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MANUAL

OF

PHYSICAL TRAINING.

(Reprint 1908 with Amendments published in Army Orders to 1st December, 1914.)

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MANUAL

OF

PHYSICAL TRAINING.

SECTION I.

OBJECT AND SCOPE OF PHYSICAL TRAINING.

1. The object of physical training is the production of a state of health and general physical fitness in order that the body may be enabled to withstand the strains of daily life and to perform the work required of it without injury to the system.

2. It is not sufficient to train the muscles alone and to neglect the heart, lungs and other internal organs, for it is on the internal organs that the body depends not only for its health but for its very existence.

3. The required condition of physical fitness necessitates that the heart and lungs should above all things be sound and healthy; but the harmonious development of the *whole*—the skeleton or framework, the internal organs (including the brain and nerves) and the muscular system—is necessary to produce this condition.

4. The ordinary daily work of the individual develops some parts of the body and neglects others. If the brain alone is worked the body suffers, and vice versâ. Manual labour is often "one-sided," the positions adopted are apt to be cramped and crooked, certain muscles are employed very much more than others and the range of movement is frequently very limited. The result of this is inharmonious development.

5. The exercises employed in a system of physical training, if they ensure as they should the harmonious development of the whole body, will at the same time correct the faults engendered by one-sided work and so put the body in a better state to perform any other work that may be required of it.

6. The above remarks indicate the primary objects that should be kept in view in the training of the *man*, whether soldier or civilian. But as regards the special training of the *soldier* in order to fit him for his life as such, apart from the technical training of the branch

of the service to which he belongs, the following requirements should be kept in view, viz.: a soldier should be well disciplined, a good marcher, intelligent, smart, active and quick, able to surmount obstacles in the field and capable of withstanding all the strains and hardships of active service.

7. The recruit on joining is not in a fit state to undertake his work as a soldier without preparation, and the performance of purely military exercises, drill, route marching, rifle exercises, stable duties, riding, gun drill, &c., are not sufficient, however gradually they may be taken, to put him into the required state of physical fitness. Neither is it possible by means of these military exercises alone to correct the bad habits too often acquired before enlistment.

8. The soldier's training is completed regimentally but in order to prepare the man for and to assist this training and with a view to attaining the requirements referred to above, the recruit is given a special course of physical training which should be conducted on the principles indicated in this Manual.

9. It must be borne in mind that the performance of the various exercises is only a means to an end and that the training is not merely for the sake of the exercises themselves but for the ultimate effects of those exercises.

10. The value of active games and sports as adjuncts to physical training cannot be over-estimated. Games and physical training should be looked upon as complementary to one another and a man's physical education can hardly be considered as quite complete without the introduction of some form of active recreation.

But however much they are encouraged, games cannot altogether take the place of physical training. They have not the same corrective effect, many of them are "one-sided," the same regular, systematic and progressive results cannot be obtained from them, and, apart from the difficulty of obtaining sufficient space for all to play, the greatest drawback to the use of games *alone* is, that the weaker and less expert performer (*i.e.*, the very man who most requires training) is often discouraged by his want of proficiency and so ends by becoming a "looker on."

SECTION II.

PRINCIPLES OF THE SYSTEM EMPLOYED.

11. The following is a general outline of the principles on which the system of instruction contained in this Manual is based :—

(i) *The exercises.*—Every exercise employed has a beneficial effect on some part of the body and furthers at

least one of the objects of the training. None of the exercises are either harmful or merely ornamental, and it is the sum total of *all* the exercises employed that produces the required results. Thus there are exercises for every part of the body (arms, legs, neck, etc.), and, in addition, exercises of co-ordination (balance marching, running, jumping, etc.) to ensure the harmonious working of the whole.

(ii) *The daily lesson.*—In every lesson exercises are given for every part of the body as well as exercises of co-ordination, and they are arranged in a certain sequence in order that the best effects may be obtained from them.

(iii) *Progression.*—The lessons are always arranged according to the capacity of the individuals for whom they are intended, gradually increasing in difficulty from week to week and month to month so as to ensure steady and systematic progress throughout the whole course of training.

Classification of Exercises.

12. The exercises are arranged in the following groups, viz. :—

Group A.—Leg exercises.
,, B.—Neck exercises.
,, C.—Arm exercises.
,, D.—Span bending.
,, E.—Heaving exercises.
,, F.—Balance exercises.
,, G.—Lateral exercises.
,, H.—Abdominal exercises.
,, I.—Dorsal exercises.
,, J.—Marching and Running.
,, K.—Jumping and Vaulting.
,, L.—Corrective exercises.

Certain special exercises are also added for practical application in the field.

13. The name of each group indicates broadly the part of the body specially affected by the exercises which are included under that head.

Some of the groups are closely related to others and the exercises in each group have also some of the effects of other groups. It is therefore sometimes difficult to decide under which group certain exercises should be classed, but the rule has been followed of classifying the exercises according to the *principal* effect produced by them and in cases in which this is difficult to determine, the exercises are included in the group in which it is more practical and con-

venient to take them, *e.g.*, the exercise of **Upward circling,** although it has a strong abdominal effect, is taken under the Heaving exercises as it has an equally strong effect on the heaving muscles, and, as it is performed on the same apparatus as many of the Heaving exercises, it is more convenient to take it under that head.

The Leg, Neck, Arm and Trunk (Lateral, Abdominal and Dorsal) exercises have special *local* effects, and the exercises of the other groups, in addition to certain *local* effects, have also a more *general* effect on the system as explained under the various group headings.

The Daily Lesson.

14. In selecting the exercises for the daily lesson the following principles should be observed :—

(i) Exercises should be selected from every group.
(ii) Easy exercises should be employed at the commencement of the lesson to prepare the body gradually for stronger work.
(iii) The stronger exercises should then be taken, the most vigorous being taken towards the end.
(iv) A few easier exercises should be taken at the end of the lesson so as to avoid too sudden a passage from the harder work to other occupations.

15. In accordance with these principles the exercises should be arranged in the form of a Table as follows :—

A.—*Introductory Exercises.*

1. A Leg exercise.
2. A Neck exercise.
3. An Arm exercise.
4. One or more easy Trunk exercise (Lat., Abd., or Dor.).
5. A Leg exercise.

B.—*General Exercises.*

1. Span bending (followed by a " complementary " exercise).
2. Heaving exercises.
3. Balance exercises.
4. Lateral exercises. } Stronger than A 4.
5. Abdominal exercises. } Stronger than A 4.
6. Dorsal exercises. } Stronger than A 4.
7. Marching and Running.
8. Jumping and Vaulting.

C.—*Final Exercises.*

1. A Leg exercise
2. A Trunk exercise (easy).
3. A Corrective exercise (often combined with an Arm ex.).

A second Heaving exercise may sometimes be added after the Marching and Running and before the Jumping and Vaulting.

16. The above is not only the order in which the exercises are entered in the Table but is also the order in which they should be performed in the lesson. This arrangement of the exercises is generally recognised as the best and most practical for obtaining the fullest benefit from the day's lesson.

17. The following are some of the reasons for the adoption of this particular sequence of exercises :—

As indicated above, a lesson, taken as a whole, should consist of a series of exercises, easy at the commencement and gradually increasing in strength and vigour towards the latter part, then decreasing in strength at the end so that at the conclusion of the lesson the circulation, which has been considerably accelerated by the stronger exercises, is sufficiently restored to its more normal state to enable the pupil to proceed to his other work without any feeling of undue agitation or fatigue. In the course of a lesson, short periods of comparative rest are arranged for by taking a comparatively easy exercise after a harder one or an exercise which gives totally different effects.

The lesson is therefore commenced with a series of easy "Introductory Exercises," of sufficient range to cover the whole body generally, and is concluded with a short series of easy and comparatively quiet "Final Exercises."

As regards the "General Exercises" of the Table, Marching and Running, Jumping and Vaulting, being the most vigorous are placed at the end of this Part to accord with the principle of gradually working up to the more vigorous exercises.

Span bending necessitates close attention to small details and concentration of energy rather than muscular strength, it is therefore better performed when the men are quite fresh and is consequently taken at the beginning of the General exercises.

As Span bending to a certain extent affects the same muscles as the Abdominal and Dorsal exercises, these latter should not be taken immediately afterwards, unless it be a light Dorsal or Abdominal exercise (not as a rule shown in the Table) as a "complementary" exercise to the bending. The choice of the next exercise therefore rests between the Heaving, Balance and Lateral groups.

The Heaving being a fairly strong group it is as well to have a complete change, giving comparative rest, between it and the Trunk exercises. The Heaving exercises are therefore taken after the Span bending, and the Balance exercises, which require brain and nerve control rather than muscular strength, after the Heaving.

This arrangement also falls in with the view that those Trunk exercises which are used in the B or "General" part of the Table,

being comparatively strong, should not be taken too early in the lesson, and, if taken after the comparatively light Balance exercises the body is somewhat rested before executing them.

The order in which the three Trunk exercises are taken is not of absolute importance, but it is probably better to adhere as a rule to the order indicated above, finishing with the Dorsal exercises on account of the special effect of the exercises of this group in correcting any tendency towards loss of carriage which may have crept in during the other exercises.

18. By following the above principles the whole body is dealt with harmoniously in every lesson and nothing is neglected. It is possible to put more work into the time available for the lesson when the exercises are taken systematically in an order definitely arranged beforehand. The work is also performed more easily and with better advantage when the exercises are arranged, as indicated, with steady progression from the easier to the harder, and the passage from rest or easy work to hard work and back again is not too sudden.

19. These then are the main principles on which the daily lesson is arranged, the following important details should however also receive careful attention :—

(i) Exercises chosen from one group should not have effects too similar to those chosen from another group, *e.g.*, it is not advisable to use **Lunging outward** and **Lunging forward** as Leg exercises and again as Lateral or Dorsal exercises respectively in the same Table. This rule also applies to the selection of auxiliary Arm movements.

(ii) It is sometimes advisable to add a *complementary* exercise or a *supplementary leg* exercise (which is not laid down in the Table) after strong exercises for the upper part of the body. These additions should not, however, be made unless there is a necessity for them. It is a question for the Instructor to decide according to the circumstances.

(iii) A *Corrective* exercise should also be taken during the course of the lesson when occasion requires in accordance with the principles indicated in paras. **294, 295** and **296.**

20. As regards the *complementary* exercises mentioned in the last paragraph—After the performance of exercises which have a strong special effect in one direction, certain exercises of an opposite nature are taken as *complementary* to them, *e.g.*, after *Span bending* exercises, **Trunk bending forward and downward** or **Knees raising** from the hanging position are often taken.

21. The above-mentioned *supplementary leg* exercises are usefully employed after *Span bending*, strong *Heaving exercises* or exercises of a vigorous nature. Easy *Leg exercises* (especially the *Knee bendings*) are used for this purpose.

Progression.

22. It is not sufficient to select a few exercises, however good they may be in themselves, and to practise them until the execution is perfect, even though the selection and arrangement of these exercises may be in full accord with the principles laid down for the daily lesson.

In selecting the exercises used in the training generally, the first consideration has been their effect on the heart and lungs, and no exercise, the effect of which on these organs is in any way injurious, has been included in this Manual.

There are however certain exercises which may be too severe for or actually injurious to the heart of a beginner, but which may be performed with advantage by this same man when he has been some time under training. It is all a question of steady progression by means of which the body in general and the heart and lungs in particular are gradually strengthened and worked up to a state of fitness to discharge the work required of them.

The exercises in each group are arranged to admit of this progression, the earlier exercises consist of the simplest and easiest movements suitable for the weak or untrained recruit, and they gradually increase in difficulty and strength towards the end so that a selection can be made from these latter exercises sufficiently advanced to give plenty of work and full benefit from that work to the strongest man.

In order therefore to obtain the required results, a progressive selection of exercises is made from each group and a series of Tables drawn up, each successive Table being made slightly more difficult than the one preceding it according to the progress of those under instruction, so that the beginner may be worked up gradually to as high a standard of proficiency as can be attained in the time available for training.

The danger of attempting to hurry physical training should be recognised by all. It is impossible to obtain good results by cramming more and harder work into the same or less time. If therefore a shorter time than usual is available for the training, the work must not be hurried or increased but should be regulated accordingly, and no attempt must be made to attain the same standard that can be reached in the longer period of time.

Training of Large Numbers.

23. An important consideration when dealing with the training of a number of men is that the exercises should admit of being performed by a considerable number at the same time, in order that the time available for instruction may be utilised to the best advantage. The majority of the exercises of the system admit of this being done.

24. The strong and active must not have special attention at the expense of the weak and clumsy, but rather the other way. The object is to train every man to a reasonable state of efficiency, and not to train a few only who are naturally athletic to a very high standard. It is the weak and awkward men therefore who require the most attention.

SECTION III.

FORMATION OF CLASSES AND CONDUCT OF PHYSICAL TRAINING AND EXERCISE.

Physical Training (Recruits).

25. By the term "Physical training" is meant the regular prescribed course of physical training under qualified instructors that a recruit is required to undergo in order to fit him to take his place in the ranks.

26. The physical training of recruits will commence as soon as possible after final approval, and will be continued every working day (5 days per week) until the course is completed.

27. Recruits on joining will be put at once into the "Last joined" class, and will commence Table I under a qualified instructor.

28. As soon as the "Last joined" class attains a convenient size (the maximum number should never exceed twenty) the attendances as a class should commence to count, and the men should remain in that class and work together, both in the gymnasium and on the barrack square, until finally dismissed. As soon as one class is fully formed as above, a new "Last joined" class should be started in a similar manner under another instructor, or under the same instructor at a different hour.

29. This method of forming the classes allows reasonable latitude for enabling men to recover from the effects of vaccination, to settle down easily into barrack life and to derive full benefit from their change of food, etc., before commencing the full routine of work. All adjustments of classes should be made at the commencement, and not in the middle or at the end of the training.

30. It may occasionally be necessary to keep back weakly men under the advice of the Medical Officer, but the progression of the physical training Tables is so gradual and carefully arranged that this should only be necessary in very exceptional cases.

31. Instead of pushing on men of exceptional intelligence, strength and activity by transferring them to more advanced classes, such men should be made use of by the instructor to assist

him by setting exercises, illustrating the work, etc., and encouraging others by their example. The adoption of this method is productive of more intelligent training, is of assistance in the selection of likely N.C.Os. and raises the style and tone of the whole class without fear of discouraging good men by keeping them back, or of overtaxing the remainder.

32. The same instructor should, whenever possible, remain with the same class throughout their course of instruction, or until the men leave the depôt, or are transferred to another station.

33. The men should work in shirt sleeves, trousers, shoes and belts. The bottom of the trousers should be tucked into the socks (without restricting the free play of the knee and hip joints), so as to relieve the hips as much as possible of the weight.

Belts are used merely to keep up the trousers, and should not be tight.

34. It is an important part of the training that men should always be scrupulously clean for their work, and they should be instructed to change their clothes and rub themselves down after work which causes them to perspire freely.

35. In inclement weather great coats must be worn in going to and from the gymnasium.

36. Weather permitting, as much of the work as possible should be performed in the open air.

37. The proper and free ventilation of the gymnasium should be attended to before, during and after work; but the instructor must take care that the men when heated are not kept standing in a draught. It is a matter of great importance that the building should always be kept clean and free from dust. The floors of gymnasia must not be allowed to become slippery.

38. Instruction in Physical training should not be given before breakfast, or within at least a full hour of the completion of a meal.

Physical Exercise (Trained Soldiers).

39. The term "Physical exercise" is used to denote the physical exercises given to the soldier under Squadron, Battery or Company Officers and N.C.Os. after he has been trained, in order to *keep* him fit, and in condition for his work as a soldier.

40. These physical exercises should be given to the men when necessary throughout the year, and especially during the winter months, and whenever the manœuvre and other work of the soldier is not sufficient to keep him in the required condition of fitness.

41. A set of Tables suitable for this physical exercise is included among the Tables at the end of this Manual. These Tables are arranged progressively on the same general principles as the whole system of training, and due care should be taken that they are used according to the condition and requirements of the men, *e.g.*, when men are comparatively "soft" on returning from furlough, discharge from hospital, &c., the Table of easier exercises should be used.

42. Alternative exercises are given in these Tables for use according to whether apparatus is available or not.

43. The Physical exercise Tables are arranged so that they can be taken by men who know the exercises, in from 15 to 30 minutes. They are therefore suitable for regular daily exercise, and may be taken as such whenever required. Undue hurry in working through a Table should, however, be avoided.

44. As these Tables are intended to be used under Squadron, Battery and Company arrangements, all regimental Officers and N.C.Os. should have a good knowledge of the details of the exercises and principles of their employment. The possession of such knowledge by superintending officers will enable them to vary the exercises according to requirements, to avoid monotony, and by degrees to improve the standard of physical fitness of their men.

45. The men should also be practised regimentally, as occasion requires, in running and surmounting obstacles on the principles indicated in Sections VIII and IX.

SECTION IV.

ABBREVIATIONS, NOMENCLATURE, EXPLANATION OF TERMS USED.

Abbreviations.

46.

A.	= Arm or Arms.	H.	= Hips.
A. b.	= Arms bend.	hang.	= hanging.
Abd.	= Abdominal.	H. f.	= Hips firm.
astr.	= astride.	Hl.	= Heels.
backw.	= backward.	Hl. r.	= Heels raise.
Bal.	= Balance.	Hvg.	= Heaving.
b.	= bend or bending.	inw.	= inward.
cl.	= close or closing.	J.	= Jumping.
Cor.	= Corrective.	K.	= Knee or Knees.
crossgr.	= crossgrip.	K. b.	= Knees bend.
Dor.	= Dorsal.	L.	= Leg or Legs.
downw.	= downward.	Lat.	= Lateral.
F.	= Foot or Feet.	Mar.	= Marching.
ex.	= exercise.	N.	= Neck.
F. cl.	= Feet close.	N. r.	= Neck rest.
F. full o.	= Feet full open.	o.	= open.
f.	= firm.	obliquegr.	= oblique grip.
fling.	= flinging.	outw.	= outward.
forw.	= forward.	overgr.	= overgrip.

pl.	= place or placing.	swg.	= swing or swinging.
pos.	= position.	Tr.	= Trunk.
r.	= raise or raising.	turn.	= turning.
sidew.	= sideways.	upw.	= upward.
sit.	= sitting.	undergr.	= under grip.
Sp. b.	= Span bending.	V.	= Vaulting.
str.	= stretch or stretching.		

(i) Parts of the body and names of the Groups of exercises are commenced with a Capital letter, all other words with a small letter.

(ii) The starting positions, when entailing more than one movement in order to obtain them, are written in the order in which the movements are commanded; when these movements are taken separately a comma is used between each; but when taken together no comma is used, and the order of the movements is given from the feet upwards.

(iii) In the Tables a dash — is used between the starting position and the exercise, and the name of the exercise (including any additional movements taken to increase the effect) is given in **thick type.**

(iv) When there is any possibility of doubt as to whether one or both Arms, Legs, Knees, etc., are meant, an " s " is added to the abbreviation when both limbs are referred to, or the figure 1 is used if only one is intended.

Nomenclature.

47. The name of each exercise, and the words of command for its execution, indicate as nearly as possible the actual movements to be performed. In the case of some of the more simple movements the *name* is also used as the actual word of command; in these cases the Imperative Mood of the verb used is employed, and such words as "*Raise,*" "*Lower,*" "*Bend,*" "*Stretch,*" "*Place,*" "*Turn,*" etc., become executive words—*e.g.*, **Heels raise.**

When, however, the name of the exercise and the exercise itself is more complicated, the Present Participle of the verb is employed for the actual name, and the Imperative Mood is used in the word of command, or the name of the exercise (or necessary portions of it) is given as a *caution* followed by the executive commands "*One,*" "*Two,*" etc., or "*Commence*"—*e.g.*, Name of exercise, **Heels raising and Knees bending.** The words of command for this exercise may be **Heels—Raise ; Knees—Bend ; Knees—Stretch ; Heels—Lower ;** or the name may be given as a caution, followed by the executive words, "*One,*" "*Two,*" "*Three,*" "*Four,*" or "*Commence.*"

It will thus be seen that, as a rule, the Present Participle is used in naming an exercise, and that the Imperative Mood, or the name

followed by numbers ("*Commence,*" if several movements are to be executed, judging the time), is employed in giving the words of command.

The Imperative Mood is also used to indicate a *position* to be maintained, and the Present Participle to indicate a *movement* to be performed while maintaining that position—*e.g.*, **Heels raise, full Knees bend, Head turning quickly ;** or, as it would be written in a Table, Full K. b.—**Head turning quickly.** In this case the *full Knees bend* position is to be maintained while the movements of *Head turning quickly* are executed.

In a combined exercise in which two movements are to be taken at the same time, only one *executive* word is used—*e.g.*, in the exercise A. b.—**Foot placing sideways with Arms stretching upward,** the commands should be **Left Foot sideways Arms upward—Stretch,** etc. ; or, of course, numbers may be used for the executive words, as indicated above. This method of employing numbers will often be found to save much time and many words of command, and should frequently be employed when taking combined or complicated exercises.

Starting Positions.

48. Every exercise is performed from a certain position called the "*starting position.*" The position of *Attention* is the starting position for the more simple movements, and it must always be taken as the starting position when no other is indicated. Fresh positions are learned from time to time as *exercises*, and many of these positions are then used as starting positions for other exercises.

The Imperative Mood is used for the starting positions, and, as a rule, abbreviations are employed to indicate them.

Starting positions other than those given in the different groups of exercises may sometimes be taken if it is considered necessary, but the principles of progression and the effect required should be kept carefully in view in their selection.

The effect of an exercise depends on the starting position from which it is performed, and the *special* effect of an exercise is often contained entirely in the starting position—*e.g.*, Forw. lying, A. b., Tr. backw. b.—**Arms stretching upward ;** the starting position here contains the required dorsal effect, and the stretching of the arms is added to increase it.

Additional Movements.

49. In some exercises additional movements are added to obtain certain effects. When such additional movements are intended to be taken at the same time as the main movement of the exercise, the word "*with*" is added before the name of the additional movement—*e.g.*, **Heels raising and full Knees bending with Arms raising sideways and upward.** In this case the movements of the arms are to be taken at the same time as the movements of the legs.

SECTION V.

METHOD OF INSTRUCTION AND HINTS TO INSTRUCTORS.

General Remarks.

50. Every instructor should have a thorough knowledge of the principles of physical training, and of the object and effects of the various exercises employed. He should, in addition, possess the power of handling a class to the best advantage, and of imparting instruction in such a way as to encourage the men to try and improve *themselves*.

51. He should endeavour to arouse the men's interest in the work to avoid making it irksome to them, and, while maintaining good discipline and full control of his class, should avoid all stiffness and rigidity, and encourage individuality, freedom of movement and an intelligent understanding of the object and value of the training. Opportunities for explaining the object of the training, the effects of exercises, etc., should be taken while the men are resting between the exercises.

52. The instructor should avoid all loud shouting and noisy, impatient, discouraging and bullying methods of handling his class. A quiet encouraging manner, free from hesitation and indecision, is productive of the best results.

53. It must also be remembered that men are not all alike, but have different characters, temperament and capabilities, and that they require handling accordingly.

54. Care must be taken that men are not kept too long without being allowed to stand easy. They should *always* be ordered to stand easy while waiting for other men of the class to perform an exercise; but should be directed to watch their performances, and take note of the instructor's remarks and corrections in order that they in turn may profit by them.

55. The men should never be kept too long in one position, especially a constrained one. An exercise should never be performed so many times that it becomes wearisome, and the strength and endurance of the men should never be pushed to extreme limits. Great care must be exercised in this respect, and no exercise should ever be performed a greater number of times than can be accomplished without loss of style and position, or the otherwise good effects of the exercise will be counteracted.

56. Keeping in view the important principles of gradual and easy progression, the instructor must note that there should not only be progression in the amount and strength of the actual muscular work, but that there should also be progression in accuracy and precision of execution, and in activity and quickness of movement.

57. Before commencing a lesson the instructor must (keeping

in view the remarks on the use of the Tables in Section XIII) carefully study the Table to be performed.

During the lesson he should have a copy of the Table with him on a card for reference if required. The card should not, however, be consulted more than is necessary, and then only when the men are standing easy—*never* when they are at *Attention*, or performing an exercise.

Explanation and Illustration of Exercises.

58. The instructor, when giving explanations, should, as a rule, take up a position in which he can see every man in the class, and they can see him without moving or turning their heads very much from their front. He should not therefore be too close to the class, or too far away. This does not mean that he is always to remain stationary, but that he should place himself where he can, according to the circumstances, best control his men, and observe the performance of the exercises.

59. Explanations of exercises should only be given *when they are required*, and then only when the men are standing easy. They should not be made longer than can be helped, and should be given in simple language which can be easily understood by the men, and *not* in the words of the book.

In giving explanations a conversational tone should be adopted, and not a monotonous intonation, as if repeating a lesson.

60. It should, as a rule, only be necessary to give a full explanation of a *new* exercise, or of the *new portion* of an exercise, and the explanation should then be given, and the exercise illustrated, immediately before it is performed. The class should therefore be formed up or opened out ready for the exercise, apparatus in position, etc., as the case may require, before the explanation is given.

61. The most essential features of the exercise should be explained first, and, later on, the details may be added. Reference to too many details at one time is more likely to confuse the men than assist them.

62. Long explanations should not be repeated more than is absolutely necessary, although a certain amount of repetition is indispensible, in order that the men may thoroughly understand what is required of them. This repetition should, as a rule, take the form of a few words *reminding* the men of the special point to notice in the exercise, perhaps accompanied by an explanatory movement or position. A word or a sign is often quite sufficient for the purpose.

63. Exercises should be illustrated either by the instructor himself performing them, or by causing an assistant or a smart pupil to perform them.

Most new exercises should, as a rule, be set by the instructor himself, but in many instances an exercise can be better explained

and attention more easily drawn to its special features, by making an assistant or one of the class set it, while the instructor explains the details. And this method should always be adopted when the exercise involves assuming positions which are difficult to maintain while speaking, and from which it is impossible to see the class.

In setting "Free standing" exercises, the instructor or his assistant should face in the direction which will best enable the men to see the particular positions or movements, *e.g.*, facing the class, or turned sideways to it, as the case may require.

Correcting Faults.

64. The instructor should remember that exercises which are well known to *him*, and which have become easy by practice, are new and often difficult to the pupil. He must not, therefore, be impatient of faults, neither must he expect perfection of execution too soon. Any endeavour made to obtain correctness of execution too suddenly is contrary to all sound principles of physical training. Just as the progress of the recruit from week to week and month to month should be steady and gradual, so also should the correction of his faults in each exercise be gradual. All the faults in an exercise should not be corrected at once, but the most important faults should first be put right, and later on those of less importance. The capabilities of the men must be carefully observed, and judgment must be exercised in deciding when to exact perfection of execution and when to be satisfied with a reasonable attempt.

65. In order that the men may be enabled to recognise their own faults it is a good plan to train them to detect and correct each other's. They should also be instructed to bear their own special faults continually in mind, with a view to avoiding them as much as possible.

66. All minor corrections should be made at the time by mentioning the fault, or rather the correction, shortly to the whole class (*e.g.*, "Heads up," "Knees straight," "Stretch the arms fully," etc.), following this occasionally, if necessary, by mentioning the name of the man who is particularly at fault.

Some of the smaller corrections may occasionally be made by a touch of the hand, but it is a mistake to use this method of correction too frequently, and it should never take the form of "pulling the men about."

67. The more important corrections should be made when the men are standing easy, and never when they are in a constrained position. Should it be occasionally necessary *during* a complex exercise to make any considerable correction, or to give any additional explanation, the word **Rest** may be given at any convenient position; the men will then rest themselves easily, and pay attention to the explanation; on the word **Position** (preceded, if necessary, by a caution) they will resume the last position.

68. The best way of correcting a fault which is habitual, or which has arisen during the course of the lesson, is by the employment of corrective exercises (*e.g.*, **Head bending backward** for bad carriage of head and neck). It should be remembered that a fault is not fully corrected until the habit has been eradicated.

69. The lesser of two opposite faults may sometimes be permitted in order to correct the greater.

70. If a man requires special correction, involving considerable attention, he should be taken separately, so as not to waste the time of the others.

Words of Command.

71. A good method of giving the commands for the various exercises is all important if good results are to be obtained. The cultivation by an instructor of a good word of command is therefore essential.

72. A *good* word of command does not mean a *loud* one; on the contrary, a loud word of command is frequently a bad one, and is always bad when given to small classes.

73. Words of command should be regulated according to the requirements of the case. They should be sufficiently loud for every man in the class to hear clearly, and no louder. The pronunciation should be distinct, and the intonation and manner of giving the command should suit the particular movement required. In fact, the word of command should, as it were, help the men to perform the exercise.

74. Every command should consist of two parts—*cautionary* and *executive*.

The cautionary part of the command should contain short but clear information as to what is required and how it is to be done. It should, in fact, indicate as closely as possible the movement to be performed, and must therefore be given clearly and distinctly, so that there can be no doubt whatever as to what is wanted. The tone of voice and method of delivery should, however, convey the idea that a *command* is being given, as distinct from an *explanation*, and should prepare the men for the movement by making them, as it were, "lie in wait" for the executive word.

A monotonous tone should therefore be avoided, but a sharp or jerky pronunciation of any word in the cautionary part of the command, which might cause the men to move prematurely, should also be avoided.

75. The executive word is only required to mark the actual point of time at which the movement is to be executed. This word, or syllable, should be given sharply (not necessarily loudly) or smoothly, according to whether the movement is to be quick or slow.

76. A pause is necessary, and should always be made, between the cautionary and executive words, so as to give the men time to prepare the nerves and muscles for the movement. Such preparation should, however, be an inward one only, and should not

be visible to the eye. With beginners the pause should be rather longer than with more advanced men, as they take longer to prepare. It is occasionally useful to vary the length of the pause for advanced classes, in order to exercise their nerve control.

77. The command **As you were,** although occasionally useful to bring men back to a previous position, should not be used too frequently; but the proper command for returning to that position should be used in preference, to ensure greater smartness of execution.

78. Whenever the word of command does not sufficiently indicate the movement to be executed until the executive word is reached, it must be preceded by an additional caution indicating the exact nature of the exercise—*e.g.*, the commands **Left Foot outward—Place** and **Left Foot outward—Lunge** should be preceded by the cautions "*Foot placing*" or "*Lunging*" respectively.

79. The command **Halt** should be used when an exercise is being performed "judging the time," and it is required to stop in any particular position.

One-Sided Movements.

80. All one-sided movements will be commenced to the *left*, or with the *left* arm or leg, as the case may be, and will be performed an equal number of times to the *right*, or with the *right* arm or leg. Such exercises are, as a rule, for the sake of convenience, described under the various group headings and in the Tables for one side of the body, one leg or arm only, but apply equally to the other side.

Combined Movements.

81. Before taking an exercise, or assuming a starting position, which involves a combination of movements, each movement should have previously been taught separately as a distinct exercise.

When it is required to execute such combined movements *at the same time* the rule to be followed is—that the movements should be *completed* together, *e.g.* :—

(i) When combining a comparatively slow leg movement with a quick arm movement, the arm movement should not be commenced until the leg movement is nearly completed, so that they may both be finished at the same moment.

(ii) When the exercise consists of two movements of the arms and one of the legs, the first movement of the arms should first be taken without moving the legs, and the movement of the legs and the second movement of the arms should then be taken and completed together.

(iii) In all movements, or combination of movements, under the following headings, viz., "Leg"; "Neck"; "Arm"; "Trunk"; a distinct pause should be observed after each movement, *e.g.*, "Right turn"; "Foot placing sideways" (judging the time); "Arms stretching upward." The object of this is to emphasize control.

Prevention of Accidents.

82. The surest way of preventing accidents is a careful adherence to the principles of gradual progression.

The instructor must, however, be prepared to "save" men from hurting themselves whenever there is any possibility of their falling in the performance of an exercise. It is in the various Vaulting exercises that this is most likely to happen.

83. The instructor should stand on the far side of the horse, beam, etc., and be prepared to save the pupil by grasping the upper part of the body, *never the legs*, if there is any chance of his hurting himself, so as to save the fall.

In "saving," care must be taken that the performance of the exercise is not interfered with if there is a chance of its being done safely. The men should not, therefore, be "saved" unnecessarily.

84. It gives men confidence in the early stages of their training to know that the instructor is "standing by" to "save"; but it must be remembered that men should be trained to rely upon themselves, and to have confidence in their own powers. As the men gain confidence, strength and skill, the instructor should therefore gradually dispense with this assistance, only "standing by" for an occasional man who requires it.

85. A slippery floor, besides preventing the proper performance of exercises, is a continual source of danger, and great care should therefore be taken that the floors of gymnasia are not allowed to become slippery.

Massed Work.

86. Several classes may occasionally be taken together under one instructor; but it must be remembered that massed work is used, not for the purpose of regular instruction in details (which can only be properly given in small classes), but as a change from the ordinary class routine, and to see how the instruction has been conducted. New exercises should not, therefore, be given to massed classes, long explanations should be avoided and classes of different standing as regards their instruction should *not* be massed together.

Massed work, taken as here indicated, gives an idea of special importance to the training, and the men are therefore likely to put their best work into it. It should never be taken too frequently, or be continued for too long at a time. It is sometimes practical to take the Introductory and Final exercises of a Table in this way.

New Instructor taking over Partially Trained Class.

87. When a fresh instructor takes over a partially trained class he should repeat the last Table performed by the men before proceeding to the next; and if any considerable interval in their training has elapsed, it might be necessary to re-commence more gradually by repeating some of the earlier and easier work till the men are fit to carry on where they left off.

SECTION VI.

CLASS ARRANGEMENTS, ETC.

Formation of the Class.

88. The class will be formed for Physical Training in two ranks, each man occupying a front of 30 inches.

Each man in the rear rank will cover a man in the front rank, at a distance of two paces (60 inches from heel to heel), the two men thus forming a *file*.

The men will always fall in in the *Stand-at-Ease* position.

Falling In and Changing Position.

89. The instructor should occasionally place the right hand man in, or direct him to take up, a certain position, and give the command **Fall-in ;** the men will then fall in on the right-hand man, take up their dressing and stand at ease as quickly as possible, each man moving independently without jostling or noise.

This method of changing the position of a class or classes should frequently be employed, so as to save many of the purely "drill movements" of *turning*, *marching*, *halting*, etc., besides a considerable amount of time and a number of words of command.

Quitting Ranks and Re-Forming (Moving "Free").

90. Whenever the men fall out and re-form as above, or when individual men, files or fours leave their places in the ranks for any purpose whatever (*e.g.*, to perform an exercise, to move apparatus, etc.), they should invariably move at a "free" double the shortest and easiest way, as quickly and smartly as possible, running lightly on the toes, maintaining a good carriage, and carefully avoiding all slouching, heaviness of movement, stiffness and constraint. By the adoption of this practice the men are trained to habits of quickness, activity and easy movement, and the value of the day's lesson is thereby enormously increased.

