatible. Several notable exceptions will, of course, occur to us, but the very fact that they are pointed at as marked men proves our point. It is quite possible to play hard and work hard, but very few have the actual physical strength which a man requires to be at the same time in the *forefront* of the class lists and the athletic lists. There are a certain proportion who can be pre-eminent in either, and the tendency of the present day is decidedly to prefer the latter with a reckless disregard of the future.

Let us in this connection consider for a few moments the case of candidates for the army. These are, as a rule, athletes by their very nature, and, if skill at games were sufficient to get them commissions, in some ways we could not wish them a better training; but, as we well know, the examinations for the army are particularly hard, and, through increasing competition, are getting harder and harder. People may grumble at this; they may say that the army will surely deteriorate through the necessary substitution of brains for physique, but the fact remains that the examinations must be passed, and, to judge from the recent records of the army, the younger men are certainly not backward in keeping up the old traditions to their fullest extent; there is no apparent deterioration whatever. Now a considerable proportion of those who obtain commissions pass direct from the public schools, but no one school attains to anything like the success of the leading private tutors; there is, however, no reason why, with less devotion to athletics, and less distractions, a much larger proportion should not be able to do without the help of these so-called “crammers.” How many there are to whom we might well apply the words of Mr. Walter Wren, in his most able defence of private tutors in the *Nineteenth Century* for June, where (p. 929) he speaks as follows of a certain case that had come under his own notice:—“Everyone who knew him knew that he had failed signally at school, done worse from a university, but ultimately achieved success by two years' honest work, by cheerful submission to strict discipline, by less play, and by making the best use of the best teaching.”

Dr. Percival, while agreeing in the main with my conclusions, took strong exception to my making use of the statistics contained in the Public School Record, as given in the *Pall Mall Gazette* for

November 5th, 1890; no one, however, as far as I know, has disputed their accuracy, and they have, in fact, been supplied in most cases by the head masters themselves; they certainly appear conclusive as far as the army examinations (Woolwich and Sandhurst) are concerned; Captain James heads the list with a total of 46, Messrs. Wren and Gurney come next with 32, and then follow Wellington College, 15; Clifton and Eton, 13; Bedford, 12; Cheltenham, Portsmouth and Oxford Military College, 10; and Marlborough, 8; in the competition for the Indian Civil Service the results are tabulated on the Government return, and come out as follows, Messrs. Wren and Gurney, 25; St. Paul's School, 3, and the rest 2 or 1.

The mention of these statistics naturally draws our attention to the Scholarship (Oxford and Cambridge) record, which is also given by the editor of the *Pall Mall Gazette*, who supplies the results for the last four years; we obtain rather curious results if we compare the number of scholarships obtained by the large public boarding schools with the number of those obtained by the large public day schools and grammar schools. These results have been called misleading because of the existence of "close scholarships" in certain schools, but, if anything, this fact tells against the day schools, as Merchant Taylors' is the only school of this class with close scholarships, whereas Eton and Winchester both possess them in considerable numbers (and also Westminster, but the record of this school is imperfect, and has not been taken into consideration); at all events St. Paul's School and Manchester Grammar School, without a single close scholarship, come before any of the public boarding schools. We have no space to enter fully into the statistics given; but if we take the four public boarding schools which head the list, Eton, Winchester, Marlborough and Clifton, we shall find that with a total* of 2,549 boys they obtained in four years 152 scholarships, whereas the four first public day schools, St. Paul's, Manchester, Merchant Taylors', and Dulwich, with a total of 2,469 boys, obtained 208 scholarships, or, roughly speaking, 25 per cent. more. Again, if we take 17 schools which are usually reckoned as the chief public boarding schools (the four above mentioned, together with Harrow, Rugby, Charter-

house, Christ's Hospital, Shrewsbury, Cheltenham, Rossall, Sherborne, Uppingham, Haileybury, Wellington, Repton and Tonbridge) we shall find that, with a total of 7,732 boys, they obtained in the four years 334 scholarships, whereas the first 25 day and grammar schools mentioned in the *Pall Mall* list, taken in the order there given, with a total of 7,656 boys, obtained 441 scholarships, the proportions being almost exactly the same as in the case of the first four.

To anyone who dispassionately examines these facts, it must seem clear that the public boarding schools are scarcely holding their own. They have practically unlimited incomes in most cases, and so are able to secure the very best teaching. The boys, moreover, are entirely in their masters' hands. Anyone who has had much to do with a day school knows the difficulty caused by the neglect of home work, and how much is lost by the carelessness of parents in this matter. There is no such difficulty where the boys are under supervision in Houses. Only one inference, therefore, remains, and that is, that there is something behind, which takes off the minds of a considerable proportion from steady work, and it almost appears as if this *must* be the undue importance attached to athletics. It is not mere loafing or idling that makes the difference, for unfortunately the proportion of good-for-nothing loafers who will neither work nor play is much greater in a day school than in a boarding school, since in the latter the pressure of public opinion is far greater.

I have before me the letter of a friend who is engaged in important educational work, and who in his time was a good oar and ran in the three miles for Oxford against Cambridge. He says:—"In the great day schools a parent who knows that his son has to win his way to the University by scholarships, takes care that he does not give 'an undue amount' of his time to games; there is no one to exercise this control at boarding schools. . . . It is not the actual time spent over the game, but the after-effects; a boy is thoroughly tired out when he comes home at seven to do his piece of composition. What heterodoxy for me! I won't say any more, but it is because I have been through it myself and felt the strain that I feel competent to speak 'with authority;'" and I may be allowed to add, in concluding this part of the subject, that I was in great measure in-

* These totals only apply to 1890, but may be taken as an average.

duced to bring forward the matter for discussion by a letter received from another friend, whose son has recently got an appointment with a good firm in London, and who wrote to me that the heads of the firm had remarked that they preferred Grammar School boys to Public School boys, because they were not so much given up to athletics. The friend I refer to was a well-known oar in his time at Oxford, and his words therefore carry more weight. Of course I know well the way in which words like these are likely to be received. I remember the time when I should probably have joined myself in the sneer against the non-Public Schools, but no amount of prestige, no amount of skill at games at the greatest Public Schools will avail in this levelling age to counterbalance the absence of dogged perseverance and capacity for sheer hard work, which is absolutely necessary for advancement in life. Athletics, in moderation, help above all things to develop this perseverance, but if made the one absorbing business of school life they tend in exactly the opposite direction.

This consideration leads us directly to another side of the subject, a side which I have always considered, from long experience and observation, to be most dangerous, and that is the deterioration of character which is inevitably caused in many boys who have come to the front in games by the amount of flattery and general adulation that is bestowed upon them by their fellows, and by the notice and favour which is often shewn them by certain of the masters. I have seen boys who gave every promise of turning out thoroughly well, gradually, from pure conceit, losing their heads and becoming thoroughly spoilt. Sometimes the nonsense gets knocked out of them later on, but occasionally it sticks to them; but, worse than this, I have seen the moral character deteriorate, owing to the boundless influence that they have gained by their position, and have not known how to use aright; on the other hand, the influence of the best athletes, when used as it often is for good, cannot be over-valued. It is in many instances far greater than that exercised by any master.

I am afraid that I am exceeding the limits of my space, but I should like to say a few words on compulsory games. In a large school it is very necessary that games should be compulsory, in order to

keep boys out of the mischief that they would otherwise be sure to fall into in their leisure hours, but I agree most thoroughly with Dr. Clement Dukes' remarks on page 41 of the present volume of this journal, where he says that big boys and small boys should be separated. Many small boys simply detest games, because they are obliged to play with older boys, who get all the fun, while they get all the kicks. I have often thought, since I left school, of the amount of unnecessary suffering that timid new boys incurred for the want of a little sorting and a little more supervision on the part of the authorities. And, further, if the games, as is usual, are made compulsory by the school rules, the punishment for cutting or neglecting them should rest in the hands of the house masters. If it is left in the hands of the elder boys, it will be sure to lead to undue severity towards unpopular boys, and undue leniency towards favourites.

A few words yet remain to be said on the question as it affects the public day schools; matters in these are entirely reversed; from the very circumstances of the case we get an absence of *esprit de corps*, which nothing can supply but the daily association out of school which is only found in the public boarding schools, and which is justly and highly valued as an essential portion of their training. As the tendency of the latter kind of school is to unduly exaggerate the importance of games, so the tendency of the former is undoubtedly to unduly diminish it, and this tendency is often very largely increased by the difficulty of obtaining any suitable ground in or near the large towns which are, of course, the home of the great day schools. I heard a leading London schoolmaster say the other day that his ground was six miles off; can we wonder that we do not hear much about athletics in cases like this? Yet these schools turn out a large proportion of men who take quite as good a position in the world as any of those who are sent out by the public boarding schools, and, taken as a whole, as far as actual work is concerned, the result sometimes seems to be superior; this does not, however, militate against the probability that, with more *esprit de corps* and more athletics in moderation, many of them might have done much better; nothing can really make up for the loss of the moral training of the playing-fields if the *aurea mediocritas*, the

true golden mean, be rigidly observed; it is not, however, fair either to parents or boys to allow work to hold the very

secondary position to which, in certain quarters, there appears to be an ever-increasing tendency to relegate it.

National Physique.

PHYSICAL EDUCATION AND THE FUTURE OF THE RACE.

By W. J. GREENSTREET, M.A.

RECENT studies in heredity have amply proved that certain environments, certain professions, and certain social situations, have a calamitous effect upon the race in general. As long ago as the days of Jean Jacques Rousseau, the fact was recognised that great towns are the "gulfs" of the human race. I am told that it has been stated, from observations made in the out-patient rooms at the Charing Cross Hospital, that it is extremely rare to find in the metropolis an individual whose father, mother, grandfather, and grandmother, were *born and bred*, and had *lived* in London all their lives. If this be so, any family would under similar circumstances become extinct in about two generations. Moreover, degeneration may be promoted with fatal facility in the West End as well as in the East. No one can maintain that long and exhausting evenings at theatres, social functions, or in places like the House of Commons, can have any but an evil effect upon those whom duty or pleasure calls to spend in that way a large portion of their lives. The continuous strain of over-excitement, coupled with a prolonged stay in an unwholesome atmosphere, cannot fail to lead to diseases of the nervous system or to some other form of physiological innutrition, and these in turn lead to sterility—an element in the problem of vast importance to the future of the nation. The same may be said of many professions, and unfortunately of those professions that are most useful to the progress of the race, while at the same time they are most trying to the individual. Some writers have been led by these considerations into a gloomy pessimism, for if these data be taken as trustworthy, and the inevitable inferences be followed boldly to their logical consequences, we are landed in some such position as this:—Progress is only attained at the expense of the degeneration of those who work the hardest; the survivors are not the fittest; every advance in

intellectual superiority leads to a decrease in fecundity, and is therefore a sentence of death to the race; the best conditions of vitality are to be found in a life of the minimum intellectual activity; and finally, as education is organised at present, the very toil and labour required to develop the faculties of the young, in the minimum time allowed by severe competition, tend to the production of sterility, and thus to the destruction *for the race* of the very capacities we are sacrificing the individual to elicit.

But there is another side to the dreary picture. The principle of sexual selection is in operation. As Spencer points out, this principle ensures the progress of the race, for man is attracted in the first place by physical beauty, health and vigour; secondly by moral beauty; while intellectual attractions come last—and even here the inborn faculties of wit, insight, taste, &c., are preferred to those acquired by prolonged study. Here then is a triple safeguard. The physical perfection of a child depending far more upon the physical condition of its mother during the period of gestation than upon that of the father, we see how important it is that the mother should be chosen for anything but those qualities which can only be acquired, in the present state of education, at the cost of so much vitality.

The late M. Guyau, a philosopher of recognised ability, devoted his attention to a study of education from the sociological point of view, and in a volume entitled *Éducation et Hérité*,* he lays down as general principles:—1st, education must have as its main object the progress of the race; and 2nd, whatever system is best for the race is *ipso facto* best for the individual. The problem is receiving unusual attention at the present moment from our neighbours across the Channel. Not only are individual philosophers like MM.

*Translated in the *Contemporary Science Series* (Walter Scott).

Guyau and Fouillée* impressed with the need for reform on the intellectual and physical sides of the curriculum, but the State itself has recognised that the present system of physical training in the primary and secondary schools in France needs revision, and individual philanthropists as well as philanthropic bodies have offered prizes for the best essays on reform in this direction. A Commission appointed to investigate the question of gymnastics in schools reported, on the whole, unfavourably as to the effects of gymnastics, as at present taught, compared with games. Here, *en passant*, I would draw attention to three interesting points in connection with this Commission. In the French army a recruit who is growing too rapidly is set to gymnastics *to check his growth*. At a Conference of teachers of gymnastics, held at Brussels, out of a large number of representatives from Germany, each professor of gymnastics was professor of some other subject, such as classics, mathematics, &c. The Commission pronounced strongly against the undue prominence given to military drill, the use of arms, &c. The first of these facts I recommend to the attention of all schoolmasters who have gymnasiums attached to their schools, the second to all schoolmasters who are not proficient in athletics, and the third to those who are interested in the formation of cadet-corps.† Each of these points might well serve as the text for a separate paper. But to return to the main question:—

With M. Guyau, we must look upon each individual as the temporary depositary of a portion of the physical force of the race. Now one race may be superior to another physically or mentally. As mental progress can only be acquired at the expense of vitality (if incessant attention be not paid to the case of each individual), and as with each marriage of two individuals of high intellectual ability and therefore of impaired vitality, the average result will be offspring of a lower intellectual and physical level, it is of pre-eminent importance that one sex should be superior to the other physiologically. Health and vigour, and *ipso facto* fecundity, are of far more importance to the race than merely intellectual endowments. As

the physiological condition is lowered, the cerebral powers are weakened, and it follows that mental capacity must be lessened.

In these days, all who want to succeed in the higher paths of life are doomed to intellectual over-work. Of course the majority do not work at this high rate of speed, and their education has therefore been—from the intellectual standpoint—so much waste of time. They leave school with vague and confused notions of all they have learned, their school-life has been, as M. Fouillée puts it, a life of “intellectual vagabondage,” but on the other hand they are saved physically. They contribute towards the maintenance of a low intellectual and moral level, but they also contribute to the continued existence of a fine race, by keeping up the physical level. The problem may now be stated in a few words. How can we reform our educational system so as (1) to prevent intellectual overwork on the part of the minority who are gifted with brilliant mental endowments, and thus secure a higher physiological level among these individuals, and also ensure the transmission of unimpaired intellectual activities; and (2) how far can we cut down the list of subjects in our school curricula, so as to teach nothing more than is absolutely necessary to the indolent majority, and that, too, in such a form as to stimulate and interest, and thus to raise the mental level of our “barbarians” and “Philistines,” while securing the continued transmission of the physical vitality which is necessary to the existence of the race.

I cannot help feeling that the radical mistake in pedagogy is the failure to recognise that the brain is an organ which has to be *strengthened*. What is transmitted by heredity? Is it the amount of knowledge acquired, or is it the intellectual power that has been gained? Surely it is brain-power that is transmitted. The effect of instruction should be increase of cerebral power, and not an exhaustion of the nervous system. The memory must not be made a storehouse of ill-digested, unorganised facts, a receptacle for the opinions of others, because this process is brain-weakening, not brain-strengthening. Mental equilibrium obtains only when co-existent with physical equilibrium. We must procure a divorce between the well-furnished intellect and the impaired physique. If we do not do this, if our educational system

* *L'Enseignement au point de vue national*. 1891. (Hachette.)

† Since writing the above I see that the municipality of Paris has decided to discontinue their support of the cadet-corps in that town.

is not shaped to this end, then the physique, the morale, and the intellectual activity of the race must degenerate, and

we, as a race, must look forward to our ultimate extinction in the "struggle for existence."

RELATION OF PHYSICAL TO MENTAL EDUCATION.*

By C. ROBERTS, F.R.C.S., &c.

EDUCATION looked at from a physiological point of view means the proper development and training for definite objects of the nervous and muscular systems, as all the functions of the body are either directly or indirectly subservient to these two systems. Hence we may, and indeed generally do, divide education into mental and physical, as it deals with the mind or the body. The development of the nervous and muscular systems is governed by the common physiological law that *the structure and function of an organ increase with use and waste with disuse or idleness*, or, in other words, *function makes structure*; while the effect of training may be defined by the two homely proverbs, "we are the creatures of habit," and "habit becomes second nature."

If a child's muscles are exercised they increase in size and power, provided a sufficient supply of nutritive material is present in the blood; and if his nervous system is exercised under similar conditions, similar results follow. On the other hand, both the nervous and muscular structures are subject to the law of limited duration, and undergo gradual disintegration or wasting, which is not adequately repaired by the nutritive process if they remain unused or lapse into idleness. The manifestation of their special functions, although in itself a wasting process, determines an afflux of blood towards the parts exercised, and thus an augmentation, rather than a diminution, of their substance takes place. The chief function of the brain is to think, the chief function of the muscles is to produce motion, and the object of the education of both is to develop these functions to the utmost, and to train them into habitual modes of action, in order to economise their use, and apply them promptly when occasion demands. A well-trained mind, like a well-trained body, produces the greatest results with

the smallest expenditure of force, and it is chaotic thinking—especially of an emotional kind—and chaotic exercise which are useless, and, indeed, often injurious to the individual. The common belief that the brain will not be exhausted if the mind is interested and stimulated to fresh efforts by a change of studies is erroneous. More work, indeed, can be got out of the brain in a given time by such a proceeding, but it is like the extra work got out of the muscles by mental excitement, and is obtained at the expense of a more rapid waste of tissues.

MENTAL EDUCATION PRODUCES PHYSICAL DEVELOPMENT.

But mental education has a much wider influence than the development of the brain: it promotes the development of the whole body. I have spoken of the nervous and muscular systems as if they were accustomed to act independently of each other, but this is not the case. Comparative anatomy shows us that the nervous system is the axis on which all the other organs and structures hang, as it were, like a suit of clothes, and to which they are all subservient. The mind communicates with the outer world by means of the organs of sense, and effects its wishes—enforces its will—by means of the muscles; and the perfection or imperfection of the senses and of the bodily frame (if the results of accidents and acquired diseases are excluded) are dependent on the perfection of the brain and nervous system; the perfection of the brain in its turn being dependent in some measure on organisation and hereditary transmission, but chiefly on the training or education it receives during its young and most plastic condition.

The proof of this is best seen in idiots, a class of children in whom we find the co-existence and co-relation of mental and physical defects. Dr. Shuttleworth, of the Northern Counties Asylum, describes idiocy as a vice of the entire organism; an affection not merely of the nervous system, but of the functions of organic life generally. Not only the lineaments

* Address on Physical Education at the Manchester Conference on "Education under Healthy Conditions."

of the face, but the shapes of the limbs, and especially of the hand, are deformed. The head is remarkably small, and bird-like in some, while in others it is excessively large and distended by hydrocephalus. Idiots are much more subject to diseases than other children, and die at the rate of about 9 to 1 of ordinary children of corresponding ages.

In physique, as well as in intelligence, idiots are much below the general population, and very far below that of the best nurtured and best educated class, as represented by the boys in our Public Schools, as will be seen from the accompanying table.

It is a remarkable fact that during the earlier and what may be considered the purely vegetative stage of growth, and before mental training has begun to tell on the more intelligent children, that there is little or no difference in stature and weight, and it is only after the age of four years that idiotic children begin to lag behind and lose more and more ground as age advances. Thus at six years of age idiots are $1\frac{1}{2}$ inches, at twelve years $2\frac{1}{2}$ inches, and at eighteen $3\frac{1}{2}$ inches shorter in stature than the general population at corresponding ages. The difference in weight is still more marked; at six years idiots are $1\frac{1}{2}$ lb., at twelve years

TABLE SHOWING THE RELATIVE AVERAGE STATURE AND WEIGHT OF PUBLIC SCHOOL BOYS, THE GENERAL POPULATION, IDIOTS AND IMBECILES, AND INDUSTRIAL SCHOOL BOYS.