Men returning to their places after performing an exercise will (moving freely, as described above) pass by the flank and rear of the class, and, on reaching their places in the ranks, will halt and stand at ease smartly, and then stand easy without making any unnecessary turnings, or introducing superfluous "drill movements."

The word "free" is applied to all movements made with the freedom, combined with smartness, described in this paragraph; and when a position or an exercise is ordered to be taken "free," the position should be assumed direct or the exercise performed freely without precise adherence to the detailed movements.

Moving "free" must not, however, be confused with the "Free standing exercises," which is the term applied to all exercises which are performed without apparatus.

Before leaving his place in the class to perform an exercise, etc., each man will spring to Attention.

Position of Attention.

91. Heels together and in line. Feet turned out at an angle of about 45 degrees. Knees straight. Trunk erect, and carried evenly over the thighs with the shoulders (which should be level, and square to the front) down and moderately back—this should bring the chest into its natural forward position, without any straining or stiffening. Arms hanging easily from the shoulders as straight as the natural bend of the arm when the muscles are relaxed will allow, but with the hands level with the centre of the thighs. Wrists straight. Palms of the hands turned towards the thighs, and the heel of the hand and the inside of the finger tips lightly touching them, fingers hanging naturally together. Neck erect. Head balanced evenly on the neck, and not poked forward, eyes looking their own height and straight to the front.

The weight of the body should be balanced on both feet, and evenly distributed between the fore part of the feet and the heels.

The breathing must not in any way be restricted, and no part of the body should be either drawn in or pushed out.

The position is one of readiness, but there should be no stiffness or forced unnatural straining to maintain it.

Common faults.

i. Neck allowed to incline forward. ii. Shoulders *forced* back. iii. Shoulders raised. iv. Shoulders (from slackness) allowed to fall forward. v. Small of the back unduly hollowed. vi. Abdomen protruded. vii. Abdomen drawn in. viii. Hips drawn back. ix. Elbows sticking out. x. Backs of the hands to the front. xi. Elbows held too far back. xii. Body and arms stiffened. xiii. Breathing restricted.

N.B.—It should be noted that a correction of the carriage of the neck will usually have the effect of correcting the carriage of the whole body.

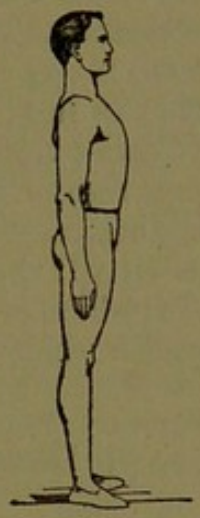
It must also be noted that a Recruit who has had no previous training cannot be expected to obtain this or any other position correctly at once, and that attempts to correct his positions too suddenly are certain to have injurious rather than beneficial effects. The principle of gradual and not forced or hurried progression should therefore be most carefully kept in view, and the instructor must

be satisfied with any improvement, however slight, providing it is steadily and gradually maintained.

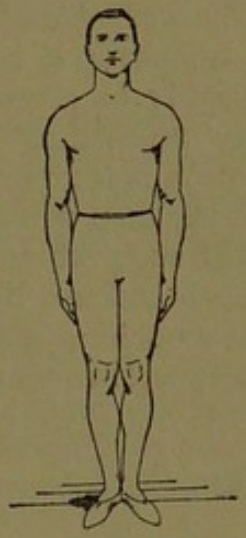
It will be found to be of material assistance in training men to obtain a good position, and a correct carriage of the whole body, to direct them, during the first few weeks of their physical training, to stretch the arms and fingers fully downward when assuming or returning to the position of Attention. This downward stretching of the arms should be considered as an *exercise* which is only intended to be used during instruction in physical training to improve the carriage of the shoulders, head and trunk.

Incorrect.
Fig. 1.

Incorrect.
Fig. 2.



Correct.
Fig. 3.



Correct.
Fig. 4.

92. **Standing at ease.**

Stand at—Ease ... Keeping the legs straight, carry the left foot about one foot-length to the left so that the weight of the body rests equally on both feet, at the same time carry the hands behind the back and place the back of one hand in the palm of the other, grasping it lightly with the fingers and thumb, and allowing the arms to hang easily at their full extent. (It is immaterial which hand grasps the other.)

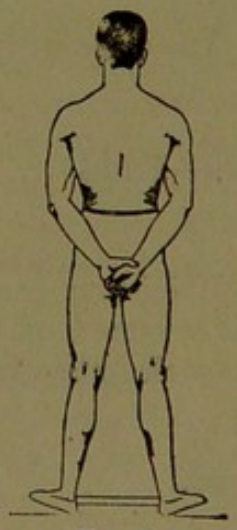


Fig. 5.

This position must be taken by the Recruit whenever he falls in for instruction.

Atten—tion ... ... { Spring up to the position of Attention described in paragraph 91.

93. Standing easy.

Stand—Easy ... ... { The men will be permitted to move freely without quitting their ground.

The word *Stand Easy* should be given whenever a rest is required, and whenever it is necessary to give any explanations. It should invariably be given when, for any reason, a class is obliged to wait before proceeding with the instruction, or when the Instructor's attention is temporarily called away from his class. On the caution *Class* the men will at once resume the *Stand-at-Ease* position.

Although when standing easy the freedom of movement of the limbs should not be restricted, the men should never be allowed to adopt slouching attitudes which would tend to counteract the value of the exercises employed in their training.

94. Dressing.

Right—Dress ... ... { The men in the front rank, except the right hand man, will turn their heads to the right, and move by short quick steps, as necessary, until they are all in line, each man occupying 30 inches of front. The men in the rear rank will look straight to their front, and will cover their front rank men correctly at two paces distance.

The class will be dressed by the left in like manner.

Eyes—Front ... ... { As soon as the dressing is correct the Instructor will give the word, and each man will turn his head and eyes smartly to the front.

Whenever ranks are closed after having been opened the men will at once look to the *right*, take up their dressing from that flank, and look to the front again without word of command.

95. Numbering.

In twos—Number ... { Without turning the head the front rank will number—*One, Two, One, Two,* and so on from right to left.

96. Stepping forward, backward and sideways.

One pace forward—March — Take a full pace of 30 inches forward with the left foot, carrying it close to the ground and pointing the toe downward, place it on the ground toe leading and close the right foot to it smartly without stamping.

One pace step back—March — Take a full pace of 30 inches backward with the left foot, and close the right foot to it without stamping.

One pace to the left—March (used only in Open Ranks) — Take a full pace of 30 inches to the left with the left foot, place it on the ground toe leading and close the right foot to it smartly without stamping, keeping the legs straight.

A pace may be taken to the right in like manner.

In stepping forward, backward and sideways the body must be kept erect, but should be carried evenly *with* the foot and *not after* it.

Two or more paces may be taken forward or backward as described above, the heels being closed only on the completion of the last pace.

In taking two or more paces *sideways*, each pace will be taken as described above, except that the heels will not be brought to the ground until the completion of the final pace.

97. Opening and closing ranks.

Open ranks—March ... — The "Ones" of the front rank will step forward two paces, the "Twos" of the rear rank will step backward two paces, and as soon as the paces are completed the whole (except the left hand man of each rank) will look to the *right* and correct their dressing quickly, looking to the front again as soon as it is correct without word of command.

Re-form ranks—March — The "Ones" of the front rank will step backward two paces, the "Twos" of the rear rank will step forward two paces, and as soon as the paces are completed the class will dress quickly by the RIGHT, and look to the front without word of command.

Should it be necessary at any time to take still more space in the ranks, the following method of opening out will be adopted :—

To the left to full (half) arm interval —Extend — The file on the right will remain still, and the remainder will move outward from that flank as rapidly, smartly and lightly as possible. Each man in the front rank will, as soon as he obtains his approximate interval, raise his right hand, arm and fingers extended horizontally palm downward, look to the right and dress at full arm interval from the man next him. The rear rank will cover correctly. (If half arm interval is ordered the hand will be placed on the hip instead of the arm being extended.)

The extension may be made to the right in like manner.

Eyes—Front ... ... — The arms will be lowered smartly to the side without noise, and the whole will look to the front.

The ranks will then be opened as described above on the command **Open ranks—March,** and re-formed again on the word **Re-form ranks—March.**

On the right—Close ... — The file on the named flank will remain still, and the remainder will close to that flank as rapidly and smartly as possible, take up their dressing and look to the front without further word of command.

When the men have rifles the extension before opening ranks will always be from the *left*.

Formation of Class for "Free Standing Exercises."

98. Some exercises are better performed with the ranks opened out as described above, facing the original front, but most of the "Free standing exercises" should be taken with the ranks opened out in this manner (without extending to full arm interval), and turned to the right or left. After turning the opened ranks, the word **Cover** should, as a rule, be given, and each rank will then cover quickly by the front and remain still.

When it is necessary to perform an exercise with assistance, such as *Foot support*, etc., and with the ranks opened and facing the front, the "Twos" should be directed to step sideways one pace to the right, so as to cover the "Ones."

99. **Turnings.**

Turning to the right—One	Keeping both knees straight and the body erect, turn to the right on the right heel and left toe, raising the left heel and right toe in doing so. On the completion of this preliminary movement, the right foot must be flat on the ground and the left heel raised, both knees straight and the weight of the body, which must be erect, on the right foot.
Two	Bring the left heel smartly up to the right without stamping the foot on the ground.
Right—Turn	Turn smartly as above, observing the two distinct movements.
Turning to the left—One	Turn to the left, as described above, on the left heel and right toe, the weight of the body being on the left foot on the completion of the movement.
Two	Bring the right heel smartly up to the left without stamping the foot on the ground.
Left—Turn	Turn smartly to the left, as above, observing the two distinct movements.
Turning about—One. Two About—Turn	Turn fully about to the right, as described for the *Right turn*, by numbers or judging the time as required.
Right (left)—Incline	As above described, but turning half right or left.

100. **Changing places.**

When the men of a class are at open intervals, with the rear rank covering the front rank, or the " Twos " covering the " Ones," at two paces distance, the places may be changed as follows :—

Changing places—One	The " Ones " (or the front rank men, as the case may be) will take a full pace diagonally backward to the left rear and close the heels, and, at the same time, the " Twos " (or the rear rank men) will take a full pace diagonally forward to the right front and close the heels. The two men, on the completion of this preliminary movement, will be in line with one another, midway between the places they originally occupied.

Two — The "Ones" will take a full pace diagonally backward to the right rear, and the "Twos" will, at the same time, take a full pace diagonally forward to the left front.

Places—Change — The places will be changed, judging the time, in two movements, as described above, care being taken that the heels are closed on the completion of the first movement.

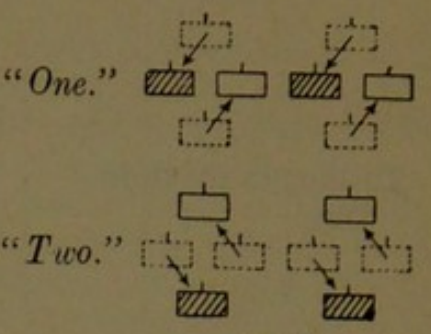


Fig. 6.

Places will be again changed to the original positions in the same manner, the man in front moving to the rear by the left, and the man in the rear moving to the front by the right.

Class Arrangements for Apparatus Work Generally.

101. The arrangements given in the following paragraphs have been drawn up with the object of providing a simple method of arranging for the performance of exercises on apparatus by individuals, files, fours or ranks of a class, without confusion, and, at the same time, avoiding the introduction of complicated "drill movements," which necessitate the learning of many small and unimportant details, and which require much time for practising to ensure their correct performance, time which can ill be spared from the legitimate training.

It will be seen that the arrangements at the various apparatus all follow the same principles, and provide for the usual situations that arise. Rapidity of performance and freedom of action has been aimed at without confusion or loss of control.

Each gymnasium may require certain special arrangements to suit the apparatus it contains, but the same principle of simplification should be kept in view when dealing with these cases, and the invention and introduction of fancy and elaborate drill movements is prohibited.

When the method of coming out from and returning to the places in class for the performance of individual exercises is thoroughly understood, the men may, if required, be ordered to follow each other in like manner without word of command.

Class Arrangements at Jumping Standards, etc.

102. The class will be drawn up, standing easy, in two ranks, facing the jumping standards, parallel to the rope and about 8 paces from it.

Individual jumping.

First—File	The first file will spring to *Attention*.
No. 1—Ready ...	The right hand man of the front rank will move out as quickly as possible at a "free" double, and place himself facing, and 4 paces from, the centre of the rope, his rear rank man at the same time taking his place in the front rank.
Jump	No. 1 of the front rank will jump as ordered, and remain at *Attention* on the far side of the rope, at the same time No. 1 of the rear rank will place himself 4 paces from the centre of the rope.
Next—Jump	No. 1 of the front rank will take 3 paces forward in quick time, turning to the *right* on the third pace, and, breaking into a "free" double, return to his place in class, halt, stand at ease and stand easy. No. 1 of the rear rank will jump as described, No. 2 of the front rank placing himself in a similar manner 4 paces in front of the centre of the rope, and so on till the whole class has performed the exercise, each man returning to his place by the right flank and rear of the class, the last man receiving the word **Fall in.**

Jumping by files or fours.

First—File or **First 2—Files**	The named file or files will spring to *Attention*.
Ready	As before, but the rear rank men will place themselves on the left of their front rank men, the file, or files, extended in single rank with one pace clear interval, and 4 paces from the rope.
Jump	As before, the men retaining their interval and jumping together, and the next file, or 2 files, taking their places in front of the rope.

Next—Jump ... ... The first file, or 2 files, will take 3 paces forward in quick time, turn to the right, and double back to their places, passing by the *right* flank and rear of the class, each man halting, standing at ease and standing easy independently but smartly, as before described; at the same time the next file, or two files, will act as above, and so on.

A succession of jumps may be taken, when the men have attained reasonable proficiency, by arranging rows of benches across the gymnasium, 5 paces between each row. The jumping will then be by fours, as above, each section of fours acting as described. When the first section of fours is at *Attention*, after having taken the first jump, the word **Jump** will be given as a command for them to take the second jump, and for the second section of fours to take the first jump, and so on.

Class Arrangements at Vaulting Horse.

103. The arrangements and words of command for them will be the same as those described for jumping over the rope by single men, except that the class will be drawn up at about 10 to 12 paces from the Horse, each man, when coming out to perform an exercise, will place himself one pace in front of the class, and the executive word for commencing the exercise will be **Go** instead of *Jump*. Those exercises on this apparatus in which the man does *not* remain stationary on the horse may be performed by the men following one another in quick succession, in which case the command will be given when No. 1 is in position ready to perform the exercise—**In quick succession—Commence.** Each man will then come out from his place, perform the exercise, and return to his place again, in the manner described above, except that he will start his "run down" for the exercise without word of command at about the moment the man in front of him "takes off," and, on "landing" after the exercise, he will without pause *double* forward for the 3 paces instead of taking them in quick time. An exercise should not, however, be taken "in quick succession" until it can be performed satisfactorily, and there must be no scrambling or carelessness about its execution.

The principle of taking exercises "in quick succession" may be applied with advantage to many other Jumping and Vaulting exercises (*e.g.*, *Jumping over rope*, *Heaving jumps*, *Vault with Foot assisting* "*taken free*," etc.).

Class Arrangements at Beam.

104. The class will, as a rule, be drawn up parallel to the beam and about 5 paces from it. The arrangements will then be similar to those described for jumping the rope, except as follows :—

When the exercises are performed individually, the waiting man will place himself 2 paces from the beam (4 paces from it if a run is required). Each man, after having recovered to *Attention* on the completion of an exercise, will place himself, as quickly as possible, moving "free," on the far side of the beam (if he is not already there), one pace from and with his back to it; he will then take the usual 3 paces forward in quick time, and return to his place at a "free" double, as before described. The men may also, if required, be directed to form up on the opposite side of and facing the beam, in a similar manner after completing the exercise.

By files or fours.

First—File or **First 2—Files**	The named file or files will spring to *Attention*.
Ready	The named files will double out as before described, and place themselves at once in position for the exercise.

Then after the completion of the exercise—

Next—File or **Next 2—Files**	The next file or files will spring to *Attention*, and, at the same time, the men who have just completed the exercise will place themselves as rapidly as possible, moving "free," on the far side of the beam (if they are not already there), as described above.
Ready	The next file or files will double out, and place themselves in position for the exercise, and, at the same time, the men who have just completed the exercise will take 3 paces forward in quick time, as usual, and return to their places at the double, as before described.

When it is required to perform a Heaving exercise at the beam "*with assistance*," the following arrangement will be adopted :—

First 4—Files ...	The named files will spring to *Attention*.
With assistance, under the beam—Ready	The named files will double out and place themselves in the required position under the beam.

The positions taken up and the subsequent procedure will be as described for the Iron Bar (*vide* para. **106**), except that after the rear rank has completed the exercise there will be no necessity to again change the ranks; but on the word **Next 4—Files** the men who have performed the exercise will place themselves in single rank (front rank man on the right of his rear rank man) one pace from and on the far side of the beam, as before described, and will then return to their places as usual on the next word **Ready.**

Class Arrangements at Climbing Ropes.

105. The arrangements will be similar to those described for the beam, etc., except that when a man who has landed with his feet on the ground, and is still grasping the rope, after having performed an exercise, he will wait in that position until the word **Next 2—Files** is given. He will then place himself on the side of the rope farthest from the class, with his back to and one pace from it, and will return to the class on the next word **Ready** by taking three paces forward, turning and doubling, etc., as before described.

Class Arrangements at Iron Bar.

106. The class will be formed up with the front rank under the bar.

To the left, 2 files to each section—Extend	The class will extend as described for extending to full arm interval (except that the arm will not be raised, and the men will look to their front as soon as extended, without command), two files between each set of supports.

The extension may also be to the right, and, if room is available, with three files between each set of supports.

On the bar with assistance—Ready	The rear rank, moving "free," will close up to the front rank, and, with *Feet astride*, will seize them by the waist, fingers to the front, thumbs to the rear.
Overgrip (undergrip, etc.)—Up	With the assistance of the rear rank, the front rank will spring up and grasp the bar as ordered, and the rear rank will then at once transfer their grasp to the knees.

The exercise may then be performed with the rear rank assisting on the caution, **With assistance,** or the rear rank may be ordered to stand clear.

Stand—Clear	The rear rank will step back two paces, taking care to prevent the front rank from swinging as they quit the grasp of their knees.

The places will then be changed, and the exercise performed by the rear rank.

For exercises performed with *crossgrip grip* all the men will be under the bar in single rank facing the right, each rear rank man behind his front rank man; and instead of changing places after the front rank has performed the exercise, the whole will be ordered to turn about. The word of command for the extension in this case will be, **To the left, 2 files to each section, to single rank —Extend,** followed by, **Right—Turn.**

To close the ranks they will be turned to the front and closed as usual.

Class Arrangements at Wall Bars.

107. The class in two ranks in close order facing the wall bars.

Front rank, back against bars—Ready	The front rank, moving "free," will double the shortest way direct to the bars, and place themselves, one man at each division, with their legs, back and head touching the bars, each man of the rear rank at the same time placing himself opposite and facing his front rank man, and 5 paces from him.

Should the word **with assistance** be given before the word **Ready,** each rear rank man will place himself close to his front rank man, and turned towards him, with his right side against the bars.

Front rank, facing the bars (etc. as required)—Ready	As above described, except that the front rank will place themselves a short arm's length from and facing the bars, or as ordered.
Places—Change or **Rear rank, same exercise—Ready, etc.**	The front and rear rank will change places, moving "free," and passing left arm to left arm, as quickly as possible, and the rear rank will prepare for or perform the exercise as ordered.

Supporting Feet.

108. When low support is required—

On the left Knee—Support	The rear rank, or the "Twos," as the case may be, will kneel down on the left knee, and grasp the feet of the front rank, or the "Ones," with both hands, keeping the arms and back straight. The position may also be taken on the right knee.

When higher support is required—

With Feet astride—Support { As above, except that the supporting rank will take the *Feet astride* position, keeping the arms, back and legs straight.

The front rank, or the "Ones," may be ordered to support the rear rank or the "Twos" in like manner.

SECTION VII.

DETAIL OF EXERCISES UNDER GROUP HEADINGS.

GROUP A.—LEG EXERCISES.

109. This group includes simple and easy exercises for the legs as distinct from the more violent exercises of marching, running, jumping, etc. The object and effects of these easy leg exercises, are as follows :—

They provide good starting positions for other exercises. They improve the control of the legs and increase the flexibility of their joints and the strength of their muscles. Many of them are also used as *supplementary leg exercises* after some of the stronger exercises for other parts of the body included in the " General Exercises " of the Table.

Being fairly easy these exercises are well suited for " Introductory " and " Final " exercises in the daily lesson.

They are subdivided as follows :—

1. Feet closing and opening.
2. Heels raising and Knee bendings.
3. Foot placings.
4. Lunging.

Starting Position.	Exercise.	Executive Word.	Detail.
110.	**Feet—Close** .... (Fig. 7.)	" *Close* "	Raise the toes and close the feet by pivoting on the heels, keeping the knees straight.
F. cl.	**Feet—Open** .... (Fig. 8.)	" *Open* "	Raise the toes and open the feet to the angle of about 45° as at Attention.
F. cl.	**Feet full—Open** .... (Fig. 9.)	" *Open* "	Raise the toes and open the feet to an angle of 90°.
111.	**Heels—Raise** .... (Fig. 10.)	" *Raise* "	Keeping the heels together, legs straight, body and head erect and well stretched, raise the heels from the ground as high as possible.
	(Heels)—Lower	" *Lower* "	Lower the heels evenly to the ground.
112. H. f., Hl. r.	**Knees—Bend** .... (Fig. 11.)	" *Bend* "	Keeping the heels together and the trunk and head erect, bend the knees outward till the thigh and lower leg form a right angle.
	(Knees)—Stretch	" *Stretch* "	Straighten the knees evenly and fully keeping the heels raised.

Common Faults.	Remarks.
110. (i) Raising the feet too high. (ii) Scraping the feet on ground. (iii) Swaying the body.	Used as a starting position for many Trunk exercises, the pelvis being better fixed than it is at Attention.
As above....	The normal position of the feet (normal foot-angle) when at Attention and unless otherwise ordered.
As above....	This is used as the starting position for Foot placing outward and for Lunging. *Note.*—Feet closing and opening may be used for correcting the angle of the feet whenever necessary.
111. (i) Heels not together. (ii) Knees bent. (iii) Body swayed and not kept erect and fully stretched.	An easy exercise for the calf muscles. Used as a starting position for all Knee bending. If the carriage of the men has been bad during other exercises, this may be taken instead of correcting each man.
(i) Heels lowered heavily.	
112. (i) Heels lowered and separated. (ii) Knees not sufficiently outward. (iii) Trunk and head not kept erect.	All Knee bending exercises have great effect on the extensor muscles and joints of the leg. Also used as *supplementary leg* exercises after strong movements of other parts of the body. Are a good preparation for jumping, and ought to be used frequently.
(i) Knees not fully stretched.	

Fig. 7.

Fig. 8.

Fig. 9.

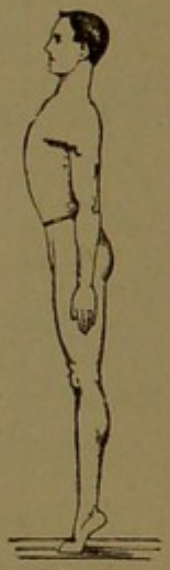
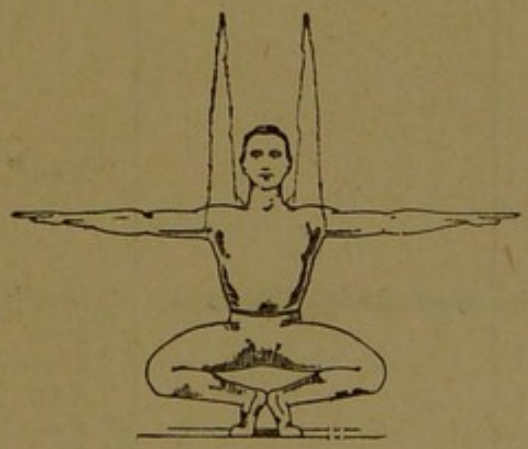


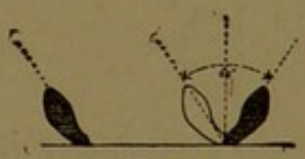
Fig. 10.

Fig. 11.

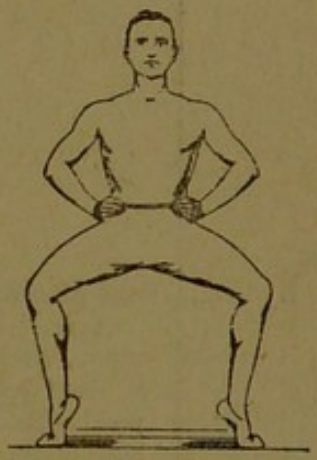
Starting Position.	Exercise.	Executive Word.	Detail.
113. H. f.	**Heels raising and Knees bending**	"*One*" .... "*Two*" .... "*Three*" .... "*Four*" or "*Commence*"	Hl. r. .... K. b. K. str. Hl. lower
114. H. f.	**Heels raising and Knees bending quickly**	"*One*" "*Two*" "*Three*" "*Four*" or "*Commence*"	As above, but each movement performed quickly
	(a) **Heels raising and Knees bending quickly with Arms stretching upward**	"*One*" .... "*Two*" .... "*Three*" .... "*Four*" or "*Commence*"	(*a*) Hl. r. and A. b..... .... K. b. and A. upw. str..... K. str. and A. b. .... Hl. lower and A. downw. str.
115. H. f. &c.	**Heels raising and full Knees bending** (Fig. 12.) *Note.*—The following movements can also be performed in the full K. b. pos. :— **Head turning quickly** or **Arms stretching sideways** (Fig. 13.)	"*One*" "*Two*" "*Three*" "*Four*" or "*Commence*"	As above, but knees bent as much as possible.
	(a) **Heels raising and full Knees bending, with Arms raising sideways and upward** (Fig. 13.)	"*One*" .... "*Two*" .... "*Three*" .... "*Four*" or "*Commence*"	(*a*) Hl. r. and A. sidew. r..... Full K. b. and A. upw. r. K. str. and A. sidew. lower. Hl. lower and A. downw. lower

Common Faults.	Remarks.
113. As above.	
114.	
As above, especially not fully stretching the legs.	
As indicated above and under A. str. upw. (*vide* para. **142**).	
115.	
As above....	Has increased effect on the muscles and flexibility of the ankle, knee and hip joints. Can also be performed quickly when a still stronger effect is required. Fig. 12.
As indicated above and under A. r. sidew. and upw. (*vide* para. **149**).	 Fig. 13.

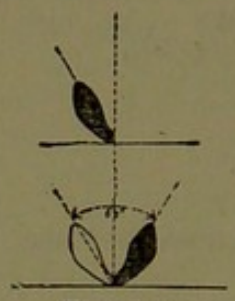
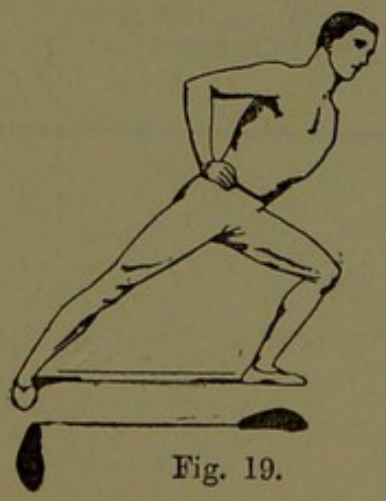
Starting Position.	Exercise.	Executive Word.	Detail.
116. H. f. &c.	**Feet astride—Place** .... (Fig. 14.)	"*One*"	Carry the left foot one foot-length to the left
		"*Two*" *or* "*Place*"	Carry the right foot one foot-length to the right
	Feet together—Place	"*One*"	Carry the left foot back to its original position
		"*Two*" *or* "*Place*"	Close the right foot to the left
	(a) **Feet astride with Arms stretching upward (sideways); or Feet astride Arms upward (sideways)—Stretch**	"*One*"	(*a*) As above and A. b. ....
		"*Two*" *or* "*Stretch*"	As above and A. upw. (sidew.) str.
117. H. f. &c.	**Left Foot sideways—Place** (Fig. 15.)	"*One*"	Keeping the knees straight, carry the left foot two foot-lengths to the left and place the toe on the ground, distributing the weight of the body evenly, and keeping the heel well raised.
		"*Two*"	Sink on the heel ....
	(Foot) inward—Place....	"*One*"	Without bending the knee, by raising the heel sharply and stretching the instep, lift the left foot off the ground, carrying the weight of the body on to the other foot without swaying, and, after a *momentary* pause, with the toe well pointed and poised about one inch immediately above the spot where it rested
		"*Two*"	Bring the left foot sharply back to its original position
118. H. f. &c.	**Foot placing sideways**	"*One*"	Left F. sidew. pl. ....
		"*Two*"	Left F. sidew. pl.
		"*Three*"	Pause.
		"*Four*"	F. inw. pl.
		"*Five*"	F. inw. pl.
		"*Six*"	Pause.
		"*One*," &c. .... *or* "*Commence*"	Repeat with right foot

Common Faults.	Remarks.
116. (i) Swaying the body. (ii) Altering the foot-angle	The body in the final position must be evenly balanced on both feet. Used as a starting position for many exercises, especially when combined with a double movement of the arms, *e.g.*, F. astr. A. upw. str.
As above	Fig. 14.
As indicated above and under A. str. upw. (sidew.) (*vide* para. **142**)	(*a*) Used as a starting position for many Span bending and Trunk exercises.
117. (i) Not taking sufficient distance. (ii) Bending the knees. (iii) Not carrying the body with the foot	All Foot placings are taken as Easy Leg exercises for the purpose of giving control of the limbs.  Fig. 15. The positions are also used as starting positions for many exercises.
(iv) Lifting the toe too high and outward	Fault (iv) can be cured by practising the first movement of " Foot inward —Place " by itself and allowing the recruit to watch his foot.
118. As above	The Metronome set at 112 gives the cadence.

Starting Position.	Exercise.	Executive Word.	Detail.
A. b.	(a) **Foot placing sideways with Arms stretching sideways (upward)**	As above	As above. The arm movements finishing at the same moment as "*One*" and "*Five*"
119. H. f.	**Foot placing sideways and Heels raising**	"*One*" } "*Two*" }	As in F. pl. sidew.
		"*Three*"	Hl. r.
		"*Four*"	Hl. lower.
		"*Five*" } "*Six*" }	As in "*Four*" and "*Five.*" F. pl. sidew.
		"*Seven*"	Pause.
		"*One, &c.,*" or "*Commence*"	Repeat with right foot.
120. H. f.	**Foot placing sideways and Heels raising and Knees bending** (Fig. 16.)	"*One*" } "*Two*" } "*Three*" } "*Four*" } "*Five*" } "*Six*" } "*Seven*" } "*Eight*" } "*Nine*" or "*Commence*" }	Similarly to 119 adding two movements for the additional "Knees bending."
121. H. f., F. full o.	**Left Foot outward—Place** (Fig. 17.)	"*One*"	Slightly bending the knee carry the left foot two foot-lengths outward in the direction in which the toe is pointing, and place the toe on the ground, keeping the heel raised as high as possible with the knee straight and distributing the weight of the body evenly.
		"*Two*"	Sink on the heel.
	(Foot) inward—Place....	"*One*"	Keeping the knee straight push off the ground with the outward foot without swaying the body and after a *momentary* pause—
		"*Two*"	Bring the foot sharply back to its original position.

Common Faults.	Remarks.
As indicated above and under A. str. sidew. (upw.)	(*a*) This is a combination of a comparatively slow movement of the legs with a quick movement of the arms. The arms should not therefore be moved at the commencement of the leg movement, but both movements should be completed at the same time, *i.e.*, as toe reaches ground and as heels come together. As an advanced exercise the arms may be stretched with "*One*" and "*Four*," bent with "*Two*" and "*Five*." The exercise has therefore an excellent effect on the nervous system.
119. As above and not raising the heels sufficiently.	
120. As before, especially lowering the heels when bending the knees.	Has stretching effect on the adductor muscles of the thigh. N.B.—The word "stretching" as used here and hereafter in a similar connection means that the muscles are stretched normally and *not* that they are strained beyond their normal limit.  Fig. 16.
121. (i) Keeping the knee stiff. (ii) Not carrying the body with the foot.	Fig. 17.
(i) Bending the rear knee. (ii) Swaying the body.	

Starting Position.	Exercise.	Executive Word.	Detail.
122. H. f., F. full o.	**Foot placing outward**	"*One*" "*Two*" "*Three*" "*Four*" "*Five*" "*Six*" or "*Commence*"	Similarly to F. sidew. pl. (para. 118).
123. H. f.	**Left Foot forward—Place** (Fig. 18.)	"*One*"	Slightly bending the knee carry the left foot two foot-lengths straight to the front, without altering the foot-angle, distributing the weight of the body evenly.
		"*Two*"	Sink on the heel.
	(Foot) inward—Place	"*One*"	Keeping the knee straight push off the ground with the forward foot without swaying the body and after a *momentary* pause—
		"*Two*"	Carry the foot back to its original position.
124. H. f.	**Foot placing forward** .... *Note.*—When F. pl. outw. or F. pl. forw. is used as a starting pos., the position of the feet may be changed (in two movements) on the word **Feet—Change.**	"*One*" "*Two*" "*Three*" "*Four*" "*Five*" "*Six*" or "*Commence*"	Similarly to F. pl. sidew. (para. 118).
125. H. f., F. full o.	**Left Foot outward — Lunge** (Fig. 19.)	"*Lunge*"	Keeping the right foot flat on the ground and the right leg straight, incline the body and lunge outward, with the left leg three foot-lengths in the direction in which the toe is pointing, left knee bent over the instep and the trunk in line with the right leg, the body and head maintaining the same relative position as at Attention.
	Foot inward—Place	"*Place*"	Keeping the right leg straight, press sharply from the ground with the left foot and resume the starting position for the Lunge.

Common Faults.	Remarks.
122. As above	
123. As in F. pl. outw. also (i) Foot placed too much outward (ii) Foot placed not far enough to the front.	
As in F. pl. outw.	 Fig. 18.
124. As above	
125. (i) Lunge too short and in a bad direction. (ii) Front knee not bent enough. (iii) Rear foot not flat on ground. (iv) Rear leg bent. (v) Trunk not in line with the rear leg. (vi) Trunk turned	Lunging is a fairly strong leg exercise, bringing a large number of muscles into play, especially the extensors of the leg. Outward lunging is also used as a Lateral exercise and is therefore again referred to under that group heading (*vide* paras. **215** and **216**).
(i) Bending the rear leg. (ii) Swaying the body	 Fig. 19.

Starting Position.	Exercise.	Executive Word.	Detail.
126. H. f., F. full o.	**Lunging outward**	"*One*" .... "*Two*" .... "*Three*" .... "*Four*" or "*Commence*"	Left F. outw. lunge .... F. inw. pl. Right F. outw. lunge F. inw. pl.
127. H. f., F. full o.	**Left Foot forward—Lunge** (Fig. 20.)	"*Lunge*"	Lunge forward in the same manner as described in lunging outward, but keeping the same foot-angle with both feet as in the starting pos.
	Foot inward—Place	"*Place*"	Recover to the starting position in the same way as from the outward lunge.
128. H. f., F. full o.	**Lunging forward**	"*One*" .... "*Two*" .... "*Three*" "*Four*" or "*Commence*"	Left F. forw. lunge .... F. inw. pl. Right F. forw. lunge F. inw. pl.
129. H. f., F. full. o.	**Left Foot backward—Lunge**	"*Lunge*"	Take the position of forward lunge by carrying the left foot 3 foot-lengths backward and bending the right knee.
	Left Foot inward—Place *Note.*—In all Lunging exercises the position of the feet may be changed (in two movements) on the word **Feet—Change**	"*Place*"	Recover to the starting position by bringing the left foot forward

Common Faults.	Remarks.
126. As above.	
127. As in lunging outward, also altering the foot angle.	Also used as a Dorsal exercise and is therefore again referred to under that group heading (*vide* paras. **241** and **243**).
As above.	
128. As above.	
219.	

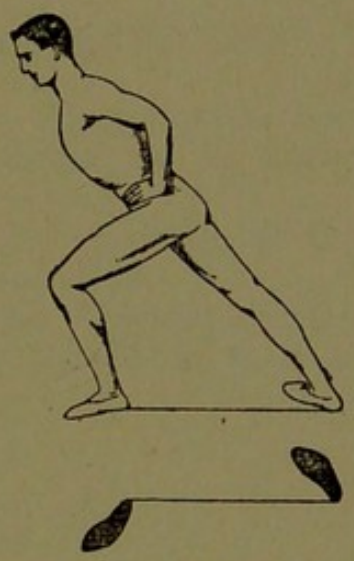


Fig. 20.

GROUP B.—NECK EXERCISES.

130. Although the exercises in this group are few and simple, they are very important, and should not be neglected. Their objects and effects are as follows :—

They develop the mobility and strength of the neck, and improve the carriage of the head and chest.

To obtain the full effect of these otherwise simple exercises the muscles employed should be contracted to their fullest extent without restricting the breathing.

Starting Position.	Exercise.	Executive Word.	Detail.
131.	**Head bending backward** (Figs. 21 and 22.)	"*One*"	Without altering the position of the trunk bend the head slowly backward, taking care that the chin is not poked forward
		"*Two*"	Raise the head slowly to its former position
132.	**Head bending forward**.... (Figs. 23.)	"*One*"	Stretching the neck upward and drawing the chin in, bend the head slightly forward
		"*Two*"	Raise the head slowly to its former position
133.	**Head bending sideways**	"*One*"	Bend the head slowly but strongly to the left keeping it well back during the movement and the face turned to the front
		"*Two*"	Raise the head slowly to its former position
		"*Three*"	Bend the head as above described but to the right
		"*Four*"	Raise the head slowly to its former position

Common Faults.	Remarks.
131. (i) Chin poked forward. (ii) Shoulders raised. (iii) Back hollowed. (iv) Breathing restricted	Used for correcting the position of the head (*vide* paras. **294** and **296**). Incorrect. Fig. 21. Correct. Fig. 22.
132. (i) Dropping the head forward on to the chest	This exercise should not be taken too soon, and it is not as a rule necessary to employ it very frequently. Fig. 23.
133. (i) Head dropped forward. (ii) Shoulder raised	Has stretching effect on the side muscles of the neck.

Starting Position.	Exercise.	Executive Word.	Detail.
134.	**Head turning**	" *One* "	Turn the head slowly but strongly to the left as far as possible
		" *Two* "	Turn the head slowly to its former position
		" *Three* "	Turn the head as described above, but to the right
		" *Four* "	Turn the head slowly to its former position
135.	**Head turning quickly**	" *One* " " *Two* " " *Three* " " *Four* "	As described above but performing each movement quickly

Common Faults.	Remarks.
134. (i) Head not kept erect. (ii) Shoulders not kept steady.	
135.	

GROUP C.—ARM EXERCISES.

136. The following are the objects and effects of the simple and comparatively easy movements of the arms which are included in this group of exercises.

They provide starting positions for various trunk exercises. They develop the mobility of the shoulder blades and joints of the arm. They improve the carriage of the upper part of the trunk and at the same time they strengthen the arms for harder work.

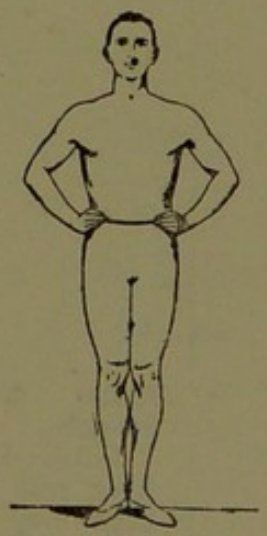
The Arm exercises are sub-divided as follows :—

1. Hips firm, Neck rest, etc.
2. Arm stretchings.
3. Arm raisings.
4. Arm swingings.
5. Arms flinging.

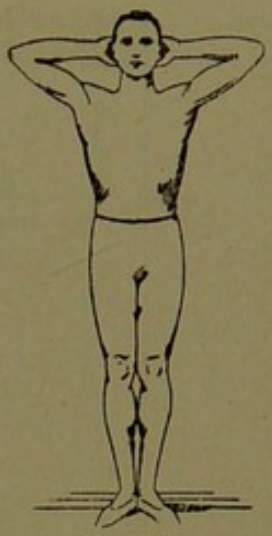
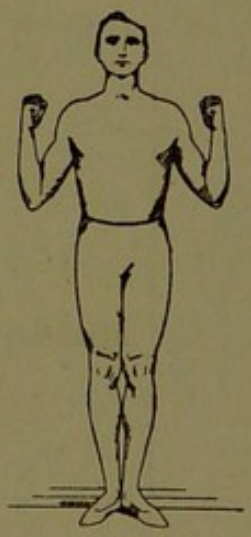
These sub-groups are employed in the following manner in the daily lesson (*i.e.* in a Table of exercises),—*Arm stretchings* and *Arm swingings*, being of an energetic nature, are used principally as "*Introductory exercises*" on account of their stimulating effect on the circulation and respiration, while the *Arm raisings* and *Arms flinging* are used as more moderate movements in the "*Final exercises.*"

The Arm exercises are a'so used in conjunction with other exercises to increase the effect of the latter.

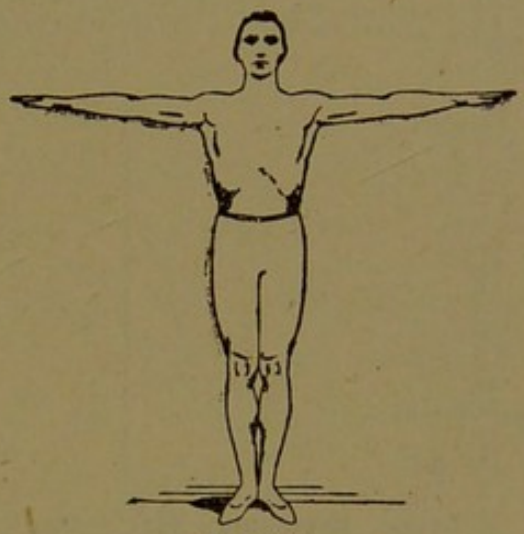
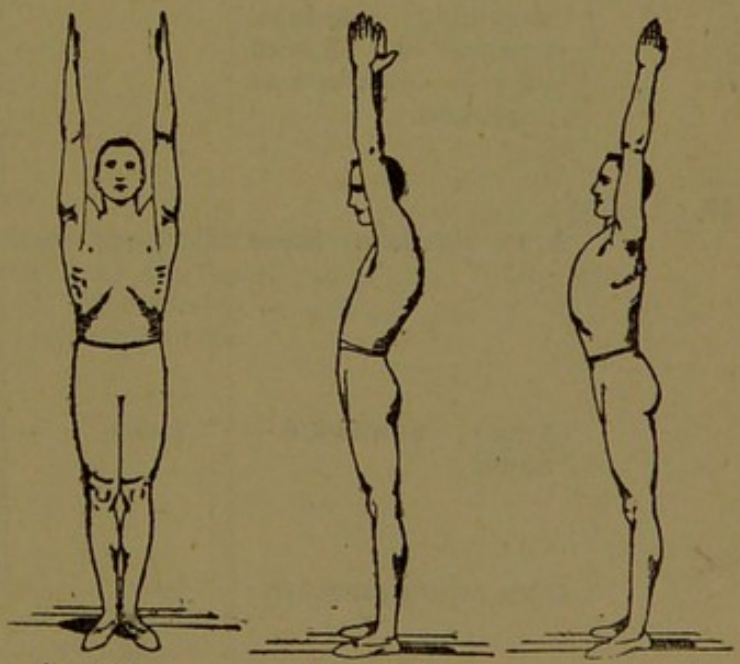
Starting Position.	Exercise.	Executive Word.	Detail.
137.	**Hips—Firm** .... (Figs. 24, 25 and 26.)	"*Firm*"	Raise the hands quickly and grasp the waist firmly just above the hips, fingers together in front and thumbs behind, palms pressed well down, shoulders kept in the same position as at Attention
	Hands—Down	"*Down*"	Lower the arms sharply to the sides the shortest way

Common Faults.	Remarks.
137. (i) Hands carried wide of the body during the movement. (ii) Heel of the hand away from the side. (iii) Hands too far back. (iv) Elbows pressed back. (v) Shoulders raised	Used as a starting position for a large number of exercises. Besides being convenient for the purpose of getting the arms out of the way of the legs, &c., in performing certain Trunk and Leg exercises, the position of Hips firm has the advantage of transferring the weight of the arms from the shoulders and upper part of the trunk to the hips, this giving rather more freedom to the chest walls. In addition, it has the effect of bracing the whole trunk for the various exercises with which it is employed. Incorrect. Fig. 24.
(i) Hands not carried close to the sides. (ii) Backs of hands turned forward.	 Correct. Fig. 25.  Correct. Fig. 26.

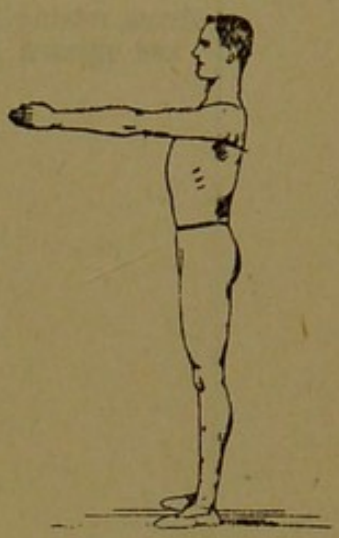
Starting Position.	Exercise.	Executive Word.	Detail.
138.	**Neck—Rest** .... (Fig. 27.)	" *Rest* "	Raise the hands quickly the shortest way and place them behind the upper part of the neck, finger tips just meeting, chest well raised, head erect and elbows pressed well back
	Hands—Down	" *Down* "	Lower the arms sharply to the sides the shortest way
139.	**Arms—Bend** .... (Fig. 28.)	" *Bend* "	Moving the elbows as little as possible from the sides, bend the arms quickly and energetically by carrying the hands the shortest way close up in front of the body till the forearms are fully bent on the upper arms, fists clenched and carried backward into line with the shoulders, the position of which should be maintained as at Attention, backs of the hands turned outward
	(Arms) downward—Stretch Note.—**Hips firm, Neck rest** and **Arms bend** may be taken from any position of the arms.	" *Stretch* "	Stretch the arms sharply downward to the sides

Common Faults.	Remarks.
138. (i) Head pushed forward. (ii) Elbows not pressed back enough	Used as a starting position for many exercises. Owing to the difficulty of maintaining the position correctly it should not to be used too early.  Fig. 27.
139. (i) Hands raised sideways in bending the forearms. (ii) Elbows forced backwards and points of the shoulders forward. (iii) Elbows too far from the body and not kept down. (iv) Head poked forward. (v) Small of the back hollowed. (vi) Finger nails turned forward	Used as the starting position for all Arm stretchings and many other exercises. As it is therefore used very frequently its correct performance is of the utmost importance. Care should be taken that the breathing is in no way restricted by forcing the elbows too close to the sides.  Fig. 28.

Starting Position.	Exercise.	Executive Word.	Detail.
140. A. b.	**Arms sideways—Stretch** (Fig. 29.)	"*Stretch*"	Stretch the arms sharply sideways in line with the shoulders, palms of the hand downward, fingers closed and fully extended
141. A. b.	**Arms stretching sideways**	"*One*" .... "*Two*" or "*Commence*"	A. sidew. str. .... A. b.
142. A. b.	**Arms upward—Stretch** (Figs. 30, 31 & 32.)	"*Stretch*"	Stretch the arms sharply upward to their fullest extent, hands the width of the shoulders apart, palms inward, fingers closed and fully extended
143. A. b.	**Arms stretching upward**	"*One*" .... "*Two*" or "*Commence*"	A. upw. str. .... A. b.

Common Faults.	Remarks.
140. (i) Hands not carried the shortest way. (ii) Hands lowered or not carried sufficiently back. (iii) Shoulders raised. (iv) Back hollowed	In addition to its use as an Arm exercise the position is often taken as a starting position for other exercises.  Fig. 29.
141. As above	
142. (i) Hands not in line with the arms. (ii) Palms not fully turned inward. (iii) Fingers not fully stretched. (iv) Arms not fully stretched. (v) Arms not far enough back. (vi) Head poked forward and back hollowed.	Owing to the attachment of the pectoral muscles to the humerus the ribs are raised considerably in the performance of this exercise. Also used as a starting position for many exercises so as to increase their effect. The correct taking of this position under all circumstances is a useful guide as to proficiency and progress.
143. As above	 Correct. Fig. 30. Incorrect. Fig. 31. Correct. Fig. 32.

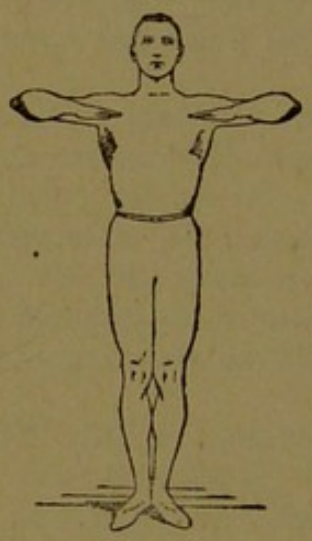
Starting Position.	Exercise.	Executive Word.	Detail.
144. A. b.	**Arms forward—Stretch** (Fig. 33.)	"*Stretch*"	Stretch the arms sharply forward in line with the shoulders, palms of the hands inward, fingers closed and fully extended, shoulders kept well back
145. A. b.	**Arms stretching forward**	"*One*" .... "*Two*" *or* "*Commence*"	A. forw. str. .... A. b.
146. A. b.	**Left Arm upward right Arm downward — Stretch** (Fig. 34.)	"*Stretch*"	Stretch the arms sharply as directed
	(a) **Arms—Change** .... Note. — **Arms stretching sideways, upward** or **forward** may be combined as required.	"*Change*"	(*a*) Bend the arms and stretch them in opposite directions
147.	**Arms sideways—Raise**	"*Raise*"	Raise the arms steadily sideways in line with the shoulders, palms of the hands downward, fingers closed and fully extended
	(Arms) downward—Lower	"*Lower*"	Lower the arms steadily to the sides
148.	**Arms raising sideways**....	"*One*" .... "*Two*" *or* "*Commence*"	A. sidew. r. .... A. downw. lower.

Common Faults.	Remarks.
144. (i) Allowing the shoulders to go forward. (ii) Rounding the back	This exercise is difficult to perform correctly, and should not, therefore, be employed too early.  Fig. 33.
145. As above	
146. (i) Trunk not kept upright. (ii) Head bent towards upward arm	Used as a starting position for some Lateral exercises.
As above	
147. (i) Shoulders raised. (ii) Hands not carried sufficiently back	*Vide* para. **295** with regard to the employment of *Arms raising* as Corrective exercises. Fig. 34.
148. As above	

Starting Position.	Exercise.	Executive Word.	Detail.
149.	**Arms raising sideways and upward**	"*One*"	A. sidew. r. ....
		"*Two*"	Turn the palms of the hands upward and immediately raise the arms to the A. upw. str. pos.
		"*Three*"	Lower the arms sideways to the level of the shoulders, keeping them well back and the palms of the hands turned upward.
		"*Four*" or "*Commence*"	Turn the palms downward and immediately lower the arms to the sides
150.	**Arms sideways and upward—Raise**	"*Raise*"	By a continuous movement raise the arms sideways and upward as described above, turning the hands steadily while the arms are passing the level of the shoulders
	(Arms sideways and downward)—Lower	"*Lower*" or "*Commence*"	Lower the arms to the sides by reversing the above movement
151.	**Arms raising forward upward sideways and downward**	"*One*"	Keeping the arms the width of the shoulders apart, raise them forward and continue the movement to the A. upw. str. pos.
		"*Two*" or "*Commence*"	Lower the arms sideways and downward
152.	**Arms swinging upward**	"*One*"	Swing the arms quickly, keeping them well stretched, forward and upward to the A. upw. str. pos.
	(Arms swinging downward)	"*Two*"	Swing the arms quickly forward and downward to the sides

Common Faults.	Remarks.
149. (i) Arms not kept far enough back during the movements	
150. As above	
151. (i) The full A. upw. str. pos. not taken before the arms are lowered when performed judging the time	
152. (i) Trunk thrown backward. (ii) Arms bent during the swing	Has a very strong stretching effect on the pectoral muscles.

Starting Position.	Exercise.	Executive Word.	Detail.
153. A. upw. str.	**Arms swinging downward and backward** (Fig. 35.)	"*One*"	As A. swg. downw, but continued backward as far as possible
		"*Two*"	Swing the arms to the A. upw. str. pos.
154. A. sidew.r.	**Arms forward—Bend** .... (Figs. 36 and 37.)	"*Bend*"	Without moving the upper arms and keeping the elbows well back, bend the forearms sharply forward and inward as much as possible
A. forw. b.	**Arms downward—Stretch**	"*Stretch*"	Stretch the arms sharply downward to the sides
155. A. forw. b.	**Arms Flinging** .... (Fig. 37.)	"*Fling*"	Without allowing the elbows to come forward, fling the arms vigorously sideways and backward to their fullest extent, keeping the palms of the hands downward, and immediately return to the position of A. forw. b.
		or "*Commence*"	Perform the A. fling. movement until ordered to stop, observing short pauses in the forw. pos.

Common Faults.	Remarks.
153. (i) Shoulders and trunk allowed to go forward	Fig. 35.
154. (i) Allowing the elbows to move forward and the hands to come too close together. (ii) Back too much hollowed	Used as the starting position for Arms flinging.  Fig. 36.
155. (i) Head poked forward. (ii) Flinging, not horizontal. (iii) Hands brought too close together in the recovery	Has a strong stretching effect on the pectoral muscles. Fig. 37.

GROUP D.—SPAN BENDING EXERCISES.

156. It should be noted that although the Span bending positions are very similar in appearance to the position of *Trunk bending backward*, the exercises and their effects are totally different. In the latter exercise the abdominal muscles, although stretched, actively prevent the upper part of the trunk from falling backward. In the Span bending, this support is provided by the wall bars, and the abdominal muscles are stretched passively by the active working of the dorsal muscles.

Span bending is specially useful for improving the carriage on account of its effect on the dorsal part of the spine, a portion of the body which, on account of its limited mobility, is difficult to act upon, and which if not exercised becomes stiff, thereby rendering the correction of the carriage still more difficult.

The apparent backward arching of the dorsal spine also means that the ribs are raised and somewhat spread apart and the capacity of the thorax correspondingly increased.

It is difficult to perform the Span bending exercises really well, but their correct performance should be most carefully aimed at as comparatively small faults very greatly lessen the effect.

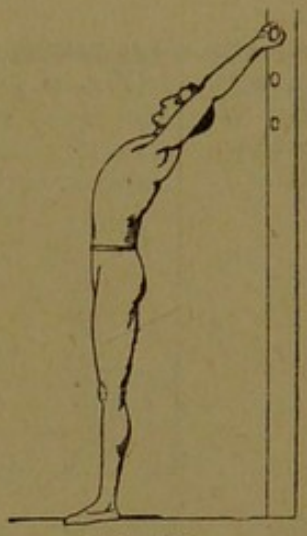
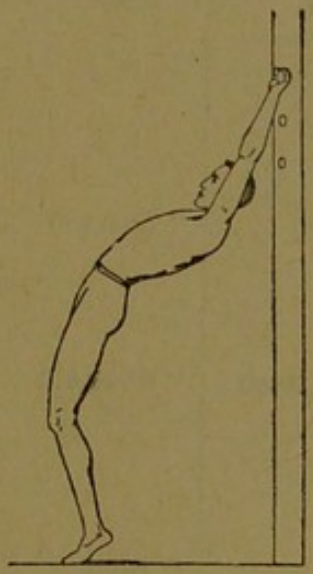
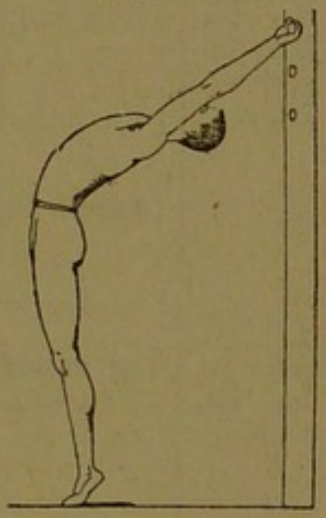
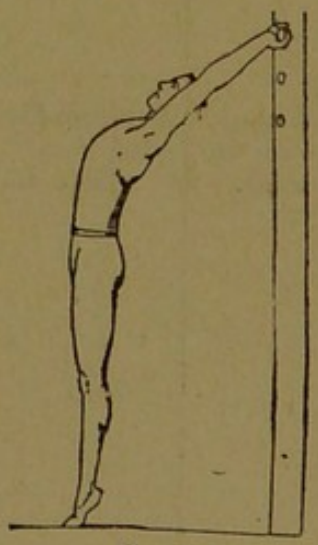
The difficulty of the exercises increases with the distance of the feet from the bars, and consequently as the bar grasped is lower, it is usually best to commence at one foot-length from the bars, and it is seldom advisable to perform the exercises at much more than two foot-lengths from them.

On account of a certain amount of difficulty in maintaining the natural breathing during Span bending, attention should be drawn to the fact that the breathing should not be restricted. The position should never be held long (not more than 30 seconds at most), the exercise should be discontinued at once in the case of a man showing any sign of effort, which is an indication that it is not being taken correctly, and more time than is absolutely necessary should never be taken up by correcting the men while holding the position.

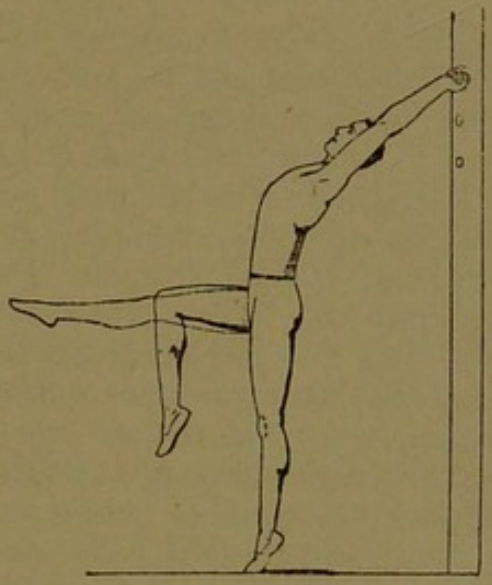
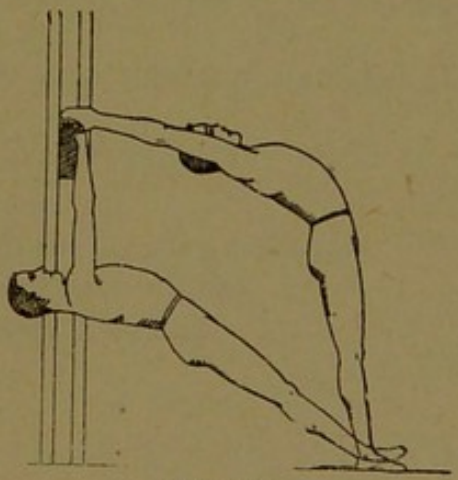
Span bending should as a rule be followed by *Trunk bending forward* and *Trunk bending downward*, and if the Span bending has been strong a *deflective leg exercise* should be used in addition.

Span bending is best performed with wall bars, but the beam or living support, or even an ordinary wall may be used.

Starting Position.	Exercise.	Executive Word.	Detail.
157. F. astr. A. upw. str., or A. swg.upw.	**Position for Span bending** (taken "free") (Fig. 38.) *Note.*—The position for Span bending having been learned by being taken "*free*," it should then be taken on the following words of command.	....	The trunk should be bent backward slightly and the whole body, bending from the ankle joints only, should then be made to fall backward in this position till the forefingers of both hands rest against one of the bars. A full grip with both hands should then be taken from below on as high a bar as possible the hands rather more than the width of the shoulders apart
F. astr. A. upw. str. or A. swg.upw.	(*a*) **Trunk backward—Bend**	"*Bend*"	(*a*) Stretching the body and arms upward as much as possible, bend the trunk slightly backward (*vide* para. **219**)
	Fall	"*Fall*"	Incline the body backward from the ankle joints without increasing the curve of the back till the hands are supported by the bars as described above
	Grasp .... (Fig. 38.)	"*Grasp*"	Grasp the highest bar possible with a full grip with both hands, wrists straight
158. Pos. for Sp. b.	**Heels—Raise** .... (Figs. 39, 40 and 41.)	"*Raise*"	Maintaining the position described above, raise the heels as far as possible from the ground
	Heels—Lower	"*Lower*"	Lower the heels to the ground

Common Faults.	Remarks.
157. (i) Hands grasping loosely. (ii) Wrists bent up or down. (iii) Arms bent. (iv) Arms not in prolongation of curve of trunk. (v) Head forward. (vi) Small of the back too much hollowed and abdomen protruded. (vii) Knees bent. (viii) Breathing restricted	The position for Span bending is better taken in this way in the first instance so that it may be properly corrected before being taken by word of command.  Fig. 38.
(i) Bending too much at the waist	 Incorrect. Fig. 39.  Incorrect. Fig. 40.
(i) As above. (ii) Shifting the feet in grasping	
158. As in pos. for Sp. b. but more accentuated	By raising the heels the length and the bend of the curve are increased and the effect of the exercise is proportionately greater.  Correct. Fig. 41.

Starting Position.	Exercise.	Executive Word.	Detail.
159. Pos. for Sp. b. with Hl. together. Hl. r.	**Leg raising forward** .... (Fig. 42.)	"*One*"	Keeping the knees straight and maintaining the Span bending position correctly, raise the left leg forward as high as possible, toe pointed
		"*Two*"	Lower the left leg to its former position
		"*Three*"	Raise the right leg as described above
		"*Four*"	Lower the right leg to its former position
160. Pos. for Sp. b. with Hl. together, Hl. r.	**Left Knee—Raise** .... (Fig. 42.)	"*Raise*"	Maintaining the correct Span bending position raise the left knee upward till the thigh is horizontal, the lower leg hanging straight downward toe pointed
	(Knee)—Lower	"*Lower*"	Lower the leg to its former position
161. Pos. for Sp. b., Hl. r., K. r.	**Leg forward—Stretch**.... (Fig. 42.)	"*Stretch*"	Keeping the thigh and the rest of the body as far as possible in the same position, stretch the leg and foot forward
	Knee—Bend	"*Bend*"	Bend the knee to the K. r. pos.
162. Fall hang. with undergr.	**Position for Span bending** (Fig. 43.)	"*One*"	By pressing strongly backward with the hands against the beam without moving the feet, raise the body forward up to the pos. for Sp. b. with palms inward, fingers extended and forefingers resting on the beam
		"*Two*"	Lower the body to the fall hang. pos.

Common Faults.	Remarks.
159.	This and the two following exercises have the effect of making the Span bending considerably stronger and should therefore not be taken until the latter is well mastered. They also have an additional oblique effect on the abdominal muscles.
160.	 Fig. 42.
161.	
162.	 Fig. 43.

GROUP E.—HEAVING EXERCISES.

163. Heaving exercises are those in which the body hangs by the hands from some apparatus, either without other support or with the weight partially taken by the feet.

They specially exercise the *heaving muscles.* These heaving muscles (situated for the most part on the trunk) draw the arms downward to the body, or, when the hands grasp a fixed object above them, draw the body up towards the arms.

When performed correctly they have a beneficial effect in developing the mobility of the thorax. On the other hand, if performed badly they merely develop certain muscles at the expense of the carriage of the body and of the mobility of the chest walls. Attempts to perform these Heaving exercises a large number of times very easily cause these injurious effects, with the possible addition of undue strain on the heart and lungs. Such practices must never be permitted, but correctness of position and style should be aimed at. Progression in these exercises should be very gradual, and it should be noted that as soon as it is found impossible to maintain the correct positions the limit of the usefulness of the exercise is passed.

The holding of the breath during these exercises, which is often a sign that the exercise is too strong for the pupil, should be specially guarded against.

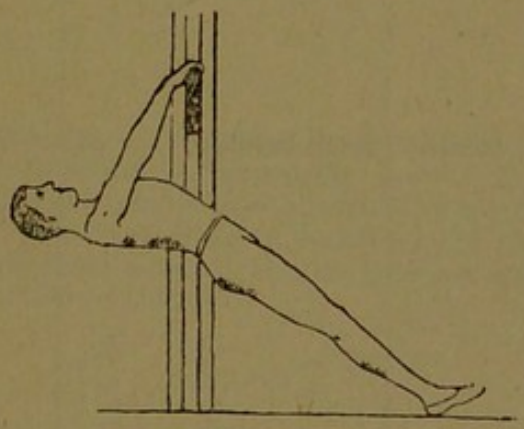
The strengthening of the flexor muscles of the arms, which is also one of the effects of the Heaving exercises, should be regarded as of minor importance.

Some of these exercises (*e.g.* rope climbing) are also of practical as well as of educational value.

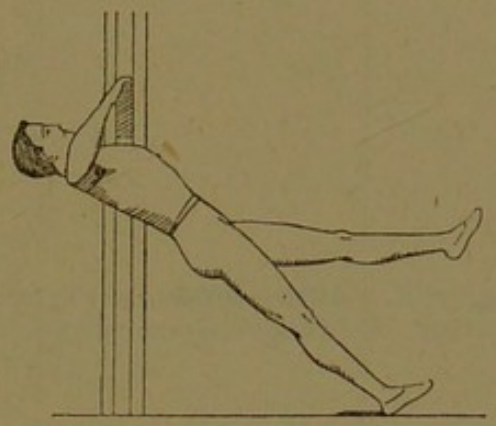
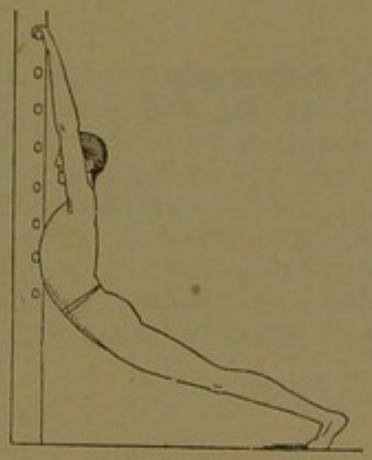
The subdivision of this group is as follows :—

1. Hanging positions.
2. Arms bending from hanging positions.
3. Travelling in hanging positions.
4. Climbing, Circling, Twisting.

Starting Position.	Exercise.	Executive Word.	Detail.
164. Short arm's length from and facing beam (wall bars)	**Beam (wall bar)—Grasp**	"*Grasp*"	Keeping the body steady grasp the beam quickly with the hands a little more than shoulder width apart
	(*a*) **With undergrip, beam—Grasp**	"*Grasp*"	(*a*) Take a short pace forward and at the same time pass the hands quickly underneath the beam and seize it with an undergrip with the hands rather more than the width of the shoulders apart, bending the trunk slightly forward if necessary
	Hands—Down	"*Down*"	Drop the hands to the sides
165. Beam grasp	**Fall hanging** .... (Fig. 44.)	"*One*"	Incline the body forward by bending the arms and raising the heels from the ground until the chest touches the beam, keeping the elbows well out
		"*Two*" or "*Down*"	Swing the legs forward and place the heels on the ground, at the same time lower the body evenly to the full extent of the arms. In this position the body and legs should be well stretched, the heels resting on the ground, feet closed, toes slightly pointed without stiffness, the weight of the body supported from the beam by the arms, which should be straight and at right angles to the body.
	On the Feet—Up	"*Up*"	By bending the arms and, if necessary, the knees, swing the feet backward under the beam and assume the beam grasp pos.