AGE LAST BIRTH- DAY.	STATURE OF MALES, WITHOUT SHOES.				WEIGHT OF MALES, INCLUDING CLOTHES.				DIFFERENCE.							
	Public Schools and Universities.		Idiots and Imbeciles.	Industrial Schools.	Public Schools and Universities.		Idiots and Imbeciles.	Industrial Schools.	Idiots less than Public Schools.		Idiots less than General Popu- lation.		Industrial less than Public Schools.		Industrial less than General Population.	
	In.	Lbs.			Lbs.	Lbs.			In.	Lbs.	In.	Lbs.	In.	Lbs.	In.	Lbs.
5	—	42.0	40.0	38.6	—	40.0	39.0	36.7	—	—	2.0	1.0	—	—	3.4	3.3
6	—	44.0	42.3	41.1	—	44.4	43.0	40.4	—	—	1.7	1.4	—	—	3.0	4.0
7	—	46.0	44.0	43.5	—	49.7	46.5	45.7	—	—	2.0	3.2	—	—	2.5	4.0
8	—	47.5	45.8	44.6	—	55.0	50.5	47.1	—	—	1.7	4.5	—	—	3.0	7.9
9	—	49.7	47.5	47.0	—	60.4	55.5	52.4	—	—	2.2	4.9	—	—	2.7	8.6
10	53.7	51.8	49.0	48.1	74.0	67.5	59.0	56.8	4.7	15.0	2.8	8.5	5.6	7.2	3.7	10.7
11	55.2	53.5	51.0	49.1	78.7	72.0	64.5	63.2	4.2	14.2	2.5	7.5	6.1	15.5	4.4	8.8
12	57.3	55.0	52.5	51.8	84.9	76.7	70.5	67.4	4.8	14.4	2.5	6.2	5.5	17.5	3.2	9.3
13	59.1	56.9	54.6	53.2	91.6	82.6	77.0	72.3	4.5	14.6	2.3	5.6	6.0	19.3	3.7	10.3
14	61.3	59.3	56.5	54.5	102.2	92.0	85.5	77.3	4.8	16.7	2.8	6.5	6.8	24.9	4.8	14.7
15	63.6	62.2	59.3	55.4	114.3	102.7	94.5	85.5	4.3	19.8	2.9	8.2	8.2	28.8	6.8	17.2
16	66.2	64.3	60.8	57.6	129.5	119.0	103.0	93.9	5.4	26.5	3.5	16.0	8.6	35.6	6.7	25.1
17	67.8	66.2	62.5	—	141.7	131.0	110.0	—	5.3	31.7	3.7	21.0	—	—	—	—
18	68.3	67.0	63.3	—	146.4	137.4	116.0	—	5.3	30.4	3.7	21.4	—	—	—	—
19	68.5	67.3	63.3	—	148.5	139.6	120.5	—	5.2	28.0	4.0	19.1	—	—	—	—
20	68.7	67.5	64.0	—	152.4	143.3	121.5	—	4.7	30.9	3.5	21.8	—	—	—	—
21	68.7	67.6	64.3	—	152.7	145.2	122.0	—	4.4	30.7	3.3	23.2	—	—	—	—
22	68.7	67.7	64.5	—	152.8	146.9	122.5	—	—	—	3.2	23.4	—	—	—	—
23	68.7	67.7	64.5	—	—	147.8	—	—	—	—	—	—	—	—	—	—
24	68.8	67.7	64.6	—	—	148.0	—	—	—	—	—	—	—	—	—	—
25-30	69.1	67.8	64.8	—	156.3	152.3	123.0	—	4.3	33.3	3.0	29.3	—	—	—	—

6lb., and at eighteen years $21\frac{1}{4}$ lb. lighter in weight than persons of the same ages belonging to the general population. Compared with public school boys, idiots are at twelve years $4\frac{3}{4}$ inches, and at eighteen years $5\frac{1}{4}$ inches shorter in stature, while at the former age they are 14lb., and at the latter age $30\frac{1}{4}$ lb. lighter in weight. The idiots included in my table are members of the better classes, and as inmates of asylums, have been situated under the most favourable hygienic conditions.

Not only among idiots, but in all other classes of the community, the physique appears to bear a definite relation to the intelligence of the several classes, and this is true not only of different members of our own race, but also of different races of mankind. The European stock stands at the head of the human family, both in physique and intelligence; while the bushmen of South Africa, the Andamanese, the Veddas of Ceylon, and the other effete aboriginal races stand at the

bottom, being equally deficient in intelligence and bodily development.

There are, it is true, other conditions of life which are favourable to physical development, such as good food, easy lives, and good sanitary surroundings, as we see from a comparison of public school boys with the inmates of industrial schools; but these conditions are themselves the fruits of intelligence, and the superior physique of the public school boy is the result of the superior intelligence of his ancestors quite as much as his social and financial position. Thus the physiological law which forms the basis of education forms also the foundation of political economy; increase the intelligence and you will increase the health and strength and with it the riches of a nation.

Other conditions show the dependence of the bodily development on that of the brain. When the brain is congenitally imperfect, the body is also imperfect, and the muscles not under proper control. When the growth of the brain is arrested at an early age the bodily growth is checked, and imbecility of mind is associated with dwarfishness of body. Boys in Industrial Schools of the age of fourteen years are nearly seven inches shorter of stature and about 25lbs. lighter in weight than boys of the same age in public schools, showing how starvation of body and mind arrests the development of both. The relatively larger heads of dwarfs are indicative of the superior vitality and importance of the brain in the animal economy, and its power to develop under difficulties and often at the expense of other parts of the body. This explains the temporary success which sometimes attends the education of under-fed and diseased children. When accidents happen to the brain or to any of its channels of communication with the senses or the muscles, paralysis and wasting of the organs follow, although the rest of the body may continue its normal course of development, showing how essential the nervous system is to the proper growth of the whole body.

PHYSICAL EDUCATION PROMOTES MENTAL DEVELOPMENT.

On the other hand, the cultivation of the physical parts of the body favours the development of the brain and nervous system, and, consequently, the mind is improved and developed by physical education. The upper portions of the brain, which were till lately thought to be con-

cerned with the intellectual faculties, are now known to be motor centres, and their development is largely dependent on the use of the motor organs, the muscles. By practising and training the senses they are rendered more acute and refined, and greater activity of the mind is the result. Greater activity of mind demands greater activity of the muscular system, which, in its turn, stimulates and creates greater activity of all the organs and tissues of the body.

The muscles not only follow the physiological law already laid down, and increase with use and waste with idleness, but by their great size and power and their almost universal distribution throughout the body, they involve all the other structures in their action. When a muscle or a set of muscles is brought into action an immediate flow of blood takes place to restore the waste, and to build up a larger and stronger muscle for future use; and as the circulation is common to the muscles and to the surrounding parts, all the tissues are renewed or invigorated by the vascular excitement incident to the muscular action. But the contracting muscles do more than this. They press on the large blood vessels passing among them, or between them and the skin, and drive the otherwise sluggish stream of venous blood, loaded with effete materials, more quickly on to the heart; the heart, in its turn, being stimulated to extra effort, forces the blood onward to the lungs, the skin, the intestinal viscera, and the glands, where it becomes purified and gathers up fresh supplies of nutriment for redistribution throughout the body, to the brain and other organs, as well as to the muscles which gave the impetus to the circulation. Hence the advantages of physical education in promoting the healthy development of the body and improving the functions of all the organs of which it is made up.

One of the most important functions of the body is the production of animal heat and the sustension of the temperature at 98° Fahr., without which life is impossible. This function is performed by the mere contact of the circulating blood with the muscles, and it is performed well or ill according to size, healthiness, and activity of the muscular tissues.

The chief object of physical education should be to make the organs of the senses and the muscles, the ready and willing agents of the nervous system, for without this the education of the mind will be

hampered or defeated. All things being equal, a blind child cannot know as much as a short-sighted one, nor a short-sighted one as much as one who possesses perfect vision, and the same is true of all other physical imperfections, hence physical education is the handmaid of mental education, and should never be separated from it. Physical education, moreover, contributes to the beauty of form and gracefulness of movement of the limbs and body by differentiating the action of muscles, so that each portion of the body is moved and controlled by the special muscle or set of muscles intended for that purpose, and not by a whole group of muscles, which can be made to act together on emergencies when great strength is required. The graceful agile movements of the athlete are evidence of the one condition, and the clumsy rolling gait of the ploughboy of the other.

PHYSICAL AND MENTAL IDLENESS AND OVERUSE.

I have said enough of the advantages of use—that is to say, of mental and physical training—in increasing the structures and the functions of the body, I must now say a few words on the consequences of disuse or idleness, and of overuse of structures and their functions. Roughly speaking, the brain consists of four structures, having different properties and uses in the animal economy. The grey matter of the brain consists of cells on which depend its special function of thinking and feeling; of the white fibrous matter which is the channel of its communication with the senses and the muscles; of ordinary connective tissues which hold the organ together and give it its shape, and allow of the circulation of the blood through the organ; and lastly, of fat diffused in varying quantities among the different tissues. The muscles have a somewhat similar composition, and consist of isolated cells, or cells held together in long rows (according as their function is involuntary or voluntary) by means of connective tissue, in the meshes of which run the vessels and nerves, and among which fat exists in varying quantities. Now the way in which the brain and muscles waste by disuse or idleness is by the shrinking or the deficient formation of the cellular structures, the place of the cells being either not filled up, or filled up by structures of simpler use and lower vitality, such as connective tissue and fat; the fat sometimes taking the place of the normal

contents of the cells and producing what is called fatty degeneration. In children the wasting chiefly takes the form of arrest of development, which can be overcome by the proper stimulus—education—while the degeneracy of tissues by the substitution of an inferior kind chiefly occurs after the attainment of adult life.

The other kind of waste is that which we have heard so much of under the name of educational over-pressure. I have already stated that the structure and function of an organ will not be renewed and strengthened unless a sufficient supply of nutriment is available, but, on the contrary, exhaustion will ensue. Further, exhaustion will take place even if sufficient nutriment is present if the organ is worked so incessantly that it has not time to appropriate the nutriment, for it will be in the same condition as if no nutriment were available, and this is true also of unsuitable nutriment. It is obvious, therefore, that children who are ill-fed, or in ill-health, should not be subjected to severe educational discipline, either of a mental or physical kind, and that even those who are in good health should have considerable intervals of rest to re-nourish the brain and muscles. The rest of the brain is sleep, and of the muscles relaxation, and both these kinds of rest are of vital importance to children. Schoolmasters (as well as parents) who are entrusted with the feeding as well as the education of children should bear in mind also that a much larger supply of food is required to meet the demands of growth than the mere use (educationally) of organs; for growth is not the result of a simple addition of materials to existing structures, but an enlargement of the structures by a process of metamorphosis, or destruction and re-formation of the kind I have already described as the result of the functional use of an organ. The instinctive mental inquisitiveness and physical restlessness of children are the result of these growth changes, and are essential to their progress, and should not be suppressed. There is no feature of educational discipline which is so injurious to mental and physical development as its tendency to suppress the joyous vivacity of childhood. The imposition of strict silence, the assumption of prim positions in school, and the marching of two and two when out for exercise, are exactions of this kind, and belong to the period when backboards and the use of the globes were the chief features of physical and mental education,

and ought to have been banished with them. School furniture has been very much improved lately, especially in elementary schools; but it is still very faulty, as it does not admit of sufficient freedom and variety of position and movement of children when at school-work. The methods of physical education should be framed in accordance with the instinctive vivacity of childhood, and when games are not possible, exercises which approach nearest to them in character should be adopted, and solemn drilling and postur-

ing requiring mental effort and attention avoided.

Physical education may easily be carried too far, and it must be regulated by the judgment of the teacher rather than the consciousness of fatigue of the pupil. It is easy to understand how the mind may overwork the muscles, because the muscles are its servants, and the mind is often carried away by ideas requiring severe muscular efforts, and under excitement it becomes oblivious to the warnings of muscular fatigue.

Physical Education.

PHYSICAL EDUCATION IN GIRLS' SCHOOLS.

By CLEMENT DUKES, M.D.Lond., *Physician to Rugby School, &c.*

THE great defect in most schools for girls, boarding as well as day schools, is the utter neglect of any real physical education; and, worse still, in many girls' schools there is an absence of any desire to remedy the omission, and give them exercise. Instead of this, physical should have a prior claim to intellectual education. We need strong, healthy, vigorous women, and yet no attempt is made to produce them during the only years in which they can be produced—the years of active growth and development. Girls certainly require, and are worthy of, the same care and attention as are bestowed upon the physical education of boys. Yet when a school is started, the last thing thought of, even when deemed worthy of consideration, is the playground and plant which is necessary for physical education. Also, when the school work is being arranged, the time is filled up for work, and few gaps are left for recreation and play. Their exercise usually consists, in those schools which give any attention to the subject, of a stately walk, two and two, in the street, weather permitting; dancing, calisthenics, and deportment once a week, and sometimes lawn tennis.

The absence of daily regular and sufficient exercise renders girls listless and apathetic, and entails pallor, functional disorders, constipation with its sallowness, foul breath and depressed spirits, crooked backs and stooping, knock-knee and flat foot with its characteristic awkward gait.

It is important, too, that parents and teachers should instil into their girls the fact that Nature, in providing for the sur-

vival of the fittest, has enjoined that a clean and clear skin, clean and glossy hair, clean white teeth, and a light, springy, graceful gait will cause their society to be sought after; while a muddy, spotty complexion, a scurfy head, uncleaned teeth, and an awkward gait will cause their society to be shunned. Also, if the physical education of girls were more heeded during their growing years, there would be less emotional disturbance, less neurotic disease, and the bloodlessness of girls, at present so common, would be less frequent, for all these defects of girlhood arise mainly from the absence of efficient exercise and recreation, and from the one-sidedness of their education.

The remedy, again, for cold feet, and chilblains on the hands and feet, which are so common amongst growing girls, is at least two hours' good hard exercise daily, instead of fires in bedrooms, hot-water bottles in bed, and hot water with which to wash.

At the present time the mental training of girls is too high in comparison with their bodily training, with consequent deterioration in development, in health, and in character.

It should be the aim of parents and teachers to instil into girls' minds the fact that it is their duty to try to be physically strong. They should be taught the necessity of being strong, vigorous, graceful, and naturally, instead of artificially, shapely. But a certain ordeal is necessary to attain this perfection of body, which can only be attained during the years of growth and development, and

that is physical exercise, by which I mean games and amusements, and not "exercise lessons." This appropriate exercise not only means muscular development, but is certain to produce a vigorous nervous tissue and brain capacity, and above all, that strength of character which is so much to be desired in women. For, believe me, weak health too often "lets things slide" that would never have been permitted, or would have been rectified, had health been more vigorous.

In order to carry out the requisite physical education of girls, I would insist:

1. That in all girls' schools, day and boarding, a playground must be provided where the girls can play.

2. That the necessary time must be given up for play; that no girl should ever be longer in school than an hour without a "break," so that she may stretch her rapidly growing limbs, use her lungs fully, and have a mental rest, and then a change of subject, and that the schoolroom may be freely ventilated.

3. That a suitable dress is also requisite to enable the limbs and ribs to move without restraint. This dress should be put on before playing, and taken off after the active game has ceased.

4. That, above all, appropriate exercise and games must be organised, and varied as much as possible, in order that the whole frame may be developed in due proportion, never forgetting the character of the female constitution.

Girls require as lively an exercise as boys to let off their animal spirits, and would enjoy it as much if only they had the chance.

The way in which girls are neglected in this matter of physical education produces girls who are useless as companions, wives who live on a sofa, and mothers who are unfit for their duties. If greater pains were taken to make vigorous bodies we should have more vigorous brains too, so that a double gain would result. Why do so many girls fail in health directly

they undergo hard mental work, sometimes becoming incapacitated for life—physical wrecks, and the victims of hysteria and other neuroses? Simply because they and their friends try to make them do the impossible. If we are to have a higher education in girls—of which they are mentally quite capable, and which is their due—without disastrous results, they must not be pressed during those years when their growth and development are so enormous (from eleven to sixteen years of age), when they leap, as it were, from childhood to womanhood at a bound; for all their nervous force is used in this development.

Further, continual application to work from day to day, from week to week, and from month to month, should never be enforced on girls, nor even should they be allowed to undergo it; periodical cessation and rest should not merely be encouraged—they are imperatively necessary. And above all, their mental education must proceed *pari passu* with a thorough physical education; otherwise, with rare exceptions, it must end in failure and serious lifelong misery to the girl. It is imperative that the physical education of girls should be feminine; equally important that it should not be, as at present, effeminate.

I have now spoken of the claims for the physical education of girls, and have hinted at the required limitations. Beyond this I am not at present prepared to go. I should be sorry to add another word on the necessity for limitations, for if I set any limitations on the present physical education of girls, I am afraid that there would be so little left that it would not survive the ordeal. At the present time all our aims should be to encourage those in authority to organise games for girls at school. The matter of control is a comparatively easy task, but let us first have something to control; at present, with a few bright exceptions, it might almost be passed through the eye of a needle.

PHYSICAL EDUCATION.—A NEW PROFESSION.*

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OPPORTUNITIES FOR SCIENTIFIC WORK.

It is hardly possible at the present day for a man to look forward to adding ma-

terially to the sum total of knowledge in any of the older professions. A man who goes into Physical Education with fair abilities and preparation expects in the course of a few years to have acquired all that has been known up to his time (the scientific side of the subject is as yet

*A paper read at the meeting of the American Association for the Advancement of Physical Education, 1890.

young) and to add materially to the sum total of knowledge on this subject. In this respect, then, does this profession differ from others, in that it is new, and every man may expect to do that scientific work which will be not merely original with him, but original to the world. In fact, each man will have to depend to a considerable extent on the results of his own investigations, for he has not, as in medicine, elaborate treatises on which to rely. The science is as yet too young to have developed them. He must expect to assist in the development of such works for the use of those who come afterward. An oak tree during the first year of its existence is susceptible to slight influences which would be entirely unfelt a few years later, even if multiplied a thousandfold. The profession of Physical Education has still to be defined; it has not yet crystallised, and thus it is possible to stamp it with one's own character as it will never be possible again. What physician in the world could now alter the practice of medicine? And yet the time was when medicine was in the same plastic state that physical education is in to-day. Men of foresight will see in this fact the possibility of a permanent influence not offered in the professions that are already formed.

It would be out of place here to attempt to discuss the nature of the various scientific problems which are presented in this field. They vary from the study of the exact effects on the heart of long and short distance running, the consideration of the relative effects of complicated movements on the brain and nerve centres, the relation between different kinds of muscular work and the intellectual activities, to the study of the laws of heredity, the relation which the rapidity of blood-flow bears to the psychical activities, and so on and so forth. The problems are without number, and are multiplying every day. Every problem which is solved in this field seems to bring to view ten, which are of more vital importance, of more difficulty and more interest, than the one before them. There are few scientific fields to-day which offer opportunities for the study of problems of greater value to the human race, or more fundamental in regard to its ultimate success, than does that of physical education. It is a factor in modern life that is as yet unappreciated. It deals with life on a broad side, is in line with the most thorough modern physiological psycho-

logy in its appreciation of the intimate relations of body and mind, is in line with our modern conception of evolution, as it works to develop a superior race. This profession offers to its students a large and broad field for intellectual activity, involving for its fullest appreciation a profound knowledge of man through psychology, anatomy, physiology, history and philosophy. To sum up this part of the argument, I would say that physical education offers a greater field for original work than almost any other. Second, on account of its youth and plasticity, it offers the possibility of a permanent influence that is never offered except in the youth of such professions. Third, this work is intrinsically of great value. Fourth, it offers a great field for intellectual activity.

The profession of Physical Education, then, differs from any that now exists. It is readily seen that it is not merely a department of medicine, which relates primarily to the prevention and cure of disease. The mere fact that a man is an excellent medical practitioner will not qualify him to take hold of educative gymnastics, although it would qualify him to understand curative gymnastics. On the other hand, the study of psychology and pedagogy will not qualify a man to take hold of curative gymnastics, although it might qualify him to understand educative exercises.