Common Faults.	Remarks.
164.	
....	Used as a starting position for many exercises. In the case of the wall bars the height to be grasped should be mentioned as a caution.
....	(*a*) Used as a starting position for several exercises.
165.	
....	Used as a starting position for several exercises. Has an excellent effect on the muscles of the back and shoulder blades and a consequent corrective effect on the carriage.
(i) Legs swung too far forward. (ii) Sliding the feet along ground. (iii) Heads poked forward. (iv) Seat dropped. (v) Shoulders allowed to go forward	 Fig. 44.
(i) Sliding the feet along the ground	

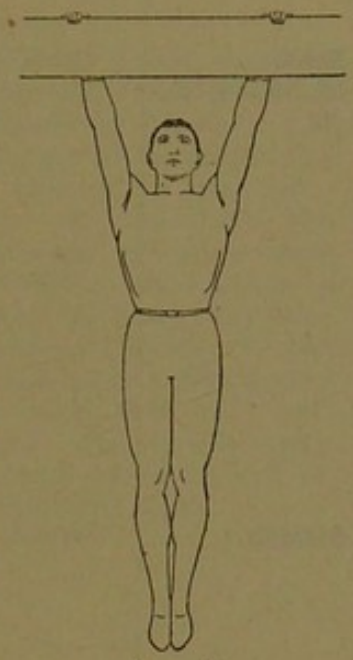
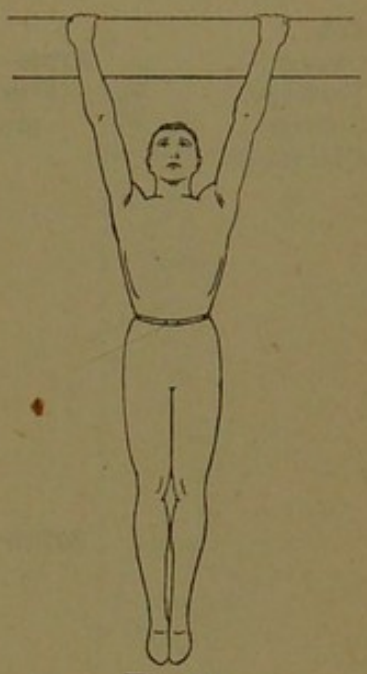
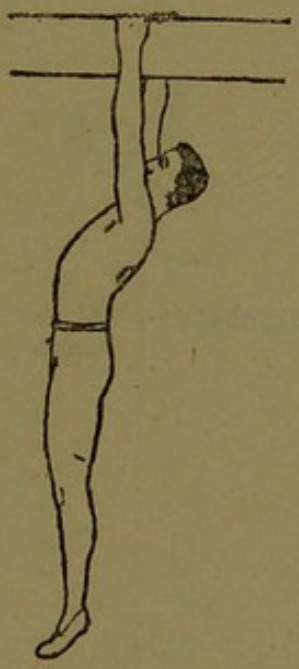
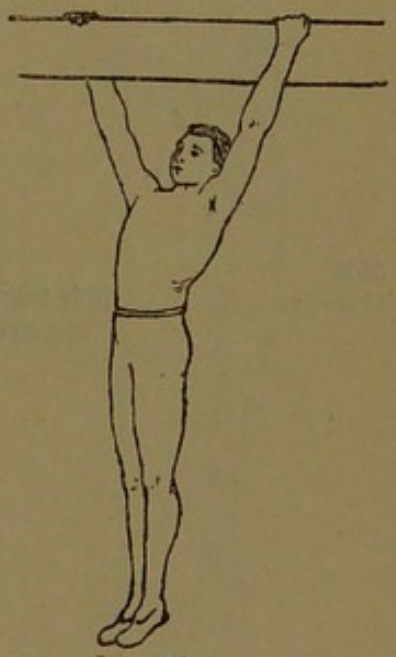
Starting Position.	Exercise.	Executive Word.	Detail.
166. Fall hang	**Arms—Bend** .... (Fig. 45.)	"*Bend*"	Maintaining the stretched position of the body, bend the arms as much as possible, keeping the elbows well back and out
	(Arms)—Stretch	"*Stretch*"	Lower the body evenly to the full hang. pos.
167. Fall hang. or fall hang., A. b.	**Leg raising** .... (Fig. 45.)	"*One*"	Raise the left leg as high as possible keeping it well stretched and the toe pointed
		"*Two*"	Lower the left leg evenly to the starting position
		"*Three*"	Raise the right leg as above
		"*Four*"	Lower the right leg as above
168. Wall bar (beam) grasp	**Arch hanging** .... (Fig. 46.)	"*One*"	Stretch the left leg backward by bending the right knee and lowering the body so that the chest rests against the bars arms fully extended toes bent forward and resting on the ground (when the beam is used the front part of the chest should be vertically under it)
		"*Two*"	Stretch the right leg backward and place it alongside the left
		or "*Down*"	In this position the toes should be under the insteps and the feet at the usual foot angle

Common Faults.	Remarks.
166. (i) Turning the toes up. (ii) Elbows allowed to go forward. (iii) Head poked forward	An easy heaving exercise. It is a good preparation for stronger exercises of this group and employs the heaving muscles of the back instead of those of the chest. Progression is obtained by lowering the height of the beam.  Fig. 45.
167.	Introduces an oblique abdominal movement and increases the general effect of the exercise.
168. (i) Knees not straightened. (ii) Heels separated. (iii) Toes pointed backward instead of being well bent forward under the insteps	Used as the starting position for *Arms bending*. Has a good stretching effect on the body. The dorsal portion of the spine should be arched as much and the lumbar portion as little as possible by the action of the abdominal muscles, the bar grasped should not therefore be too low.  Fig. 46.

Starting Position.	Exercise.	Executive Word.	Detail.
168.—*contd.* Wall bar (beam) grasp—*contd.*	**On the Feet**	"*One*"	By bending the left knee bring the left foot forward and place the toe on the ground in the position it occupied in wall bar (beam) grasp pos.
		"*Two*" or "*Up*"	Bring the right foot up to the left and raise the body into the wall bar (beam) grasp pos.
169. Arch hang.	**Arms—Bend** .... (Fig. 47.)	"*Bend*"	Keeping the elbows well out and back, bend the arms as much as possible, allowing the ankle joints to stretch naturally as the body is pulled upward
	Arms—Stretch	"*Stretch*"	Lower the body to its former position by stretching the arms evenly
170. Fall hang. .... Arch hang.	**Arch hanging** .... **Fall hanging**	"*One*" "*Two*"	Bend the arms and swing the legs from one position to the other
171.	**Over grip** .... (Fig. 48.)	....	Hands grasping the beam a little more than the width of the shoulders apart, finger nails to the front. When hanging from the beam the body should be well braced, the head slightly back and the chin drawn in, knees straight, toes together and pointed.

Common Faults.	Remarks.
(i) Bending the arms. (ii) Feet brought too close to the apparatus	
169. (i) Elbows not kept back and away from the bars or beam	Is a further preparation for stronger Heaving exercises encouraging the employment of the heaving muscles of the back
	Fig. 47.
170.	Has a useful alternate effect on the abdominal and dorsal muscles in addition to its value as a Heaving exercise.
171. (i) Head poked forward. (ii) Body slack. (iii) Shoulders forward. (iv) Legs apart. (v) Back hollowed by bracing back the legs.	The correct holding of the hanging position with the various grips constitutes an exercise in itself when properly taken and should be regarded as such. These hanging positions are used as starting pos. for most of the heaving exercise. When grasping a *bar*, all the various grips described should be taken, with thumbs round it. The method of jumping up to and down from the beam or bar is described under J. and V. ex. (*vide* para. **277**).

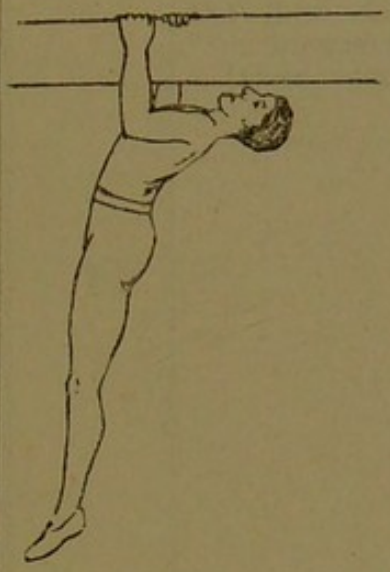
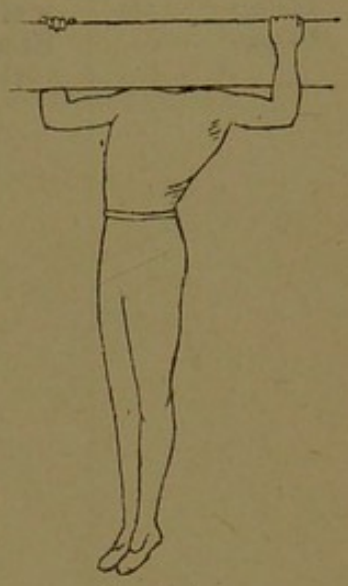
Starting Position.	Exercise.	Executive Word.	Detail.
172.	**Under grip** .... (Fig. 49.)	....	As described above except that the hands will be on the other side of the beam, finger nails to the rear
173.	**Cross grip** .... (Fig. 50.)	....	As described above except that the hands will be close together on opposite sides of the beam and the shoulders at right angles to it
174.	**Oblique grip** .... (Fig. 51.)	....	As described above except that the hands will be rather more than the width of the shoulders apart on opposite sides of the beam and the line of the shoulders diagonal to it
175. Under beam shoulders parallel to it / Under beam shoulders at right angles to it	**Over grip** / **Under grip** / **Oblique grip** / **Cross grip** } **Up**	"*Up*" ...	*Described under J. and V.* (*vide* para. 277).
	On the Feet—Down	"*Down*"	

Common Faults.	Remarks.
172. As above.	 Fig. 48.  Fig. 49.
173. As above.	
174. As above.	 Fig. 50.  Fig. 51.
175.	

Starting Position.	Exercise.	Executive Word.	Detail.
176. Overgr. .... Undergr. Crossgr. Obliquegr.	**Arms—Bend** .... (Figs. 52, 53, 54, 55, and 56.)	"*Bend*"	Maintaining the correct position of the body from head to heels as in the hanging position bend the arms as much as possible keeping the elbows well back
	Arms—Stretch	"*Stretch*"	Lower the body evenly to its former position by straightening the arms
177. Overgr. or undergr. or Ditto with A. b.	**Side travelling**	"*Commence*"	Shift the grasp of the left hand to the left along the beam as far as can be conveniently managed, then shift the right hand an equal distance also to the left, and repeat the movements as often as necessary
178. Overgr.	**Side travelling changeing grip**	"*Commence*"	By means of a slight twist, turn the body forward to the left, quit the grasp of the beam with the right hand and seize it again with *under grip* on the same side of the beam and on the other side of the left hand. Take the next pace in a similar manner by turning the body backward, quitting with the left hand and again seizing the beam with *over grip*, and so on

Common Faults.	Remarks.
176. (i) Head and chin poked forward, back rounded and chest flattened. (ii) Elbows and shoulders not kept back enough. (iii) Legs bent at the knees and apart	It is in these exercises especially that attention should be drawn to the danger of attempting to "pull up" a large number of times at the expense of correctness of style. It is better to raise the body only once part of the way to the beam maintaining a good position than to "pull up" the whole way several times in bad or indifferent style.
(i) Lowering to a slack position	Incorrect. Fig. 52.
177. (i) Jerking the legs and losing the correct position of the body	
178. As above	Fig. 53. Fig. 54.

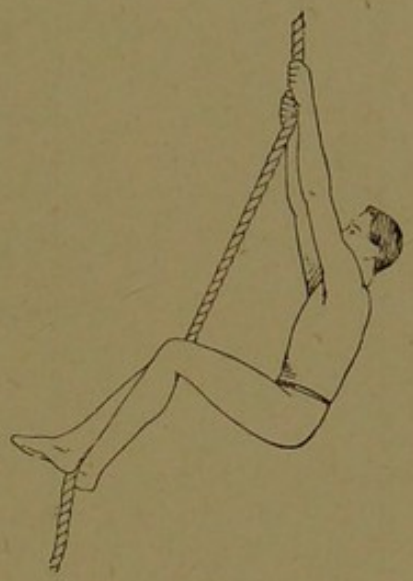
Starting Position.	Exercise.	Executive Word.	Detail.
179. Crossgr. or Obliquegr. or Ditto with A. b.	**Backward travelling**.... *Note.*—Backward travelling with cross grip and A. b. may also be performed on the Bridge Ladder	"*Commence*"	Travel backward along the beam by shifting the grasp of the hands alternately one behind the other
180. Obliquegr.	**Backward travelling with Arms bending between each pace**	"*Commence*"	Travel backward as described
181. Overgr.	**Side travelling with swing**	"*Commence*"	Keeping the legs straight swing the body in the direction of the beam, and as it swings to the left (leading hand) shift the grasp of that hand along the beam to the left and on the return swing shift the grasp of the right hand the same distance to the left
182. Undergr. or overgr.	**Upward circling** (beam or bar)	"*Up*"	Keeping the legs together and the knees straight, bend the arms and the hip joints, swing the legs over the beam and raise the body to the "First position" (described under J. and V., *vide* para. **279**)
First pos. with fingers to rear, thumbs to front	**Downward circling**	"*Down*"	Bending forward over the beam from the hips, and keeping the legs straight, lower the body and legs steadily to the starting pos. for *Upward circling*. As the body is lowered the legs should be kept close to the beam till the insteps touch it

Common Faults.	Remarks.
179. (i) Loss of position	 Fig. 55.
180. As above	 Fig. 56.
181. As above	
182.	Has also a strong effect on the abdominal muscles. The following progressive steps may be adopted in teaching this exercise :— (*a*) Beam head height, left foot forward (the swing obtained from the rear leg assists the circling). (*b*) Beam a little under the height of the stretched arms, and the circling assisted by a slight spring from the feet. (*c*) Beam above height of stretched arms. *Circling with overgrip is not used on the beam.*
(i) Movement performed too quickly and without sufficient control. (ii) Legs thrown forward	

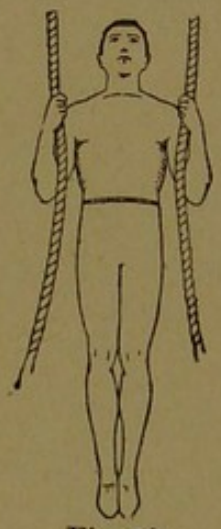
Starting Position.	Exercise.	Executive Word.	Detail.
183. Close to and facing the beams	**Twisting to sitting position with left Hand forward** (Double beam)	"*Grasp*"	Grasp the upper beam with under grip with the left hand which should be opposite the right shoulder, and with over grip with the right hand which should be opposite the left shoulder
		"*Up*"	Bend the arms and, turning the body about to the right, come to the sitting pos. on the lower beam, passing the head under the upper beam which should then be seized with over grip, body upright and arms bent
	On the Feet—Down (with left hand forward—Grasp)	"*Down*"	Grasping the upper beam with the left hand with under grip and with the right hand with over grip as described above, turn the body to the right and resume the standing position facing the beams
184. Sit. pos. with overgr.	**Twisting about with left Hand forward**	"*Grasp*"	Grasp the upper beam, left hand with under grip, right hand with over grip, as described above
		"*Twist*"	Bend the arms and, raising the legs to a horizontal position, turn the body completely about to a sitting position facing the opposite direction, passing the head under the upper beam and seizing it with over grip

Common Faults.	Remarks.
183.	
184.	
(i) Bending the knees	Has a useful additional effect on the abdominal and lateral muscles. When several men are performing this exercise close to each other on the same beams, the knees must be bent sufficiently to clear the next man and straightened again immediately.

Starting Position.	Exercise.	Executive Word.	Detail.
185.	**Position for climbing with left Hand and right Foot leading** (Fig. 57.)	"*One*"	Grasp the rope with the left hand as high as possible
		"*Two*"	Grasp the rope with the right hand immediately under the left
		"*Three*"	Keeping the arms straight raise the thighs to a horizontal position, grip the rope between the inside of the knees and the outside of the feet, right foot in front of the left, the rope passing between the left shin and right calf (*i.e.*, over the left instep and outside the right heel)
		"*Down*"	Resume the position of Attention
186.	**Climbing** .... (Fig. 58.)	"*One*"	As above
		"*Two*"	As above
		"*Three*"	As above
		"*Four*"	Maintaining a firm grip of the rope with the legs, bend the arms and straighten the legs without any undue hollowing of the back
	(Every alternate pace)	"*One*"	As above but right hand grasping as high as possible
		"*Two*"	As above but left hand under right
		"*Three*"	As above but left foot in front of right
		"*Four*" or "*Climb*"	As above
	Down	"*One*"	Lower the body to the full extent of the arms allowing the rope to slip through the legs.
		"*Two*"	Grasp the rope in line with the breast with the lower of the two hands
		"*Three*" *or* "*Down*"	Grasp the rope with the upper of the two hands immediately above the other

Common Faults.	Remarks.
185.	 Fig. 57.
186.	When the correct method has been acquired and the pupil is sufficiently strong the knees may be raised in the third movement as high as possible without bending the arms.
(i) Looking down	Fig. 58. In descending a rope moving "free," the position of the body and legs should be as in the 3rd movement of climbing (Fig. 57) and the body lowered hand under hand.

Starting Position.	Exercise.	Executive Word.	Detail.
187.	**Climbing with double rope**	"*One*"	Grasp the left rope with the left hand as high as possible
		"*Two*"	Grasp the right rope with the right hand level with the left
		"*Three*"	As for single rope climbing but with both ropes gripped between the legs
		"*Four*" or "*Climb*"	As for single rope climbing The next pace will be taken in a similar manner but with the right hand making the first movement and the position of the legs changed
188. Climbing	**Side travelling from rope to rope** (Fig. 59.)	"*Commence*"	Seize the neighbouring rope with the left hand at the same level as the right and relax the grasp with the legs. After a moment's pause grasp the left rope with the legs as described above and transfer the right hand to the same rope, and so on
189. Obliquegr. left Hand forw. right Hand uppermost	**Position for climbing inclined rope**	"*Up*"	Bending the arms, raise the left leg, and hook the bend of the knee over the rope immediately below the left hand. The left leg should then be nearly at right angles to the rope, thigh at right angles to the trunk, which should be straight, right leg straight and in line with the trunk, toes pointed and arms slightly bent

Common Faults.	Remarks.
187.	
188.	 Fig. 59.
189. (i) Left leg not placed close to the hand. (ii) Left leg not square to the rope. (iii) Right arm not bent. (iv) Right leg bent. (v) Back not kept straight	The exercises on the inclined rope can also be taken on the beam.

Starting Position.	Exercise.	Executive Word.	Detail.
189—*contd.* Pos. for climbing inclined rope	(*a*) **Climbing inclined rope**	"*Climb*"	Shift the left hand upward so as to grasp the rope a full pace above the right, then, without pause, change the relative positions of the legs by swinging the right leg up over the rope and the left leg down. Continue the climbing by taking each pace in a similar manner with alternate hands and legs leading.
190. Overgr. left hand uppermost	**Climbing inclined rope with turning**	"*One*"	Bending the arms, raise the left leg and hook the bend of the knee over the rope immediately above the left hand, right leg straight and in line with the body
		"*Two*"	Shift the left hand so as to grasp the rope immediately above the leg with undergr.
		"*One*"	Turning the body backward to the right shift the right hand upward so as to grasp the rope a full pace above the left with overgr., drop the left leg from the rope and hook the right knee over it close above the right hand
		"*Two*"	As above, but shifting right hand above the leg
		or "*Climb*"	And so on with alternate hands and legs

Common Faults.	Remarks.
(i) Moving the legs before the hand. (ii) Not placing the leg near enough to the hand	A single pace only may at first be taken to ensure correctness of execution before proceeding with the climbing.
190.	The strength of the exercise may be increased by dropping the body so as to hang at the full stretch of the arms between each pace.

GROUP F.—BALANCE EXERCISES.

191. Balance exercises are those which develop the power of balancing the body under varying conditions, and are divided into two sub-groups, viz. :—

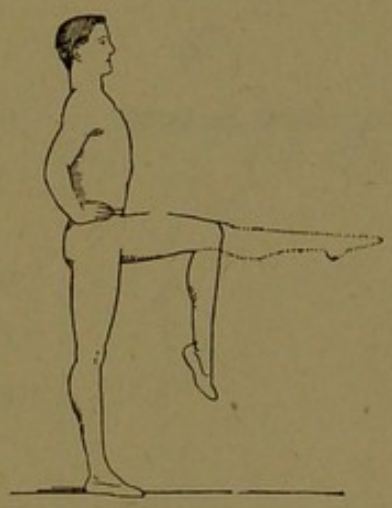
1. " Free standing " Balance exercises.
2. Balance exercises on apparatus (beam).

Progression in the Free standing Balance exercises is effected by reducing the base on which the body is supported, raising the centre of gravity of the body by altering the position of the arms from H. f. to N. r. to A. upw. str., and in the exercises on apparatus by increasing the height above the ground at which the exercises are performed.

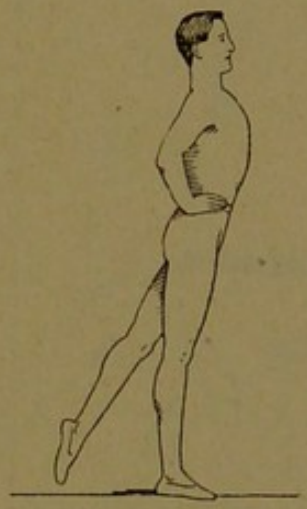
The Free standing exercises are taken in a precise and definite manner, with the whole class working by word of command. The exercises on apparatus admit of and require more freedom of movement for securing and maintaining the balance, and are taken individually or by several men at a time, working independently, words of command being dispensed with as much as possible.

The Balance exercises employ a large number of muscles, but require little actual strength. They require very accurate co-ordination of movement, and consequently have an excellent effect on the brain and nerves. They cultivate the power of control over the body and limbs, overcome stiffness and awkwardness, give an easy carriage to the body, and make the movements free and well ordered. They also train the men's " nerve " and accustom them to moderate heights.

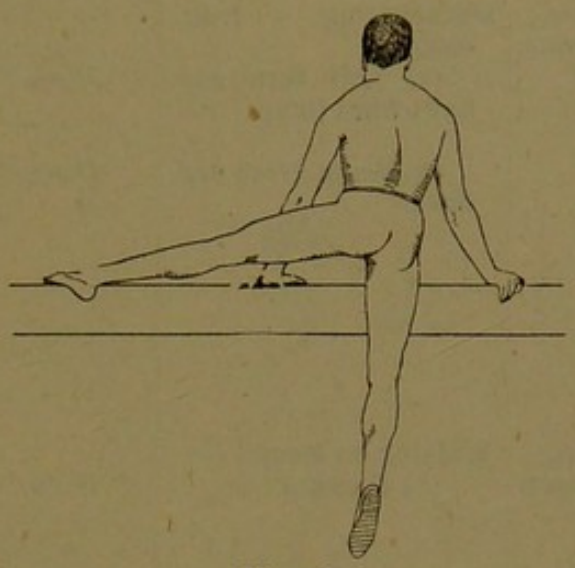
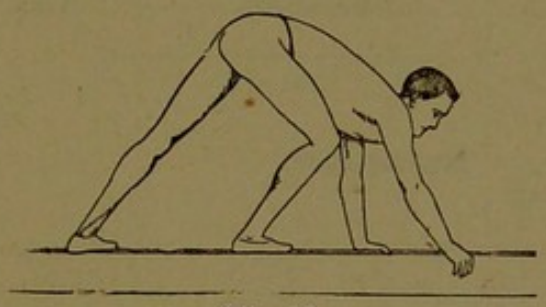
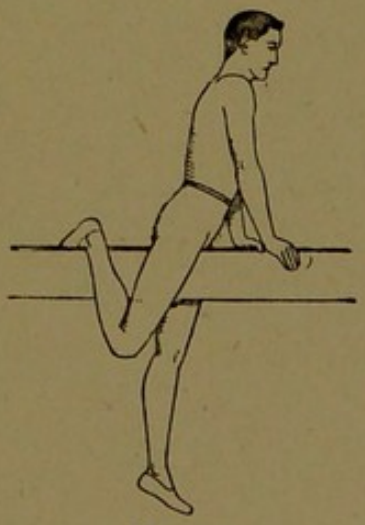
Starting Position.	Exercise.	Executive Word.	Detail.
192. H. f., &c.....	**Left Knee—Raise** .... (Fig. 60.)	"*Raise*"	Keeping the body erect bend the left knee and raise it upward until the thigh is at right angles to the body and the lower leg hangingstraightdown ward with the toe pointing to the ground
	(Knee)—Lower	"*Lower*"	Lower the leg to its original position.
193. H. f.,&c.....	**Knee raising**	"*One*"	Left K. r.
		"*Two*"	K. lower.
		"*Three*"	Right K. r.
		"*Four*"	K. lower.
194. H. f., &c., K. r.	**Leg forward—Stretch** .... (Fig. 60.)	"*Stretch*"	Keeping the body steady and the thigh raised as much as possible, stretch the leg and foot forward.
	Knee—Bend	"*Bend*"	Bend the knee to K. r. pos.
195. H. f., &c.....	**Leg raising forward** .... (Fig. 60.)	"*One*"	Keeping both legs straight and the body erect raise the left leg forward as high as possible, toe pointed.
		"*Two*"	Lower the leg to its original position.
		"*Three*"	Raise the right leg as above.
		"*Four*" or "*Commence*"	Lower the leg to its original position.

Common Faults.	Remarks.
192. (i) Knee not raised high enough. (ii) Lower leg not vertical. (iii) Standing leg bent. (iv) Trunk and head not kept erect	In this and in all the other Free standing Balance exercises, the words of command should be given comparatively slowly and the movements performed steadily and evenly, and not by jerks.
193.	 Fig. 60.
194. (i) Body, head and standing leg as above. (ii) Knee lowered	
195. (i) Body, head and standing leg as above.	*Leg raising forward, sideways, and backward* may be combined as required.

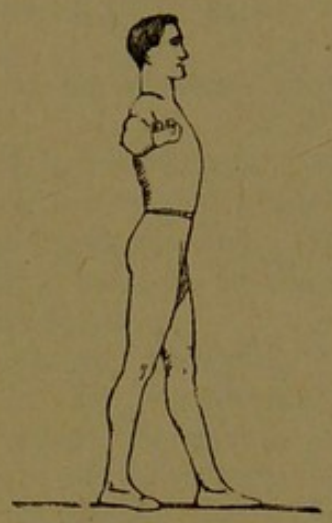
Starting Position.	Exercise.	Executive Word.	Detail.
196. H. f., &c.....	**Leg raising sideways**	"*One*"	Keeping both legs straight and the body as erect as possible, raise the left leg sideways to the left, toe pointed.
		"*Two*"	Lower the leg to its original position.
		"*Three*"	Raise the right leg as above.
		"*Four*" *or* "*Commence*"	Lower the leg to its original position.
197. H. f., &c.....	**Leg raising backward** .... (Fig. 61.)	"*One*"	Keeping both legs straight and the body erect, raise the left leg backward as far as possible, toe pointed.
		"*Two*"	Lower the leg to its original position.
		"*Three*"	Raise the right leg as above.
		"*Four*"	Lower the leg to its original position.
198.	**Mounting beam, left Foot leading** (beam up to knee height)	("*Mount*") .... *or* ("*One*") ("*Two*")	Place the tread of the left foot on the beam and with a slight spring from the ground straighten the left knee, turn at once to the right and place the right foot on the beam in front of the left, assuming an erect position.
199. With run....	**Mounting beam, left Foot leading** (beam between knee and hip height)	("*Mount*")	Mount the beam as above but with a run, springing lightly off the right foot.

Common Faults.	Remarks.
196. (i) Body inclined more than absolutely necessary. (ii) Legs bent.	
197. (i) Body inclined forward. (ii) Leg bent. (iii) Small of the back too much hollowed.	 Fig. 61.
198. (i) Not facing the beam in stepping up.	In all Balance exercises on apparatus the arms should be used (unless otherwise directed) to assist in maintaining the balance by being extended or partially extended sideways and raised or lowered with a "give and take" movement as required without any stiffness. Although executive words of command are here shown, it is better to omit them whenever possible for these Bal. ex. on apparatus so as to put no restraint on the freedom and ease with which the exercises should be performed.
199.	

Starting Position.	Exercise.	Executive Word.	Detail.
200. First pos.	**Mounting beam left Foot assisting** (beam over hip height as required) (Figs. 62 and 63.)	(" *Mount* ")	Keeping the knee straight, raise the left leg sideways and place the inside of the foot on the beam; then, turning towards the right and reversing the right hand, place the right foot on the beam close to the left hand and between it and the left foot and assume an erect position with the right foot in front of the left and body turned fully to the right.
201. First pos.	**Sitting-astride**	(" *Astride* ")	Swing the left leg over the beam to a sitting position astride it, body and head erect, legs straight, hands grasping the beam in front of the body with the arms straight.
202. Sit. astr.	**Mounting beam left Foot leading** (beam over hip height as required) (Figs. 64 and 65.)	(" *Mount* ")	Bend the left leg backward and place the instep across the beam; then raise the body and, placing the right foot in front of the left, assume an erect position as described above.
Sit. astr.	As above but with swing	(" *Mount* ")	Swing the legs backward and place the inside of the feet on the beam on opposite sides of it, one foot close in front of the other, and assume the erect position as described above.

Common Faults.	Remarks.
200. (i) Taking too long over the exercise. (ii) Showing obvious over anxiety.	 Fig. 62.
201.	 Fig. 63.
202. As above As above	 Fig. 64.

Starting Position.	Exercise.	Executive Word.	Detail.
203. Standing on beam	**Dismounting from beam—**		
	(a) **Left turn and downward jump**	(" *Jump* ")	Turn and jump down as described (*vide* para. **272**)
	(b) **Beam grasp and down**	(" *Down* ")	Bend down and grasp the beam with both hands the width of the shoulders apart and in front of the feet, and jump down facing the beam.
204. Standing on beam	**Walking on beam—**		
	(a) **Forward**	(" *Walk* ")	Walk forward steadily maintaining the erect position and the normal foot-angle.
	(b) **With Knee raising**	(" *Walk* ")	Walk forward as described above but with H. f., Knee raising.
	(c) **Backward**	(" *Walk* ")	Walk backward as above described.
205. Standing on beam	**Turning about**	....	When the left foot is in front turn right about on the tread of both feet keeping the legs straight, and *vice versâ*.

Common Faults.	Remarks.
203.	
204. (i) Looking down. (ii) Stooping. (iii) When about to lose the balance not pausing to regain it.	 Fig. 65.
As above	
205.	

GROUP G.—LATERAL EXERCISES.

206. This group consists chiefly of the exercises of *turning* the trunk and *bending* it *sideways*.

The side muscles of the trunk and the adductors, abductors and rotators of the thigh are those which are specially affected. The muscles of the spine and front of the trunk are also employed, and the exercises have consequently a close relation to the Dorsal and Abdominal exercises, especially to the latter.

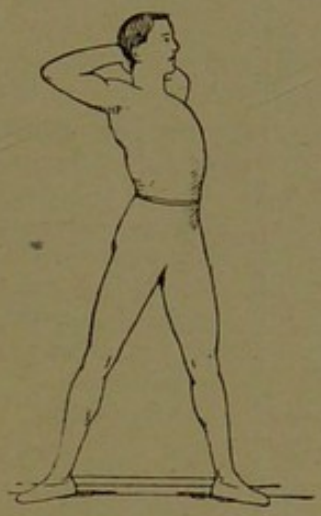
The Lateral exercises develop the lateral flexibility of the spine and its power of rotation on its axis. By the alternate elevation and depression of the ribs they increase the general mobility of the thorax. The "one-sided" nature of these exercises is therefore advantageous if care is taken, as should always be the case, to perform them an equal number of times in each direction; symmetrical development of the body is then ensured. The strengthening of the muscles employed also greatly facilitates the general control of the body.

Somewhat different effects are obtained in this group by varying the position of the feet and legs and so fixing the pelvis more or less as the case may be. And progression is obtained by raising the centre of gravity (from H. f., to A. b., to A. sidew. r., to N. r., to A. upw. str.) thereby increasing the leverage, and also by increasing the speed with which an exercise is performed.

The Lateral exercises are divided into the following sub-groups:—

1. Trunk turning
2. ,, bending sideways.
3. Exercises "on one Hand," on the ground, bench or at wall bars.
4. Exercises of lunging outward.

Starting Position.	Exercise.	Executive Word.	Detail.
207. F. cl. or F. sidew. pl., or F. outw. pl., or F. forw. pl., and H. f., or A. b., or N. r., or A. upw. str.	**Trunk turning—** **(To the left—Turn)** .... **(Forward—Turn)** .... (Fig. 66.)	"*One*"....	Keeping the head in the same relative position to the shoulders as at Attention, the feet firm on the ground and the legs straight, turn the trunk steadily as far as possible to the left.
	Note.—Arms stretching upward may also be taken from the A b., Tr. turn, pos.	"*Two*"....	Turn the trunk steadily forward to its original position.
		"*Three*"	Turn the trunk to the right as above.
		"*Four*" or "*Turn*"	Turn the trunk forward as above.
208. As above....	**Trunk turning quickly**	"*One*".... "*Two*".... "*Three*" "*Four*"	As above but each movement performed quickly.
		or "*One*"....	Turn the trunk to the left as above.
		"*Two*"....	Turn the trunk to the right as above.
209. 1 pace from and side towards wall bars	**On the third (fourth, fifth) bar, left Foot—Support**	"*Support*"	Raise the left leg sideways, keeping the knee straight and pointing the toe upward, and insert the foot between the third and fourth bars gripping them tightly by pressing the toes against latter and the heel against the former.
	Foot inward—Place....	"*Place*"	Resume the starting pos.

Common Faults.	Remarks.
207. (i) Feet not kept firm on ground. (ii) Knee bent. (iii) Head and shoulders not kept in their relative position. (iv) Small of the back hollowed.	The starting positions for the feet and arms are placed in progressive order. It should be noted that in F. forw. and F. outw. pl., when the left foot is advanced the turning should only be made to the left and *vice versâ*, as the required fixing of the pelvis will not otherwise be obtained.
208. As above.	 Fig. 66.
209.	Used as a starting position for *Trunk bending sideways* when a stronger effect is required.

Starting Position.	Exercise.	Executive Word.	Detail.
210 F. cl., or F. sidew. pl., or F. forw. pl., and H. f., or A. b., or 1 A. upw. 1 A. downw. str., or A. sidew. str., or A. upw. str., or N. r.	**Trunk bending sideways** (Figs. 67 and 68.)	"*One*"	Without altering the relative position of the head, shoulders and arms, bend the trunk steadily as far as possible to the left.
		"*Two*"....	Raise the trunk steadily to the upright position.
		"*Three*"	Bend the trunk to the right as above.
		"*Four*" *or*	Resume the upright position as above.
	(To the left—Bend) .... **(Upward—Stretch)**	"*Bend*" "*Stretch*"	
	Note. — *Trunk bending sideways* may also be taken with *Foot support* on wall bars or bench and the effect thereby increased. (Fig. 69.)		
211. H. f., or N. r. and F. sidew. pl., or F. astr. A. sidew. str.	**Trunk bending sideways quickly**	"*One*" .... "*Two*" .... "*Three*" "*Four*"	As above but each movement performed quickly.

Common Faults.	Remarks.
210. (i) Feet not kept firm on the ground. (ii) Trunk turned or inclined forward or backward. (iii) Relative position of head not maintained. (iv) Legs and hips not kept steady.	The starting positions for the feet and arms are placed in progressive order, the N. r. position being taken after the A. upw. str. on account of the greater difficulty experienced in maintaining it correctly, although the effect of the leverage is not so strong. When using the F. forw. pl. starting position, the bending should only be made to the left when the left foot is advanced and *vice versâ* for the reason mentioned *re* the "Turnings." And in the same way when 1 A. upw. and 1 A. downw. str. is used the bending should only be to the right when the left arm is stretched upward and *vice versâ*.

Fig. 67.

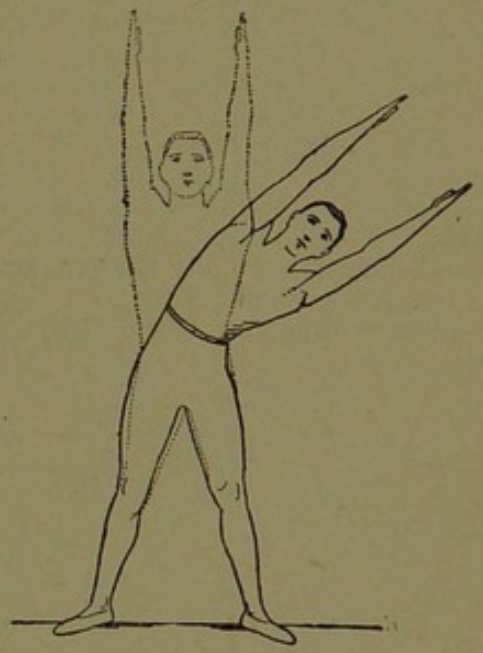


Fig. 68.

211.

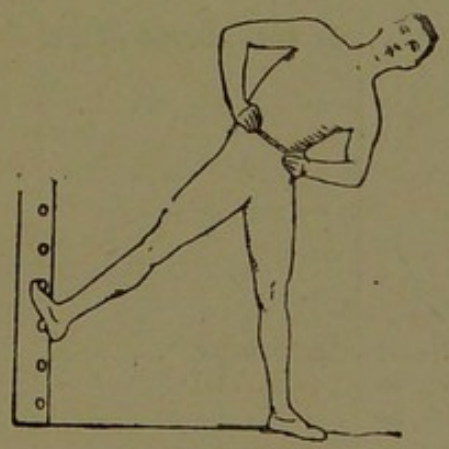
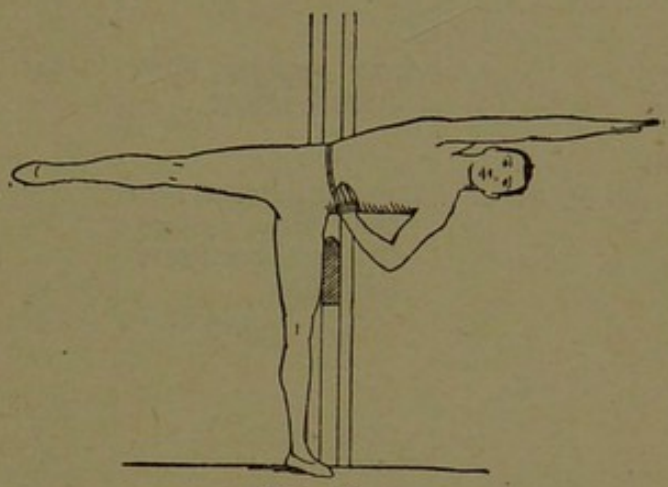
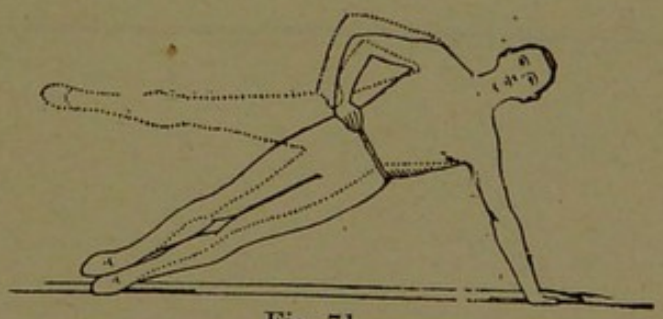
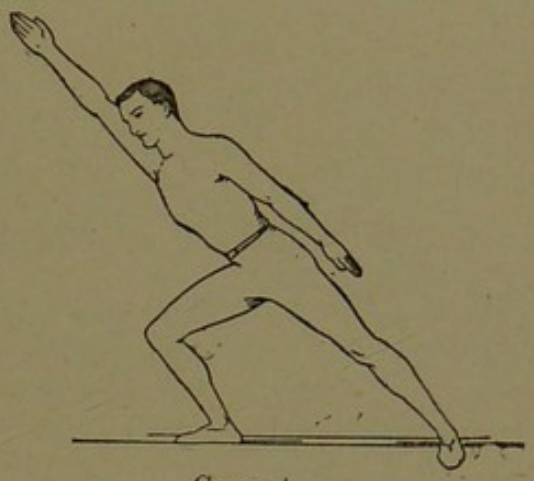
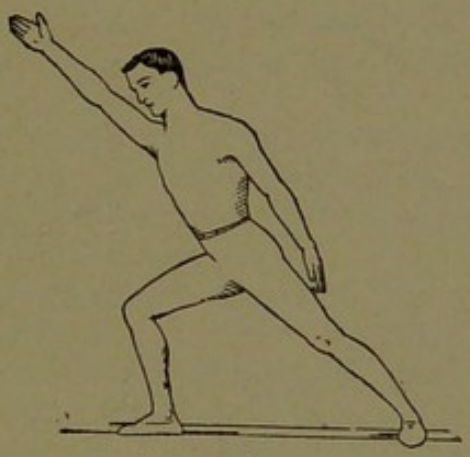


Fig. 69.

Starting Position.	Exercise.	Executive Word.	Detail.
212. H. support 1 A. upw. 1 Hand H. f.	**Trunk bending sideways with Leg aising** (side against beam) (Fig. 70.)	"*One*"....	Keeping the left foot firm and the left leg (the one touching the beam) straight, *incline* the body over the beam to the left and at the same time raise the right leg, keeping it straight and in line with the body.
		"*Two*"....	Resume the starting position.
213. On the Hands (on bench or ground or at wall bars)	**On the left Hand—Turn** (Fig. 71.)	"*Turn*"	Raise the right hand from the ground and with it take the H. f. pos., at the same time turn the body to the right, bringing the weight on the left arm which should be at right angles to the body and place the right foot immediately over the left. When at the wall bars the free hand should grasp the highest bar that can be reached in line with the other hand.
	On both Hands—Turn	"*Turn*"	Resume the starting position.
214. On the left Hand (on bench, or ground or at wall bars)	**Leg raising** .... (Fig. 71.)	"*One*"....	Raise the right leg as high as possible allowing the hips to follow the movement.
		"*Two*"....	Resume the starting position.

Common Faults.	Remarks.
212. (i) The leg not raised at once or sufficiently high.	This exercise is not a Trunk bending in the usual meaning of the term as the spine is *inclined* to one side and not bent laterally.
213. (i) Dropping the hips. (ii) Bending the body forward or backward.	 Fig. 70.
214.	 Fig. 71.

Starting Position.	Exercise.	Executive Word.	Detail.
215. F. full o., A. b.	**Left Arm upward right Arm downward left Foot outward—Lunge** (Figs. 72 and 73.)	"*Lunge*"	Lunge outward as ordered (*vide* para. **125**) and stretch the arms sharply upward and downward the rear hand about a hand's breadth from the thigh, the movement of the arms being completed at the moment the foot reaches the ground.
	Arms bending Foot inward—Place	"*Place*"	Resume the starting position.
216. F. full o., A. b.	**Lunging outward with one Arm upward one Arm downward stretching** (Figs. 72 and 73.)	"*One*"	Left A. upw. right A. downw. left F. outw. lunge.
		"*Two*"....	Resume starting pos.
		"*Three*"	Right A. upw. left A. downw. right F. outw. lunge.
		"*Four*" or "*Commence*"	Resume starting pos.

Common Faults.	Remarks.
215.	 Correct. Fig. 72
216.	 Incorrect. Fig. 73.

GROUP H.—ABDOMINAL EXERCISES.

217. The abdominal muscles, especially the large muscle in front of the abdomen (rectus abdominis), are those which are principally affected by the exercises of this group. These muscles play an important part in maintaining the proper carriage of the body.

The *Trunk bendings backward* stretch the front abdominal muscles, *On the Hands*, gives static contraction of the same muscles at their middle length, and the *Leg raisings* and *Knee raisings* in the lying and hanging positions shorten them. A normal length and strength of these muscles is thereby produced and the carriage consequently corrected.

Trunk bending backward also increases the mobility of the dorsal portion of the spine and thus tends to lessen the dorsal curve.

Well developed abdominal muscles provide a firm support for the organs of digestion contained in the abdomen.

Owing to the attachment of the front abdominal muscles to the pelvis and the lower part of the thorax, there is a tendency in performing these exercises to draw the ribs downwards, the effect of this being to somewhat restrict the breathing. The movements should therefore be of short duration and it may also be necessary for the instructor to remind the men to breathe freely during these exercises in order that the best results may be obtained.

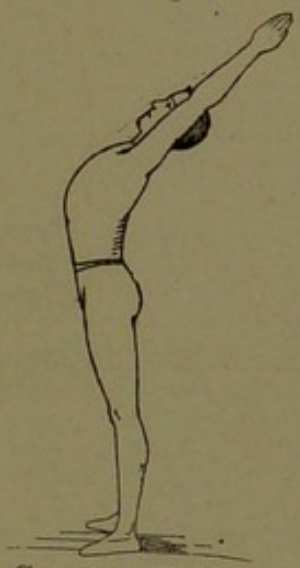
The following are the sub-groups of the Abdominal exercises :—

1. Trunk bending backward.
2. Exercises " On the Hands," on ground, bench or beam.
3. Leg and Knee raising.

Starting Position.	Exercise.	Executive Word.	Detail.
218. F. sidew. pl., or F astr., or Hl. together, or F. forw. pl., and H. f, or A. b., or A. upw. str.	....	"*One*"	Keeping the knees straight, bend the upper part of the trunk slowly backward, the head commencing the movement and kept well back with the chin drawn in. The bending should *not* be made from the waist alone, but the whole spine should be arched.
		"*Two*" *or*	By reversing the movement raise the trunk to the starting pos.
	(Trunk backward—bend)	"*Bend*"	
	(Upward—Stretch) .... *Note.* — *Trunk bending backward* may also be taken with *Foot support* on wall bars or bench, and to make the exercise still stronger the knee of the standing leg may be bent at the same time as the body.	"*Stretch*"	
219. 1 pace from and facing wall bars	**On the third (fourth, fifth) bar, left Foot—Support**	"*Support*"	Keeping the knee straight, raise the left leg and insert the foot between the third and fourth bars, gripping them firmly by pressing the toes against the latter and the heel against the former.
	Foot inward—Place	"*Place*"	Resume the starting pos.
219A. 1 pace from and facing the wall bars.	**Trunk bending backward**	"*One*" "*Two*"	
	Trunk backward—Bend	"*Bend*"	As in para. **218.**
F. support, H. f., or A. b., or A. upw. str.	**Upward—Stretch**	"*Stretch*"	

Common Faults.	Remarks.
218. (i) The bending made only in the small of the back. (ii) Head not carried back sufficiently. (iii) Chin not drawn in. (iv) Knees bent. (v) Breathing restricted.	As one of the objects of this exercise is to stretch the dorsal portion of the spine a very great bending backward is not required. At the commencement of the movement the body should however be stretched well upward and then the bending backward in the dorsal region commenced. At first, the bending should be only slight but correct, and as progress is made the bending may be increased by degrees.
	Progression in the *Trunk bendings backward* is obtained, as in the Lateral exercises, by raising the centre of gravity from H. f., to A. b., to A. upw. str.; the position of N. r. is not as a rule used with these exercises owing to the difficulty experienced in maintaining the position correctly, a faulty N. r. position being very likely to counteract some of the otherwise good effects of the exercises of this group.
219.	Used as a starting position for *Trunk bending backward.*

Fig. 74.



Correct. Fig. 75.

Incorrect. Fig. 76.

Starting Position.	Exercise.	Executive Word.	Detail.
219B. 1 short pace from and facing the wall bars.	**On the third (fourth, fifth) bar, left Foot—Support**	"*Support*"	Keeping the right knee straight, raise the left leg, and insert the foot between the third and fourth bars, gripping them firmly by pressing the toes against the latter and the heel against the former. In this case the left knee should be bent.
	Foot in ward—Place	"*Place*"	Resume the starting position.
2'9C. F. full o., F. support, H. f., or A. b., or A. upw. str.	**Trunk bending backward**	"*One*"	Keeping the head, trunk and right leg in the same relative position to each other, *incline* the body backward by straightening the left knee.
		"*Two*"....	By reversing the movement resume the starting position.
	(Trunk backward—Bend)	"*Bend*"	
	(Upward—Stretch)	"*Stretch*"	
220. Facing bench	**Sitting on bench—Down**	"*Down*"	Turning quickly about (moving "free") sit on the bench, heels on ground, toes pointed, legs straight, body and head erect, arms straight, wrists resting on front edge of bench, palms inward.
	On the Feet—Up	"*Up*"	Spring to attention, turning about ("free") so as to face the bench.
	Sitting on ground—Down	"*Down*"	Passing through the full K. b. pos. place both hands on the ground a little to the rear and at the same time shoot the legs to the front, toes pointed, legs straight, body and head erect, palms of the hands on the ground.
	On the Feet—Up	"*Up*"	Pressing sharply from the ground with the hands and drawing the feet in, spring to Attention.

Common Faults.	Remarks.
219B. Standing leg not directly under the trunk (*i.e.*, not perpendicular).	The correct bar to take is the one which ensures the thigh of the supported leg being horizontal, while the erect position of the rest of the body is maintained.
220.	"Sitting" on bench and on ground are used, with *Foot support*, as starting positions for *Trunk bending backward*.
	Foot support may be taken at the wall bars with both feet inserted between two of the bars at the required height, or with living support as described under "Class Arrangements" (*vide* para. **108**).

Starting Position	Exercise.	Executive Word.	Detail.
221. Sit., F. support and H. f., or A. b., or A. upw. str.	**Trunk backward—Bend**	"*Bend*"	Keeping the body erect and well braced up, incline it steadily backward as far as required.
	Upward—Stretch .... (Fig. 77.)	"*Stretch*"	
222.	**On the Hands** .... (Fig. 78.)	"*One*"	Bend the knees quickly outward, incline the trunk slightly forward and place the palms of the hands on the ground rather more than the width of the shoulders apart, fingers turned slightly inward, arms straight and nearly vertical. The back should be kept straight and the head in the same relative position to the shoulders as at Attention.
		"*Two*" .... *or* "*Down*"	Keeping the arms straight shoot the feet backward till the body and legs are straight and fully stretched, the weight supported by the toes and hands. Heels together, feet at the normal foot-angle, arms at right angles to the body, head in the same relative position as at Attention.

Common Faults.	Remarks.
221. (i) Back rounded. (ii) Head poked forward. (iii) Breathing restricted.	It should be noted that the "Trunk bending" is really a "Trunk falling"; *i.e.*, no movement takes place in the upper part of the trunk, the erect position of it being maintained throughout the exercise. Progression, besides being obtained by the starting position of the arms, can also be made as follows, viz., by stopping the backward inclination at 45°, then with the body in line with the legs and later continuing the inclination downward as far as possible.
222. (i) Rounding the back and dropping the head forward in the first movement. (ii) Body dropped slackly between the arms. (iii) Slackening the abdominal muscles and thereby hollowing the back. (iv) Raising the seat. (v) Head not kept in its relative position to the body.	The exercise is here described for both hands and feet on the ground, but progression is best obtained by first taking it with the hands higher than the feet (on bench or beam), then with hands and feet on the ground, and afterwards with the feet higher than the hands (on bench, &c.). When the hands are on a bench or beam the positions are taken in a similar manner, except that the thumbs are placed against the near edge of the bench or beam. When the feet are to be on a bench, &c., the position is taken in three movements, the first as described, the second placing left foot on bench and the third placing right foot on bench.

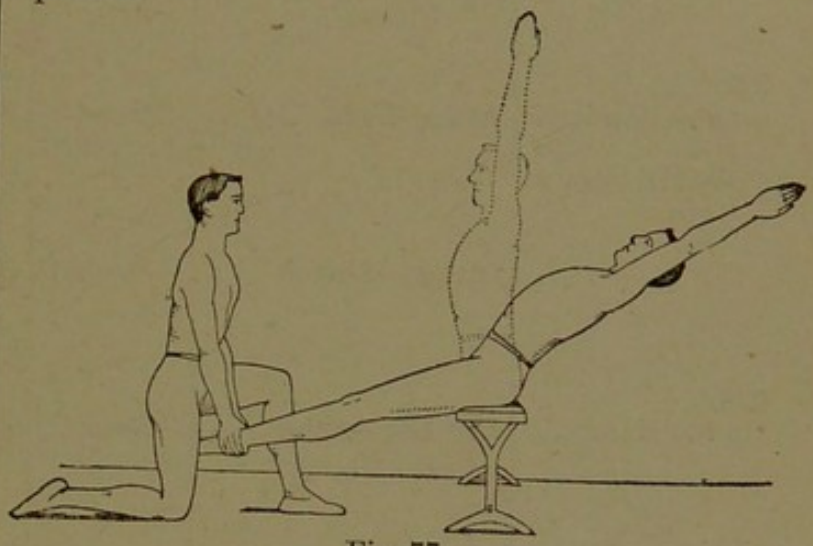


Fig. 77.

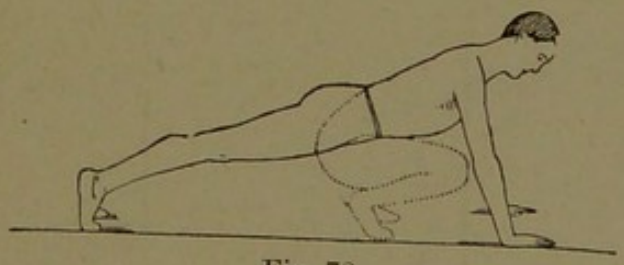
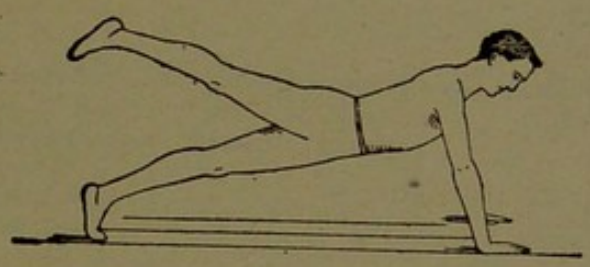
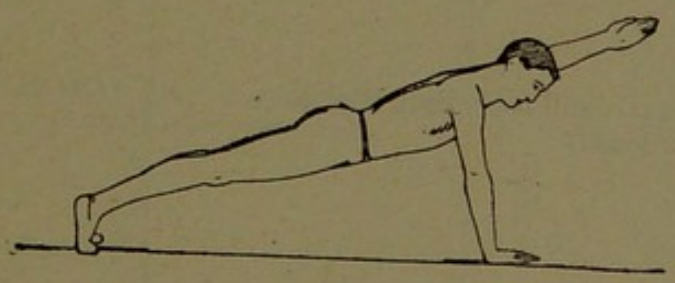


Fig. 78.

Starting Position.	Exercise.	Executive Word.	Detail.
	(Hands inward — Turn)	"*Turn*"	Turn the left and then the right hand inward.
	(Hands forward — Turn)	"*Turn*"	Turn the hands as described.
	On the Feet	"*One*"	Resume quickly the first position of *On the Hands*.
		"*Two*" or "*Up*"	Spring to Attention.
223. On the Hands or ditto with Hands inward turn	**Arms—Bend**	"*Bend*"	Without in any other way altering the position of the body lower it close to the ground by bending the arms.
	(Arms)—Stretch	"*Stretch*"	Resume the starting position by straightening the arms.
224. On the Hands	**Left Leg—Raise** .... (Fig. 79.)	"*Raise*"	Keeping the leg straight raise it as high as possible, toe pointed, without altering the position of the body.
		"*Lower*"	Lower the leg to the starting pos.
225. On the Hands	**Left Arm forward and upward—Raise** (Fig. 80.)	"*Raise*"	Raise the left arm steadily as ordered without altering the position of the body more than is absolutely necessary.
		"*Lower*"	Lower the arm to the starting pos.

Common Faults.	Remarks.
223. (i) Altering the straight position of the body.	The bending of the arms increases the effect on the abdominal muscles.
224.	This exercise has also a lateral and an oblique effect on the abdominal muscles.  Fig. 79.
225.	Has also a lateral and oblique effect on the abdominal muscles.  Fig. 80.

Starting Position.	Exercise.	Executive Word.	Detail.
226. In front of wall bars	**On the top bar—Up**	"*Up*"	Described under "Jumping and Vaulting." exercises (*vide* para. 278)
	On the Feet—Down	"*Down*"	
227. Overg. (wall bar or beam)	**Left Knee—Raise**	"*Raise*"	Bend the left knee and raise it upward until the thigh is at right angles to the body and the lower leg hanging straight downward with the toe pointing to the ground.
	(Knee)—Lower	"*Lower*"	Lower the leg to its original position.
228. Overgr., K. r.	**Leg Forward—Stretch**	"*Stretch*"	Keeping the thigh raised, stretch the leg and foot forward in line with it.
	(Knee)—Bend	"*Bend*"	Bend the knee to K. r. pos.
229. Overgr. (wall bar or beam)	**Knees—Raise** .... (Fig. 81.)	"*Raise*"	Raise both knees as described above.
	(Knees)—Lower	"*Lower*"	Lower both knees.
230. Overgr., Ks. r.	**Left Leg (Legs) forward—Stretch** (Fig. 81.)	"*Stretch*"	Stretch one or both legs as described above.
	(Knees)—Bend	"*Bend*"	Bend one or both knees.
231. Overgr. (wall bar or beam)	**Legs raising**	"*One*"	Keeping the knees straight and toes pointed raise the legs to a horizontal position.
		"*Two*"	Lower the legs to their original position.

Common Faults.	Remarks.
226.	Used as a starting position for *Knee* and *Leg Raising*.
227. (i) Lower leg not vertical. (ii) Breathing restricted. (iii) Head not kept back.	
228. (i) Breathing restricted. (ii) Head not kept back.	
229. As above.	The knees may occasionally be raised as high as possible, on the word, *Full knees raise*.
230. As above.	
231. (i) Breathing restricted. (ii) Head not kept back.	The legs may occasionally be raised as high as possible (*Full legs raising*).

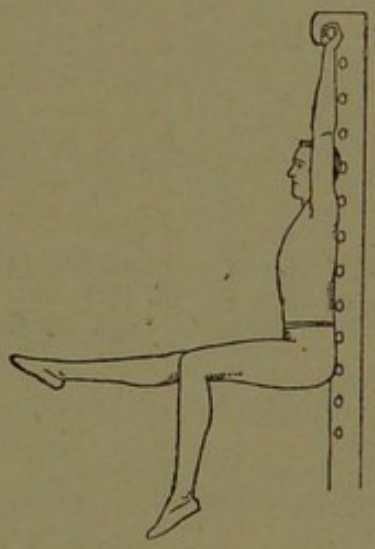
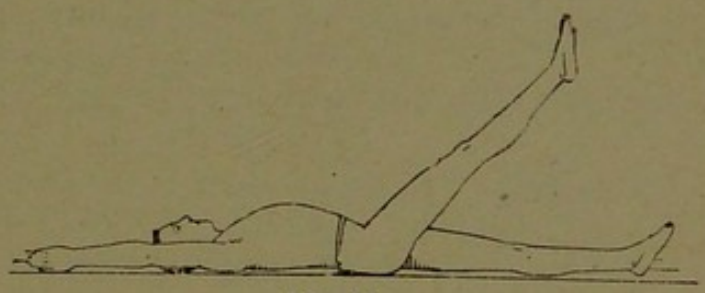


Fig. 81.

Starting Position.	Exercise.	Executive Word.	Detail.
232.	**Lying on the back—Down**	"*Down*"	Passing through the full K. b. pos. place both hands on the ground a little to the rear, and at the same time lower the body quickly backward to the ground and shoot the legs to the front. The body should thus be stretched flat on the back, feet together, toes pointed, arms to the sides, palms of the hands on the ground.
	On the Feet—Up	"*Up*"	Pressing sharply on the ground with the elbows and hands and drawing the feet in, spring smartly to Attention. If the command is given when lying in the A. upw. str. pos., the arms should be swung forward and downward to the ground in executing this movement.
233. Lying, A. upw. r., or N. r.	**Left Leg raise** .... (Fig. 82.) **Legs raising.**	"*One*"	Keeping the knees straight and the toes pointed raise the leg or legs steadily to an angle of 45°, without raising the seat from the ground.
		"*Two*"	Lower the leg or legs steadily to the ground.

Common Faults.	Remarks.
232.	Used as a starting position for *Legs raising*.
233. (i) Breathing restricted. (ii) Knees bent. (iii) Back hollowed.	 Fig. 82.

GROUP I.—DORSAL EXERCISES.

234. The Dorsal exercises bring into play and develop the whole of the extensors of the spine, from the sacrum and pelvis to the skull.

These muscles are specially employed in holding the spine erect, and are thus of particular importance in correcting and maintaining the carriage of the body and head. When the body is bent or inclined forward, as is the case in so many of the movements and positions assumed in daily life, it is these muscles which prevent it from falling forward ; they are therefore constantly in use, and the work thrown on them is considerable.

The correct carriage of the spinal column being a matter of importance, particular attention should be paid to developing the dorsal muscles, which play such a prominent part in its carriage and movement.

Many exercises of this group also have a strong effect on those muscles at the back of the thigh which are attached to the pelvis. If these muscles are too weak, as is often the case, they tend to alter the inclination of the pelvis, and consequently have an injurious effect on the carriage (*vide* para. **398**).

The Dorsal exercises are divided into the following sub-groups :—

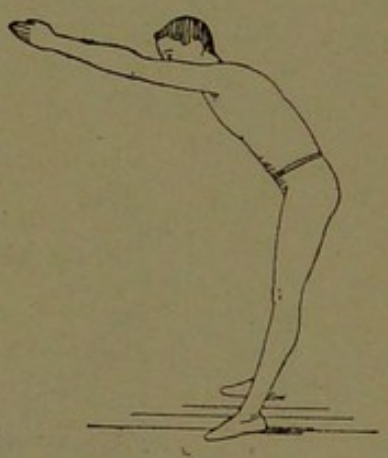
1. Trunk bending forward in " free standing " positions.
2. Trunk bendings in the " forward lying " position.
3. Exercises of lunging forward and backward.

Starting Position.	Exercise.	Executive Word.	Detail.
235. F. sidew. pl., or F. astr., or Hl. together, or F. forw. pl., and H. f., or A. b., or A. upw. str.	**Trunk bending forward** (Figs. 83, 84 and 85.)	"*One*"	Incline the trunk slowly forward from the hips, keeping the back straight, the chest advanced and the head in the same relative position as at Attention.
		"*Two*" .... *or* "*Bend*"	Slowly resume the starting position.
	(Trunk forward — Bend)		
	(Upward—Stretch)	"*Stretch*"	
	Note. — The following additional movements may be taken from A. b., *Trunk forward bend* pos., viz.— **Arms stretching sideways** **Arms stretching upward** and from the A. upw. str. *Trunk forward bend* pos. the following— **Arms swinging downward and backward**		

Common Faults.	Remarks.
235. (i) Head or chin poked forward. (ii) Back rounded. (iii) Knees bent.	The position obtained is used as a starting position for *Trunk downward bend*, and both these exercises are frequently used after Span bending.

Fig. 83.

Correct.
Fig. 84.



Incorrect.
Fig. 85.

Starting Position.	Exercise.	Executive Word.	Detail.
236.			
Tr. forw. b.	**Trunk downward — Bend** (Fig. 86.)	"*Bend*"	Incline the body downward from the hips as far as possible without rounding the back or contracting the chest.
	Forward—Stretch	"*Stretch*"	Raise the body to the starting position.
	(*a*)		
Tr. forw. b.	**Trunk full downward —Bend**	"*Bend*"	Bend the body as far downward as possible.
	Forward—Stretch	"*Stretch*"	Raise the body to the Tr. forw. b. pos.
237.			
Facing bench	**Forward lying—Down**	"*Down*"	Bend quickly forward and place the hands on the ground on the far side of the bench, body and legs straight, heels together, arms straight and at right angles to the body, the centre of the thighs resting on the bench.
	On the Feet—Up	"*Up*"	Resume the starting position as quickly as possible.
	(*a*)		
Forw. lying, F. support.	**Hips—Firm** .... (Fig. 87.)	"*Firm*"	As usual.
	or		
	Arms—Bend	"*Bend*"	
	Hands—Support	"*Support*"	Resume the *forw. lying pos.* with hands on ground.

Common Faults.	Remarks.
236. (i) Back rounded. (ii) Head brought forward. (iii) And in A. upw. str. pos. Arms brought forward.	In performing this exercise with A. upw. str., no attempt should be made to reach the ground with the hands by rounding the back or bringing the arms forward, but the Arms must be kept well stretched and at the same relative position to the trunk and head while the body is being inclined downward. *Trunk full downward bend* should only be used as a *complementary* exercise after *Span bending*, &c.

Fig. 86.

237.

"Forward lying" on bench is used, with *Foot support*, as starting position for *Trunk bending backward* and *Trunk bending forward*.

Foot support may be taken at the wall bars, with both feet inserted between two of the bars at the required height or with living support as described under "Class Arrangements" (*vide* para. **108**).

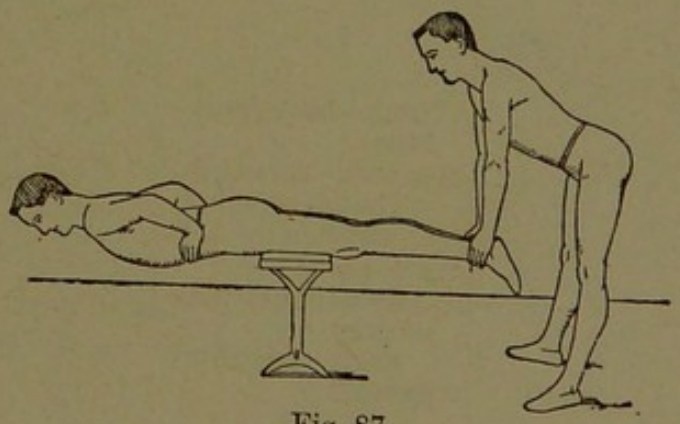


Fig. 87.

Starting Position.	Exercise.	Executive Word.	Detail.
238.	**Forward lying—Down** (on ground)	"*Down*"	Passing quickly through the position of *On the hands*, *Arms bend*, lie flat on the ground face downward, and stretch the arms upward, placing the palms on the ground.
	On the Feet—Up	"*Up*"	Reversing the above movement, spring smartly to Attention.
239. Forw. lying F. support and H. f., or A. b., or A. upw. str.	**Trunk bending backward** (Fig. 88.)	"*One*"	Bend the upper part of the trunk slowly backward, the head commencing the movement and well kept back with the chin drawn in. The bending should *not* be made from the waist alone but the whole spine should be arched.
		"*Two*" or "*Bend*"	Resume the starting pos. by reversing the above movement.
	(Trunk backward—Bend)		
	(Forward—Stretch)	"*Stretch*"	
	The following may be added in the A. b. pos. :—		
	Arms stretching sideways		
	Arms stretching upward		

Common Faults.	Remarks.
238.	"Forward lying" on ground, with *Foot support*, is used as starting position for *Trunk bending backward.*
239. (i) Small of the back unduly hollowed (ii) Poking the head and chin forward. (iii) Breathing restricted.	This is a typical Dorsal exercise in the fullest meaning of the term and is capable of producing the best and strongest effects of the group.

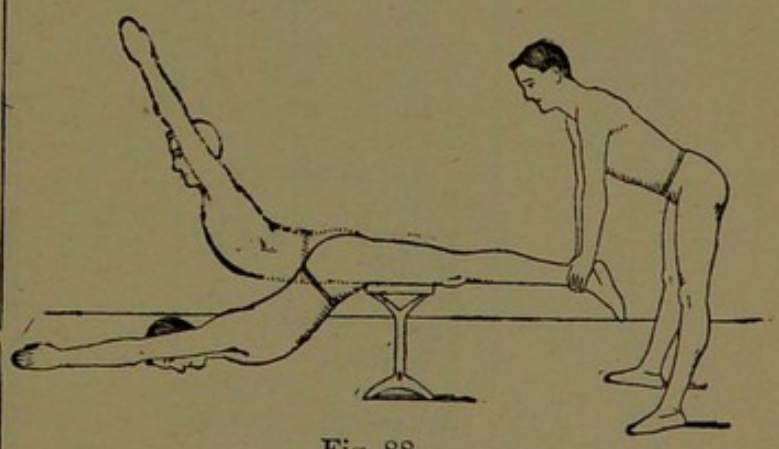
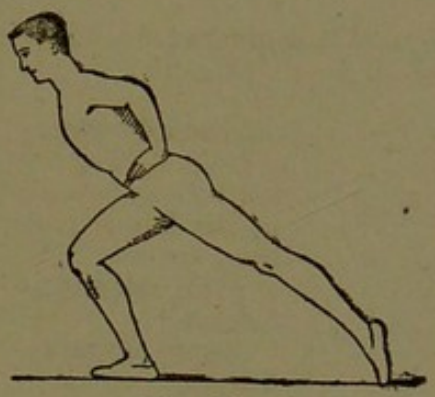
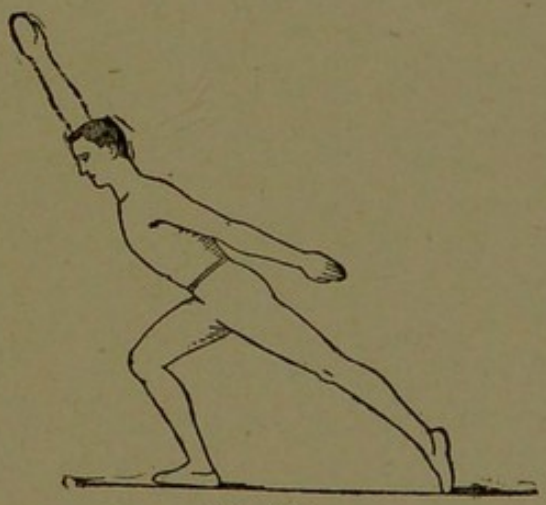
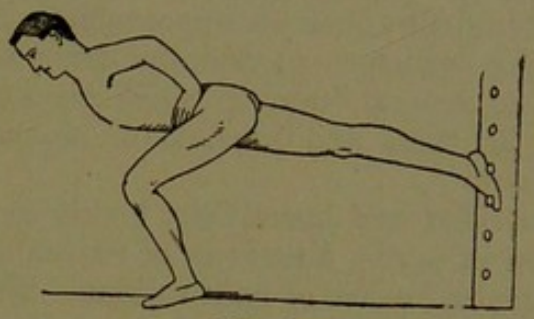


Fig. 88.

Starting Position.	Exercise.	Executive Word.	Detail.
240. Forw. lying F. support and H. f., or A. b., or A. upw. str.	**Trunk bending forward** (Fig. 88.)	"*One*"	Incline the trunk slowly forward from the hips, keeping the back straight, the chest advanced and the head in the same relative position as at Attention.
		"*Two*" *or* "*Bend*"	Slowly resume the starting pos.
	(Trunk forward — Bend)		
	(Forward—Stretch) .... The following may be added in the A.b. pos.:— **Arms stretching sideways**	"*Stretch*"	
241. F. full o., and H. f., or A. b.	**Left Foot Toe support backward — Lunge** (Fig. 89.)	"*Lunge*"	Lunge backward as described, keeping the weight of the body on the right leg which should be well bent, and place the toe of the left foot, which should be pointed, on the ground four foot-lengths to the rear. The toe should be used merely to gain steadiness.
	Foot inward—Place....	"*Place*"	Keeping the body and rear leg in line resume the starting pos. by straightening the front leg steadily.
	Note. — The following may be added in the Lunge position of this exercise, viz. :— **Arms sideways — Stretch** **Arms upward — Stretch** and from the A. upw. str. pos. the following :— **Arms swinging downward and backward** (Fig. 90.)		

Common Faults.	Remarks.
240.	
241. (i) Front knee not bent sufficiently. (ii) Leaning the body too much forward. (iii) Rear toe not pointed	 Fig 89.
	 Fig. 90.