I take it that there is no other factor which is as prominent in the development of any profession as the kind of men who take upon themselves the functions of that profession. The advance of physical education will depend more upon the kind of men who take up this work as their profession, than upon any other one factor. If it is largely taken up by men of little education and small abilities, the work will never become of the greatest value, nor will it be favourably known to the general public. If, however, on the contrary, men of collegiate training, philosophic minds, of broad purposes and earnest hearts, are induced to enter this field, the profession will show that it is intrinsically a broad, scientific, philosophic field, and it will be recognised by thinking men as one of the departments in education, fundamental in the upbuilding of the nation.

OBJECTS OF PHYSICAL EDUCATION.

There seems to be a very general misapprehension, even among intelligent men, as to the nature of the work in which we are engaged. By many it is regarded simply as a speciality in medicine; others think it merely a department in athletics; others still, with more gross ideas, regard us as men who devote our time and energy to the building up of muscular tissue.

Perhaps I can best define the profession by stating its objects. It is difficult to formulate any classification that is at once logical and complete. The following, therefore, is presented, not without feelings of diffidence, as in some respects, at least, it differs from any that have been hitherto presented.

I will make three grand divisions of exercises, according to their purpose: namely, Educative, Curative, and Recreative Gymnastics. Hard and fast lines cannot be drawn, assigning each exercise to a particular one of these classes, as frequently it will be found that one exercise belongs to two or more classes at once. This is a division of the objects of exercise, and not of exercises themselves. I will now take up the divisions somewhat in detail.

I. EDUCATIVE EXERCISES, OR PHYSICAL EDUCATION.

We adopt the following definition for the object of educative exercises: "To lead out and train the physical powers; to prepare and fit the body for any calling or business, or for activity and usefulness in life." This may be divided as follows:—

(a) *Muscular Strength*. This includes strength of the heart and respiratory muscles, as well as the arms, legs, and body.

(b) *Endurance*, a matter of the heart, lungs, and nervous system, as well as of the extrinsic muscles.

(c) *Agility* or quickness of action, being largely an affair of the central nervous system.

(d) *Muscular Control*. Excellence in almost any art or trade involves accurate control or discipline of certain parts of the body. In playing the violin, a great deal is demanded in this direction, first as to the co-ordination of the fingers of the left hand, being able to place them rapidly, independently, and with absolute precision, both as to time and locality, upon the finger board of the violin, in a position

that is naturally awkward; second, to be able to use the right and left arms with entire independence, the muscles of the wrist being used principally in one case, and of the fingers in the other. In piano playing there is similar training. The hands have to learn to work independently, and even the fingers independently of each other. They have to learn to act with extreme rapidity, with absolute certainty, with automatic regularity. And so on with all the musical instruments, there is a large amount of work to be done which is primarily, fundamentally, and essentially, physical training. In the trades there is a similar state of affairs. Perfect control is fundamental, and is usually secured only by years of practice on the thing to be done. . . .

There are numerous departments in the trades, the arts, and daily life, where the excellence of work depends largely upon physical training in some branch. Today these are manned by specialists—specialists, not in physical training, but in the *end* for which the training exists. . . .

(e) *Physical Judgment*. This may be called a correlative of muscular control, this the intelligence telling when and where. "It is a sort of psychic trigonometry by which the trained mind calculates the distance, position and motion of objects." None of the important points already considered can take the place of this, nor can we get along without it. A man wishes to jump a ditch; he has no time to measure it and calculate how much muscular effort will be required to clear it, but physical judgment enables him to do all this at once. There seems to be confusion as to the difference between muscular control and physical judgment. Take a catcher behind a base ball bat; physical judgment tells him where to put his hands, and the exact instant that the ball will reach them; muscular control enables him to put his hand where he chooses. One might be able to put his hands where he chose, but not know where; or he might know where without being able to place his hands there.

(f) *Self Control*. This may be described as the power of the mind over itself. It is the power which gives self-possession, allowing a man to act naturally in times of excitement and danger.

(g) *Physical Courage*, that which renders a person willing to undertake, that quality which comes to one naturally, from a knowledge of his ability, gained through experience. "There is sometimes a con-

stitutional timidity, or lack of what we may call physical faith, that has to be overcome." A presumptuous daring is not physical courage, being born usually of ignorance of the real dangers rather than a calm meeting of them.

(h) *Symmetry*, harmonious, or all-round development of the body. The strength of a chain is represented by the weakest link, and this is not untrue of the body.

(i) *Grace*, which is fundamentally economy of action. It differs from muscular strength and from muscular control. A man may have both these and not be graceful. Comparing grace and symmetry, grace is beauty of action, while symmetry is beauty of form.

(j) *Expression*. In America we do not know very much about these special exercises. The Delsarte gymnastics, perhaps, are the best example of this type, their aim being primarily to enable the body to express the thoughts, ideas, emotions of the mind in the most intelligible way to other minds through their eyes and ears, thus including much of gesture, elocution, &c.

2. CURATIVE EXERCISES.

We now come to the second division. It is not designed to trench upon the field of the medical profession; but it is well known that some disturbances of the system can be cured, and many prevented, by the correct use of exercise. The same is true in relation to some bodily deformities. Certain cardiac, spinal and nervous diseases and disorders of the nutritive system are peculiarly susceptible to gymnastic treatment. I will not speak further of this branch, as its importance is already coming to be understood.

3. RECREATIVE EXERCISES.

There is a real and fundamental difference between recreative or play exercises and educative gymnastics. It consists primarily in the attitude of the will, and it matters little so far as this is concerned whether it has to exercise itself in confining the mind to a difficult task in arithmetic, or to keeping a fixed and sustained

attention on the leader of a calisthenic drill. To illustrate—you will all recognise the picture in some form or other—a class of young ladies, students, are to take exercise, they are already taxed mentally to their utmost. This is the argument for their exercise. Calisthenics are prescribed. Then one of two things will follow, either they memorise a series of exercises, so many movements, so many counts to each movement, and subsequently do these exercises together, or they follow a leader by word of command. *In each of these there is more required of the nervous system than of the muscular system.* From twelve to twenty-four different movements are done, from fourteen to sixteen counts on each movement, each one being required to remember the movement that comes next, &c. The amount of muscular work demanded is trifling, the degree of attention required is large. In the other case, where a leader is followed, but no set of movements has to be committed, at the word "attention" every eye is fixed on the leader, and at the word of command each one does the exercise with all the precision possible, both as to time and movement.

In both these classes of exercises the will, the attention, must be controlled. They may be educative, but they are not recreative. If brain centres need recreation, it is a radical and fundamental mistake to give gymnastics that shall call upon those same centres. If school children need gymnastics that shall further tax their wills, and thus the nervous system, then by all means let us give them these exercises, but if not let us prescribe exercises which shall take and secure more muscular strength and have less nervous drain. I am not criticising all calisthenic drills for school children, only those which demand attention and will, when recreation is needed. Automatic movements are not included in this class. The mere fact that a lesson is interesting is no proof that it is not exhausting; the same is true of exercise.

Hygiene.

ON HEALTHY HOMES.

Notes of a Gresham Lecture delivered on April 8th, 1891.

By E. SYMES THOMPSON, M.D., F.R.C.P.

It is a common observation that the well-being of the children is the best test of a healthy home, and that the sanitary

defects of a house are shown by the stunted, puny, or delicate appearance of the younger members of the family. It

must not, however, be forgotten that the evil influences of unhealthy homes are often scarcely apparent, when the exuberant vitality of youth masks the faulty development of the body. Instability of tissues often does not manifest itself, especially in the form of lung disease, until the age of from eighteen to twenty-five. Lowered vitality induces increased susceptibility to noxious influences, as well as diminished capacity for physical exertion.

We can as yet know but little of the results of the recent Census, but it is manifest that the urban population is increasing with giant strides. Consequently the great demand for town houses raises the value of land, and thus the temptation arises to crowd together too many houses on a given space, and dangerously to compress tenements which, with more ample space, might have been made salubrious.

Mr. Ritchie's new measure bids fair to produce order out of chaos, and to lay down and enforce laws which should markedly improve the physical condition of our townfolk.

The height of our houses must not exceed the breadth of the street, and the air space behind must not be encroached upon.

Again, the window space should be at least equal to one-tenth of the floor area in each room; and inasmuch as thin and inadequate walls fail to keep out cold and damp, a thickness of fourteen inches should be insisted upon.

The injurious effects of "back-to-back" houses have been so forcibly demonstrated that we may faintly hope that this mode of economising space at the expense of health will not be encouraged.

Even when the general condition of these "back-to-back houses" is superior to that of other tenements with which they are compared, it is found that the ratio of sickness and mortality is greater. In the districts in which all houses are thus arranged, the mortality is 5.2 per 1,000; when 50 per cent., are back to back it is 3.6; and when none are back to back, 2.8.

This same ratio is found to apply to the deaths from infectious disease, from diarrhoea and other diseases. The compulsory notification of infectious disease, which has but recently come into action, teaches the same lesson, and there can be no doubt that the *physique* of the inhabitants is affected *pari passu* with sickness and mortality. Many "flats" occupied by the middle and even upper middle class lack thorough ventilation and adequate sunshine, and have the same serious defects which are shown to attach to back-to-back houses.

In great blocks of workmen's dwellings the desire to make the most of a limited space is often carried to a point destructive to health. In some instances—notably in Shoreditch—a large number of the rooms are so dark and airless as to be unfit for use, and many of the sanitary arrangements are incompatible with health. Thus, instead of providing more healthy homes, in some instances the new buildings are even more unhealthy than the cramped, tumble-down cottages which they have replaced.

It is not enough to secure good water supply and efficient drainage, the air, floor space, &c., must be adequate, and the construction of dwellings should be inspected before as well as after their erection. Thus only can we hope to improve the *physique* and moral well being of the ever-increasing urban population who bid fair in the near future to form the bulk of the population of Great Britain.

Investigators into the life history of organic germs show that sunlight quickly destroys the bacilli of tubercle, that even diffused daylight exercises a potent influence, whilst in a dark, stagnant, and humid atmosphere these noxious germs exist for a protracted period.

It thus appears that not only is the vulnerability of the human body increased in dark, airless, badly-constructed houses, but that these unsanitary conditions tend to the propagation of micro-organisms which are now recognised as terribly destructive to life.

Gymnastics.

HOME GYMNASTICS AND GAMES.

EXERCISES WITHOUT APPARATUS.

THE time is not distant when a private or home gymnasium will be deemed as necessary to a properly constructed town

house as a "bathroom with hot and cold water laid on," and the attention of the readers of *PHYSIQUE* has already been

called to the subject. Several answers to our correspondents' questions have been received but they refer to the use of apparatus, chiefly to weights and pulleys and elastic bands, it being nobody's interest to call attention to exercises which do not require the use of apparatus or a teacher. We shall refer to these ingenious and useful apparatus later; at present we wish to call attention to some very useful exercises without apparatus which were common enough thirty or forty years ago, but which seem to be quite forgotten now. They are described in some of the older manuals of gymnastics—notably in those of Captain Clias and Signor Voarino, the first teachers of gymnastics in our Royal Military Academies—but which are now rarely to be found even on the old book stalls. These exercises were very popular with boys and young men as being more of the nature of indoor games than gymnastics, and while admitting of a certain amount of rivalry among the performers, they gave rise to a good deal of fun and merriment among the spectators. They are quite free from danger and are suitable alike for the bathroom, school-room, the study, or the lawn. Some of them may be practised by girls under suitable restrictions of dress and place. They may easily be practised from the following descriptions and without the assistance of a teacher.

EXERCISES FOR STRENGTHENING THE MUSCLES ON THE FRONT OF THE BODY (*Flexor or doubling-up muscles*).

Upper part of the body, 1st Exercise. The pupil should lie on his back on the floor, keeping the body stiff, the arms extended close to the sides, and the legs and heels in the same line. Without moving the heels he ought to raise the body very slowly into a perpendicular line, and remain seated; then resume his former position without moving the lower extremities.

2nd. The same exercise may be performed, crossing the arms on the breast, with the palms of the hands on the elbows.

3rd. This is performed with the arms extended with the fingers clasped above the head. The arms are brought forward at the same time as the body, and in a line with the shoulders, without separating the hands. The original position must be regained.

Lower extremities, 1st Exercise. The pupil, still lying on his back, should gradually raise the right leg perpendicu-

larly without moving any other part of the body, and lower it again to the first position. The same exercise should be performed with the left leg. Both legs are then raised in the same way, and when the pupil has acquired sufficient strength in his back, he should endeavour to raise gently the lower extremities and the back, and touch the ground behind his head with his toes; keeping both arms extended and resting on the ground, he must return to the first position. Then, by allowing the legs to descend gently, and the body to rise, the knees continuing stretched, he remains seated on the ground.

2nd. The pupil being seated on the ground, the knees bent, the soles of the feet flat against each other, the arms extended and the lower part of the legs held steadily between his hands, should descend slowly on his back, carrying his legs over his head, and keeping his arms still extended; then by a contrary effort he should return to his first position.

EXERCISES FOR STRENGTHENING THE MUSCLES IN THE BACK OF THE BODY (*Extensor or opening-out muscles*).

1st Exercise. The pupil, being placed on the ground with his face downwards, extended and supported by the arms and toes, the hands turned inwards, the fingers pointing towards each other, must allow the body to sink slowly, bending the arms gently and still keeping the body extended, without, however, permitting the belly to rest on the ground, and touch his hands with his lips; then return to the first position very slowly. This exercise should be repeated very gently several times.

2nd. The pupil being in the same position must place the right hand under the right hip, keeping the left in its place and the ends of the fingers inwards; he must then allow the body to sink towards the ground, gently bending the arms and keeping the body still extended on the toes, and touch the left hand with the lips, the same exercise to be performed with the other hand.

3rd. The pupil having his body extended, with his face downwards, the points of the toes on the ground and the feet resting against a wall, must move the hands slowly backwards one after the other, at the same time raising the legs up the wall. He must continue these movements till his body rests in an upright position against the wall, the weight of the body supported on the arms and the

nose touching the wall. He must then descend gently, as he rose, keeping the knees straight, the hands and feet making the same movements. This exercise ought to be performed with great care, and it is well at first to have assistance in moving the legs. It should not be attempted by girls.

EXERCISES WITH CHAIRS.

1st Exercise. The pupil being placed between two chairs of the same height, each hand on the back of the chairs, the seats of which are turned outwards, must rest the whole weight of the body on the wrists, keeping the arms extended, and raise the lower part of the body into a line with the wrists. This position must be maintained for a few seconds, and the lower extremities must be allowed gradually to return to their first position.

2nd. The pupil standing in the first position, supporting the body on the wrists, must bend both knees and descend gently till the knees almost touch the ground; he must then rise into the first position by the help of the wrists and shoulders.

3rd. The pupil, standing between two chairs, the seats of which are turned inwards, must place a hand on each edge, keeping the thumbs inwards, the knees bent, the feet close together, and the heels raised. He must then raise the body on the wrists and extend forward the lower extremities, at the same time straightening them, and thus descend gently to the ground; he must rise again, still keeping the lower extremities extended in front, and return to the first position.

4th. The pupil, being placed between two chairs, the back of one being turned in and the other out, with the right hand on the back of one and the left on the seat of the other, must gently raise the

lower extremities, and extend them in front; the upper part of the body is to remain perpendicular and supported on the wrists; he must then raise the lower extremities, bearing the whole weight of the body on the left wrist, and place both legs on the back of the chair by a gentle and regular impulse. He must then return to the first position by the same means, and perform the same exercise on the opposite side.

5th. The chair being fixed on the ground so as not to move, the pupil must place himself behind it and support both hands on the sides of the back; he must then raise the body on the wrists, and elevate the lower extremities to a horizontal line, then return to the first position.

6th. Two chairs being placed with the seats turned inwards, the pupil will put his right foot between them, the left knee must be bent towards the ground, both hands fixed on the edges of the seats, and the right knee supporting the body; he must then endeavour to bring his face to the ground by extending the left knee and allowing the right to go to the ground. He is to raise himself by a contrary movement and return to the first position, repeating the performance with the left side.

7th. An ARM-CHAIR being placed in the middle of the room, the pupil must place himself facing the seat, with a hand on each arm of the chair, and raise his body on the wrists, at the same time raising and crossing the legs; he must then pass them forwards between his arms, straightening the knees, and carry them over the back of the chair without touching it. He must then cross them again and return to the first position. All these exercises should be repeated several times.

Societies.

THE LONDON PLAYING FIELDS COMMITTEE.

(Abstract of Report of the Committee for 1891.)

THE purpose of this Committee is to encourage and keep alive within the area of London and its immediate suburbs the peculiarly English sports of cricket and football, and its formation is due to the alarming growth of the metropolis within recent years. At present there appears to be no limit to this extension, and no doubt economists are right in telling us

that it is a sign and necessary result of what is called our "national prosperity." But, as is well known, there has been for some years past a strong movement amongst leading Englishmen of all classes and professions to counteract as far as possible the most obvious evils which follow in the train of such prosperity as this. Powerful societies have been formed for preserving Commons and Footpaths, for laying out Public Gardens, and for retaining in the midst of town life something of the grace and dignity of nature.

To all such societies the London Playing Fields' Committee wish to appear not as a rival, but rather as the most recent ally. These societies have indeed from the first expressed their entire concurrence with its objects, and from some of them it has already received the most valuable assistance and advice. The sphere of the Committee is so distinct and well-defined that there seems no danger of overlapping with others who have long been engaged in different departments of the same cause.

All who are in any degree acquainted with the everyday life of average Londoners outside the comparatively small circle of wealth and high position, must be aware how very difficult it is for the large majority of young men and boys to find opportunities for healthy outdoor exercise. The desire still exists. A member of the London County Council has calculated that for every acre of cricket field in London and the suburbs there are at least a thousand young men eager to play on it. Anyone who has visited the parks and open spaces where cricket and football are allowed, and has seen the grounds closely packed with players, will agree with what Mr. Alfred Lyttelton said at the first public meeting of this Committee, that a man who plays cricket on Victoria Park would face the bloodiest battle with absolute indifference. Such things are evidences of true zeal; but it is a zeal which up to the present has been neither rewarded nor encouraged, and it can hardly be expected to survive many seasons of the disappointments, uncertainties and dangers, which mark the career of the ordinary London cricket or football clubs. The English love of sport, perverted by want of opportunity for active exercise, produces the gambler and the loafer. Men who, under better conditions, might have developed into active and healthy English people, *degenerate into mere spectators at athletic contests*, which might almost be compared to gladiatorial shows held by professional giants for the idle amusement of a puny crowd.

The merely physical contrast between the swarming offspring of our great cities and the men who have been brought up on their village greens or on the playing fields of our ancient homes of true education is, if seriously considered, one of the most discouraging and alarming facts of our contemporary history—alarming because the lower type is increasing with enormous rapidity, not only in actual

numbers, but in proportion to the more powerful stock. The physical decay of a nation is invariably accompanied by moral decay, by loss of nerve and loss of self-restraint. Recognising this, the London Playing Fields' Committee confidently put forward their scheme as a matter of public and national importance. Not, of course, that they regard Playing Fields as a magic pill or cure-all for the evils of modern civilisation. Their method is but one among many agencies, all striving for the same general good; but it has the advantage of being one of the few methods as to the benefits of which no sane man can raise a question, and it also possesses what is in England the rather remarkable qualification of being entirely independent of any party or phase of opinion, political or religious, for it maintains a principle on which all thoughtful men may unite for the common service.

It must not be thought that the work of the Committee will benefit only the artisan, the handicraftsman, and the labourer. Even more than by these the Playing Field is required by the small clerk, the shop boy, and other growing youths who are compelled to spend the greater part of the week at sedentary occupations, in unwholesome air, and too often under artificial light. To employers of such labour as this the provision of Playing Fields ought especially to come home. But, in fact, those who are willing to show practical sympathy with the Committee's objects ought to be drawn from every class and section of the country; for they should include all who respect the strong and self-reliant qualities which hitherto have been proverbially English, all who detest the thought of national degeneracy, and abhor nervousness and effeminacy—all, finally, who would wish the great English sports to remain a truly national heritage, and not to become the narrow privilege of the wealthy classes, and a few professional athletes.

During the past year the Committee has obtained seven acres at Wandsworth, twenty-four acres at Raynes Park, and twelve acres near Wormwood Scrubs, which have been laid out for cricket and football; and the Corporation of London has allowed the Committee to lay out fifteen pitches in Epping Forest. Next to increasing the number of Playing Fields the Committee attach much importance to obtaining cheaper railway fares for players, and use their influence with the Directors to this end.

Reviews of Books, Pamphlets, &c.

OLD ENGLISH SPORTS AND PASTIMES.

By the Rev. P. H. Ditchfield, M.A.,
Rector of Barkham. Methuen and Co.,
London, 1891.

The constant migration of the country people to the large towns is a problem of great interest and importance to those who are concerned for the future physique of the nation, and numerous measures are put forward for stopping it by persons who hold different views as to its causes. Some advanced politicians look to the cheapening of land and to the possession of small holdings and allotments by the peasantry as the best remedy, but although some good results may be expected in this direction it is not more work, or more wages, or better living, but more play and more amusements which the country folk want and which they flock to the towns in search of. The great majority of the migrants are young men and women who are not in a position to acquire land or to manage it properly if they possessed it, and there is a sentimental side of the question which has been quite lost sight of by persons who have written on the subject. Since the destruction of village industries by the introduction of machinery, and the softening of labour by the same means, together with the cheapening of locomotion, the "emancipation" of women by education and other causes, towns have become the chief, and indeed almost the only places, where young unmarried women can find suitable employments, and where they can find them in abundance owing to their acceptance of occupations which have been hitherto followed by men, at a lower rate of wages. Hence the village "spinsters" go to the towns as servants, factory hands, dressmakers, shop assistants, schoolmistresses and the like, and the young men accompany or follow them for sentimental and instinctive rather than for economic reasons—for there is not an equal demand for their labour. Thus it is the women rather than the men who are to be studied by those who seek to solve the question of how to check the migration of the country folk to the towns, and anyone who can devise sufficient light occupations and sufficient amusements for our village maidens in their own homes will be the most likely to succeed. The demand for female labour outside domestic service may, and probably will, soon slacken, or

the fashion for independence may "go out," or men's wages may become good enough for them to keep their daughters and sisters from becoming their rivals in economic fields. All this may happen, but there will still remain the difficulty of overcoming the dull and monotonous life in country places which results from the pressure of the commercial spirit of our times. We may well ask with Mr. Ditchfield if it is not possible to restore some of the sports and customs which diversified the lives of our forefathers and made England "merry." This is a pleasant dream of the author, which is shared by many other persons who have the health and happiness of the rural population at heart, and there seems everywhere a growing feeling in favour of more recreation for the people, which, with judicious fanning, as it is done by this charming little book, may result in the attainment of the desired object. As our author justly points out, the amusements as well as the morals of the rural population have always been in the keeping of the Church, and it is to the clergy principally that we must look for help and inspiration in this matter. The old holidays of Christmas, Easter, and Whitsuntide are rapidly being blotted out by the objectionable commercial title of "Bank Holidays," and they are being kept in a most objectionable manner, quite at variance with the moral and the physical interests of the working classes and their old traditions. Our games and sports, which were formerly shared by both sexes and persons of all ages, are now become contests for men only, in which few can take part except as spectators, and some of them are so technical as to be entirely devoid of interest to young women, or too rough and violent to be witnessed by them. "Old English Sports" is a book of interest to the antiquarian as well as the social reformer, and is a model volume for the shelves of a free or village library. It forms an excellent supplement to Mr. Ditchfield's earlier publication, "Our English Villages."

NOTICE TO CORRESPONDENTS.

Communications, Books, &c., must be sent to the Editor of *PHYSIQUE*. Addressed and stamped envelopes must be enclosed when contributions are to be returned. Business letters must be addressed to the Publishers, Messrs. George Bell and Sons, York Street, Covent Garden, W.C.

GYMNASTICS IN ELEMENTARY SCHOOLS.*

By Dr. FERNAND LAGRANGE,

Author of "The Physiology of Bodily Exercise."

I.

ALL the world is agreed in proclaiming the importance of the rôle of muscular exercise in the education of the child. But people do not understand one another so easily when it is a question of determining the mode of applying this precious hygienic agent. It must be admitted that, in this respect, the scientific documents capable of guiding us in the choice of a rational method are still incomplete. Many books have been written in France of late years, with the purpose of setting forth the advantages of gymnastics in all their forms; but their authors have, up to the present time, given little scientific study to the comparative values of the different exercises in most common use, and to the determination of the advantages or disadvantages of each according to special cases and individuals.

One is, indeed, generally not over well received when one sets to work to make a rational criticism of such and such an exercise, for each one of them can reckon its own fervent advocates. The exercises in most common use are certainly not all perfect, but they all possess the common character of producing in the body a series of general effects capable of improving the health and increasing the physical strength. The result is that every man who has assiduously practised any given exercise retains a certain gratitude towards it for the very real advantages he has derived from it. There is but one step from gratitude to partiality, and thus each man finds himself driven to proclaim the superiority of the exercise which he has made his own speciality; and so we find that with some men fencing is held to be the best form of gymnastics, while with others it is rowing, or walking, or gymnastics with apparatus.

But if, instead of devoting our sole attention to a single exercise, we seek to become initiated into all, we soon perceive that, side by side with its general effect on the organism, each form of gymnastics, or of sport, may produce a local effect in some part of the body, special effects on some function, and very diver-

sified influences on the nutrition and development of the subject. Hence arises the forcible conclusion that all varieties of exercise are not equally to be recommended in all cases and for all persons. It cannot be claimed absolutely for any one exercise that it is superior to all the others, but our selection must be made from among the different forms of gymnastics according to the aim we are seeking and the result we wish to obtain.

The best exercise, then, will be the one which produces physiological actions which conform best with the desired result. It must, however, be observed that this result, in many cases, is not in strict hygienic order. In the gymnastics of the Fire Brigade, for instance, the object is to turn out active, quick, and bold life-savers, rather than men of good figure and regular proportions. In those of young girls, on the contrary, the aim will be, I imagine, to favour the regular development of the body and the harmony of form, rather than to develop acrobatic aptitudes. The fencer wishes to acquire precision of movements, correctness of eye, the complete agreement of brain with hand, rather than great increase of strength. In similar fashion horse exercise and many kinds of sport aim at developing in the man certain entirely special aptitudes. These different results of exercise should be carefully distinguished from its purely hygienic effects, but they are unfortunately very often confused together when physical education is in question.

Yet again, from the point of view of hygiene itself, how many different indications present themselves, and how many questions arise. Will an exercise, excellent for the adult, be good for quite young people, and should it be used indifferently among children at any age? Nay, further, among children of equal age, would it not be proper to modify the methods a little according to whether it is for country children or those in towns—for those who follow manual occupations, or those who devote themselves to intellectual work?

Finally, by the side of the hygienic point of view, arises the practical ques-

* *Travaux de la Commission de Gymnastique, Paris Imprimerie Nationale, 1888 (Hachette).*

tion: it is often impossible to employ the exercise which theoretically would be the best by reason of the material difficulties of installation or expense. How then are we to make up these deficiencies, and how shall we adapt the most rational gymnastic methods to insufficiency of space, for instance, or want of time?

The problem of physical education is then sufficiently complicated, and will still require much time for its solution; but we may, at least, now define its limits. It seems to me that the question of school gymnastics should be presented thus: what special indications should be answered by physical exercise applied to the children of elementary schools, that is to say, children from seven to fourteen years of age, who have to undergo more or less severe brain work?

Here, I think, is the place for a preliminary reflection. We cannot dream of satisfying completely all the indications of physical education among children; or, to explain myself more clearly, the physical education of a man cannot be complete from his infancy. This truth, which cannot be escaped in theory is, however, overlooked in practice, and, in the application of exercise to the child, people often act as if they were unwilling to leave anything to be done by those who will have to direct the physical education of the adolescent and the adult. They want to develop at the same time the muscular power, resistance to fatigue, dexterity, and suppleness; they would make the scholar apt in the execution of bold, difficult movements, under the pretext that they will be useful to him later on in life; they would teach him the management of arms and military manœuvres, because one day he will become a soldier. In a word, under the pretext of making virile generations, they would like to make little men of our children. This is a dangerous excess. There has been much talk of overweighting the school programme; let us beware of overweighting the gymnastic programme of the children. And, that my thoughts may not be misunderstood, I have no intention of asking that the time devoted to bodily exercise in our schools should be curtailed; on the contrary, it should be added to. I say that, among the exercises applied to children may be found many which are unsuited to their age, and which might be reserved for the period of adolescence, and sometimes even for adult age.

Between the ages of seven and fourteen physical education should aim principally

at hygiene rather than application. The pressing matter is to make children healthy and well developed, without concerning ourselves too much about the physical qualities which will be useful to them later on; they will acquire these quickly enough when the right time comes. It is useless, for instance, to teach a very young child difficult movements, and this for two reasons: The first is, that he will forget those which will be useful to him to know at the age of twenty before that age, if he does not keep them up. The second reason is that there is no necessity to devote a period of many years to an apprenticeship to the most difficult muscular movements. In support of this argument I cannot resist the temptation of quoting the words of M. Ducret which I find reproduced in a pamphlet by Colonel Doex: "Last year, at a great meeting, a school battalion came forward and executed admirably the handling of arms and accessories. His superiors sent for the instructor and complimented him. He, quite delighted and anxious to show his zeal, allowed them to know that the squadron he commands had only had twenty lessons. This seemed astonishing, and earned him double praise. But the impression made on us was very different. 'Why,' said we, 'should some years be devoted to teaching a thing which can be learned perfectly in twenty days?'"

That which is true concerning exercises with rifles applies equally to exercises with instruments, such as the trapeze, the rings, the fixed bar, &c. The partisans of these apparatus lay stress on the utility of children acquiring at an early age a knowledge of movements which will be very serviceable to them in adult life, under certain circumstances. If the exercises with fixed apparatus cannot be learned in twenty days, like the exercise of school drill, at any rate they do not require an apprenticeship of more than one year. They can then be conveniently reserved, with all the other useful exercises, for the last period of adolescence; the time from seven to fourteen years being devoted to purely hygienic exercises. If it were objected that adult subjects have lost their aptitude for difficult exercises, it would suffice to remark that the greater number of our teachers of gymnastics began the use of instruments while serving with their regiments, that is to say, after the age of twenty years.

It would be possible to define the several periods of the physical education

of children in the same manner as in their intellectual education. Under the head of intellectual we have preliminary, secondary, and higher-class; why then should not similar degrees exist in physical education? At present, in our methods of gymnastics, the teaching of children differs in no respect from that of adolescents and men. The age of the subjects is perhaps taken into account to lessen the violence of the exercises, but in no way to change their form; the lesson is doubtless shorter for the little ones than the big ones, but it requires the same apparatus for both; and you may see in our gymnasiums seven-year-old children, as well as young people and well-set men, hanging on to the trapeze and rings, and climbing the fixed and parallel bars.

The child should therefore have a method of gymnastics distinct from that of the adult. This method should not aim at a point of application more or less distant; it should not endeavour to assume a military character, but should be above all and almost exclusively *hygiénic*. It should above all seek to make the children healthy; it should help them to attain the maximum of their development, and see that their regular development is effected without deformity and without blemish. Over and above this indication, which results from age, there is another which results from the cerebral conditions under which school children are placed, by the simple fact of their being at school. The scholar requires diversion from the intellectual toil which, rightly or wrongly, we declare to be excessive; and this diversion can only be given by pleasure and recreation. Such are the two essential characters which should belong to the gymnastics of children—they should be *hygiénic* and *recreative*. Let us enquire if they combine these two qualities.

Is the existing system of school gymnastics free from reproach from the point of view of hygiene? We do not hesitate to say No. In our opinion it would seem that the methods of exercise have been selected rather for the ease of their application than for their hygienic merit. They are adapted less to the needs of children than to the establishments and customs of schools. Now, notwithstanding the solicitude and zeal shown by our governing bodies, the conditions of schools are still far from being perfect. In our schools two things are wanting for the

application of exercises—they are time and space. We have endeavoured to find gymnastic methods which could be employed within a very small space, and to give to the child a great deal of muscular work in a very short time; and appliances have been found which concentrate the movements, and allow the administration, almost without moving, of a large expenditure of muscular effort in a short time. Gymnastics with apparatus have been introduced. But is this really what the rational hygiene of the child requires? Do people think it sufficient to weigh out approximately the dose of exercise which is necessary for him, for example, during one week, and to administer that dose to him all at once? What would be said of an alimentary regimen in which the rations of nourishment sufficient for many days should be taken at one single meal? Of these two practices, however, the one is no more rational than the other. The muscular exercise of the child should be as carefully divided into doses as his nourishment, and extreme fatigue is no less dangerous for him than indigestion. With the gymnastic lessons separated by too long intervals we fall into this dilemma—either the work at each lesson will be too severe, and then the health of the child will be exposed to different risks; or the work will be lessened, and so the exercise will be insufficient. The vice of our existing methods is that of calling for severe efforts repeated at very rare intervals, while what is required for the child is a system of exercises, very moderate but very frequently repeated.

The exercises of gymnastics with apparatus all aim at finding more or less ingenious combinations, by the aid of which the muscles of the child are subjected to severe strain. Now it is a fact, demonstrated by the physiology of animal growth, that too severe muscular efforts may affect the development of the young subject, and even arrest it for an indefinite period, while setting up prematurely the ossification of the epiphyses. This fact is well known in veterinary hygiene, and all breeders of horses know that a colt put into harness or to the plough too soon will never attain the shape and general development to which his nature and breeding had destined him. Among men the arrest of development undergone by country children when they are put too soon to the agricultural labour usually reserved for adults, has been

already observed. Teachers of gymnastics also give us authentic observations which show the pernicious influence of the abuse of exercise with apparatus on the development of the form. Every one can assure himself that gymnastics with apparatus are unfavourable to the development of the young child. To this end we need only examine closely those infant prodigies who are seen at circuses, and even in gymnastic societies, doing feats with apparatus. They are generally very badly developed, small, lanky in form; their muscles are hard, but small, as if shrunken. The identical exercises which in adult age produce such excellent results, produce very bad ones in a child from seven to thirteen years; if gymnastics with appliances do much towards forming those magnificent young men turned out by our school of Joinville, they can only induce atrophy in the scholars of our elementary schools. Thus we find that, in the existing methods of physical education (with apparatus), the muscular labour is given in improper doses. The times of work are not sufficiently frequent, and we commit a hygienic heresy when we assert that we can compensate for the rarity of the exercises by the greater energy of the muscular efforts we exact from the child.

But the work of the muscles is not only badly divided out in point of time; it is moreover badly distributed in point of its localisation in the different parts of the body, and therein we find the capital failing of the gymnastics with instruments. All the exercises with fixed instruments—trapeze, rings, loose rope, fixed bars, parallel bars—all these exercises, I assert, localise the muscular effort almost exclusively in the arms and the upper part of the trunk, leaving the muscles of the pelvis and the lower limbs almost inactive. In the case of the child we must not aim at localising the muscular effort over a limited region, but, on the contrary, we should endeavour to generalise it by distributing it over a large number of muscles at the same time. In this way each group of muscles takes a share of the exercise proportioned to its strength, and the effort is less fatiguing. The aim of exercise in the child should not be to induce fatigue quickly, but rather to bring all the functions into greater activity.

Fatigue in exercise is not a benefit; it is, on the contrary, a drawback, sometimes a danger. The ideal should be to bring all the great functions into activity, to

quicken the current of blood, and to expand the lungs without fatiguing the child. Now this result is more easily obtained by exercising the legs than the arms; for the legs, being much stronger than the arms, can do much more work without becoming fatigued. Moreover, the exercises of the lower limbs, of which running is the type, are far from localising the effort in the legs alone. In the child who runs, the pelvis, the vertebral column, the arms even, are associated in the exercise. In him who climbs the loose rope, or who mounts a ladder by the strength of his wrists, the trunk and legs must remain limp and take no active part in the work. The muscular effort, for the child who runs at a moderate rate of speed, is in reality more considerable than that of the child who climbs the loose rope; but it is distributed among a larger number of muscles; each takes in the performance of the exercise a share proportioned to its strength—in a word, it tends to generalise itself over the whole body. And the natural result of exercises which generalise themselves is to produce, with equal labour, less fatigue than the exercises which are much localised. The division of labour renders it less fatiguing.

The tendency towards localisation of exercise in gymnastics with apparatus has one advantage in the adult and adolescent, namely, to develop very quickly the muscles of the region which is at work. The child does not get this benefit as compensation for the fatigue which he feels. As a matter of fact, all observers have noticed this remarkable fact, as well as we ourselves—that the muscular system in the child hardly develops at all before the twelfth or thirteenth year. Among young subjects, even those who devote themselves habitually to severe muscular efforts, as in circuses, we never see those very pronounced muscular prominences which develop so quickly with exercise on the limbs of young men from seventeen to twenty years of age. We must then reserve the exercises with apparatus, which have for their object the development of the arms, to a more advanced period of adolescence. For the child this branch of gymnastics is useless, because the muscles cannot acquire a great development at this age; and it is hurtful because it necessitates too severe muscular efforts by concentrating all the work in too limited regions.

Finally, these gymnastics with apparatus are deserving of a final reproach,

which would alone suffice to absolutely proscribe them: they are capable of producing in the child divers deformities, which have been but little studied, but already are well known to many teachers of gymnastics. All these more or less ingenious combinations possess the essential character of necessitating abnormal attitudes and movements, for which the body is not constructed. Beyond the exercises, which bear too evidently the mark of acrobatism, there are many others which seem at first sight less extravagant, but which are quite as ill-adapted to the conformation of the human body. It results from these abnormal gymnastic attitudes, frequently repeated, that the normal form of the body becomes modified. As M. Marcy has so well shown in his "Machine Animale," our organs have always the tendency to adapt themselves, by a change of form, to muscular actions which are often repeated. But the body of the young child adapts itself more easily than that of the adult to all the movements which it executes, and to all the attitudes which it assumes. Abnormal movements often repeated tend to stamp on the skeleton of the child persistent modifications in similar fashion to the vicious attitudes of scholars, of which M. Dally has demonstrated the sad results. The exercises so frequent in gymnastics, in which the body is raised by aid of the arms, tend to give to the child a conformation which resembles that of the climbing animals. The type of these animals is the monkey, and everyone must have remarked how the monkey, when upright, presents an arched appearance, with his round back and his shoulders raised so as to touch the back of the neck. This is exactly the exaggeration of conformation acquired by gymnasts when they have commenced too young, and have made excessive use of the exercises with apparatus.

The advocates of this method of exercise assert that it may have the advantage of correcting certain deviations already acquired, and that, in consequence, orthopædic effects may be hoped for from it. But that is exactly where we find the proof of its dangers. As a matter of fact, if these exercises are able to reform a

distorted shape, it is because they have the power of modifying the form of the body; the modifications which they produce may well become as hurtful in unskilful, as they might become useful in skilful, hands. Orthopædy improperly applied inevitably produces deviations in subjects which did not before show them, and always aggravates existing deviations. Who, then, will guarantee us that the method of gymnastics with apparatus will not be improperly applied? In order to suppose that certain specialist doctors are sufficiently initiated into the mechanism of these different exercises to be able to utilise them therapeutically—of which there is considerable doubt—it will require still a long time to disseminate precise knowledge on this subject, and to enable our gymnastic masters easily to put them into practice. For my part, I, a surgeon, who have studied and constantly practised for many years all the exercises in general use, should refuse the responsibility of applying to a young child, with an orthopædic object, all the movements of gymnastics with apparatus. In my opinion, many analytical studies must be made before one will be able precisely to determine the effects of these movements.

Such are the hygienic objections to the system of gymnastics with fixed apparatus which form the basis of physical education in France. The convenience of its application in schools cannot recompense for the different dangers which it presents in the education of the child of from seven to fourteen years. But, on the other hand, these gymnastics, with their severe muscular contractions, their bold and difficult movements, are excellent at a more advanced period of life, when the skeleton, the articulations, and the limbs have become more set. They can, then, better than any other method, enlarge the muscles, give to the upper limbs an astonishing strength, and to the whole body aptitudes almost superhuman, which may be very valuable under many circumstances of life. Let us, then, reserve them for the later years of adolescence, but do not let us allow a child to exercise himself on fixed apparatus before his fifteenth year.