Starting Position.	Exercise.	Executive Word.	Detail.
242. 1 short pace from and back towards wall bars, F. full o.	**On the third (fourth, fifth) bar, Left Foot —Support**	"*Support*"	Bend the left knee and place the foot between the third and fourth bars, pressing the toe against the former and the sole against the latter.
	Foot inward—Place	"*Place*"	Resume the starting pos.
243. F. support on wall bars and H. f or A. b.	**Foot forward—Lunge** (Fig. 91.)	"*Lunge*"	Lunge forward as usual far enough to fully stretch the rear leg.
	Foot inward—Place.... Note. — The following may be added in the Lunge position, viz. :— **Arms sideways—Stretch** **Arms upward—Stretch** and from the latter pos. :— **Arms swinging downward and backward**	"*Place*"	Resume either the starting pos. by carrying the front foot back or the erect position by bringing the rear foot up to the front (according to which foot is named)

Common Faults.	Remarks.
242.	Used as a starting position for *Lunging forward.*
243.	 Fig. 91.

GROUP J.—MARCHING AND RUNNING.

244. This group includes, beside marching and running, all the exercises of the legs which are performed on the move, except jumping and vaulting.

Marching should be light, free and springy, it should also be economical of the power employed in order that the ground may be covered with comparatively little effort.

No exercise is more used in daily life than walking, but the number of people who walk badly is very large. The ability to cover long distances in the ranks without undue fatigue can only be acquired by practice on the line of march, but it may be stated with confidence that an improvement in the method of walking or marching (which is so essential for a soldier) is best effected by a course of general training which gives full control of the body and limbs, lightness and freedom of movement and general fitness to the system.

One-sided and insufficient bodily development with its resulting stiffness of joints, heaviness of movement and lack of control is the most general cause of bad walking. The various forms of *Marching exercises* together with the *Leg* and *Balance exercises* are those which are specially employed for the correction of these faults.

All marching exercises are commenced with the left foot, and are usually performed by a class in file moving round in a circle, or along the sides of a rectangle with slightly rounded corners, the size of which (depending on the space available) should not be too small. The instructor should take up a position outside this circle so that he may best keep his class under observation.

Marching in a circle should give way to marching in line or opened ranks whenever conditions permit. The object of marching in line is to improve each man's stride. The correct step should be kept, but men should be allowed to take their most easy and natural length of pace. This is purely a physical exercise and is beneficial in preventing stiffness in marching.

When performing the exercises in this way the men should open out from the front, without word of command, to 2 paces to admit of full freedom of movement.

Running or doubling is included in this group, but is also closely allied to jumping. Its educational value in training men to lightness, activity, ease and quickness of movement cannot be overestimated. It is also the simplest way, when taken carefully and progressively, of training the heart and lungs, and thus has a very practical value in training the " wind " and powers of endurance in order that ground may be covered quickly whenever required without undue fatigue.

After *running* exercises the *Quick March* should always be taken in order that the more normal rate of circulation and respiration may be restored before proceeding to other exercises.

245. The length of pace and cadence in the various forms of marching are as follows :—

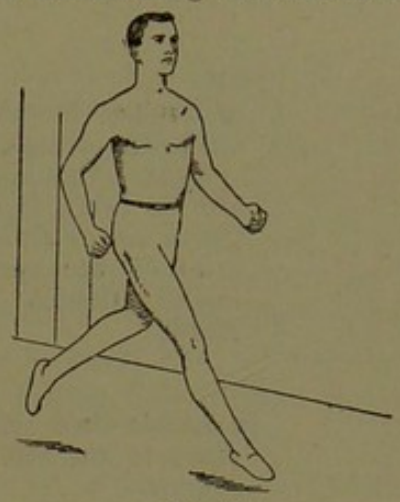
Slow March,	30	inches and	75	to a minute.	
Quick	,,	30	,,	120	,,
Double	,,	40	,,	180	,,

These are the normal paces and cadence for practical use on parade and in the field, but when the Marching Exercises are employed as physical training exercises the men are more lightly clothed, are carrying no weights and are wearing light shoes, the cadence may therefore be increased with advantage to about 140 per minute in quick time in order to give more life and smartness and to obtain more value from the movements. And when running or doubling the pace should be lengthened considerably according to requirements so as to encourage a free and natural stride.

Starting Position.	Words of Command.	Detail and Remarks.
246.	**Quick—March**	Step off smartly with the left foot in quick time, taking care that the first pace is a full one. The legs should be swung forward alternately freely and naturally from the hip joints, each leg as it swings forward being bent sufficiently at the knee to enable the foot to clear the ground. The foot should be carried straight to the front, and, without being drawn back, placed firmly upon the ground with the knee straight but so as not to jerk the body. The body should be maintained as erect as possible, its relative position being as described for the position of Attention, well balanced over the legs and carried evenly forward without swaying from side to side, and with head erect. The arms must not be stiffened but should swing freely and naturally from the shoulders, the right arm swinging forward with the leg and *vice versâ*. If the arms are swung in this way, they will bend naturally at the elbow as they swing forward and will straighten as they swing back, the movement being free without being forced. *Common Faults.* (i) Body inclined too much forward from the hips. (ii) Shoulders raised. (iii) Body swayed from side to side. (iv) Arms stiffened and shoulders brought forward. (v) Arms swung from the elbows only with the upper arm kept still. (vi) Arms swung across the body. (vii) Knee bent as the foot is placed on the ground.
	Halt	The word *Halt* will be given as one or other foot comes to the ground, the moving foot will complete its pace, and the other will be brought smartly up in line with it.
247.	**Quick mark—Time**	Raise each foot alternately about six inches from the ground, keeping the feet almost parallel to it, the knees raised to the front, the arms steady at the sides, the body steady and the cadence the same as in *Quick March*.

Starting Position.	Words of Command.	Detail and Remarks.
	(*a*)	(*a*)
Quick march	**Mark—Time**	On completing the pace with the advancing foot mark time as above, correcting the covering or dressing as the case may be. *Note.—Marking time* should never be continued for more than a few paces.
Quick mark time	**Halt**	Close the heels and remain still at Attention.
248.		
	Slow—March	Step off and march as described for *Quick March* but in slow time and keeping the arms and hands steady at the sides, pointing the toes downward and placing them on the ground before the heel, each leg being straightened smartly as it comes to the front before the foot is placed on the ground. *Note.*—This is an excellent exercise for gaining control of the limbs and balance of the body in marching, &c.
	Halt	As above described.
249.		
Quick march	**Heels—raise**	Rise on the toes as high as possible, keep the legs straight and, maintaining the same cadence as in the quick march, shorten the pace to about 18 inches, stretch the arms downward and keep them steady at the sides. Each step should be taken with just sufficient spring of the ankle joints to prevent stiffness of movement.
	Heels—Lower	Resume the *Quick March.*
250.		
Quick or double march	**Change—Step**	Complete the pace with the advancing foot and bring the ball of the rear foot up to the heel of the advanced one, which will take another pace forward without losing the time, two successive steps being taken with the same foot. To change step when marking time two successive beats will be made with the same foot.
251.		
H. f.	**In quick time, sideways to the left (right)—March**	Rising on the toes, step sideways to the left with the left foot and close the right foot to it, and repeat the movement till ordered to halt, keeping the legs straight, the heels raised and the body steady.

Starting Position.	Words of Command.	Detail and Remarks.
	Halt	(The word *Halt* should be given when the heels are together.) Take one more pace sideways and at the same time lower the heels to the ground.
252. From the Halt, H. f., or Quick mark time, H. f.	**With Knees raising quick mark—Time**	Keeping the body erect raise the knees alternately till the thigh is at right angles to the body and the lower leg hanging straight downward with the toe pointing to the ground. The cadence should be rather slower than quick time.
	(**Knees—Raise**)	
	Halt	Halt as from *Quick Mark Time.*
253. From the Halt, H. f., or Quick march, H. f.	**With Knees raising quick — March**	Keeping the body erect, raise the knees alternately as described above and move forward or continue to move forward rather slower than in quick time and with paces shortened to about 18 inches, taking care to carry the body well forward over the leading foot as it comes to the ground with the toe leading and the knee straight.
	(**Knees—Raise**)	
	Quick — March or **Halt**	Resume the *Quick March* or *Halt* as ordered.
254. Quick march, H. f.	**On the left Foot—Hop**	Keeping the body as erect and steady as possible hop forward on the toes of the left foot, springing from the knee and ankle joints and taking paces of about 18 inches, the right leg straight and kept well to the rear, toe pointed.
	Feet—Change	Swing the right leg forward and hop as above on the right foot. *Note.*—The cadence should be as in quick time and not more than 6 paces taken with each foot.
	Quick—March	Resume the *Quick March.*
255. Quick march, H. f.	**On alternate Feet—Hop**	As soon as the left foot next comes to the ground hop once on that foot as above described, then swing the right foot forward and, taking a full pace with it, hop once on that foot and so on, taking care to maintain the body erect and steady and the shoulders square to the front.
	Quick—March	Resume the *Quick March.*

Starting Position.	Words of Command.	Detail and Remarks.
256. From the Halt, or Quick march, or Quick march with Hl. r.	**Double—March** .... (Fig. 92.)	Step off with the left foot and double on the toes with easy swinging strides, inclining the body slightly forward but maintaining its correct carriage.  Fig. 92. The feet must be picked up cleanly from the ground at each pace, and the thigh, knee and ankle joints must all work freely and without stiffness. The whole body should be carried forward by a thrust from the rear foot without unnecessary effort and the heels must not be raised towards the seat but the foot carried straight to the front and the toes placed lightly on the ground. The arms should swing easily from the shoulders and should be bent at the elbow, the forearm forming an angle of about 135° with the upper arm (*i.e.*, midway between a straight arm and a right angle at the elbow), fists clenched backs of the hands outward and the arms swung sufficiently clear of the body to allow of full freedom for the chest. The shoulders should be kept steady and square to the front and the head erect. *Common Faults.* (i) Not moving sufficiently lightly. (ii) Allowing the heels to touch the ground. (iii) Moving too stiffly. (iv) Not swinging the arms freely and easily, *e.g.*, keeping the upper arms too close to the sides, sticking the elbows out, or swinging the arms across the body. (v) Swaying the body. (vi) Poking the head forward.

Starting Position.	Words of Command.	Detail and Remarks.
	Quick — March or **Halt**	Resume the *Quick March* or *Halt* as ordered.
257 Double march, H. f.	**Knees—Raise**	Raise the knees as before described but shorten the paces and take them rather slower than in double time.
	Halt	Halt as ordered.
	or **Double—March**....	As ordered.
	or **Quick—March**	As ordered.
	Note.—This may also be taken from *Quick march Knees raise* on the command **Double — March**	
253. H. f.	**In double time sideways to the left—March**	Rising on the toes and keeping the knees straight take a succession of paces sideways to the left in double time making the movement slight and springy, keeping the body erect and the heels off the ground.
	Halt	Close the heels and at the same time lower them to the ground.

GROUP K.—JUMPING AND VAULTING.

259. The principal exercises of this group are of a bold, active and vigorous character; they engender habits of activity, dash and energy, develop confidence and a consciousness of power, and, as they often require determination and pluck for their execution, are invaluable in the training of a soldier.

Each exercise consists of several movements, following one another in a harmonious succession, each movement requiring due regulation as regards time, strength and rapidity. Co-ordination of the muscles, control of the body, alertness and agility are thus acquired.

Jumping exercises are those performed without the assistance of the hands and arms. *Vaulting* is the term applied to those exercises in which the hands and arms are used for supporting the weight of the body on some apparatus during their execution.

260. All jumping and vaulting exercises consist of three parts, in addition to the preliminary run which is used in many of them, viz.:—

(*i*) The "take off." (*ii*) The actual jump or vault. (*iii*) The "landing."

261. The "take off" can either be from one foot as in the high and long jumps, or from both feet as in most vaults. It is made up of a quick bending, followed by an immediate and powerful stretching of the hip, knee and ankle joints, and in training should always be taken from the fore part of the feet (otherwise the required lightness will not be obtained), but without any stiffness of the ankle. In the higher and longer jumps it is impossible to avoid bringing the heel to the ground in the "take off," but the practice obtained in "taking off" from the toes whenever possible improves the spring and makes the jumping light.

The distance in front of the obstacle at which a man should "take off" must vary with the height which is to be cleared. It is, however, a matter of judgment, and cannot be definitely laid down. The instructor must therefore watch the men carefully and tell them if they make the mistake of "taking off" too near or too far off when jumping a rope, &c.

In all jumping off one foot, the left and right feet must be used alternately. In "taking off" from one foot the jump is as it were a continuation of the run, but in jumping off both feet the last pace

of the run consists of a sort of preparatory jump, taken with the object of bringing both feet together for the spring. This preparatory jump should be short and quick so as to reserve as much of the power as possible for the actual jump or vault.

The use of a spring-board in all educational gymnastics (physical training) should be avoided, as it prevents a man from developing his own springing powers, and makes him trust to the spring-board for the spring.

262. The *jump* itself commences as the feet leave the ground, and finishes at the instant they again touch it. Just before the feet meet the ground at the end of the jump or vault the body should be fully stretched, although at the moment of landing the legs should be free from stiffness and ready to bend at once.

263. In "*landing*" the toes must meet the ground first, and the fall of the body should be broken evenly by a "giving" of the ankle, knee and hip joints at the moment of impact. The knees should be bent to about a right angle and kept well out, the feet at the normal foot-angle, heels together and raised, arms at the sides, trunk vertical and head erect. The knees should then be straightened nearly as quickly as they were bent and the heels lowered.

The body during the landing should be in full balance so that the position of Attention may be assumed correctly before moving off. The legs should work like a spring, at first compressed by the weight on landing and then extended for the recovery, the amount of "give" being regulated according to the requirement of the height, or, rather, the depth of the drop.

It is essential that a correct method of landing should be acquired, as it is in the landing that accidents are likely to occur owing to faulty method.

"Full knee bending" is an excellent exercise for improving the "landing," and should be constantly practised. Having once learnt this exercise, the knees should be fully bent whenever "landing" is performed, until the end of the course. "Free" standing jumps are also an excellent preparation for both "taking off" and "landing."

The latter (*i.e.*, the landing) should be taken carefully and progressively, at first by numbers and later more freely, securing complete control and balance by occasionally halting in any of the intermediate positions. The better the training in this respect the less the necessity for mats and mattresses, the use of which should be discouraged as much as possible. Mats and mattresses cause dust, and besides preventing proper "landing," they also cause nearly as many accidents as they prevent. Without them the men are far more likely to learn how to break the fall correctly by the elasticity and spring of their muscles.

In the more practical jumps and in all jumps which are taken "free" and with the intention of moving forward immediately afterwards, the heels may be brought to the ground on landing, as the legs are straightened instead of passing through the *Heels raise* position.

264. *The run.*—Most of the jumps require a forward movement which necessitates a run. The "take off" supplies the upward movement and *the run* the forward movement. The run is commenced from the position of Attention by raising the heels, a few paces forward are then taken, the paces being regulated so that the required foot shall be in front at the "take off" and the speed increased (never checked) at the end of the run to obtain the necessary impetus.

In the early stages of training the run should not therefore be for more than three paces and should be commenced with the foot from which it is intended to jump. Being started at a fixed distance from the obstacle, it prepares men to gauge their stride correctly when approaching a jump with a longer run.

265. The above remarks apply generally to jumps of moderate height and limited length for training purposes in a gymnasium. In jumping greater heights and longer distances the principles should be the same, but the movements may be taken more freely according to individual requirements. But it should be noted that when jumping *height* the run should be short, and when jumping *length* the run should be long enough to obtain topmost speed at the "take off" in order to gain the necessary forward impetus.

Starting Position.	Exercise.	Executive Word.	Detail.
266.	**Upward jumping** .... (Fig. 93.)	" *One* "	Hl. r. ....
		" *Two* "	K. b.
		" *Three* "	Spring quickly from the ground vertically upward, at the same time fully extending the body and legs, keeping the arms straight at the sides and carrying the head and feet backward without bending the knees, drop to the ground from the jump on to the toes with the knees practically straight but not stiff neutralising the shock of the landing by a spring-like " giving " of the ankle, knee and hip joints and remain in the K. b. pos.
		" *Four* "	K. str.
		" *Five* " or " *Jump* "	Hl. lower As above, but judging the time, taking the two first motions rather quickly.
267.	**Upward jumping with turning to the left**	" *One* "	Hl. r. ....
		" *Two* "	K. b.
		" *Three* "	Jump upward as above, turning in the air to the left and remain in the K. b. pos.
		" *Four* "	K. str.
		" *Five* " or " *Jump* "	Hl. lower
268.	**Upward jumping with Arms raising sideways**	" *One* "	Hl. r.
		" *Two* "	K. b.
		" *Three* "	Jump upward as before, raising the arms sideways while rising from the ground and lowering them to the sides while descending.
		" *Four* "	K. str.
		" *Five* " or " *Jump* "	Hl. lower

Common Faults.	Remarks.
266. (i) Not stretching sufficiently in the jump. (ii) Landing too heavily	This and all the free standing jumps are at first taken by numbers, in order that the separate movements may be learned and control may be obtained. To gain further control it is often useful to give a longer or shorter pause between each word of command and movement when jumping by numbers. But the important part of these exercises is to learn the exact timing of the motions in taking the spring and landing; this can only be effected by performing the exercises "judging the time." In order, however, to be certain that full control has been acquired it is occasionally useful to order the class, when judging the time, to halt after the third or fourth movement, *i.e.*, in the second K. b. or Hl. r. pos. Two or more jumps may be taken in quick succession by making use of the landing position of one jump for obtaining the spring for the next.
267. (i) Commencing the turning in the K. b. pos.	
268.	

Fig. 93.

Starting Position.	Exercise.	Executive Word.	Detail.
269.			
	Upward jumping with Arms swinging upward	"*One*"	Hl. r.
		"*Two*"	K. b.
		"*Three*"	As before, swinging the arms upward while rising and downward while descending
		"*Four*"	K. str.
		"*Five*" or "*Jump*".	Hl. lower
270.			
	Forward jumping	"*One*"	Hl. r. ....
		"*Two*"	Bend the knees and incline the body slightly forward
		"*Three*"	Jump as before described but forward, landing in the K. b. pos.
		"*Four*"	K. str.
		"*Five*" or "*Jump*"	Hl. lower
271.			
	With one (three) paces forward off the left Foot—Jump	"*Jump*"	Raise the heels and then take one or three paces forward (as ordered) on the toes, commencing with the left foot and jump forward as described for forward jumping but off the left foot
	(*a*) **With turning to the left one (three) paces forward off the left Foot—Jump**	"*Jump*"	(*a*) As above, but turning in the air to the left
272. From bench, &c.	**Downward jumping** (off the left or right foot)	"*One*"	Swinging the left leg forward with the knee straight, jump forward and downward off the right foot, keeping the arms to the sides, stretching the body in the air and landing as before described, remaining in the K. b. pos.
		"*Two*"	K. str.
		"*Three*" or "*Jump*"	Hl. lower

Common Faults.	Remarks.
269.	
270.	This exercise is not performed with the object of jumping as far forward as possible, but for correctness of style.
271.	Correctness of style should be aimed at and not the covering of a long distance. The " taking off " pace should always be taken quicker than the other paces to work up for the spring. The class should occasionally be ordered to halt in the second K. b. or Hl. r. pos. as mentioned above, in order to ensure complete control.
272.	No attempt should be made when jumping from a considerable height to increase the drop by jumping upward, but rather the other way, *e.g.*, the body should be, as it were, let down easily by well bending the taking off leg before actually taking off.

Starting Position.	Exercise.	Executive Word.	Detail.
273. H. f.	**Hopping with leg raising sideways**	"*Commence*"	Keeping the body as erect and steady as possible, hop upward on the toes of the right foot, springing from the knee and ankle joints and at the same time raising the leftleg sideways, lowering it again and then hopping on the left foot and raising the right leg sideways, and so on alternately on each foot
274.	**Jumping over rope. With three paces forward off the left Foot—Jump** Note. — This should also be taken "free" off either foot.	"*Jump*"	Jump, with three paces run, as before described but raising the knees and feet sufficiently high to clear the rope and assisting the spring by a "free" upward swing of the arms which should however be again brought to the sides as the toes meet the ground in landing
275. 1 pace from and side towards rope.	**Jumping over rope with oblique run**	"*Jump*"	Take a pace forward with the foot that is nearest the rope, then a pace forward with the other foot, and, taking a spring from the ground, swing the first leg over the rope, followed by the other, at the same time raising the arms forward in line with the shoulders and inclining the trunk slightly forward; land on the other side of the rope on the toes of the first foot and then on the toes of the second foot, continuing to move forward in quick time

Common Faults.	Remarks.
273. (i) Swaying the body. (ii) The movements not being easy and light.	
274.	The rope should at first be quite low, correctness of style being aimed at rather than height. The jumping should be just high enough to clear the rope easily and no more, and, to ensure control, an occasional halt may be made in one of the landing positions as before described, but taking care to avoid stiffness or any unnecessary additional movements. As style, lightness and control are acquired the rope should be raised.
275. (i) Not continuing to move forward while jumping and landing. (ii) Making the movements too stiff and heavy	This exercise should not be taken until a thoroughly good style of jumping with a straight run has been acquired.

Starting Position.	Exercise.	Executive Word.	Detail.
276.	**Long jumping** (over two chalked lines). **With three paces forward off the left Foot—Jump** *Note.* — This should also be taken "free" off either foot	"*Jump*"	Raise the heels and then take three paces forward on the toes, commencing with the left foot and jump forward as before described but over the two chalked lines, landing in correct form
277. Under beam, shoulders parallel to it; Under beam, shoulders at right angles to it	**Over-grip**, **Under-grip**, **Oblique-grip**, **Cross-grip** — **Up**	"*Up*"	Raise the heels, bend the knees, jump upward, at the same time swinging the arms upward, and grasp the beam as ordered
Overgr. Undergr. Crossgr. Obliquegr.	**On the Feet—Down**	"*Down*"	Raising the body a few inches by a slight pull with the arms, quit the grasp of the beam with the hands, swing the arms downward and drop to the ground on the toes, landing as usual with K. b., K. str., Hl. lower
278. (In front of wall bars)	**On the top bar—Up**	"*Up*"	Placing the left hand and right foot on the highest bars that can be reached, and grasping firmly with the hand, seize the top bar with the right hand little finger close to the left partition, board turning about in doing so, and grasping the other end of the same bar with the left hand with overgr. The body should then be hanging from the top bar with overgr., head, shoulders, seat, legs and heels, all touching the bars, toes together and pointed

Common Faults.	Remarks.
276. (i) Taking off too far away from the first line. (ii) Not rising quite high enough to get the required length	This is a useful preparation for jumping longer distances, correctness of style being aimed at and not length of jump. The chalk lines on the floor should be about 2 paces apart. In the "take off" the toe should be just short of the first line, and in the "landing" the feet should be just clear of the second. As the style improves this jumping should be practised in the open on prepared ground, over ditches, &c., and the distances increased.
277. (i) Not at once taking the proper grip	The *positions* of overgrip, &c., are classified with the Heaving exercises and are therefore described under that group heading (*vide* paras. **171** to **174**).
(i) Not swinging the arms down to the sides as the grasp is quitted. (ii) Bending the body forward	
278.	Used as a starting position for *Knee* and *Leg raisings*. The method of obtaining the position is here described in detail; it should, however, be taken as quickly and smartly as possible and with considerable freedom of movement.

Starting Position.	Exercise.	Executive Word.	Detail.
	On the Feet—Down	" *Down* "	Swing the legs forward, keeping them straight, push slightly from the back, let go the bar, and alight on the ground as usual, swinging the arms downward to the sides
279. Beam grasp (*vide* para **164**)	" **First position** " .... (Fig. 94.)	" *One* "	Retaining the grasp of the beam with the hands, take a short preparatory jump forward off both feet and remain with the knees bent ready to spring upward
		" *Two* " .... or " *Up* "	Spring up to the position, viz., arms straight, hands the width of the shoulders apart, trunk supported above the bar by the arms, shoulders down, spine fully stretched, front of the thighs resting against the beam, legs straight, toes pointed, head and feet slightly drawn back showing an even curve from head to heels with the body pressed well up between the arms
	On the Feet—Down	" *One* "	Swing the legs a little forward keeping the knees straight
		" *Two* "	Swing the legs a little backward from the hip joint and at the same time push the body a little backward from the beam and alight on the toes on the ground a short pace from the beam, bending the knees to break the fall as before described and retaining the grasp of the beam with the hands
		" *Three* "	K. str.
		" *Four* " or " *Down* "	Resume the starting pos. (beam grasp)

Common Faults.	Remarks.
279. (i) Shoulders not pressed down. (ii) Back rounded and chest flattened. (iii) Legs allowed to fall forward	Used as a starting position for many vaults, it is also used very frequently as an intermediate position between other exercises on the horizontal bar in recreational gymnastics. In *Upward circling* with undergr. and some other exercises the same position is obtained, but with the fingers to the rear and thumbs to the front, and should it be required (as is sometimes the case) to take the position with the fingers to the rear in this way, the men should be ordered to "reverse the hands."

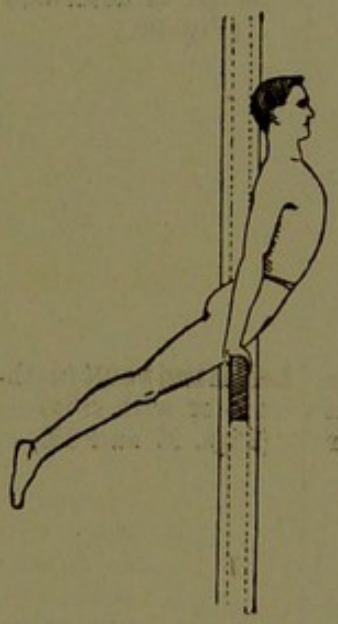


Fig. 94.

Starting Position.	Exercise.	Executive Word.	Detail.
280. First pos., or beam grasp, or with run	**Vault to left with Foot assisting** *Note.*—When taken from the *beam grasp pos.*, or *with a run*, the position with the foot on the beam should be taken direct from the upward spring. It should usually be practised "free" (Fig. 95.)	"*One*"	Raise the left leg sideways and place the inside of the foot on the beam
		"*Two*" or "*Vault*"	Lean the body forward over the beam, raise the right leg and pass it over the beam inside the left foot, quitting the grasp with the left hand, and then with the right, and land as usual on the ground on the opposite side of the beam and facing away from it
281. Beam grasp, or First pos., or with run	**Vault to left** .... *Note.* — When taken from "First pos." the movement is commenced by swinging the legs forward, and completed as described (Fig. 96.)	"*Vault*" or "*Go*"	Take off from both feet, jump up with straight arms and bent knees keeping the back as straight as possible and swing the body over the apparatus to the left pivoting on the hands, knees together, toes pointed, changing the position of the hands, left hand first and then the right, and land as usual on the toes facing the apparatus
282. Left Hand beam grasp and right F. forw. pl., or with run	**Left Hand vault** (without or with rifle) (Figs. 97 and 98.)	"*Vault*" or "*Go*"	Keeping the legs straight swing the left leg over the apparatus followed by the right, supporting the weight of the body on the left hand, arm straight, at the same time raise the right arm, bending it at the elbow, forearm vertical; land as usual on the toes on the opposite side of the apparatus and facing away from it, dropping the arms to the sides

Common Faults.	Remarks.
280.	This is the simplest and easiest kind of vault, and, when taken "free," it is one of the most practical methods of surmounting in the field a low wall or railing of moderate height.

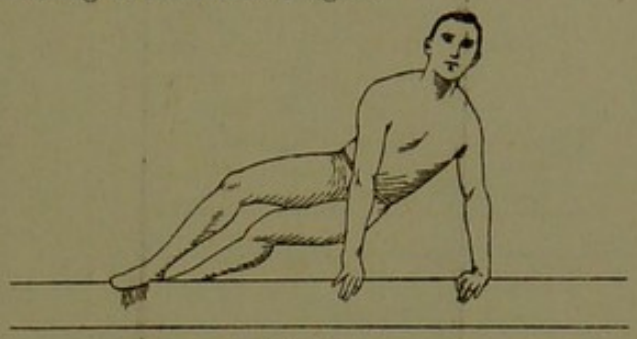


Fig. 95.

281. May also be taken on box horse.

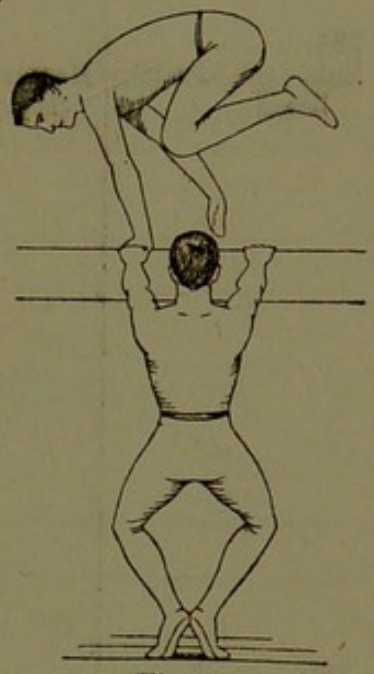


Fig. 96.

282. This is a practical method of surmounting an obstacle (*e.g.*, a stout railing) in the field. The upward swing of the free arm, with or without a rifle, should be made so as to assist the raising of the body over the apparatus or obstacle.

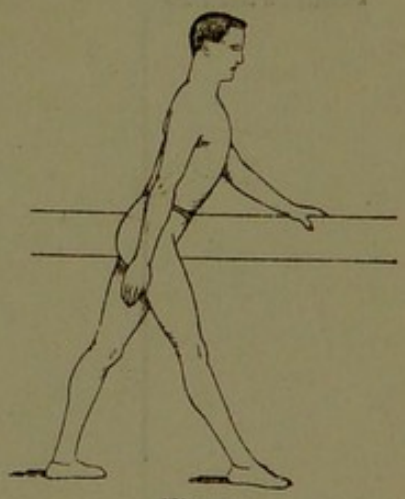
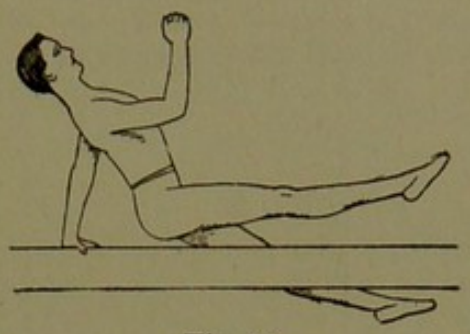
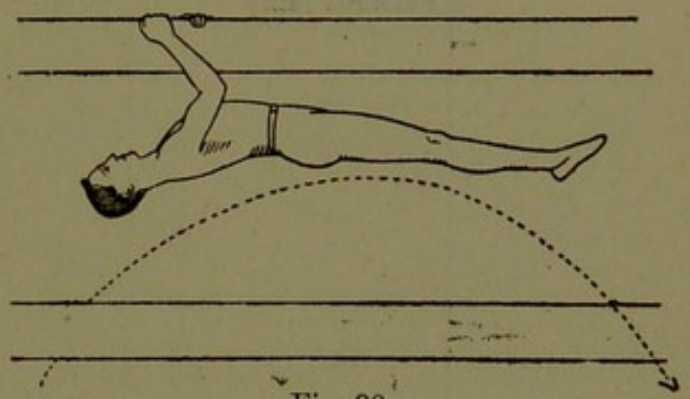


Fig. 97.

Starting Position.	Exercise.	Executive Word.	Detail.
283. First pos. on upper of two beams	**Vault to left** (over double beam)	"*Vault*"	Reverse the right hand, bend the body forward from the hips, and, placing the left hand on the lower beam vertically under the right, swing the legs over the beam to the left, keeping them straight, and land as usual facing to the right, retaining the grasp of the upper beam with the right hand
284. Side to double beam	**Heaving jump** .... (Fig. 99.)	"*Jump*"	Jump off both feet, as far forward as possible to get the required swing, and grasp the upper beam with crossgr., hand furthest from beam in front, bend the arms and swing the legs over the lower beam by bending from the hips, stretching again vigorously in clearing it so that the body is horizontal, let go the beam and land as usual with side to and nearest hand on the lower beam
285. Facing double beam, with run	**Heaving jump**	"*Jump*"	Take off from both feet far enough from the beam to just reach it comfortably with the jump, seize the upper beam with overgr. and bent arms, bend the knee and hip joints so as to clear the lower beam, straighten them again sharply and shoot the body forward with the assistance of the arms. Land as usual, swinging the arms downward to the sides

Common Faults.	Remarks.
283.	 Fig. 98.
284,	The K. b. pos. of the "landing" may be used, if required, for obtaining the spring for a second *Heaving jump* back to the side from which the first jump was started.  Fig. 99,
285.	

Starting Position.	Exercise.	Executive Word.	Detail.
286.			
	On the Knees (Fig. 100.)	"*Go*"	Run to the horse, and, taking off close to it, spring upward off both feet, placing the hands on the horse the width of the shoulders apart bending the hips and knees so as to raise the latter between the hands to the top of the horse to the following position, viz., legs together, toes pointed, knees to the front and fully bent, shins resting on the top of the horse, insteps touching the rear edge, body and head erect and sitting well back on the heels, arms to the sides
	Forward jump	"*Jump*"	Spring forward off the insteps, throwing the arms freely to the front without stiffness, so as to assist the spring and alight as usual on the toes, arms to the sides
287.			
	On the Feet to Attention	"*Go*"	Run to the horse, and, taking off close to it, spring upward off both feet, placing the hands on the horse the width of the shoulders apart bending the hips and knees so as to raise the feet to the top of the horse, then immediately straighten the body to Attention
	Downward jump	"*Jump*"	Jump downward off one foot keeping the arms to the sides as before described (*vide* para. 272)

Common Faults.	Remarks.
286. (i) Putting too much pace into the run. (ii) Taking off too far from horse. (iii) Overbalancing forward	This and the following exercises are all taken at the box horse. When it is required, as in this and the next exercise, to remain stationary on the horse, the "take off" should be quite close to it and the jump made directly upward rather than forward.
287. (i) Taking off too far from horse. (ii) Jumping forward instead of upward. (iii) Not immediately taking the correct pos. of Attention on the horse	

Fig. 100.

Starting Position.	Exercise.	Executive Word.	Detail.
288.	**On the Feet and off** .... (Fig. 101.)	"*Go*"	Run to the horse, jump off both feet, and, placing the hands on the horse the width of the shoulders apart, and, keeping the legs together, bend the hips and knees so as to raise the feet to the top of the horse into the K. b. pos. with the body inclined forward, and then, without any pause, jump well forward, straightening the legs and stretching the body in doing so, arms to the sides, and land as usual
289.	**Between the Hands**	"*Go*"	Run to the horse and jump off both feet, placing the hands on the top as before, and, inclining the body well forward, bend the legs well up under it, so as to clear the horse, keeping the knees and feet together and assisting the forward movement by pressing off with the hands; land as usual
290.	**Left Hand vault** (without or with rifle)	"*Go*"	As described for the beam but with a run (*vide* para. **282**)

Common Faults.	Remarks.
288. (i) Not putting enough pace and dash into the run. (ii) Taking off too close to the horse. (iii) Not springing forward immediately the feet touch the horse	Whenever it is required, as in this and most of the following exercises, to either clear the horse altogether with the feet, or to touch it momentarily with them in passing, the "take off" should not be too close to it, and the jump should be made well forward and slightly before (not after) the hands are placed on the horse.