II.

Exercises with apparatus do not constitute all our school system of gymnastics. We see employed also in schools a series of exercises which do not demand the use

of any apparatus, or at least only require *moveable* and *light instruments*. They are called exercises "on the floor," because they are executed standing upright. In

these exercises the child bends, stretches or displaces in different directions his limbs, trunk and head, at the word of command of the teacher who counts, one, two, three, &c. These movements are excellent exercises from the hygienic point of view. They make every part of the body undergo an effort exactly proportioned to the strength of its muscles, and call for no vicious attitude of the trunk, no abnormal employment of the limbs. They are very practical in their application, because they permit of a great number of pupils being exercised at the same time in a confined space. They are thus equally convenient and hygienic; but they cannot be called *recreative*, which is a grave reproach in the case of scholars whose brains have to work hard. These movements in combination are often excessively tiresome, and the child (in the disgust which he conceives for them), endeavours to escape from them. This he can easily do, at least to a certain extent. If he cannot escape the discipline which compels him to join in the movement ordered, it is easy for him, at least, to evade the muscular effort, without which the exercise produces no effect. For this it is sufficient for him, while keeping time, to move his limbs without stiffening them. He thus avoids contracting the *antagonistic* muscles, whose intervention is indispensable, in order to make a genuine expenditure of strength. It will be said that a more strict surveillance would secure the conscientious execution of the movement. What, then, becomes of the distraction, the freedom of mind, which the scholar ought to find in gymnastics? How shall he rest from study if the surveillance which he undergoes in the classroom is succeeded by the severe discipline of the gymnastic teacher?

Instead of constraining the child to execute strictly his exercises, it would be far better to endeavour to make him like them. This would be the only way to render them efficacious, for the child will always know how to escape the exercise which disgusts him. When one is present at a lesson, one sees that hardly four or five out of thirty pupils conscientiously carry out their exercises; the others pass in their turn to each appliance; blunder through the movement which the teacher finishes for them, and retire without having made the faintest effort. Nor is this the fault of the masters, who are generally full of zeal and devotion: it is the fault of the method. Our gymnastics ought to

be recreative, they are wearying; in place of a distraction, the child finds in the exercise a fresh task to add to so many others. For the child, pleasure is not only a moral satisfaction, it is also a hygienic necessity. Under the influence of perpetual constraint, nutrition becomes less active, and the vital functions languish. The school system of gymnastics in France supplies no food for this necessity for amusement.

All the faults of school gymnastics, such as we see at present, spring from this character which they possess, and which we have pointed out in our former remarks, of being composed of artificial exercises. Artificial methods of exercise start from a false idea—they imagine that natural exercise is insufficient for the child. The exercise pointed out by his instinct would be amply sufficient for him, if only it were listened to whenever it spoke. But the social conditions in which he is placed do not permit him to yield to the need for exercise whenever it arises. This need, through being so often repressed, ends by becoming weakened, and eventually disappearing altogether. The body accommodates itself to the sedentary life, and the daily insufficiency of movement ends by bringing about muscular idleness and habits of inertia.

The state of functional languor, which we now observe so commonly among town children, would not exist if they were placed under the conditions desired for giving scope to the necessity for exercise which they feel naturally. There would be no need for the teachers of gymnastics if the scholar had at his disposal, during a sufficiently long time every day, a large space and the permission to amuse him therein in perfect freedom. That would be all the necessary stock of tools of natural gymnastics.

In order to comprehend the effects of these instinctive gymnastics it will suffice to remark that animals have no other to aid in the development of their bodies. . . . Why should we ridicule the lessons taught by horse-breeders? Will our comparison between the child and the colt be thought inappropriate? But the whole of physiology is made up of comparisons between man and the animals. And assuredly direct observation of animals in good condition gives better authority for proper conclusions than does vivisection. Admit, then, that natural gymnastics are sufficient for young animals, and we are permitted by analogy to conclude that the pro-

cedures, exercises employed for the child, should conform as nearly as possible to those inspired in him by instinct. The form of exercise then which comes nearest to natural exercise is *play*. Play is only the bringing into more or less methodical rule the instinctive movements, those which every living being feels himself spontaneously impelled to execute under the influence of the necessity for exercise. It may be called the type of natural exercise, since, among the greater number of animal species, the young play among themselves and with their parents.

Play belongs to all ages. When applied to adults or young men, it takes now-a-days the name of *sport*. Sport is derived manifestly from games; it is even sometimes difficult to draw the exact limit which separates sport from games. In general the exercises of sport are games which take a more methodical form, more refined than the games of children; they demand a greater display of muscular strength, more difficult movements and a longer apprenticeship. Fencing, riding, and boating are types of sporting exercises. They come between games and gymnastics properly so-called, and should be reserved for an advanced period of adolescence.

Games constitute, in truth, the method of exercises most appropriate to the hygiene of early youth, and deserve none of the reproaches justly made against *gymnastics with apparatus* and the *exercises on the floor*. They are essentially recreative; require, so to speak, no apprenticeship; call for none but natural movements, and are executed without the aid of apparatus, by the limbs alone, or with *toys* which cannot cause any deformity of the body. They do not present the inconvenience of localising the work, of concentrating the efforts upon too feeble muscular regions, nor of requiring contractions of excessive intensity from certain muscles. Observation proves that games, methodically applied, are able to give excellent hygienic results.

The strength and resisting power of young Englishmen are proverbial, and one is compelled to admit that, among them, games are sufficient to develop the body to its highest point. But the adoption of the system of exercise held in honour in the English universities is subject to a serious objection. The English games are, we are told, too elegant, too aristocratic. The trials which have been made in France, and notably at the Monge

School, have shown, that if they produce excellent hygienic results, they cost too much in application for our middle classes. One would not be able, for still stronger reasons, to recommend them in our elementary schools, whose pupils come from a condition of life still less well-to-do.

This difficulty is not insurmountable, and assuredly means might be found of popularising these games, and rendering them less costly to put in practice. We are well aware that, for some time past, some distinguished men, among whom M. Pierre de Coubertin deserves the first place, have been occupying themselves actively in the search after the solution of this problem. But, while awaiting its solution, could we not endeavour to give new life to our old French games? These may well claim to be popular, for the most elegant of them all, the celebrated game of *tennis*, is still assiduously practised by the peasants of the Basque country. Unfortunately these national games have, now-a-days, fallen into neglect. Our fathers still played them, then our generation began to despise these games, and, at the present moment, our children no longer know how to play them. If we were desirous of establishing exercise by games in our schools it would be necessary, in the first place, to try and re-settle their history, and it would be doubtless no easy matter to find again the form and rules of the amusements which constituted the gymnastics of our forefathers. Happily, this study has already been made; and, in order to glean from it practical results, we have only to look at our neighbouring country. Belgium has for a long time banished from its schools of preparatory and intermediate instruction the acrobatic gymnastics still imposed upon our children in France, and has inscribed in its programme of school gymnastics more than sixty different games, many of which have, or had formerly, their analogues with us.

During the last twelve years the practical proof has been made among our neighbours, who are satisfied with the results obtained. Their games are various, and graduated according to age; their scholars find in them at the same time a healthful recreation and a sufficient muscular work; they are as fond of games as other children, but dislike the exercises with apparatus and combined movements. No punishment is so painful for the Belgian schoolboy as that of being deprived of his play. On the other hand,

being excused from gymnastics would be willingly accepted as a reward by the greater number of our French collegians.

Therefore, and this is the end of what I have to say, if at the present time material difficulties, such as they may be, stand in the way of the adoption of the *natural* methods of exercise typified by games, let us agree to recognise that these methods are the most natural for the development of young children. If we cannot put them into practice all at once, let us impatiently await their appli-

cation as the most desirable of reforms. If, meanwhile, we are compelled to have recourse to *gymnastics with tools*, for want of something better, let us be fully aware that this is not the best school gymnastic system, but one which has many faults, and which we are compelled to use for want of a better. Do not let us consider this system as an advance made upon natural exercise, but as a palliative, destined to remedy, as far as possible, the difficulty of applying this exercise; let us, in a word, consider it as a last resource.

THE NATURE OF PHYSICAL TRAINING, AND THE BEST MEANS OF SECURING ITS ENDS.*

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IN ordinary speech it is convenient to speak of moral, mental, and physical training as if they had little or nothing in common; though, strictly speaking, the principles which underlie each are practically the same. My main contention in regard to the nature of physical training is, that bodily exercise constitutes so considerable and necessary an element in all human training that physical training is entitled to be recognised and provided for as an integral and indispensable factor in the education of all children and youth.

The aim of any and of all human training is to educe faculty, to develop power. As the means of developing power, certain actions are selected, taught, and practised as exercises: and power when developed takes the form of some action or exercise due to muscular contractions. Viewed thus, muscular exercise is at once a means and an end of mental, and moral, as well as of physical training; since without bodily actions we have no means of giving expression to mental power, artistic feeling, or spiritual insight. Without muscular tissue we cannot live or move.

It behoves us then, at the outset, if we wish to discuss intelligently the means of securing the ends of physical training, to consider somewhat closely the nature and proper effects of muscular exercise. We need consider here only such muscular tissue as is found in the voluntary muscles, which constitute nearly one-half of the human body by weight. Contractility,

the distinctive endowment of muscular tissue, has its seat in the protoplasmic contents of the muscle cells. The amount of motion which is transmitted by a contracting muscle to the bones of a joint—or whatever parts of the body the muscle is set apart to set in motion—depends upon the number and arrangement of its component cells.

These muscle cells are sausage-shaped bodies, varying from $\frac{1}{800}$ to $\frac{1}{100}$ of an inch in diameter, and are seldom more than $1\frac{1}{2}$ inches long. The cell protoplasm is contained in a tubular sheath of tough, elastic, connective tissue, and is closed at both ends. Sarcolemma is the technical name given to this sheath. The sarcolemma has a single opening, through which the essential central strand—the so-called axis cylinder of a nerve fibre—finds its way into the muscle fibre or cell. The terminal portion of the nerve fibre spreads out under the sarcolemma, forming a flat protuberance known as the motor end-plate, and then ramifies in fine fibrils throughout the contractile cell-substance. At its hither, or central end, the axial fibre of the nerve is continuous with the irritable gray matter of a nerve cell. We have, then, the contractile substance of the muscle cell connected with the irritable stimulus-generating and transmitting substance of the central nerve cell, the connecting link being the axis cylinder of the muscle or motor nerve, which cylinder is simply a portion of the nerve cell's irritable contents long drawn out, in the form of a strand (which is protected and insulated by appropriate sheaths which we need not here describe) until it reaches the muscle fibre, in which it takes the form of the end-plate and its ultimate fibrils. What is true of a single muscle fibre is true of all the fibres of a given muscle; and what is true of one voluntary muscle is true of the entire five hundred. Voluntary muscles have sensory as well as

* A Paper read at the Conference on Physical Training at Boston, U. S. A., 1889.

motor nerve fibres. They are channels for the impulses which give rise to muscular sensibility, and are connected with centrally situated nerve cells which minister to our muscular sense—the sense, that is, which keeps us informed concerning the condition of the muscles, and the extent to which they are contracted.

Under normal conditions the muscle cell shortens only when it is stimulated through the discharge of some portion of the energy of a motor nerve cell into it. Muscular contractions are therefore dependent upon the action of the nerve cells in which they are initiated and controlled.

Without dwelling upon the details of structure presented by muscles and their nervous connections, it is sufficient to recall to mind that a single muscle is a vast aggregation of contractile cells, arranged in myriads of linear series called fibres, which in turn are gathered into packets, technically termed fasciculi; that muscle arteries and veins usually lie alongside of each other amongst the fasciculi, while their capillaries form a fine mesh-work lying between and upon the fibres and cells, without penetrating the sarcolemma of any cell; that the walls of the capillaries are permeable to lymph, as the fluid portion of the blood is called, so that muscle fibres are enabled to derive their food-supply from the lymph in which they are bathed; that fibres and fasciculi, together with their accompanying nerve fibres and nutrient blood-vessels, are supported and bound together by elastic connective tissue; and that the muscle so made up has its own special sheath and is bound by inelastic tendons to the parts which are approximated through its action.

The effects of exercise upon a muscle and its nervous connections now demand our attention. Immediately a muscle begins working, under whatever stimulus, the blood stream passing through it becomes changed. The arterial twigs dilate; more blood is poured into the capillary vessels which surround its fibres, and more blood flows away from it, through its veins, towards the heart. If the supply of arterial blood to a muscle is cut off or diminished, its irritability is lowered; *i.e.*, a stronger stimulus is required to make it contract. The same result follows also, if it is fed with blood deprived of oxygen, or otherwise poisoned; or if the muscle vein is tied and the waste products, normally drained off through the veins, are retained in the muscle. The irritability of a muscle is also lowered by prolonged or excessive stimulation, even when its in-going and out-going blood streams are unobstructed. *These, then, are the main conditions for the health of a working muscle: a full supply of proper food and of oxygen, unimpeded and sufficient drainage, and*

rest at due intervals. Given these three conditions in the body, and exercise of a working muscle causes it to increase in size and weight, through an increase of the size and number of its fibres. Furthermore, a working muscle differs from a resting muscle in that it is appreciably hotter; by the presence of a low murmur, called the muscle sound; and on account of certain electrical peculiarities which it presents. Now a healthy muscle habituated to exercise, a trained muscle, that is, can do more work, and do it better, than an unexercised muscle, and for two reasons. Exercise makes the muscle larger, harder, and stronger, improving it simply as a tool in all its structure; and secondly, the muscle responds more quickly and fully to the stimuli by which it is stirred up to work. In other words, the muscle becomes more responsive and obedient to its stimulators, the nerve centres, through its better acquaintance with them. Growth, or increase in the size and number of its structural elements, and development, or increased facility in its functional activity, are the main effects of exercise in the case of a single muscle. The same is true of the muscular system as a whole. Exercise enlarges and strengthens it on the one hand, and renders it more readily discriminative and responsive as regards stimuli, on the other.

Muscular activity, too, is one of the chief agents in promoting wholesome tissue changes in all of the bodily organs, and determining the normal growth and development of the organism as a whole. The normal growth and balanced working of the organs concerned in the digestion and assimilation of the food; the circulation and oxygenation of the blood; and the secretion and excretion of waste or noxious products of tissue changes, are all largely promoted by well-regulated muscular exercise. The influence of exercise in these respects, and in securing the full and symmetrical growth of the bones and muscles is somewhat generally, though vaguely, appreciated, and constitutes the burden of eulogy and exhortation of most of the articles and addresses of those who advocate physical training.

The nervous element involved in muscular exercise is oftener overlooked or neglected than recognised and set forth. Maclaren, whose book on "Training in Theory and Practice" is the best of its class in English, defines exercise as "muscular movement" simply, and declares its object to be the "destruction and renovation of tissue."

This is the ordinary view, from which you will find but little deviation. "We seek in vain in most physiological textbooks," says Du Bois Reymond, Professor of Physiology in the University of Berlin, "for instruction respecting exercise. If it is given, only the so-called bodily exercises are generally considered, and they are represented as merely exercises of the muscular system. Therefore it is not strange that laymen in medicine, teachers of gymnastics, and school teachers believe that. Yet it is easy to show the error of this view, and demonstrate that such bodily exercises as gymnastics, fencing, swimming, riding, dancing, and skating, are much more exercises of the central nervous system, of the brain and spinal marrow. It is true that their movements involve a certain degree of muscular power, but we can conceive of a man with muscles like those of the Farnesian Hercules, who would yet be incompetent to stand or walk, to say nothing of his executing more complicated movements."

The arm of the blacksmith has been brought into play so often, by writers and talkers upon exercise, that every school boy credits the statement that muscles grow larger, harder, and stronger when duly exercised, and become weak, flabby, and wasted if they are suffered or forced to remain inactive. It is less obvious, though it can hardly be doubted, that use and disuse work similar effects in the case of nerve cells and fibres, both sensory and motor. There is abundant evidence, though much of it is of the negative sort, to show that the exercise of the muscles not only reacts upon the nerves and centres with which they are connected, in such wise as to enhance the power and ease with which they originate and transmit stimuli, but that it also leads to an increase in the size, number, and elaboration of their parts. But this evidence is chiefly to be sought in the writings of those who have made the normal and diseased conditions of the nervous system their special field of study; since textbook makers and the writers of popular articles seldom make use of the material which has been accumulated by professional physiologists, and those who devote themselves to the study and care of the idiotic, the paralysed, and the insane.

The fact should never be lost sight of that a single muscle is not a simple organ, but is made up of two clearly distinguishable, though conjoined, mechanisms; a

contractile, executive mechanism, the muscle proper, and a stimulating, regulative mechanism consisting of nerve fibres and gray-matter nerve cells. Each mechanism has its blood-vessels for supplying food and drainage; and the amount of blood supplied to each is proportionate to its functional activity. If in life the two mechanisms become dissociated, or if either suffer from mal-nutrition, unregulated exercise, or structural depravity, the dual organ is thrown out of gear, and its working becomes disordered or abolished in much the same way as in a human being, when it is attempted to split him into a mental part and a bodily part, and to train the dissevered fractions to functionate as entities. Muscular action is then a resultant effect due to the balanced working of the conjoined mechanisms alluded to. The nervous mechanism is concerned in a somewhat higher kind of work than that of its merely muscular colleague, and may be said to represent the movements of which the latter is the seat and instrument. Between the nervous arrangement which represents the twitch of a single muscle inserted into the base of a hair follicle, and that which represents and governs the varied and rapid muscular adjustments which characterise the hand and fingers of a cunning craftsman or artist, there exists every grade of complication.

If we compare an adult man and one of the highest of the lower animals, in respect of the movements of which they are capable, we find that they possess many in common, such as those of locomotion, respiration, and the like, but that man is distinguished from the brute by certain movements such as those involved in maintaining the erect posture, and in the action of the hands and vocal organs; and that, corresponding to these two classes of movements, there are two classes of nervous mechanisms by means of which they are represented. These mechanisms have been well termed fundamental and accessory respectively.

Similarly it is demonstrable that while the human infant and adult possess many nervous mechanisms identically alike in structure and function, the adult is characterised by certain other mechanisms whose structural peculiarities, connections, and powers have been evolved and super-added as the result of growth and training. The law of evolution, as applied to the nervous system, is now very generally recognised by neurologists.

In Ross's "Diseases of the Nervous System," for instance, this law, which was originally enunciated by Herbert Spencer, is described as "a progressive integration, both of structure and function, during which there is a passage from the uniform to the multiform, the simple to the complex; from the general to the special. The nervous system of man is at first similar to that possessed by all animals which possess a nervous system, or, at any rate, all those which are sufficiently elevated to possess a spinal cord; but as development proceeds, the nervous system of man becomes differentiated from that of an ever-increasing number of the lower animals, while still maintaining a general likeness to the nervous system of the higher animals up to the time of birth. This, then, constitutes the fundamental portion of the nervous system of man; but after birth the accessory portion which, up till this time only appears in a rudimentary condition, now undergoes progressive development. It will then be seen that the fundamental portion is first developed, and that the superaddition of the accessory portion greatly increases the multiformity, the complexity, and the speciality of the human nervous system, and that it is the latest product of its evolution."

There are certain areas in the gray matter of the fore-brain of man whence proceed, it is now generally held, stimuli to the most important groups of voluntary muscles. In one of these regions are the centres which control the different groups of muscles of the upper extremity; and for the sake of simplicity we may consider that the centres of the muscles which move the shoulder, elbow, wrist and fingers lie near to and are connected with one another. The movements of the shoulder and elbow, as well as those of the trunk, are fundamental and well organised in the infant, as compared with those of the wrist and fingers, which are accessory, and later acquired. In order that the movements of the different segments of the fore-limb should be properly co-ordinated as to force, direction, and degree, their motor centres must habitually discharge their stimuli in due sequence and degree. This comes only through practice. Observations on young puppies show that their motor areas are not sufficiently developed until they are ten days old, for them to make voluntary movements with their limbs. Ferrier declares that "the degree of development and control which a puppy reaches in ten days or a fortnight is not attained by the human infant under a year or more." The infant, through the growth and development of the appropriate accessory centres, first gains control over its foot and leg, then over its arm and hand, and later, over tongue and lips. It is evident

that the arms of a blacksmith, and those of a five-year-old boy, and of an infant differ greatly as regards size, strength and skill; but the essential differences which exist between them reside in the nervous mechanisms which represent the movements of which their respective muscles are capable, rather than in the muscles themselves. Not only are the motor nerves of the blacksmith the largest, but the cells in his motor areas in the brain are also more numerous, larger, more branched, and more widely connected with other cells. Exercise plays, if not the predominant, at least a very considerable, part in producing this result; and the still more important result, viz., that the motor centres of the blacksmith discharge their stimuli more directly, steadily, accurately, and tirelessly into their appropriate muscles than do those of his apprentice. It is hardly necessary to show, though it could easily be done, did space permit, that the organs of special sense and the sensory centres are similarly affected and improved by exercise.

The obvious effects of exercise are at once seen, if one compares the right and left arms of the average blacksmith with one another. It is well known that the centres which control the right hand are situated in the cortex or outer layer of gray matter of certain portions of the left fore-brain; and that those which control the left hand are in the right fore-brain. Flechsig, who has made exhaustive studies as to the course and number of the motor fibres which connect the muscles of the two extremities with their respective main centres, concludes that the number of fibres going to the right hand is, to the number of fibres going to the left hand, as three to two.

The mere disuse of a muscle causes it to diminish in size. This wasting is technically called atrophy. The most extreme forms of muscular atrophy and paralysis are due to diseased conditions which originate in nerve centres or nerve fibres, though to the uninstructed eye the muscles would appear to be the only organs affected. Lesions in the central nerve system may cause the bones to atrophy, as well as the muscles. The development of a group of muscles, of an entire limb, or even of one side of the body, may be arrested by reason of certain forms of central nervous disease which occur in infancy and childhood. Observations made upon the brains of persons born with an

arm or hand lacking, taken in connection with those made upon the brains of persons who had had an arm or hand amputated, go to prove that the suppression or considerable diminution of certain movements brings about a condition of atrophy, or arrested development, as the case may be, in those centres which would normally represent such movements. One may attain to the stature and semblance of manhood, and yet, by reason of the arrested development of certain of his motor centres, be nothing better than an infant, or a mere animal, as regards his powers of action; while epilepsy, paralysis, and atrophy may reduce a man, stage by stage, to the condition of an untrained child, or of a helpless idiot, or even to that of a living corpse.

The functional improvement of the nervous mechanism which represents any movement, whether it be simple or complicated, reflex, automatic, or voluntary, is the most important effect of muscular exercise; or, in other words, *muscular training which fails to develop brain power, falls short of its aim.* It is not altogether clear just how it comes about that, through trial and repetition, an action which is at first a difficult or impossible feat becomes a pleasurable accomplishment, then a routine-performance, and at last an almost instinctive act. But there is a settled conviction among those who know most about healthy and diseased nerves, that the frequent or habitual passage of stimuli from a given group of cells through definite fibres to the muscles concerned in a given movement, leads to some kind of a rearrangement of the molecules composing the irritable protoplasm of fibres and cells, so that less and less resistance is offered to the passage of subsequent impulses from the same source. Somehow or other the memory of past actions and the stimuli which evoked them becomes imbedded or organised in the motor centres. His once too- vividly impressed sensory centres cause the burnt child to dread flame; and the difficulty of interesting an old dog in new tricks, except so far as he delights to criticise and decry them, arises from the preoccupation of his centres by old impressions, rather than from their increasing insusceptibility to fresh ones.

From careful studies made as to the character of the dreams of the blind, it appears that the memory of visual objects is not organised until between the fifth and seventh year of life. Persons born blind do not dream of objects in

the outer world; and those who become blind before attaining their fifth year do not dream of objects seen by them before their loss of sight. They are blind-minded as well as blind-eyed as regards such objects. There are authentic cases recorded of persons whose memory of objects—seen before the access of their blindness—persisted for twenty, thirty, and even fifty years; then the record of their visual impressions became effaced, and they ceased to dream of objects in the outer world. The case of a man born without either hands or feet is in point here. Although he had eyesight he did not dream of executing hand or foot movements; yet he had sufficient use of his stumps to write what is termed "a good hand." There was no record of hand or foot movements in the centres which ordinarily control such movement; so that he was unable to dream of movements which he had never executed. On the other hand, the instances are very numerous in which men, who having lost a limb by amputation, could feel their fingers or toes while awake, and dream in sleep, or when awake, of making complicated movements with their lost members. "Persons who have had an arm amputated," says Dr. Weir Mitchell, "are frequently able to will a movement of the hand, and apparently to execute it to a greater or less extent. A small number have entire and painless freedom as regards all parts of the hand." They must be blind-minded, indeed, who can deny in the face of such facts that muscular exercise plays a part in the development of brain power. "The muscles," says Dr. Crichton-Browne, "not only, by the locomotion which they render possible, widen the field from which our sense impressions are gathered, but also by the experiences which their own activities involve, expand our mental resources a thousand fold. An analysis of our ideas at once reveals to us that we have few that are of purely sensory origin: our ideas of form are not mere revived optical impressions, which are properly limited to colour, but ocular impressions combined with ideal ocular movements. Our idea of a circle is a combination of an ideal coloured outline with an ideal circular sweep of the eyeballs, or it may be of the tactile impressions coinciding with an ideal circumduction of the arm or hand, or perhaps both these factors combined. And so it is with our ideas of weight, distance, and resistance, which all involve sensory and motor factors; and to revive in memory any such ideas is to revive both the sensory and motor elements of their composition, and to repeat definitely in certain nerve centres the processes which correspond with certain motor acts."

Now the centres of motor ideation require to be exercised in order that they may be properly developed, and may contribute usefully to mental processes; and hence muscular training is likely to assume a more important and precise place in our educational systems of the future than it has done hitherto. The defective exercise of any group of muscles during the growth period of its own particular centre will

result not only in the dwarfing of that centre, but a corresponding hiatus or a general weakness must exist in the whole mental fabric.

From this we might deduce that swaddling bands so applied at birth as to restrain all muscular movements, and kept on during infancy and childhood, would result in idiocy—a speculation to which the wretched muscular development of most idiots and imbeciles, and the fact that their mental training is most successfully begun and carried on through muscular lessons, give some countenance. *We should also have to infer, that in order to hold up a sound and vigorous brain, we must insure free exercise to the different groups of muscles in the order of the development of their centres, and must in no degree interfere with the natural sequence of their evolution.* That being so, we must necessarily ascertain what that natural sequence is which is so important a guide to education; for, in our present ignorance of it, we may unwittingly be doing much mischief.

Suppose that we are encroaching on the time at which hand centres ought to receive their most valuable education—their nascent period—and are devoting that time to the cultivation of the tongue and lip centres, then we should be impairing the full development of the brain; for the hand-controlling centre, if not fully exercised at its nascent period, can never afterwards attain to the highest cunning. But it seems that not only tongue, but hand, and foot, and eye, and arm, and every muscle of the body, must be trained in due season, if education is to do what we expect of it, and result, not in headaches, and imbecilities, and nervousness, and insanity, but in well-balanced growth of body and mind.

It seems to me evident that muscular exercise deserves more attention than educators have ever been willing to give it, and that when properly chosen, regulated, and guided, it may make a boy into a better man, in many respects, than his father was, and enable him to transmit to his children a veritable aptitude for better thoughts and actions. Herein lies the power of the race for self-improvement, and the evolution of a higher type of man upon the earth.

“I do not think,” says Bagehot, in his “Physics and Politics,” “that any who do not acquire this notion of a transmitted nerve-element will ever understand the connective tissue of civilisation. We have here the continuous force which

binds age to age, which enables each to begin with some improvement on the last, if the last did itself improve, which makes each civilization not a set of detached dots, but a line of colour, surely enhancing shade by shade. There is by this doctrine a physical cause of improvement from generation to generation, and no imagination which has apprehended it can forget it; but unless you appreciate that cause in its subtle materialism; unless you see it, as it were, playing upon the nerves of men, and age after age making nicer music from finer chords, you cannot comprehend the principle of inheritance, either in its mystery or its power.”

We have seen that the effects of exercise upon a single muscle are chiefly two. On the one hand, there results a general condition which may be termed the heightened health of the neuro-muscular machine, which state of health involves the attainment and maintenance of a normal degree of size, strength, and working power in its structural parts; and on the other hand, a more complex and special effect, viz., the acquisition or organisation by its neural parts, of proper habits as regards the origination, transmission, and regulation of stimuli. *The ends of exercise may then be characterised as the promotion of health and the acquisition of correct habits of action. The first is a hygienic end, while the second is a distinctly educational end.* It matters not whether we consider a single muscle, which admits of only a single limited motion, or a group of muscles, or the communal structure we call the human body, or a class of school children, or a regiment of soldiers; the ends of exercise in each case are the same, and can only be attained by a combination of hygienic and educational measures.

The main field of education is, then, the nervous system, and the especial province of physical training is found in its accessory portions. The principles of all forms of physical training, however various and divergent their special ends may be, are based upon the power of the nervous system to receive impressions and register them or their effects; in other words, upon its ability to memorise the part it has played in acquired movements, and on occasions to recall and revive such movements.

It is coming to be clearly recognised that the function of our public and preparatory schools and colleges is not to fit their scholars to engage as specialists in

either intellectual, commercial, or industrial pursuits. The same rule holds good as to the kind, or, rather, degree of physical training which should be aimed at in our schools and colleges. It is not their business to train up ball-players, carpenters, clerks, or professionals of any kind. General bodily training is the kind demanded; but training so general that it is vaguely, or spasmodically, or half-heartedly carried out, or worse still, that is left to run itself in accordance with the whim or frenzy of the persons to be trained, will surely and deservedly fall short of success. Intelligence, system, organization, and patience are just as imperatively required in physical training as in the training of engineers, musicians, or philologists.

The law of the evolution of the nervous system seems to me to furnish a sufficient criterion by which to estimate the worth or success of any scheme or system of physical training. Any system that does not provide first of all and continuously for the training and exercise of the central or fundamental groups of muscles will fail utterly in securing either the hygienic or the educational end of exercise; and any system which substitutes training of the accessory neuro-muscular mechanisms for that of the fundamental ones, or which exacts undue work of undeveloped accessory centres, or attempts their training out of the proper order of their ripening, is bound to contribute more towards the promotion of brain forcing than towards its prevention.

The most fundamental mechanisms of the trunk are those which are concerned in the movements of respiration and of circulation. They are quite fully organised at birth: but the need for their exercise ceases only with the life of the organism. The centres which represent the muscles by means of which the trunk is kept erect and balanced upon the pelvis are accessory, if compared with those mentioned above, but are fundamental as compared with those which represent the muscles of locomotion. The muscles of the trunk are called into fuller and more frequent play as soon as the child ceases to go on all fours, and it must then learn, after a fashion, which may exigently demand correction or further training later on, to co-ordinate the movements of its limbs with those of its trunk. The child learns to flex its thigh upon the body, the leg upon the thigh, and to elevate the heel from the ground considerably earlier

than it can raise its toes, so that the foot shall swing clear of the ground and it be enabled to begin another step. What folly it would be to try to teach a toddling infant to run, or jump, or dance!

Similarly the training of the hand and fingers should not only be preceded, but accompanied by the exercise of the muscles of the forearm, arm, shoulder and trunk. You shall not gather ripe manual cunning from a limb whose trunk attachments are undersized, untrained, or deformed. This fact points to the danger of exacting genuine manual training from young pupils, especially if it be divorced from its proper adjuvant and corrective, general gymnastics. It is simply impossible to make any technical drill, such as wood-turning, penmanship, singing, piano exercises, or even the manual of arms, meet the proper ends of bodily education either for children, adolescents, or adults. Technical training, appealing as it does to the most accessory mechanisms, should be grounded on general hygienic and educational training; should not be pushed at too early a stage; and should be left, where it belongs, in the hands of special trainers.

Pastimes, out-of-door sports, and systematic gymnastics are the forms of exercise which yield the best results in the physical training of school children and college students. The plays of the kindergarten, the athletic sports to which British and American youth are so devoted, and the systematic gymnastics of the Swedes and Germans have all developed from one germ, from healthful play, that is; the vital energy of this germ is found in the universal and ineradicable impulse of all healthy children to play. The children of every generation, no matter how prim, or sour, or ascetic their parents may be, are always playing animals. That it is so is a most fortunate thing for the race: were it not so, the victims of war, pestilence, and education, and of that voracious monster that men call business, would be vastly more numerous than they are.

In the athletic sports of young men we see the highest and fullest expression of the play instinct. The essential difference between athletics and gymnastics is one of aim. The aim of athletics, unless of the illegitimate professional sort, is pleasurable activity for the sake of recreation; that of gymnastics is discipline or training for pleasure, health and skill. We have but to compare the aims, methods and results of each, and to call to mind the

characteristics of the nations which have affected athletics on the one hand and gymnastics on the other, to perceive that gymnastics are more highly developed, and present more features of educational value. Gymnastics, as compared with athletics, are more comprehensive in their aims, more formal, elaborate, and systematic in their methods, and are productive of more solid and considerable results.

I have no disposition to disparage athletic sports. I would that they were more general and better regulated than they are in our country. I believe that they are valuable as a means of recreation; that they conduce to bodily growth and improvement; and that their moral effects are of value, since they call for self-subordination, public spirit, and co-operative effort, and serve to reveal the dominant characteristics and tendencies, as regards the temper, disposition, and force of will of those who engage in them. But they bear so indelibly the marks of their childish origin, they are so crude and unspecialised as to their methods, as to render them inadequate for the purposes of a thorough-going and broad system of bodily education. It is well to promote them, and it is becoming increasingly necessary to regulate them; but it is unwise and short-sighted to consider them as constituting anything more than a single stage in the best bodily training.

Gymnastics have been most popular and general among the most highly trained nations, such as the Greeks of old and the Germans of to-day. The most athletic, and, at the same time, one of the most ill-trained of modern nations, is the British. I mean simply this, that an Englishman believes, and acts upon the belief, that you come to do a thing right by doing it, and not by first learning to do it right and then doing it; whereas the Germans leave little or nothing to the rule of thumb, not even in bodily education. German gymnastics embrace three well-marked fields or departments, viz., popular gymnastics, school gymnastics and military gymnastics. The organisation of the last two departments is maintained and controlled by the government for strictly educational purposes; while the Turnvereine, as the popular gymnastic societies are called, are voluntary associations of a social and semi-educational but wholly popular and patriotic character. The fondness of the German people for gymnastics is as marked a national trait as is the liking of the British for athletic

sports. The German system of gymnastics has been most highly developed in Prussia, where not far from a-fifth of the population is undergoing systematic physical training at the present time, under the combined agencies of the schools, the army, and the Turnvereine. In Switzerland and in Norway and Sweden, you will find school and military gymnastics, especially in Sweden, quite as fully developed as in Germany, and popular gymnastics not so much so.

One of the main defects of our school training hitherto is found in the fact that lessons and tasks are set which involve the activity of the accessory parts of the nervous system before its fundamental portions have been properly built up and trained. The result of this inverted and unnatural order of teaching is seen in myriad forms of nervous disease which find expression in St. Vitus' dance, grimaces, spasms, convulsions, and other forms of disordered muscular action, as well as in the protean forms of headache, nervous exhaustion, and mental derangement, so common now-a-days amongst sedentary people and brain-workers. For the purpose of forestalling such results, I would encourage games for boys and girls during their school life; and would require of them compulsory attendance upon instruction in gymnastics, drawing and modelling, and in the elements of certain selected handicrafts for general educational purposes. Physical training has long been recognised as an indispensable means for awakening and developing mental faculty in idiots; and has been employed with astonishing success, for several years, in the training of criminal dullards in the State Reformatory at Elmira, New York. Did time permit, it would be interesting to consider the methods and results of teaching gymnastics to idiots and criminals. I must content myself with referring you to the writings of the late Dr. Edward Seguin, of New York, the reports of the managers of the Elmira Reformatory, and the brochures of Dr. H. D. Wey.

My plea is, that inasmuch as physical training enters of necessity into the training of every school child, every apprentice, every recruit, those who undertake to train scholars or craftsmen, artists or authors, should see to it that mental training should not be pursued to the neglect or detriment of bodily training; that each kind of training should be given its proper place in the compulsory curriculum of our

public schools; and that bodily training should be given in appropriately fitted places, by specially trained and well-qualified teachers, in a systematic, well-ordered, and rational way.

It is not within the scope of this paper to set forth the lessons to be learned from the best European systems of physical training, or to show how fragmentary and defective our so-called American systems have been and are; but I may remark, in passing, that a careful study of the

German and Swedish systems of school gymnastics will be found an indispensable preliminary step for those who propose to organize a natural, rational, safe and effective system of American physical education.

The price of wisdom may be beyond that of rubies; but the price of health, which Plato conceived to be the natural order and governance of one another, in the parts of the body, its price is above that of either gems or wisdom.*

ON STAMMERING.

By E. J. SELTMAN, B.A.

AN article on stammering should possess considerable interest for the majority of our readers. Many will have a stammering friend or acquaintance, and all have, doubtless, come into contact, at one time or another, with persons afflicted with this form of impediment of speech, for, unfortunately, these cases are frequent in England. In southern latitudes (I am speaking of Europe only) they are of rarer occurrence. Climate moulds man both in matter and mind, and to its gentle moods we must, mainly, attribute this comparative immunity in the south. Advancing northwards, I have found the numbers of stammerers to increase. They are more numerous in Germany than in Italy, more frequent in England than in Germany, and more, again, are to be met in Scotland than in the south of England. I am aware that this has been denied. I can only state that, in regard to the above countries, I am speaking from personal observation and study. We do not possess statistics as to their number in this, or in any other country, except Prussia, where a census, taken not long ago, has shown one child at least in every hundred to be a stammerer. On that occasion the usual distinction has, I believe, been drawn between stammerers and stutterers. Stammering is defined by elocutionists as an initial difficulty in articulating; stuttering as a repetition, more or less frequent, of the first word of a sentence, or the first syllable of a word. Drawing this strict line of demarcation, they have endeavoured to find different causes for each. I am convinced that the

two are radically and fundamentally one, and both are here implied in the term of stammering. Stuttering, or the repetition of a syllable or word, is to be met with in most stammerers. It is a trick, an effort to grasp the next word or syllable which (*not* the one he repeats) he dreads as difficult, or rather imagines to be difficult; to use a French phrase by way of illustration—*Il recule pour mieux sauter*. The subject is little understood by the general public, and even the medical profession has given small attention to it, so that enquiry has rarely gone beyond taking notice of the various *accidental expressions* of stammering, without realising that these are not *the* impediment.

Before, however, proceeding to analyse and explain stammering *per se*, it may be well to recall briefly to the reader the process by which speech is effected.

The action of the whole speech-producing apparatus has been aptly compared to that of a wind instrument. The lungs are the wind-producing portion of it; the larynx, with the vocal chords, is its vibrating or sounding portion, changing the air from the lungs into sounds, or vocalising it as it passes through the rima glottidis. Finally, as the breath is emitted through the mouth cavity—as it were the pipe of the instrument—the action of the organs of articulation, viz., the tongue, teeth, and lips, may be likened to the function of the stops of the wind instrument. Such is the physiological relation and working of these organs. But it is only part of the functions which produce speech, the first act originating in the mind which creates the word, the image of thought, and, through the brain or nerve action of

* The Editor is responsible for the alteration of type and the use of italics instead of sub-headings.

volition, transmits it for despatch to the respiratory, laryngeal, and articulatory apparatuses. Speech, then, is effected by the harmonious joined action of the mind, the nerves, the lungs, the laryngeal organs, and the organs of articulation.

Our next step is to try and ascertain which of these agents is at fault with the stammerer.