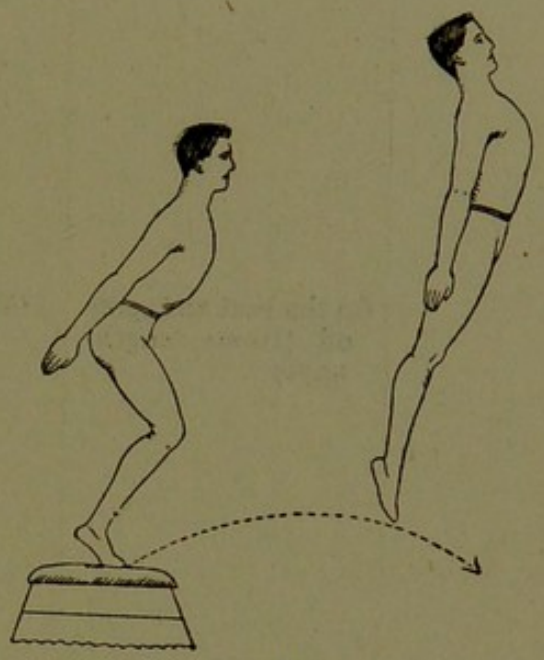
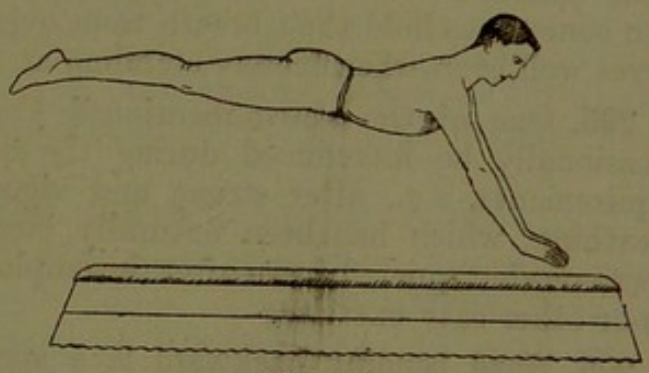


Fig. 101.

289. (i) Not putting enough pace and dash into it. (ii) Taking off too close to the horse. (iii) Keeping the hands too long on the horse	In this exercise the feet should not be actually passed between the hands, but the hands (assisting the forward movement) should quit the horse before the feet clear it. When the exercise is new the attention should be specially devoted to *clearing* the horse as described, and as progress is made, attention should be turned *to the "landing," e.g.*, stretching the body *after* clearing the horse and "landing" as previously described.
290.	The run should be made as straight as possible, with only a very slight curve just before reaching the horse. The pace of the run should not be too fast.

Starting Position.	Exercise.	Executive Word.	Detail.
291. Attention on top of and at near end of horse	**Splits off** (Horse lengthways)	"*Off*"	Bend the knees slightly, spring forward from both feet and place the hands on the end of the horse, arms straight, straighten and open the legs allowing them to pass one on each side of the end of the horse, at the same time push off from and quit with the hands, then close the legs, straighten the body and land as usual
292.	**On the Feet and splits off** (Horse lengthways)	"*Go*"	Run to the horse, jump off both feet, place the hands on the near end of it, bend the hips and knees well up and place the feet on the same end, at the same time shifting the hands to the far end and finish with *Splits off*
293.	**Splits over** (Horse lengthways) (Fig. 102.)	"*Go*"	Run to the horse, jump off both feet, and, throwing the legs, which should be kept straight, well up in the air, reach for the far end of the horse with the hands, and, without checking the forward movement, separate the legs and clear the end of the horse as before described for *Splits off*

Common Faults.	Remarks.
291.	
292. (i) Not putting enough pace and dash into it. (ii) Pausing with the feet on the horse	
293. (i) Insufficient pace and dash. (ii) Not throwing the legs up sufficiently. (iii) Not placing the hands far enough forward on horse	 Fig. 102.

GROUP L.—CORRECTIVE EXERCISES.

294. It is found to be beneficial to conclude the daily lesson with an exercise of a quiet and somewhat corrective nature. Such exercises are selected from those already described under the various group headings, and the following are those which are most usually employed :—

1. **Head bending backward.**
2. **Arms raising sideways.**
3. **Arms raising sideways with Heels raising.**
4. **Arms raising sideways and upward.**
5. **Arms raising forward, upward, sideways and downward.**

It will be noticed that *Arms raising* exercises are those which are most frequently used for this purpose. These exercises should be taken in such a way as to coincide with the ordinary rhythm of breathing and the movements of the Arms, &c., should be easy, smooth, and continuous without sudden pauses and jerks.

In this connection it should be noted that unrestricted breathing should be maintained during *all* exercises and the instructor should, if necessary, remind the men to breathe freely, especially during those exercises in which there is any likelihood of the breath being held. This is a matter of some importance as experience shows that men sometimes hold their breath from over anxiety to acquit themselves well even when merely standing at Attention on parade.

295. One of the above-mentioned Corrective exercises should occasionally be introduced during the daily lesson according to requirements, *e.g.*, after strong and vigorous exercises, when the breathing, which has been naturally increased by such exercises, has somewhat quieted down after the employment of a *supplementary leg* or other easy exercise.

296. Head bending backward is a specially useful exercise for the correction of the carriage, and may be frequently employed for this purpose.

In addition to the above it may be mentioned that Overgr. (wall bar)—**Knees raising** is a useful correction for the common fault of "hollow back," and that both H.f.—**Heels raising** and Quick march —**Heels raise** are good correctives for "flat foot."

SECTION VIII.

OBSTACLE TRAINING, ETC.

297. The following exercises are all of a practical nature, and with one exception (viz., *Mounting the pommel horse*), prepare for surmounting obstacles in the field. Efforts should be made to provide obstacles, other than those here referred to, locally for the purpose of improving this branch of the training. Apparatus, etc., may also be arranged as obstacles in the gymnasium with the same object, and the men practised in surmounting them, following each other in succession in single rank, files or fours, rapidly and smartly.

These exercises should be taken in the Table with the Jumping and Vaulting, and should also be practised regimentally at any convenient season by men who have completed their recruit's training.

They should be practised at first *without* and afterwards *with* rifles; and although at first they should be taught in detail, they should, as soon as possible, be taken "free," the regular progression of the physical training enabling this to be done without difficulty.

THE SHELF.

298. The class will be drawn up, standing at ease, in two ranks in close order, facing the shelf and about 8 to 10 paces from it.

299. One rank mounting shelf with assistance (by numbers).

Front rank, below shelf—One	Both ranks spring to *Attention*, front rank double out and take *left* F. forw. pl. pos., with left foot about 12 to 15 inches in front of the front edge of shelf, and dividing the intervals evenly. Rear rank remain at Attention.

(About 1 yard per man should be quite sufficient interval for the performance of this exercise.)

Two ...	Front rank swing left about on the left foot so as to face the rear rank, at the same time lunging backward with the right foot, but keeping the body erect, and placing the hands, with the fingers interlaced, on the left thigh.

Rear rank, on the shelf—One ... Rear rank double out and take *right* F. forw. pl. pos. with the weight of the body on the right foot, which should be a few inches to the right of the front rank man's forward foot, the left heel raised, and the hands on the shoulders of the front rank.

Two ... Rear rank place the left foot in the front rank man's hands, spring from the ground with the right foot and straighten the left leg, at the same time transferring the hands from the shoulders to the edge of the shelf, and, with the assistance of the front rank, rise above the shelf, straightening the arms, raising the seat well up and bending the right knee, and place the right foot on the shelf close to the right hand.

To assist in this movement, the front rank (as the rear rank man straightens his leg after springing from the ground) will bring the right foot smartly up to the left, at the same time raising the locked hands upward as high as possible and slightly forward.

All these movements must be performed rapidly and continuously.

Three ... Rear rank, turning left about, spring smartly to *Attention* on the shelf.

Front rank come to *Attention*.

Front rank—Fall in ... Double to the places previously occupied by the rear rank, turn about, halt and stand at ease (moving " free ").

Downward circling (from *Attention* on shelf).

One ... Take " First position " (*vide* para. **279**), with hands reversed on edge of shelf, and legs resting on it.

Two ... Circle downward steadily to undergr. hang. pos. (*vide* para. **182**).

Three ... Drop lightly to the ground, as usual, and remain at *Attention*.

Fall in ... ... Double to the places that the front rank previously occupied, turn about, halt and stand at ease (moving " free ").

The ranks will thus be changed ready to repeat the exercise with the other rank.

N.B.—At first the instructor should assist each individual when circling downward until he is sure that each man can perform this part of the exercise with safety. The men should, however, be trained to circle down without expecting assistance.

300. One rank mounting shelf with assistance (judging the time).

Front rank, below shelf—Ready	Execute the two movements described above as quickly as possible, without any pause between them.
Rear rank—Up ...	Execute the three movements as quickly as possible, without pausing between them.
Fall in	Front rank fall in as above described.
Downward circling—Down	Execute the three movements described above, observing a slight pause in the "First position," and circling downward steadily, again observing a slight pause before dropping to the ground.
Fall in	As above.

Repeat with the other rank.

Downward jumping (from *Attention on* shelf).

301. The men will be turned to the right or left as required, and will jump downward as directed (*vide* para. **272**) off one foot, but moving "free," and taking the jump in their stride as they arrive at the edge of the shelf, the first man jumping a little to the right, the second a little to the left and so on, so as to be quite clear of each other when landing. There must be no attempt to increase the depth of the drop by jumping upward, on the contrary, the drop should be minimised as much as possible by jumping directly towards the mattress. (The use of a mattress is necessary in a gymnasium with a hard floor when jumping from the greater heights.) In landing the body should be inclined slightly *forward* rather than backward, and as each man "lands" he should at once *move forward* 3 paces, wheel and return to his place in the class (but as a front rank man), moving "free," and by the flanks and rear of the class. The class will then be in position ready to repeat the exercises with the other rank.

The pace at which the men follow each other in jumping should at first be slow (if necessary the men may jump individually by word of command), but with practice the pace should be increased till it can be taken very rapidly.

302. Both ranks mounting shelf with assistance

Front rank, below shelf—Ready	As before.
Rear rank—Up ...	As before.
Front rank—Up ...	Front rank turn about and rear rank step forward close to the edge of the shelf, and stand with feet astride, knees slightly bent, body inclined forward and the hands ready to assist the front rank. Front rank jump up, seize the shelf with both hands and pull up as quickly as possible. As soon as the heads of the front rank appear above the shelf, the rear rank, placing the right hand at the back of the head and the left under the chin, assist the front rank over the "dead point" at the end of the pull up. The front rank, thus assisted, mount the shelf, as usual, turning left about. Both ranks should then be at *Attention* in two ranks, front rank in front, with their backs to the wall.

Should the shelf be too high for any man to reach by jumping, his rear rank man will lie down flat on the shelf, and, reaching as far downward as possible with his right hand, hold the right hand of the front rank man with a "butcher's grip," placing his left hand on the edge of the shelf to give him lifting purchase. The front rank man will then spring from the ground, and, assisted by the rear rank man pulling, will seize the edge of the shelf with the left hand and immediately transfer his right hand also to the edge of the shelf. The rear rank man must then at once jump to his feet, and both will proceed as above directed.

After jumping or circling down, the class will fall in as usual, with changed ranks ready to repeat the exercise with the other rank in front.

When the above method of mounting the shelf has been learned satisfactorily, it may be performed *judging the time* on the word **Both ranks above the shelf—Go.** Both ranks will then spring to *Attention*, the front rank will double forward below the shelf; after a slight pause the rear rank will follow, and both will proceed as above described, without further word of command.

Ten-Foot Wall.

303. The class will be drawn up in fours turned to the right, at loose intervals, facing the wall about 8 paces from it, and standing at ease.

304. Surmounting wall with assistance.

First four, to the wall—Ready — The *first four* will spring to *Attention*, double out and assume the *Ready* pos. for the front rank below shelf, but with the right shoulder, buttock and foot against the wall. The *second four* spring to *Attention*.

Next four—Up (*second four*) — The *second four* will act as described for the rear rank at the shelf, but using the hands while rising to steady themselves against the wall, and then grasping the top of it and swinging the right leg over to the right, assume the position of *sitting astride* the wall facing the left. The *first four* assist as described for front rank at shelf.

Next four — Ready (*third four*) — The *third four* will act as described above for the first four.

The *second four* will dismount on the far side of the wall by swinging the left leg over by the rear, letting themselves down to the full extent of the arms with the hands grasping the top of the wall, and then quitting with the right hand, press away from the wall with it, quit with the left hand and drop to the ground, turning about in the air so as to face away from the wall and landing as usual.

The *first four* double about 8 paces forward, and turn about, moving "free."

Next four—Up (*first four*) — The *first four* will mount the wall as described above, assisted by the *third four*. The second four will move forward on the far side of the wall, or form up in any position that may be ordered.

And so on, each section of fours alternately assisting and mounting until the last section is left at *Attention* at the foot of the wall.

"Ones"—Up ... The "Ones" or *odd numbers* of the section may then mount the wall as above, assisted by the "Twos" or *even numbers*, thus leaving 2 men (front and rear rank) at the foot of the wall.

Front rank—Up ... The *front rank* man may then mount the wall to the *sitting astride* pos., assisted by the rear rank.

The last man (rear rank) may then mount with assistance as follows :—

Last man—Up ...	The *front rank* man swings the left leg over the wall to the rear, and, leaning over the wall with his legs on the far side, reaches downward with his hands on the near side, fingers interlaced, arms straight. The *rear rank* man takes a short run, jumps forward and upward at the wall, placing his left foot against it as high as he can conveniently manage, and seizes the hands of the front rank man with his own right hand followed immediately by the left. *Both men* then pull upward, and the rear rank man transfers first one hand and then the other to the top of the wall, and continues to rise above the wall till he is able to throw his right leg over it, and so assume the sitting position. As soon as the rear rank man has transferred both his hands to the wall, the front rank man lets himself down on the far side as usual.
Last man—Down ...	The last man lets himself down as usual.

The above is the usual method of teaching a class to surmount the ten-foot wall, as it is suitable for the usual length of these walls. Should, however, the length of the wall admit, a whole rank may be assisted up at the same time ; then the " Ones " (or odd numbers) of the remaining rank assisted by the " Twos " (even numbers), and then every other man assisted by the man next on his right, and so on, on the principle described above.

The whole class, or as many of them as possible, may also be taught to surmount the wall as described for the " last man " with assistance from above.

In teaching a class carrying rifles to surmount this wall, the rifles should be slung as for escalading, or they may be passed over in batches when one set of men are on the far side and one set on the top of the wall.

Obstacle Course.

305. The following are the usual obstacles provided for instructional purposes :—

Posts and rail 2 feet high ...	Clear jump.
,, ,, ,, $3\frac{1}{2}$,, ,, ...	Left or right Hand vault.
Ditch (varying width) ...	Long jump.
Inclined and horizontal planks	Run up, along and downward jump.
Wall 6 feet high	Surmount without assistance.

These obstacles are usually arranged so that four men can negotiate them at the same time. The class should therefore be drawn up in fours (on a wider front if there is room), turned to the right, and facing the first obstacle about 8 paces from it. The movement between the obstacles should always be at a "free" double, and the following progressive steps taken to teach the men to negotiate the whole course.

306. By word of command.

First four, clear jump —Go	Double forward, jump as usual, and move forward a sufficient number of paces to admit of the remainder of the class forming up behind them, halt and stand at ease.

Each section of fours will then be ordered to "Go" in like manner.

First four, left Hand vault—Go	Double forward, vault as ordered and move forward as before.

And so on, the same procedure being adopted for the other obstacles, each being cleared by the whole class before the next is taken.

The six-foot wall is surmounted as follows:—Run forward and jump forward and upward at the wall, placing the left foot against it as high as can be conveniently managed, seize the top with both hands and mount to the sit. astr. pos. by swinging the right leg over to the right. Then place both hands in front of the body on the top of the wall, swing the left leg over by the rear, and vault to the ground, placing the right hand on the far side of the wall in doing so, as in vaulting over double beam.

When "judging the time" the sit. astr. pos. should be omitted, and the wall cleared at once by bringing the left leg up to the right as it is swung over the wall.

When rifles are carried, the right forearm should be placed on the wall instead of the hand, and the rifle held clear of it in mounting; the sit. astr. pos. must then be taken, and care taken in dismounting to prevent damaging the rifle.

307. Judging the time.

The class being drawn up as described, the word "Go" is given at the start only to each section of fours when the section in front has gone sufficiently far to prevent checking the pace at any time during the course. Each section should then complete the whole course without further word of command at a good sharp pace without pause, keeping their dressing by the right or left hand man as directed.

To encourage the spirit of emulation, the men in each section of fours may (when reasonably proficient) be allowed to race the whole length of the course.

Pommel Horse.

308. The class should be drawn up in two ranks parallel to the horse, and about 4 paces from it. The men will come out from and return to their places as usual, and will perform the exercise as explained below.

A man in position for the exercise will stand on the "near" side of and a few inches from the horse facing the imaginary head, just in front and clear of the front pommel, right arm raised as if holding the rein. The men will also be practised in mounting from the "off" side in a similar manner.

Prepare to mount ...	Turn to the right on the ball of the left foot, and, moving lightly on the toes, step sideways to the right front, so as to be opposite the centre of the saddle, close the left foot to the right, and seize the top of the pommels with the hands.

By numbers.

Mounting by numbers —One	Bend the knees and spring quickly from the ground up to the "First position," with the hands gripping the pommels.
Two ...	Swing the right leg over the horse and assume the riding position, as per "Cavalry Training," breaking the fall of the body by placing the right hand against the side of the saddle in doing so.

Judging the time.

Mount	As above passing through the movements without pause.

Dismounting.

Prepare to dismount	Place both hands on the front pommel, keeping the body erect.
Dismount ...	Swing the right leg over the horse to the rear, and drop to the ground lightly on the toes facing the saddle, landing as usual, and without pause turn on the ball of the right foot and take a pace with the left to the left front lightly on the toes, closing the heels and raising the right hand as if holding the rein.

This exercise is used as a preliminary training for mounting a horse without stirrups, and progression should be obtained by gradually raising the height of the pommel horse till it is somewhat higher than the average troop horse.

SECTION IX.

RUNNING TRAINING.

309. Running *exercises* are performed in the course of physical training for their educational effect, to teach the recruit the proper method of moving, and, with the other exercises of the course, to prepare him for *Running training*, the object of which is to enable him to cover a reasonable distance at fair speed without any undue signs of fatigue.

310. This *Running training* must be carried out regimentally and, in the case of the Infantry recruit, should commence at the depôt under squad instructors, and should be so continued at the headquarters of the Battalion. It should not be commenced too soon after enlistment, and should be carefully regulated to the capacity of the individuals. Progression in this, as in other training should not be too quick. It is not, as a rule, advisable to commence this training until the men have been about six weeks under physical training instruction.

311. The style of running should be on the principles described in para. **256,** but the speed should be regulated according to the necessities of progression by varying the length of pace and the cadence.

312. Continuity in this, as in other branches of training, should be aimed at (especially in the early stages), or the desired results cannot be obtained. When the distances covered are quite short, the running practice may be given 4 or even 5 days in the week, but rather less frequently at the commencement of the training When longer distances are covered, 3 or even 2 days a week may be ample.

313. The training should be commenced by running about 60 to 80 yards at a moderate pace, and then marching at ease in quick time until the normal breathing is restored. Another 60 or 70 yards may then be taken at a run, followed by marching at ease. A total of not more than 200 to 250 yards actual running may be taken in this way for the first few days ; the distances may then be gradually increased and the pace also slightly increased as the men prove equal to it.

314. As the distances covered without breaking into quick time are increased the number of periods of alternate running and walking should be reduced, and great care taken to avoid pushing the men beyond their powers. Signs of abnormal distress at the conclusion of the running mean that the progression has been too rapid, or that the man who shows such signs is not fitted for the training, and should be brought to the notice of the Medical Officer.

315. It is inadvisable to fix a hard and fast rule as to the exact distances that should be covered—this must be left to the discretion of the Officer in charge of the training—but it will show good progress if at the end of 6 weeks' running training the men are able to cover half-a-mile at fair speed without stopping or showing undue fatigue. The fully trained soldier should, however, be able to do more than this. To cover a mile of ground at a moderate pace without undue fatigue, after several months' training, is a reasonable standard to aim at.

316. From the above it will be seen that the running training of Recruits should always be taken in squads, and never in masses composed of men of different stages of training.

317. After a few weeks of the above training an occasional variation should be made by making the men race with each other at full speed for about 75 to 100 yards (not more). This practice is of great value as a change from longer distances, as it keeps the men quick and active; and by roughly handicapping the men the work may be regulated according to the individuals, and the spirit of keenness and emulation is introduced with advantage to all.

318. The clothing, etc., worn at these running practices should vary with the weather and progression. Boots should, as a rule, be worn, although the occasional use of shoes is most beneficial, improving as it does the lightness and springiness of the movement. The running should frequently be performed in the shirt sleeves, and, during the first 5 or 6 weeks of the training, it should always be so performed (except in very severe weather), and without arms. As the training progresses rifles should frequently be carried, and later on equipment worn according to requirements.

319. Running practice should not be carried out before breakfast, or too soon after a meal. Neither should it be carried out by whole Battalions irrespective of the training or the condition of the individuals. Men coming off furlough, from hospital or from some employment which has prevented them from having such training for some time, must be considered and brought into condition again by degrees, or serious harm may be done.

320. The running practice can often with advantage be carried out in connection with other training on drill or manœuvre parades, the total of the day's work being taken into consideration when regulating the amount.

321. The recruits' running training should be continued on the progressive lines indicated above until his training is completed, and he is finally passed into the ranks; and, as a trained soldier, he should then be kept fit by practice whenever necessary, due observance being paid to the above principles.

SECTION X.

USE OF DUMB-BELLS AND RIFLES.

322. There is no difficulty in making a selection from the exercises included in this Manual which will provide work sufficiently severe for all the ordinary requirements of training and exercise. If, therefore, the soldier is trained on the principles herein inculcated, there will be no necessity whatever for the employment of additional weights such as dumb-bells, rifles, etc., and, during the period of recruit training, their use as auxiliaries to this training is more, likely to do harm than good.

323. There need be no fear that the men will not become *strong enough* without the use of dumb-bells. If a man cannot, however, be made sufficiently strong for the ordinary work required of him as a soldier by the time he has finished his regular course of recruits' training herein laid down, such a man is either not fitted for the particular branch of the service for which he is being trained, or he is not fit for the service at all, and should be brought to the notice of the Medical Officer. Any attempt to make such a man stronger by the additional use of dumb-bells and heavier work than that prescribed would not only be of no avail but would probably cause him serious injury, and his inability to keep up with the normal rate of progression should have drawn attention to his case long before the end of his training.

324. The employment of special exercises with dumb-bells and rifles in the physical training of recruits is, therefore, not only unnecessary, but may be injurious.

Use of Dumb-bells.

325. The use of light dumb-bells should be kept for voluntary or recreational gymnastics. Many men, during the hours devoted to voluntary attendance in the gymnasium, will pick up a pair of dumb-bells and derive considerable benefit from their use, and as, during the voluntary hours, this is done of their own free will, they are not likely to do such work if they find it too hard for them.

The following exercises with dumb-bells are therefore recommended for use on such occasions :—

Arm Exercises.

(i) **Arms bending.**
(ii) A. b.—**Arms stretching sideways (upward).**
(iii) **Arms raising sideways (forward).**
(iv) **Arms raising sideways and upward.**
(v) **Arms raising forward, upward, sideways and downward.**

Leg Exercises.

(i) **Heels raising and Knees bending with Arms stretching sideways (upward).**
(ii) A. b., full K. b.—**Arms stretching sideways (upward).**
(iii) **Heels raising and full Knees bending with Arms raising sideways and upward.**

Trunk Exercises.

(i) F. astr. A. sidew. str.—**Trunk bending sideways.**
(ii) A. b., F. sidew. pl.—**Trunk turning with Arms stretching upward.**
(iii) F. full. o., A. b.—**Lunging outward with one Arm upward one Arm downward stretching.**
(iv) A. b., forw. lunge—**Arms stretching sideways and upward.**

Use of Rifles.

326. The use of the rifle in physical training should be confined to training men to handle their rifles with ease and care when surmounting obstacles, vaulting, running, etc., as indicated under those headings.

SECTION XI.

RECREATIONAL GYMNASTICS.

327. The value of active games and athletics in providing exercise of a recreational nature has been alluded to in para. **10.** The greater the variety of athletic amusements which the men are given the opportunity of taking up the better, in order that individual tastes

may be suited, and as many men as possible encouraged to develop habits of activity by employing their leisure time in healthy recreation.

328. What may be termed *Recreational Gymnastics*, as distinct from *Educational Gymnastics* (physical training), may therefore be included under the same category as athletic games, and opportunity afforded for their encouragement.

329. The following may be classified as *Recreational Gymnastics* viz. :—

Boxing.
Wrestling.
Swimming.
Bayonet fighting.
Fencing.
etc., etc.

To the above may also be added exercises with the following apparatus :—

Horizontal bar.
Parallel bars.
Vaulting horse (pommel or box).
Bridge ladder.
Pair of rings.
Indian clubs.
Dumb-bells.
etc., etc.

330. The various exercises on the apparatus here referred to are very numerous, and the difficulty of describing them satisfactorily on paper is very great ; it is not therefore considered advisable to include them in this Manual. A variety of such exercises are, however, taught at the Headquarter Gymnasium at Aldershot, and the services of trained N.C.Os. should therefore be available to teach these exercises, as required, to men who are desirous of learning. Whenever a gymnasium is open for voluntary practice one or more certificated N.C.Os. should be in attendance to assist by their advice and example.

331. The practice of Recreational Gymnastics being purely voluntary, there is no great danger of the men straining themselves by overdoing it. The certificated N.C.O. on duty in the voluntary hours must, however, take care that dangerous exercises are not attempted by " untrained " men. He should also be ready to assist and advise beginners according to their capacity, to " save " men who require it when performing exercises in which there is a chance of falling, and to teach the men how to help each other.

332. The introduction of recreational features into the regular " physical training " and " physical exercise " Tables should also be encouraged, especially in the Running, Jumping and Vaulting exercises. This may be done by occasionally making ranks, sections

of fours, etc., compete against each other in a rapid succession of "free" vaults and jumps, surmounting obstacles, etc., or in any other way that can be devised, in order to promote interest in the work, and encourage rapidity and freedom of movement. The value of the judicious combination of such recreational features with the more definitely ordered methods of training can hardly be over-estimated, and instructors should therefore frequently introduce exercises of this nature into the training.

SECTION XII.

ELEMENTARY ANATOMY AND PHYSIOLOGY.

Anatomical Outlines.

The Bones of the Skeleton, etc.

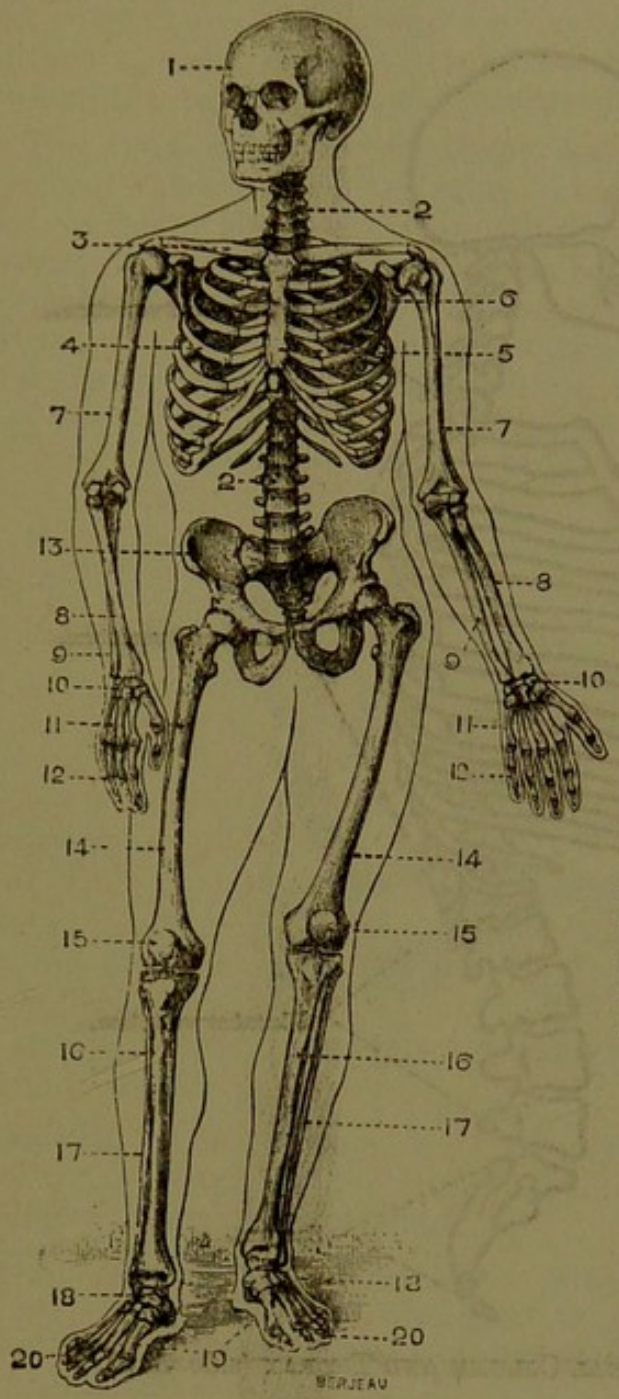
333. The **skeleton** consists of a number of bones, some long, some short and irregular, held together by bands or ligaments at the joints, which allow of greater or less movement between them. The bones determine the general shape and proportions of the body, give attachments to the muscles, and form levers on which the muscles act to perform the various movements of the body. They also form cavities for the protection of important organs.

334. A **joint,** or articulation, is the place where two or more bones work on each other. The ends of the bones where they touch one another are covered with a smooth, glistening material called **cartilage,** and they are kept together by bands which allow the bones to move in certain directions, but are tight in certain positions, so as to prevent the bones from slipping out of place. These bands are called **ligaments.** Inside the joint is an oily material, like the white of a raw egg, called **synovial fluid,** which lubricates the ends of the bones, and allows them to glide smoothly over one another. The membrane which lines the joint and provides this material is called the **synovial membrane.**

The two principal kinds of joints are the ball and socket and the hinge joint. The ball and socket joint allows one of the bones to move freely in all directions. The shoulder and hip are joints of this description. The second kind of joint, working like the hinge of a door, allows of movement up and down or backwards and forwards only, as in the elbow and knee.

335. The bones of the head and face are together called the **skull.** The skull consists of two portions, viz.:—The **cranium,** a strong bony case for the protection of the brain, and the face,

which consists of a number of bones, of which one only, the lower jaw, is movable. There is a hole in the base of the skull, through which the spinal cord communicates with the brain.



1. Cranium, or skull.
2. Spine formed of vertebræ.
3. Clavicle, or collar-bone.
4. Ribs.
5. Sternum, or breast-bone.
6. Scapula, or shoulder-blade.
7. Humerus.
8. Radius.
9. Ulna.
10. Carpus, or wrist-bones.
11. Metacarpal bones.
12. Phalanges, or fingers.
13. Pelvis.
14. Femur, or thigh bone.
15. Patella, or knee-cap.
16. Tibia.
17. Fibula.
18. Tarsus, or ankle bones.
19. Metatarsal bones.
20. Phalanges, or toes.

Fig. 103.—The Skeleton.

336. The bony parts of the trunk are the spinal column, the thorax and the pelvis.

The **spinal column,** or backbone, is composed of 24 separate and somewhat similarly shaped bones called **vertebræ,** placed one above the other. Each vertebra is a kind of bone ring with a flattened *body* in front, a projection behind called the **spinous process** and two lateral projections called **transverse processes.** These

processes serve for attachments for muscles. The vertebræ are placed one above the other, so that their rings form a long cavity called the **spinal canal,** which contains and protects the **spinal cord.** The spinal column ends below in a bone called the **sacrum.**

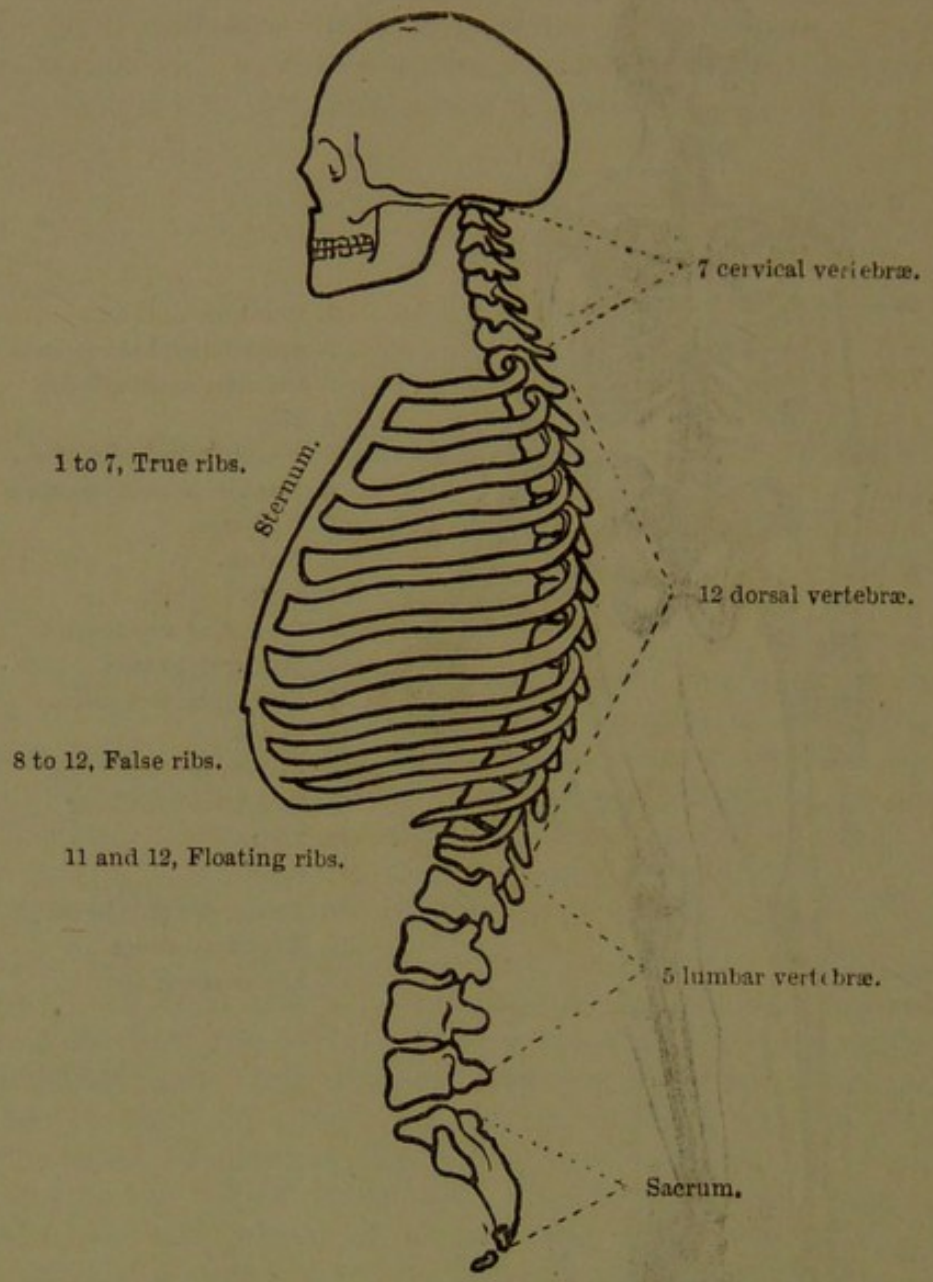


Fig. 104.—Skull, Spinal Column and Thorax (side view).