To the ordinary observer, who has watched, on one or more occasions, the distressing spectacle presented by a bad stammerer, there would seem to be little doubt as to which organs are "at fault." Look at the facial distortions of the sufferer, the spasmodic clenching of his teeth or jerking of his jaw, his helpless tongue labouring and spluttering unintelligibly in disjointed syllables and words. Are not these organs—the organs of articulation—at fault? Momentarily they are certainly "at fault," yet they are not faulty. This same boy who, just now, presented a sight almost as distressing to those obliged to listen to him as it is to himself, may, a few minutes hence, when alone, recite his Cicero or read aloud Shakespeare with perfect ease and fluency, with a better delivery, a clearer enunciation than would those that pitied his speechlessness a little while ago. Can his articulating organs, then, can the larynx, can the lungs, be defective? Assuredly not. Ask the boy what he thinks of the condition of his organs of speech. If he is intelligent he will tell you he does not think them wrong; "or," he will say, "I should never be able to speak as easily as I do when I am alone or with some of my friends. But, then," he may add, "there comes that fellow Jones, whom I don't like and who always chaffs me about it, and I am done for. He is almost as bad as the mathematical master. I don't like mathematics; it makes me nervous to look at the master, and of course I can't get my words out." "So then it is all nervousness when you can't speak?" "Of course it is." But, you may object, "no boy likes everything he is obliged to learn, and if the mathematical master makes you feel nervous, the classical one has a similar effect on your class neighbour. Does that make him stammer? No. Besides, I know he is a much more nervous boy than you are; his bat misses the ball twice or three times when yours does not fail you once; you clear a ditch, when his legs refuse from nervousness, though they carry him as far on level ground as do yours."

"Well, anyhow, I am more nervous in talking," he persists. Is he right? In so far as he merely contends that he *feels* nervous in speaking, yes. But he is not when he maintains nervousness to be the real cause of impediment. As to his feeling nervous, how else could he feel, with this dreadful stammer ever ready to break in on him before a strict master, and in the presence of a score of thoughtless, unsympathetic companions? He knows he *must* stammer again, for has he not stammered fifty times before during the mathematical lesson, and this time, he is but too certain, it will be worse than ever. He is ashamed of himself, and angry with everybody. He knows he will make a fool of himself, and his pride must pay for it, when the boys make fun of him after the lesson. All these emotions he includes in the term "nervous," and they all are, directly and necessarily, caused by the discomfort and distress of his impediment. When ascribing the latter to nervousness, he simply, and not unnaturally, mistakes the effect for the cause.

What and where, then, is the root of stammering? We may be enabled to look more clearly into this matter if we can ascertain in what way impediments are mostly originated.

It has been maintained that stammering was always congenital; that it was not contracted, but was in the individual from birth. And, indeed, there can be no doubt that impediments do not infrequently "run in families;" that they, like many infirmities, after being lost in one or two generations, reappear in a later one. Likewise has it been ascertained that the "hitch" in articulating commences in some cases after an illness, such as scarlatina, measles, typhoid fever, or that it is first noticed after a sudden shock to the system—a severe fall or a fright. In the majority of cases, however, the impediment originates in a different manner: it is "caught." Here is a class of young children all of whom speak perfectly well. A stammering child is introduced, and in a short time several perhaps speak as badly as the new comer, or worse. It is evident that these children have not been inoculated with a physical defect by their little companion, for it is not conceivable that a defect could be communicated through the medium of hearing. The senses communicate such impressions to our minds through, and by way of, our brain, and our minds reproduce the

impressions through the brain and by the act of volition. Science has not been able to determine definitely which is the particular and very minute portion of the brain used by the mind in the act of speaking; though the posterior third of the third frontal convolutions has been suggested as the instrument deputed to guide the movements of the organs of articulation, while the coating of the brain has been supposed to generate volition. Now, though this be a correct theory, the thought cannot be seriously entertained for a moment that stammering, when beginning in the manner described, viz., transmitted from one child to another, is, from the first moment, diseased or defective brain matter. In such cases (and they form the great majority) stammering is received into, and reproduced in, the general intellect or the mind which cannot be localised. Yet, that only some children should contract an impediment thus while most escape the infection, must be accounted for by assuming a predisposition for stammering in their minds, and this predisposition may be, and in many cases doubtless is, an inheritance which can be roused either directly in the aforesaid manner, or through reaction from brain matter on the mind owing to an illness or a sudden shock. But be the latent disposition brought out by direct or indirect influence, in its development it takes but one course—it impairs the will and establishes a fixed idea with all the idiosyncrasies engendered by such a habit of the mind. Let us take a case in point in order to illustrate this.

Here is a young child that has recently only shown a tendency to stammer. At present, at any rate, the little one cannot be said to be a "nervous stammerer;" he does not mind in the least, as he has not sense enough to mind it. A few years later he is sent to a school, of which we will suppose you the master. The boy is evidently excited when he meets you, and stammers very much, the father remarking within his hearing that he never saw him so bad, and this only makes him stammer worse. From that day he never manages to address you with at least comparative ease. Why is this? It *must* be so, the boy having been thoroughly demoralised by his first and all subsequent conspicuous failures. Whenever circumstances oblige him to speak to *you*, his mind works in this manner: "I must say this, and want to say it. But I have never yet been able

to speak well to the master—how can I now?" Of course, these opposing thoughts are not always framed clearly in the boy's mind; they may, usually, not get beyond the stage of "sensation." None the less surely are they bound to take effect as opposing forces on the breathing and the speaking apparatus. The first sensation or thought—"I must tell"—impels the organs, while the second—"I shall stammer again; I cannot tell"—impedes. The result is that spasmodic action, that struggle which we call stammering. The struggle between the positive and the negative forces continues, till one gets the better. If the former, then, after more or less resistance, the words are uttered at last. If the latter, the attempt to speak is either abandoned altogether, or the stammerer may alter and readjust his sentence, choosing other words in the place of those he thought of first, but fancied difficult. These difficulties, then, are not real; they are spectres of a habit of fearing certain words, or dreading to speak to certain persons, or of speaking at particular places—in short, under certain circumstances in which, or similar ones, the stammerer had before spoken with much difficulty. The oftener he is under these special conditions the more firmly this imaginary inability to speak gets rooted in his mind. It must be evident that, if other habits grow slowly through the accumulative force of mechanical repetition, stammering must gain a hold much more rapidly, because it is *dreaded*. This fear has, as I said before, a double effect: it impairs volition, and it produces—along with and around the central fixed idea of inability to speak—numerous idiosyncrasies. These latter are legion, as there is hardly a stammerer (with the exception of young children that have not yet developed the habit) without some peculiar to himself.

Thus, a young man told me recently (after I had convinced him by the experience of practical tests that he was really able to speak well to strangers in the street, in houses and shops): "There is one place that I still feel afraid of—a ticket office, for I cannot talk through that little hole." This, by the way, is a common experience, and is easily accounted for by the push and hurry which generally accompany the taking of a ticket. However, the peculiar experience in regard to railway stations of this young gentleman has not yet been told, for he added:—"I used not to have very

much difficulty at stations, till I read that people always stammered when they took a ticket." The case is a striking illustration of the sudden rise in the imagination of the stammerer of a new and particularly strong difficulty. Others fancy they can speak better in a dark room than a light one, or *vice versa*. I remember a patient who derived, or imagined he derived, help in speaking from a small pencil case. This amulet, imbued with healing virtue, he used to grasp in his left hand while gesticulating with the right for additional safety. Nothing but this particular pencil case would do, and when he was made to exchange it for another object, he immediately stuck. The very words and letters that appear difficult vary and fluctuate—now M is the most dreaded letter, and a few months hence L or any other letter may have taken its place. No doubt a long and constant misuse of will and intellect in regard to the function of speech may at last injure the instruments of the mind, whichever divisions of the brain these instruments be. It cannot, therefore, be too strongly impressed on parents and other responsible persons, to check the mischief in the bud whenever a young child shows a disposition to stammer. If this, however, has been neglected for some time, and the impediment, consequently, begins to develop and to establish itself, then the child should, without delay, be confided to competent hands.

As regards the checking of an incipient impediment with very young children, all must be done by the noiseless force of quiet influence and steady example. The child must *never* be told "not to stammer any more," much less must he be threatened with even the slightest punishment, should he stammer. Little ones do not stammer in the true sense; they only show a disposition to do so. This, at its first appearance, is a mechanical and unconscious act, and may, therefore, be readily repressed till nature corrects it wholly. Direct notice, then, must not be taken of the child's hesitation. But the parents and the other members of the household should accustom themselves to speak to him always in a quiet, gentle, slow and deliberate manner. Little children are so imitative that they readily adopt the same way of speaking, and the hesitation will soon disappear of itself. Of course, special care must also be taken of the general health of such a child, as an unsatisfactory condition in

that respect will quickly search the weak point and call forth the latent disposition. This much may be said about the prevention of stammering in young children.

As regards the treatment of the confirmed stammerer many remedies have been tried, but without very conspicuous success. The well-worn pebble of Demosthenes I will only touch on in order to correct a misconception in regard to the impediment of that worthy and illustrious person. Demosthenes, we are credibly informed, could not pronounce the first letter of his art, Rhetorics—in other words, he could not roll the R. This was a defect of his articulation, not stammering; and, like all such defects, it could be corrected by a persevering training of the organs of articulation. The R, in ancient Greek, judging by analogy from its modern offspring, was formed similar to the English R, by the tongue vibrating slightly against the palate, but an aspiration preceding it. It is conceivable that Demosthenes may have found a small stone useful in practising this vibration or roll of the tongue. But had he been a stammerer, the pebble could not have cured him.

Aristotle, the polyhistor of antiquity, did not enter deeply into the knowledge of this subject. He says stammerers are tongue-tied, and that their tongue consequently is not quick enough to keep pace with their imagination. Hippocrates adduces affections of the ear as the cause of stammering. Galen ascribes it to a weakness of the muscles of the tongue. After the dark ages, which tell us nothing on the matter, we have in the sixteenth century the opinion of Mercurialis. He says that impediments of speech are caused by a "moist" disposition, and prescribes that the tongue be rubbed and dried with honey, salt and sage. He also advises much practice in loud and distinct speaking. Bacon is of a similar opinion.

During the first half of the present century two ways of cure were mainly advocated and tried—artificial appliances, and surgical operations of the muscles of the tongue. It is evident, from what has been said about the nature of stammering, that such remedies must be valueless, because they fail to touch the root of the difficulty which is not in the organs of speech.

Before remarking on the principles of a successful mode of treatment, I shall, for the sake of clearness and precision, summarise my previous explanations very

briefly. Stammerers often imagine, as also do their friends, that there is some functional obstacle and derangement in the organs of speech rendering the formation of certain sounds and words difficult; or that constitutional nervousness has so deranged these organs as to render their free and natural use unattainable. People thus afflicted, or who have friends thus afflicted, usually are slow to believe that the seat of the trouble is not in the nerves nor the organs of speech, but in the mind; in fact, that the inability to speak is not a real but a fancied one, and that it is not the result of nervousness, but nervousness the result of it. Yet the fact that the sufferer has much less, if any, difficulty under certain conditions (when feeling quite at ease with others and particularly when alone) shows that the difficulty is not real but imaginary. This habit of thought, like all habits, grows on him. He more and more shrinks from certain words, substituting others, or avoids speaking to some persons, or at certain places. When compelled to speak under such conditions his mind creates a double sensation—a positive and a negative element of thought: he wants to speak—he feels as though he could not speak. Thus the organs of speech being acted upon at the same moment by these opposing motors, will, when driven onward by the first thought, be instantly checked and impeded by the second. The result is the struggle called stammering, and it continues till either the positive or the negative force gets the better. If the former—the wish to speak—the words will emerge at last. If the latter—the feeling of inability—speaking is either given up altogether for the time, or those words which were thought specially difficult are changed for others.

It having been shown that the difficulty takes its rise in an abnormal action of the mind, it is evident that a real cure of stammering depends on the changing and rectifying of the mental action. Three manifestations, three expressions of the mind—if I may say so—have a direct bearing on the production of speech—intellect, will and temperament. The first and second create speech, while the third qualifies the action of the two. It has been explained that these agents are all in an abnormal, an unsound condition,

with the stammerer. The intellect, or thinking faculty, has conceived imaginary difficulties. The will has been weakened by long and constant failures to produce speech. The disposition, or temperament, has been warped by discomfort, irritation, and disappointments, the inseparable companions of this affliction. Though thus, in the matter of his speech, intellectually perverted, morally (*i.e.*, in regard to his will) weakened, made often irritable and cross in his disposition, the sufferer is of a sound mind in all other things. He is not, as has been suggested by some, something of a madman and an idiot. On the contrary, he frequently proves himself a gifted boy or a clever youth, and his deficiencies can be corrected by one experienced and competent to convince his intellect, to rule his will, to sympathise with such wise moderation as is beneficial and salutary to his temperament. To explain here all the means to this end would be out of the question, even though limitation of space did not forbid it; they vary in their application with the individuality of the man. Along with this intellectual and moral influence there must also go a systematic correction of the tricks that stammerers get into in regard to the use of the organs which unite to fulfil the bidding of the mind, and as their functions are, in part, of a complicated nature, careful speech training, strictly in accordance with the natural action of the whole speech-producing apparatus, is a matter of moment.

Those who wish for full information on the subject should apply to me at 66, Victoria Street, London, S.W. I wish to state beforehand, however, that I exact no promise of secrecy in regard to the mode of treatment, and that I do not, on the day of consultation, guarantee a cure, because I do not, from the very first moment, know the case in every aspect, and I do not know the stammerer himself in his intellectual and moral capabilities. In almost every case I am, however, able to say from the first, if real benefit and improvement can be effected. This mode of treatment is also used with much success in Germany, where it has received Government diplomas, and it has been adopted in Sweden at Government Institutions for the Deaf and Dumb, to which is attached a department for the cure of stammering.

DEFECTS IN SPEECH AMONG SCHOOL CHILDREN.*

By DR. HERMANN GUTZMANN, of Berlin.

IN general the subject of defects in speech has been but little treated in a medico-scientific manner, and yet it is decidedly of a general medical, and accordingly also of an international, interest. This latter remark is not superfluous, since it has been frequently asserted that among particular nations no defects in speech occur. Thus Kussmaul,† and after him many others, state that the Chinese are said to be exempt from stuttering. This is decidedly not correct, as the Chinese have a special word for stuttering. Stuttering and stammering are met with everywhere where human speech is heard, less, it is true, among particular nations, more among others, according to character, temper, language, climate. The statistical statements of civilised nations, as far as they have been generally made, give results, agreeing pretty well, regarding the percentage at which stuttering (it is mainly a question of this defect) occurs among particular nations.

All these statistics, however, are based for the most part on estimates—excepting those made in the army—and are therefore not conclusive, judging of the extent of the evil. The following statistical data refer to observations made—in round numbers—among 200,000 school children. The first census of this kind was undertaken in 1882 by Berkhan, at Brunswick, among 8,235 children, and showed 0·8 per cent. of stuttering children. In 1886 a similar census was taken at Berlin, where among 155,000 school children there were found to be 1,550 stutterers, equal to 1 per cent. At Elberfeld there were counted in 1887, among 18,500 school children $1\frac{1}{4}$ per cent. stutterers. According to a census taken last year, in the principality of Waldeck-Pyrmont, there were found to be among about 10,000 school children 1 per cent. stutterers and 0·5 per cent. stammerers. Lastly, in this year statistics have been made in the town of Posen and neighbourhood, showing, among 11,833 school children, 1·5 per cent. stutterers and, besides, 0·4 per cent. stammerers. The proportion of stutterers to stammerers is about 1 to 0·25, those children who stutter and stammer at the same

time being counted among the stutterers. From these data you see (the census everywhere has been taken by the authorities themselves) that among the school children there are found to be on an average 1 per cent. stutterers and $\frac{1}{4}$ per cent. stammerers. There are in Germany, in round numbers, 8,000,000 school children. If we reckon among them 1 per cent. stutterers and $\frac{1}{4}$ per cent. stammerers, then we have in Germany not less than 80,000 stuttering, and 20,000 stammering school children, together, therefore, 100,000 school children afflicted with defects in speech.

From the statistics mentioned there follow, however, some other facts. The census in the Berlin parish schools ("Gemeindeschulen") show that among children in the first school year there stuttered only 0·5 per cent.; among those in the second school year there stuttered above 1 per cent., and among those in the last school year there stuttered above 1·5 per cent. The census by Berkhan at Brunswick, as well as those of Elberfeld and Posen, gave exactly similar results. Always in the second school-year a doubling of the rate per cent. shows itself; then again a slight decrease thereof, until in the last school year a renewed increase takes place. Children in the second school year are seven to eight years old, those in the last school year thirteen to fourteen years. No doubt the bodily development of the children has some influence, and it might not seem too presumptuous to bring in causal connection with the larger rate per cent. of defects in speech in the case of children at the age of seven or eight, dentition, in the case of those thirteen to fourteen years old the development of puberty. This causal connection has hitherto not yet been specially emphasised, and even Axel Key,* whose copious lecture you have heard at the second general meeting of this congress, does not mention the impediments of speech. There exist certainly still other reasons for this increase in the defects in speech—however, it would lead us too far to enter more fully into them. In regard thereto I refer

* A paper read at the Berlin Society of International Medicine.

† Kussmaul, Die Störungen der Sprache, 1881, S. 231.

* Axel Key, Die Pubertätsentwicklung und das Verhältniss derselben zu den Erscheinungen der Schuljugend.

to my former publications.* It need hardly be specially emphasised that such conditions indicate a state of urgency. Good speech is necessary for the proper development of children. Stuttering children are frequently affected physically by their defect; they become shy, timorous, reserved, melancholy. Quite a natural consequence is their backwardness in mental development. The teacher cannot possibly have special regard to the stuttering children; generally he passes them by in order not to delay the teaching and thereby prejudice the children who speak normally. If in consequence the child remains backward in its mental development and education, it would be wrong to attribute this to faulty mental talents—as Schrank does. On the contrary, stuttering children are frequently very talented; one might rather say of stammerers that they are principally found amongst the “silly and mentally stunted.”

If the child now enters life, after leaving school, he is placed face to face with the choice of a calling, which is rendered much more difficult by trying to find one in which the existence of a defect in speech does not exercise a disturbing influence.

The objection that in later years stuttering disappears of itself cannot weaken the significance of the facts mentioned. Even if the misfortune improves at the age of twenty or even later, yet its injurious influence has already been acting on the psychical and mental training, as well as on the choice of a calling. Besides, this improvement in speech does not at all occur so frequently as is generally believed. Chervin's † military statistics showed, for instance, that during the years 1850 to 1869 there were among each thousand recruits in France 6·32 stutterers, who had to be excluded from military service solely on account of their defect in speech. It is true that other statements showed much lower percentages. Thus, in 1884, in Austro-Hungary, 0·5 per mille of those liable to military service were put back owing to stuttering. Almost the same result is shown from statistics of Italy of the same year. In Russia the percentage is said to be about equal to that of France; regarding Germany no authentic statistics are before me.

Reverting to the first-mentioned census among school children, as well as to the evils resulting from impediments in speech, we understand that in face of such startling percentages the school authorities were obliged to take energetic measures. The first trial, regarding which I can give you a fairly accurate account, was made at Potsdam. A teacher, taught according to our method, was entrusted in 1886 with the instruction and treatment of twelve stuttering children. According to the report of the Royal Government at Potsdam to his Excellency the Minister, Dr. von Gossler,* out of the twelve children nine were perfectly cured after three months. During a second term, in 1887, in which were included the three children remaining over from the first term as not cured, out of the twelve children eleven had been cured, as may be seen from the same report. It must be specially mentioned that none of the stutterers discharged as cured in the first term had a relapse. Induced by the success at Potsdam, in 1888 two teachers from Elberfeld were referred to us; they have had to do here hard practical work, while between times, in a series of special lectures, I made clear to them the theory of the subject and the scientific proof of the method; the material for practice was taken from some Berlin parish schools.

It is true, great exertions on the part of both teachers were necessary, for the period of four weeks which was allowed therefor is somewhat short; nevertheless, I became convinced that it suffices in order to obtain a clear insight into the nature and the methodical treatment of stammering and stuttering. The routine and the judging of an individual case follows naturally with practice. This conviction is confirmed by the success which the two teachers from Elberfeld have accomplished. During both the courses for children which the two gentlemen gave at Elberfeld, and each of which included eight to nine boys bound to go to school, all the children were cured. By these good results his Excellency the Minister, Dr. von Gossler, was induced to send to all Royal Government, as well as to all Royal Provincial School-Collegia, a direction to the effect that they should urgently recommend to all authorities a

* Hermann Gutzmann, *Die Verhütung und Bekämpfung des Stotterns in der Schule*, Leipzig, 1889.

† Chervin, *Statistique du bégaiement*. Paris.

* *Centralblatt für die gesammte Unterrichtsverwaltung in Preussen*. Nov.-Dec., Heft, 1888.

proceeding similar to that of the town of Elberfeld.

Since this time already the fourth course for teachers is taking place, in which always more than twenty teachers participate by order of their Governments or school authorities respectively. Including the teachers staying here at present, at the end of this term there will be ninety-five teachers trained in our method of the treatment of stuttering and stammering children. This number distributes itself over all provinces of the Prussian monarchy, so that there is already a pretty large number of towns where continually lessons for stuttering and stammering school children are given. The results are very gratifying everywhere, and it is, therefore, to be hoped that, with further development of this organisation, the number of stuttering and stammering children will be reduced to a minimum. At the end of the term the children were not only almost all of them freed from

their defect, but the psychical effect was perfect everywhere. The children became again cheerful, fresh, self-reliant, after having been relieved of a defect which had oppressed them so much. It is gratifying to say that relapses were rare under the close observation to which they were thenceforward subjected.

The extent and purpose of my communication preclude my entering into particulars of our method. My intention was merely to draw your attention to an indisputable evil, and to awaken your interest for the manner in which here in Prussia one has successfully tried to remove it. I hope, gentlemen, that I have attained this end, and I invite all of you to come and witness the course of instruction now taking place here. Twenty-eight teachers participate therein; as material for practice there are over 120 stuttering and stammering children. In the event of a visit from you, I shall not fail to demonstrate our method.*

PHYSICAL TRAINING OF OUR SOLDIERS AND SAILORS.

ARMY RECRUITS.

COLONEL G. HATCHELL, in a paper which he read at a recent meeting of the Royal United Service Institution, gave his testimony to the satisfactory results produced by the new system of physical training, as not only is the recruit's chest and muscles well developed, and he himself made nimble and self-reliant, but, from the handiness and activity he learnt in the gymnasium, he picks up his drill with much greater facility. The only defect of the course is that it is too short, lasting only six weeks, and consisting of about thirty attendances of an hour and a half a day; however, the average increase in chest, even after this limited course, is $\frac{3}{4}$ inch, of fore arm $\frac{1}{4}$ inch, and of upper arm $\frac{1}{2}$ inch, but in weight only four ounces. Town lads improve in physique more than their brothers from the country after joining. Moreover, their quickness and faculty for receiving instruction contribute to make them, if not such machines as the agricultural labourer, certainly more useful soldiers.

Experience shows that, besides his gymnastics, a recruit practically does not attend more than ten drills in the week in summer and nine in the winter. He also loses valuable time from vaccination, and perhaps sickness, and also from bad

weather. Under these circumstances, in his first ten weeks' service it requires all the energies of the drill instructors to make him proficient in infantry drill. If more be attempted the result will not be satisfactory; pushing on a recruit too fast is a common but short-sighted practice, and the mischief thus done is afterwards seldom, if ever, repaired. The recruit's progress in drill depends almost entirely on the efficiency of his instructor. Non-commissioned officers should, I think, come to the depôt on probation, and if found unsuited after three months' trial should be remanded to their battalions.

The essentials of a good drill instructor are three. First, he must know his work, that is, he must study his drill book, and learn thoroughly those sections he is expected to teach. Not learn it by heart, far from it, but be able to explain in his own language what to do, and how to do it. The old habit of rattling through long cautions in the words of the book should be strictly forbidden. The best way to show a recruit how a thing is done is for the instructor to do it himself, drawing his attention to any points that may be necessary in words of his own, and the

* It is fully described by Albert Gutzmann: "Das Stottern," Third Edition, Berlin, 1890.

fewer the better. The second qualification for a "drill" is a good manner, which includes a good temper. The old bullying drill sergeant of former days, before whom recruits trembled in their boots, has almost disappeared, and we find we can get on just as well without him. While the squad is standing at ease, the instructor should talk to them on matters of drill, explaining the reasons for each practice or movement, what muscles it is intended to call into play, &c. The third essential is, of course, a good word of command. Everyone knows what a good word of command is, but many from carelessness fail to cultivate it, and constant supervision by the adjutant and sergeant-major must rectify this omission. Another important point in drill is not to change men constantly from one squad or instructor to another, like going to a higher class at school. When recruits become further advanced the smartest of them should be exercised occasionally in drilling the squad, more especially the temporary lance-corporals, to give them confidence and train their word of command. It is called in the drill-book "mutual instruction," a name it scarcely deserves.

Recruits should be allowed to remain fourteen weeks instead of ten at the depôt, and no man should be sent to join his battalion until he has completed a ten weeks', instead of six, course of gymnastics; his musketry course; and learned all ordinary drills and duties. There would be a slightly increased accumulation of recruits at the depôt, for whom accommodation could easily be provided; but a more formidable obstacle is the absence of rifle ranges and gymnasiums at many of the head-quarters of regimental districts, although the latter, at least theoretically, are supposed to exist. The War Department has, however, at several depôts, erected temporary sheds for gymnastic exercises, which answer the purpose fairly well, and in the schemes for new rifle ranges the requirements of the depôts should not be overlooked. At any rate, the recruits will have the same facilities for musketry as the trained soldiers of the depôt, and, although inconvenient, they might be detached for their twenty-one days' course, as they often are, after joining their battalion. Let us suppose that at the depôt of a double battalion regiment six recruits join every week. At the end of four weeks there will be twenty-four men available to begin a course of

gymnastics, which will go on for ten weeks concurrently with drill and later with musketry, drill or musketry being performed in the morning and forenoon, and gymnastics in the afternoon; six weeks later, or at the end of the tenth week, this same squad will commence its musketry, concluding it by the end of the fourteenth week. Instead of the old method of doing gymnastics at one time and nothing else, or musketry and nothing else, gymnastics and musketry should be blended with the recruit's drill and work concurrently, producing at the end of his tour at the depôt a soldier fit to take his place in the ranks of his battalion.

The difficulty at present is to obtain instructors and gymnastic accommodation for the large body of recruits under training at depôts; but these highly trained gymnasts who perform wonderful feats on the horizontal bar are not needed for a simple recruit's course. Every company non-commissioned officer, or at any rate a large proportion of them, should be required to undergo an easy course of gymnastics, sufficient to enable them to put a squad of recruits through when necessary.

SAILORS ON MODERN SHIPS.

If men cooped up on board ship, says the *United Service Gazette*, do not have something to stir their blood and harden their muscles they rapidly deteriorate, become discontented, and their usefulness is impaired. Sails and spars formerly supplied this want. Their management in the teeth of the elements gave all the hardiness, agility, and self-reliance necessary for efficient fighting. Granted that they are retained in the training ships; but otherwise, even in cruisers, they will ere long be entirely things of the past. In ships that are without sails and spars, does the steady execution of the ordinary drills, combined with routine ship-cleaning, give the necessary physical development? The experience of the American navy would at any rate seem to point to the contrary, for in the current *Proceedings* of the United States Naval Institute, Lieut. R. C. Smith, United States Navy, in the course of an able and lengthy article on the disposition and employment of the American Fleet, observes that the men found to-day in ships without or with little canvas, and markedly the apprentice boys, are lacking in that skill, strength, and suppleness which characterise the ideal sailor, and which are absolutely essential to a well-conducted and efficient service. Of the exercises devised for

physical development the greater part should be compulsory, but men should be encouraged in every way to practise athletics for recreation. It is only by awakening their interest that the best results are to be obtained. In this direction the British navy compares favourably with that of the United States, but as we are losing our spars and sails there is room for a further advance.

In order to insure continuous effort and uniformity of practice, it is evident that the physical training of the crew should be in the hands of some one individual. It is doubtful whether a suitable person could be found in many of the ships as the complements are at present made up.

The writer of the article above referred to suggests that there should be created a rate of Athletic Instructor in all ships having a complement of a hundred men or more, and that an assistant should be allowed if the number exceeds two hundred. The instructor should, in the British Navy, be a chief petty officer, and his assistant a petty officer.

These instructors are common in other Services—the French, for instance, who have a school of gymnastics near Paris, in which men are trained in all physical exercises and then sent out as instructors. *Such a school, under an able head, would be of the greatest benefit.* In action the instructor should have a fighting station. A man of his training would be of inestimable value in handling the element usually found below decks.

And now as to the exercises which are recommended. In many respects we seem to be ahead of the Americans. Boxing and fencing are put at the head, the latter to include broadsword, the bayonet exercise, and cane drill. For sword exercise there should be regular cutlasses with buttons on the tips, and gloves as well as masks should be supplied. A plain hickory stick is all that is required for cane drill, with perhaps the addition of gloves and a thick suit of clothes.

It is not claimed that actual use will be made of these accomplishments for war purposes except in the case of the cutlass and perhaps of the bayonet, but for physical training they are unsurpassed. For

developing courage, nerve, strength, suppleness, self-reliance, a quick eye, and, in fact, all the qualities necessary for fighters, they have no superior.

Other practicable appliances are to be found in clubs and dumb-bells, in pulley-weights, in the horizontal and parallel bars, and in the vaulting-horse. The necessary instruction in these appliances would be given by the trainer, but it is upon the men themselves that success would most depend.

To the above exercises there should be added swimming, rowing, and running, and, we are asked to believe, tumbling. Swimming cannot be too much encouraged. The instructor would provide slings and bands to be used by beginners, of whom, curiously enough, some are still, notwithstanding the great improvement effected in that respect, to be found in every ship. Running could be practised only in such ships as have wide continuous decks. A track should be laid off, so many laps to the mile, and the men encouraged to compete. The instructor would give lessons in the proper manner of breathing, carrying the body, and using the feet and toes. It is curious what gawks most men are in running, usually because they forget they were once boys, and try to impart dignity to the gait.

A rubber or felt-soled shoe with spring-heel is recommended for this purpose; in fact, it is a growing opinion that a shoe of this sort is the proper habitual wear on board ship, a heavier shoe to be supplied for landing.

Running over the masthead is splendid exercise, and requires no special outfit. All ships will have at least a military mast. Tumbling is by its advocates said to be the best of all exercises. There is obviously room for it on board ship. In fact, athletics is a very simple thing if we will only recognise its necessity and set about it with a little system.

One of the most healthy forms of exercise, as well as skill in handling boats, is promoted in the British Service by the encouragement given on every possible occasion to our men to engage in races under sail and oars.

Societies.

CHILDREN'S COUNTRY HOLIDAY FUNDS.

AT this season of the year the newspapers contain many appeals for funds to send town-dwelling children to the country, and we are sure there is no form of philanthropy which is more worthy of support. It is a form of helping the helpless which cannot be abused, as every town child, whether ailing or well, should be sent to the country as often as possible. It does not pauperise the recipients, as children neither count the cost, nor indeed, know the source of the funds for such expeditions; while to the parents it is chiefly a matter of organisation, as many of them are willing to share the expense when they know that their children will be properly cared for. This feeling of self help will grow as parents begin to realise the advantages to the health, intelligence, and happiness to their children which result from such changes.

The educational advantages of trips to the country for children are not sufficiently understood, or the holiday funds would have more supporters. It is generally believed that town children are more intelligent than country children of corresponding ages, but this is an error. The result of some examinations of children on entering elementary schools (ages from four to six years) in Boston, U.S.A., a few years ago shows that "the average intelligence of country children ranks higher than that of city children, and in some respects very greatly;" and that "the city life of children is unnatural, and those who grow up without knowing the country are defrauded of that without which childhood can never be complete or normal." "A few days in the country at this age," says Mr. Stanley Hall, the writer of the report, "has raised the level of many a city child's intelligence more than a term or two of school training could do without it. Many children locate all that is good and imperfectly known in the country, and nearly a dozen children volunteered the statement that good people when they die go to the country—even here from Boston. Additional force is thus given to the argument for excursions by rail or otherwise, regularly provided for the poorer children who are causing the race to degenerate in the great centres of population." It will hardly be credited that among these Boston children—a

town one-tenth the size of London—80 out of a hundred had never seen a beehive, 77 a crow, 65.5 an ant, 62 a snail, 50 a frog, 20.5 a butterfly; 92.5 per cent. had never seen growing wheat, and 66 growing blackberries; 63 had never planted a seed, and 55.5 had never seen buttercups growing. In kindergartens country occupations are made the basis of the children's games. They sow, mow, make hay, tend animals and the like, yet all the while such occupations must be as strange and unintelligible to the majority of the children as the alphabet or the multiplication table. We once asked the mistress of one of these schools if she could not find some town occupation, with which the children were familiar, as a basis for the games of the kindergarten, but she shook her head in a hopeless manner, as much expressive of despair as of deprecation of such an idea. Town children have no out-door games or amusements except wandering about the streets looking into shops and dodging street vehicles; indoors they make scrap books, collect seals, crests and postage stamps, keep shop, and play with dolls and toys and the like, sedentary occupations for the most part which are at variance with the physical requirements of growing children. The country, on the other hand, affords every opportunity for the bodily movements and the variety of form, colours, sounds and sensations which are the foundations of the intellectual and physical development of all classes of children.

There is one inconvenience in connection with the country holidays of poor children which must not be overlooked by their promoters. In most parts of the country the cottages are as much overcrowded as town houses from which the children are taken, and though the children spend most of their time out of doors during the day, the sleeping accommodation in cottages is much less than the day accommodation, as many members of the family are at work all day, and sometimes the cottages are quite deserted. In making arrangements, therefore, for boarding out children, the sleeping space should be the first consideration. In the very poorest class the town child must necessarily become an addition to the cottager's family, but in a rather better class it might be convenient and a mutual ad-

vantage to both families to exchange children, the country children coming up to town to make room for the town children in their country homes. This is what actually takes place in the middle and upper classes in the routine of exchanging visits among the younger members of their families. A country child would not suffer in health from a few days' visit to town, and a round of visits to the museums, picture galleries, public buildings, and other sights of London would be of considerable educational value to them.

THE HOME ARTS AND INDUSTRIES ASSOCIATION.

THE Princess of Wales recently opened the seventh annual Exhibition of the Home Arts and Industries Association. The aims of this Society, which is rapidly developing, are to teach the working classes such arts as wood carving, *repoussé* work in metal, basket making, and similar handicrafts which may be followed at home in hours of leisure. The promoters desire to train the eyes and fingers of its pupils, thereby not only adding to their

resources and powers of enjoyment, but increasing their value as workmen and making them more fit to earn a livelihood in whatever occupation they may adopt. The occupations suggested are such as will fill up the idle hours of lads and girls, especially at the age when they have left school and not taken up a regular trade, and will keep them happily employed at home. The operations of the Society also promote pleasant and sympathetic intercourse between the educated and the poor, enable the possessors of art knowledge and culture to impart their gifts to those who are without either, tend to revive the old handicrafts which once flourished in England, but which have now almost died out, and encourage the labouring classes to take a pride in making their homes beautiful by their own work. In carrying out these ideas the Association has been remarkably successful. It started with forty classes, and now, at the end of six years, it has over 400 at work in all parts of Great Britain and Ireland, the instruction given being entirely gratuitous, all necessary expenses being defrayed by voluntary subscriptions.

Reviews of Books, Pamphlets, &c.

THE ESSENTIALS OF SCHOOL DIET; OR DIETS SUITABLE FOR THE GROWTH AND DEVELOPMENT OF YOUTH. By Clement Dukes, M.D., B.S.Lond., *Senior Physician to Rugby School*. London: Percival and Co. 1891.

Those persons who talk and write so glibly of the physical degeneracy of our population and the evils of over-pressure in schools at the present day are probably ignorant of the conditions of school and college life as it existed two or three centuries ago, and a comparison of the diet and discipline of students in the colleges at Cambridge (practically, the public schools of the time) in the middle of the sixteenth century, as recorded by Mullinger in his history of the University, with what it is now, as shown by Dr. Dukes' book, will be useful in correcting those pessimistic opinions.

"As it was then the professed rule of life with the monks, the friars, and the secular," says Mullinger, "it was also the prevailing theory in the discipline of

those whom they taught and trained for their several professions. The man fasted, voluntarily bared his back to the scourge, kept long and painful vigils; the boy was starved, flogged, and sent to seek repose where he might find it if he were able. Lever, the master of St. John's in 1550, described the scholars of his college as going to dinner at ten o'clock, content with a penny piece of beef among four, having a little 'porage' made of the broth of the same beef, with salt and oatmeal, and 'nothing else.' After this slender dinner, he continues, 'they be either teaching or learning until five of the clock in the evening, when they have a supper not much better than their dinner. Immediately after the which they go either to reasoning in problems or into some other study, until it be nine or ten of the clock, and then, being without fire, are fain to walk or run up and down half an hour to get a heat in their feet, when they go to bed.'" No doubt many of these starvelings were absorbed

by the Church, and as celebrates they did not directly affect the national physique; but the system must have been a serious drain on the best intelligence of the nation, which was not compensated for by the more robust and illiterate military class, which were the rulers of the country. The same condition of starvation and long hours of work no doubt existed in the charity schools of the period, and to our discredit much of the monkish and subsequent puritanical asceticism survives in the shape and uniformity of dress, and the plain living and discomfort of such institutions as the Foundling, Christ's Hospital, and other charity and pauper schools of the present day.

It is pleasant to turn from this painful picture of mediæval school life to that which Dr. Dukes puts before us. His aim, he tells us, has been to insist only on the conditions which are necessary for the attainment of the highest state of growth and development of the youth of both sexes, without touching on the borderland even of luxury in the dietary of school children. Still, we find such toothsome things as sausages, pork-pie, steak, tongue, eggs, and hot rolls for breakfast; and soups, meats of all kinds, puddings, tarts, cheese, &c., for dinner in his *menus*. For one day he recommends the following bill of fare:—"Quarter of lamb, goose or hare; potatoes, beans; jam-tarts, and cheese;" and there is a similar variety of good things for every day in his four weeks' bill of fare. Dr. Dukes does not put forward any novel views on the diet of school children, his object being to familiarise parents, schoolmasters, and schoolmistresses with the facts of science already known to medical men, and to call special attention to some practical details on the purchasing, cooking, and eating of foods. He gives sensible advice to parents and children on the unreasonableness of their expectations, and a great many practical hints to house masters on matters which ought to be familiar to them, but which are liable to be over-looked by persons whose chief duties are to cultivate the intellectual rather than the physical development of their pupils.

Dr. Dukes is, we believe, the first writer on dietary who has made use of anthropometric observations as a basis for his work, and he is also, we think, the first medical man to treat the dietary of children in its relation to the growth and development of the body, rather than

from its medical aspect. The scientific side of the subject is well up to date, but the book is delightfully free from the dreary details which make the dietaries of the sick-room so repulsive to persons with a sound digestion. We are all of us so much under the influence of the doctors and their sick-room dicta that children are too often treated as invalids when in perfect health, and consequently are insufficiently nourished. A good deal of mischief is also being done to the physique of the rising generation by the numerous concentrated essences and foods for saving normal digestion and the trouble of preparing food by the ordinary methods. Children's teeth decay before they are full grown, or become overcrowded, and the jaw bones, both upper and lower, are imperfectly developed from lack of use of the teeth on solid and substantial articles of food. It is neither necessary nor desirable that the food of growing children should be always tender and highly digestible; on the contrary, as their digestion is very rapid, such foods put them in constant danger of going with empty stomachs a great part of their time, or if they are allowed to eat when hungry, they over-eat themselves and become "bilious," especially if they do not get plenty of exercise, which they rarely do at school. There would be fewer decayed and crowded teeth, and fewer under-hung jaws, if children were made to spend more time over their meals, in chewing tough crusts of bread, and picking gristly bones, as their grandfathers did before them. For the due performance of all the functions of digestion—which are by no means confined to the mouth and stomach—it is necessary that children should take a considerable quantity of indigestible, though, of course, harmless matter, in the shape of woody fibre and the natural diluents of foods. This explains the advantage of "whole meal bread" (which contains a considerable amount of indigestible bran) in school dietaries, and which is so strongly recommended by our author in this excellent little work before us.

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