The 24 vertebræ of the spinal column are divided as follows from the top downwards into :—

7 cervical, or vertebræ of the neck.
12 **dorsal,** or vertebræ of the back.
5 lumbar, or vertebræ of the loins (small of the back).

The spine, when held as erect as possible, is not perfectly straight, but is curved forward in the cervical portion, backward in the

dorsal, forward again in the lumbar region and backward at the sacrum.

Between the vertebræ are pads of elastic cartilage, which prevent jarring and allow of a certain limited movement of the vertebræ, and consequent bending and turning of the spinal column. The movement, owing chiefly to the shape of the vertebræ, is greatest in the cervical region, less in the lumbar and least in the dorsal.

The skull rests on two slight depressions on the uppermost vertebra, which is called the **atlas,** in such a way that the hole in its base covers the ring in the atlas. The skull is capable only of a slight forward or backward rocking movement on the atlas. The second cervical vertebra, called the **axis,** has a bony peg projecting upwards through the front part of the ring of the atlas. This peg is separated from the spinal cord by a ligament, and, when the head is turned from side to side, the skull and atlas together rotate round the peg

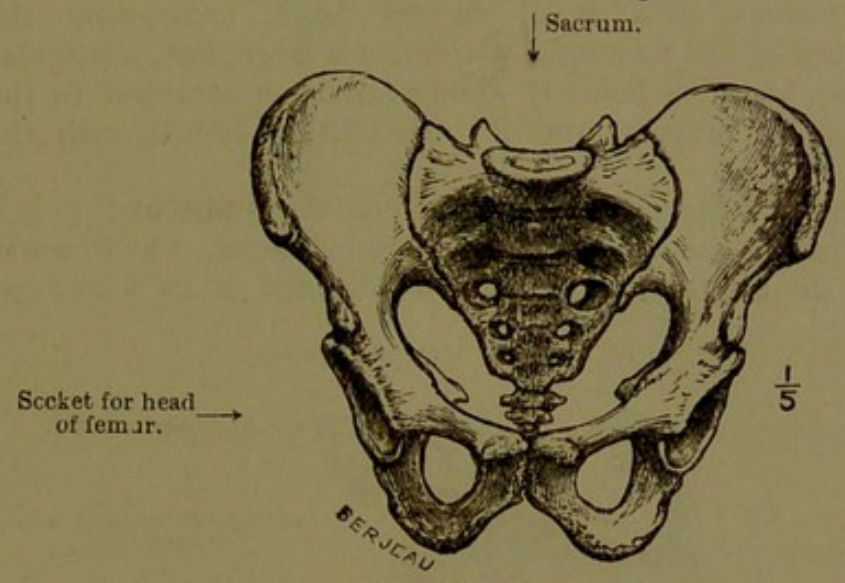


Fig. 105.—The Pelvis.

of the axis. The varied movements of the head, or rather of the neck, are, however, for the most part effected by the bending and turning of the cervical vertebræ.

337. The **thorax,** or chest, is a large bony cavity containing the heart, lungs, gullet, etc., and great blood vessels. It is formed by the union of the twelve dorsal vertebræ with the ribs and the **sternum,** or breast bone.

There are twelve **ribs** on each side. Each pair of ribs is connected behind by movable joints with the dorsal vertebræ. The upper ten pairs are connected in front by means of broad flat cartilages with the sternum (the first seven direct and the eighth, ninth and tenth by means of the cartilages of the ribs next above them).

The ribs are inclined downwards from the backbone, and, when raised, as in inspiration, the cavity of the thorax is increased ; and, when lowered, as in expiration, the cavity is diminished.

338. The **pelvis** is composed of the **sacrum** and the **innominate** (or nameless) bones, one on either side, which are firmly united to form a basin-shaped cavity, which contains the lower parts of the abdominal viscera. The lower limbs are attached to the pelvis.

339. The upper limb is divided into the shoulder, the arm, the fore-arm, the wrist and the hand.

The shoulder connects the arm to the trunk, and includes two bones, the **clavicle,** or collar-bone, and the **scapula,** or shoulder-

Fig. 106.—Right Collar-bone (seen from above).

blade. The former is a long, curved bone, connecting the scapula to the top of the sternum; the latter a large, flat, triangular bone lying upon the ribs behind. The scapula is attached to the trunk by means of muscles and its articulation (joint) with the clavicle.

340. The bone of the upper arm is called the **humerus;** it is a long bone having at its upper end a rounded head, which works in a socket in the **scapula,** or shoulder-blade, and at its lower end

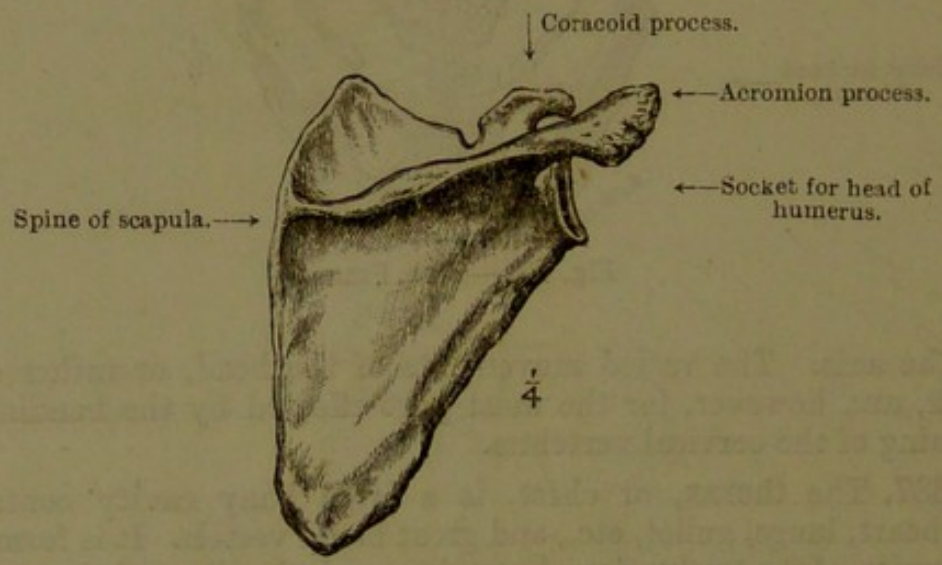


Fig. 107.—Right Shoulder-blade (seen from behind).

a roller-shaped surface, which, with the bones of the fore-arm, forms the elbow joint. The socket in the scapula, being shallow, the humerus has a wide range of movement in all directions at the shoulder joint.

341. The bones of the fore-arm are the **radius** and the **ulna.** The radius extends from the outer side of the elbow to the thumb side of the wrist. The ulna extends from the inner side of the elbow to the little finger side of the wrist; at its upper end is a projection,

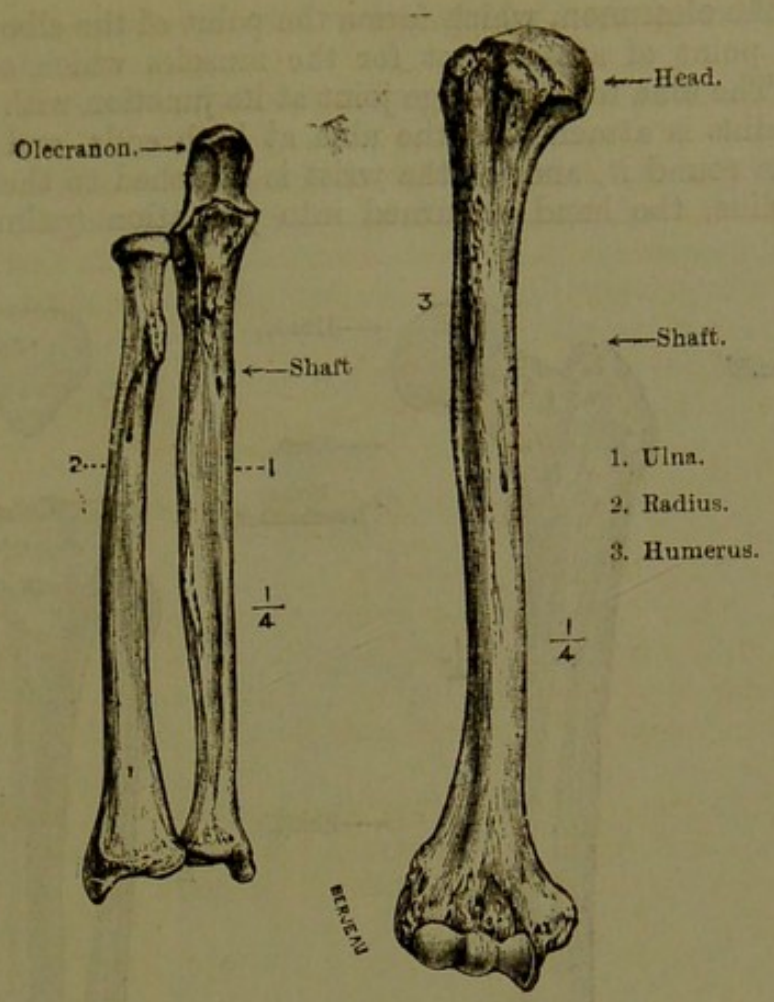


Fig. 108.—Bones of the Right Arm and Fore-arm.

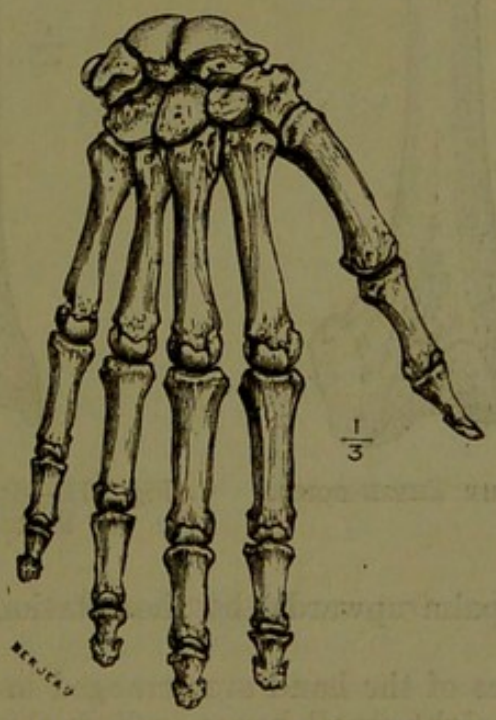


Fig. 109.—Bones of the Right Hand.

called the **olecranon,** which forms the point of the elbow, and serves as the point of attachment for the muscles which straighten the arm. The ulna forms a hinge joint at its junction with the humerus. The radius is attached to the ulna at both ends, and is capable of rotation round it, and, as the wrist is attached to the lower end of the radius, the hand is turned into pronation (palm downwards)

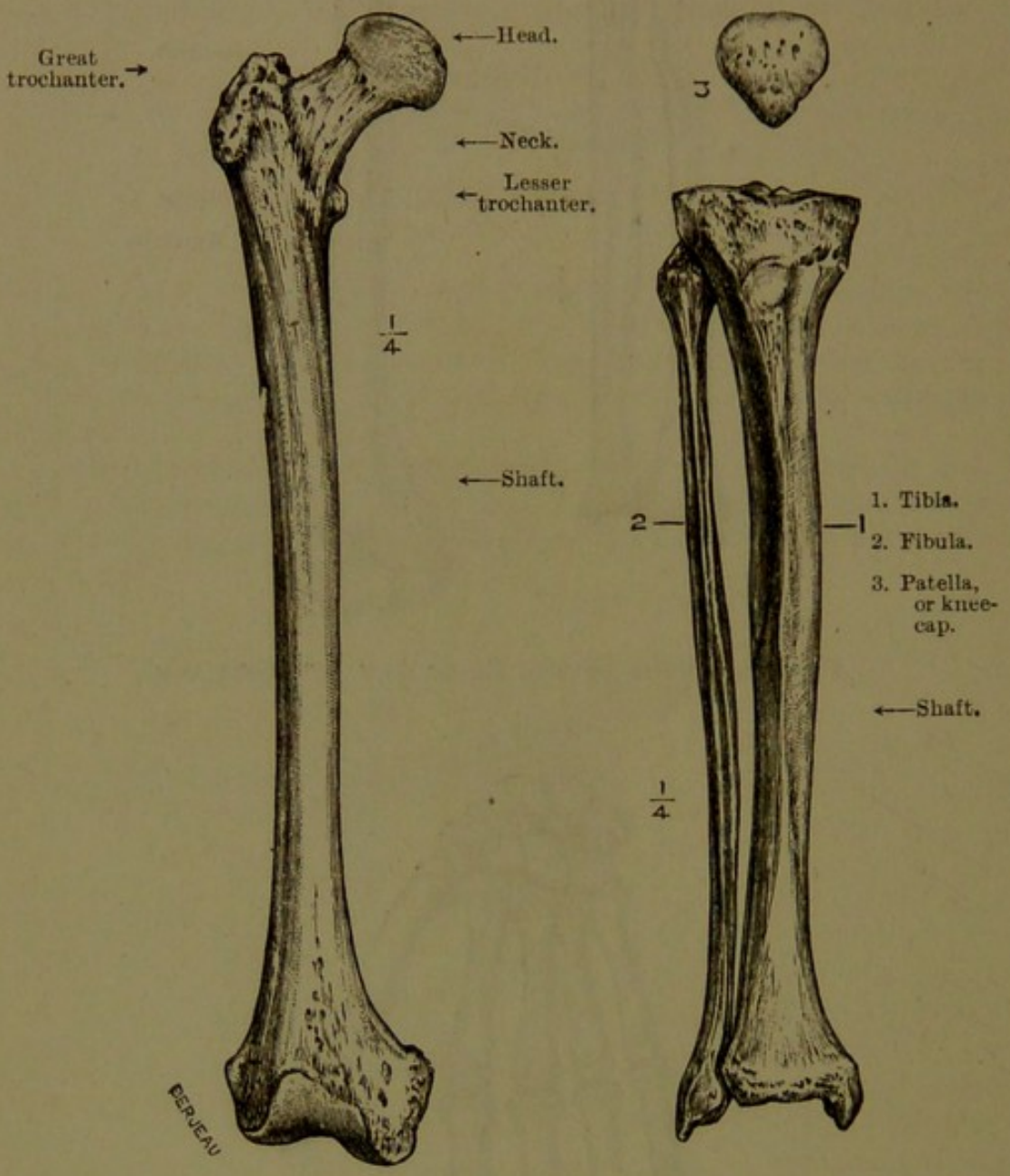


Fig. 110.—Right Thigh-bone. Fig. 111.—Patella, Tibia and Fibula (right leg).

and supination (palm upwards) by the rotation of this bone round the ulna.

342. The bones of the hand are arranged in three rows: firstly, in the wrist are eight small bones, called the **carpus**; secondly, a row of five long bones, called the **metacarpus,** forming the palm;

and, lastly, three small bones for each finger and two for each thumb called the **phalanges.**

343. The lower limb is divided into the thigh, the leg and the foot.

The **thigh** is that portion which extends from the hip above to the knee below; its one bone is named the **femur,** or thigh bone, and is the largest and strongest in the body. At its upper end there is a rounded head which fits into a deep cup-shaped socket in the outside of the pelvis, forming the hip joint; below, the expanded end enters into the formation of the knee joint. Protecting the knee

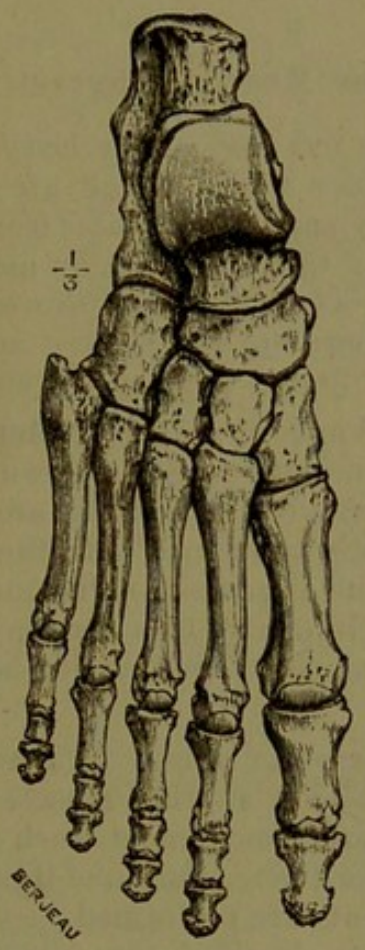


Fig. 112.—Bones of the Right Foot.

joint in front, and serving as a point of attachment for certain muscles, is a small bone called the **patella,** or knee-cap.

The ball and socket junction of the femur to the pelvis admits of movement of the thigh in all directions, but owing partly to the deepness of the socket the movement is more limited than that of the shoulder joint.

344. The **leg,** extending from the knee to the ankle, has two bones; the larger one lying on the inner or great toe side is called the **tibia,** or shin bone, upon the flat expanded head of which rests the lower end of the thigh bone; the more slender one, on the outside, is called the **fibula.**

The articulation of the tibia to the femur admits of a hinge movement of the leg on the thigh.

345. The construction of the foot is like that of the hand; it has three rows of bones: seven short strong ones, called the **tarsus,** in the ankle; secondly, a row of longer ones, called the **metatarsus,** corresponding to the sole of the foot and instep; and, lastly, three small bones for each of the four outer toes and two for each great toe, called the **phalanges.**

The bones of the foot are placed in such a way as to form an arch, giving strength and elasticity. The heel is formed by the largest bone of the tarsus, the **os calcis,** projecting behind the junction with the tibia.

The Muscular System.

346. Muscles are the red flesh of the body. They are made up of a number of muscular fibres, which are collected together in bands or bundles. They pass in most cases from one bone to another, and are usually attached to these bones by means of **tendons.** The muscles have the power of contracting or shortening their length, and thereby moving the bones to which they are attached. In this manner the limbs and different parts of the body are made to move.

347. There are two kinds of muscles, **voluntary** and **involuntary.** The former are under the influence of the will, and by their means the body and limbs are moved. The latter are not under the control of the will, and are mostly concerned with the action of the internal organs of circulation and digestion. The muscles connected with the mechanism of breathing are, to a certain extent, under control of the will, but perform their work under ordinary circumstances involuntarily.

348. For every muscle, or group of muscles, which performs a certain movement, there is another muscle, or group of muscles, which performs the opposite movement, such muscles are said to be **antagonistic.** It is by the due regulation of these antagonistic muscles that controlled movements are performed.

The muscles are also classified into various groups, according to the movements they perform, as follows:—**Flexors** and **extensors** which bend or stretch respectively the limbs or trunk, or the limbs on the trunk; **adductors** and **abductors,** which draw the limbs to or carry them outwards from the trunk; **pronators** and **supinators.** which turn the hand into *pronation* or *supination* (palm turned downward or upward respectively, or in a corresponding direction with reference to the position of the arm); **rotators,** which rotate the limbs.

The Organs of the Thorax and Abdomen.

349. There are two large cavities in the body—the chest or thorax—and the belly, or abdomen.

The **thorax** is separated from the abdomen by the diaphragm, which forms the floor of the thorax and the roof of the abdomen. The **diaphragm** is a large flat dome-shaped muscle attached at its edges to the lower ribs and spine, and arched upwards. It is pierced by the gullet and large blood vessels. The diaphragm is specially concerned with the action of breathing. The two lungs and the heart are situated in the thorax, filling it entirely, together with the blood vessels and the gullet, which pass through it, and the windpipe, or **trachea,** which communicates with the lungs. The heart is situated in front, with its apex on the left side and pointing downwards to the left.

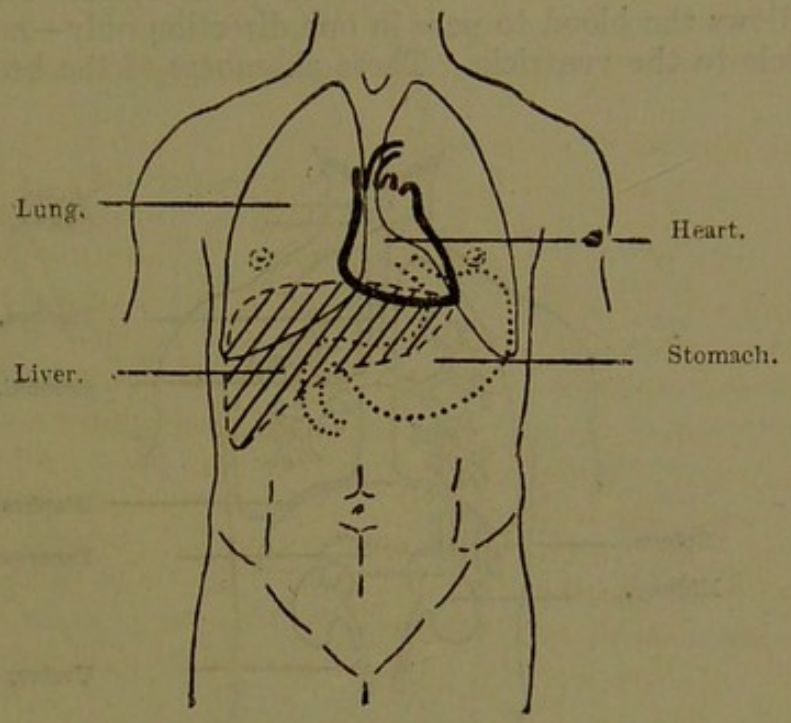


Fig. 113.—Position of Organs in Thorax and Abdomen (seen from the front).

350. The **abdomen,** the walls of which are formed chiefly of muscles, contains the stomach, the bowels or intestines, the liver, spleen, pancreas, kidneys and bladder. The **liver,** a very large organ, is placed just below the diaphragm on the right side. The **stomach** is close under the diaphragm on the left side, and varies in size according to whether it is empty or full. The **pancreas,** or sweetbread, lies across the front of the spine just above the level of the navel. The **spleen,** an organ concerned in the formation of the blood, is placed behind the stomach and close under the diaphragm. The **kidneys** are situated at the back of the abdomen, one on each side of the back-bone and close to it, just above the level of the waist; they communicate by means of two tubes with the **bladder,** which is quite low down in the middle of the front part of the pelvis. The bowels, consisting of the **small** and **large intestines,** fill up practically the whole of the remaining space in the abdomen.

The Circulatory System.

351. The organs of circulation are the means by which nourishment and oxygen are carried to all parts of the body, and waste matters carried to places where they are to be got rid of. They consist of the heart and blood vessels, and contain blood.

The **heart** is a muscular pump, about the size of a clenched fist. It is divided into a right and left half, separated by a partition, so that nothing can pass directly from one side to the other.

Each half is divided into an upper, thin-walled chamber, called an **auricle,** and a lower thick-walled chamber, called a **ventricle.** There is a valve between each auricle and ventricle which allows the blood to pass in one direction only—namely, from the auricle to the ventricle. These chambers of the heart contract

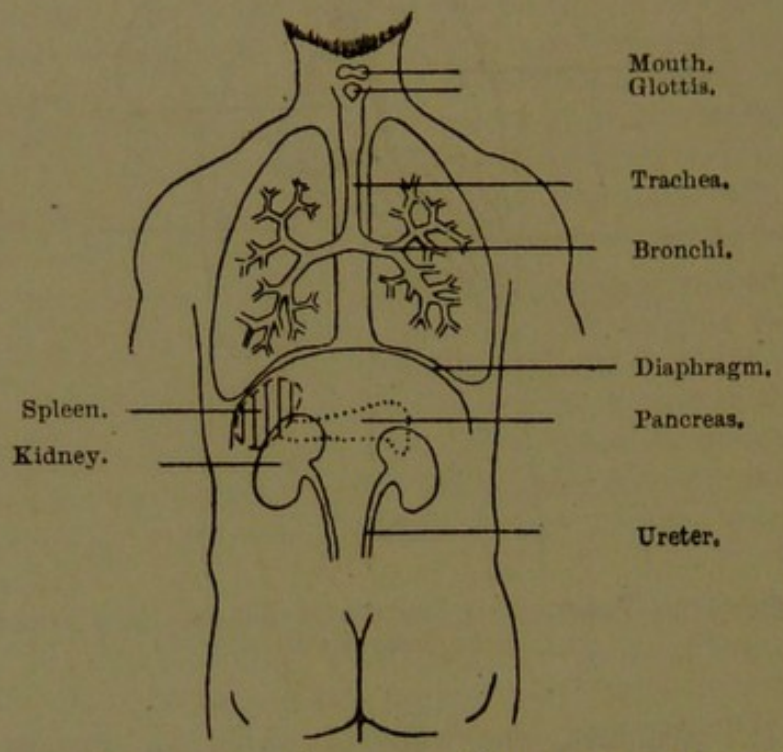


Fig. 114.—Position of Organs in Thorax and Abdomen (seen from behind).

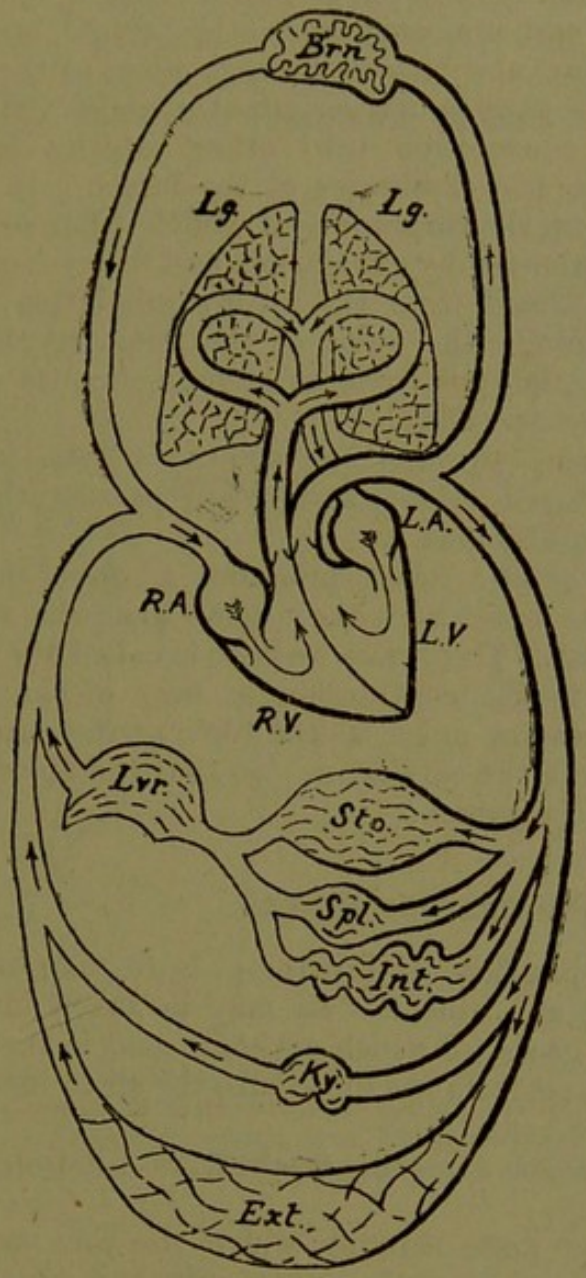
about 72 times to the minute when the body is at rest, and so force the blood into the arteries (described below), and through them to all parts of the body. The blood is returned to the heart by means of the veins. A continuous circulation is thus kept up.

352. The **blood vessels** are tubes containing blood, extending from the heart to every part of the body.

There are three kinds of blood vessels—arteries, capillaries and veins.

Arteries are strong, thick-walled tubes leading from the ventricles (of the heart), they branch outwards as they proceed to the various parts of the body and, becoming smaller, divide into very small

vessels called **capillaries.** The blood in the arteries contains dissolved nutriment from the digestive system, and oxygen from the lungs. The walls of the capillaries are so thin that this nutriment (including the oxygen) is enabled to pass through them from the blood into the tissues of the body, while the impurities from the tissues pass into and are carried by the blood into the veins.



Brn. = Brain, etc.
Lg. = Lungs.
L.A. = Left auricle.
R.A. = Right auricle.
L.V. = Left ventricle.
R.V. = Right ventricle.
Lvr. = Liver.
Sto. = Stomach.
Spl. = Spleen.
Int. = Intestines.
Ky. = Kidneys.
Ext. = Extremities.

Fig. 115.—Diagram Illustrating the Circulation of the Blood.

The capillaries form a close network all over the body, and, gradually collecting together and getting larger, they become veins.

The **veins,** thin-walled tubes, commencing thus in the capillaries, become fewer in number and larger in size as they get nearer the heart, until they end in the large veins which open into the auricles (of the heart). There are a number of valves in the veins, which

allow the blood to pass freely towards the heart, but prevent it from flowing backwards towards the capillaries.

353. Starting from the left ventricle, the blood, containing nourishment from the food and oxygen from the air in the lungs, is pumped by the contraction of the ventricle into the arteries, and thence into the capillaries, where it travels comparatively slowly, and gives up nourishment and oxygen to the tissues, receiving from them in exchange carbonic acid and other waste matters. It then passes into the veins, and returns through them to the right auricle. From the auricle it then passes into the right ventricle, and is pumped by its contraction into other arteries leading into the lungs and so into the capillaries of the lungs. In these capillaries the blood gives up the carbonic acid, which it has received from the tissues, to be eliminated by exhalation, and receives oxygen which the lungs have obtained from the air by inhalation. The aerated blood returns through the veins of the lungs to the left auricle, and thence to the left ventricle to recommence its course through the body, as above described.

The blood, when passing through the arteries of the general circulation, is of a bright red colour, and, when passing through the veins, is of a dark purple colour.

The pumping action of the heart produces a wave through the arteries, which can be felt where they come near the surface of the body, as at the wrist. This wave or beat is called the pulse, the beats corresponding to the contraction or beat of the heart. In the veins there is no beat or pulse, as the force of the current is expended in passing through the capillaries ; so that the blood flows in the veins in a steady even stream.

The Respiratory System.

354. The object of respiration, or breathing, is to take air into the lungs, so that oxygen gas from the air may be taken into the blood, and certain waste gases (of which carbonic acid is the chief) and watery vapour, may pass from the blood into the air in the lungs, and so breathed out of the body.

The organs of respiration are—the **trachea,** or windpipe, and the **lungs.**

The **trachea** is a stout tube through which the air, which is drawn in through the nose or mouth, passes into and out of the lungs. Its upper part, the **larynx,** is the organ of voice, and opens into the back of the mouth and nose. The windpipe can be felt in the throat under the skin, where it lies immediately in front of the gullet. In the thorax it divides into two tubes, the **bronchi.**

There is a flap, called the **epiglottis,** at the upper opening of the larynx, which covers it, and prevents food from passing into the windpipe when swallowing.

The bronchi are **strong** tubes leading from the windpipe to each lung. In the lungs the bronchi branch out in all directions, becoming

smaller and their walls thinner as they proceed to their closed endings, the **air cells.**

The two lungs lie in the cavity of the thorax, one on either side. Each consists of a mass of minute, extremely thin-walled cells, the air cells, which are the blind endings of the bronchial tubes. In the walls of the air cells are spread a network of capillaries. The air cells communicate directly with the external air through the bronchi, windpipe, larynx, mouth and nose, and with the blood through their thin walls.

355. The **act of respiration consists of** :—**Inspiration,** or drawing

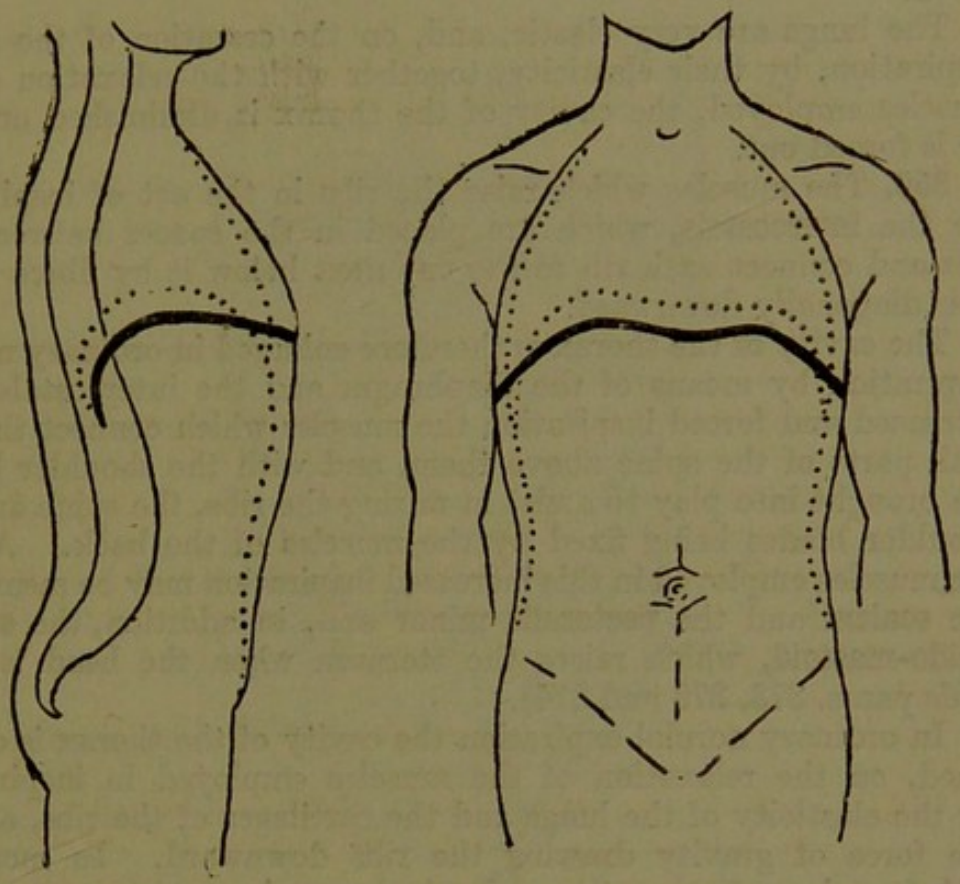


Fig. 116.—Diagrams showing a Side and Front view of the descent of the Diaphragm and Enlargement of Thorax and Abdomen in inspiration (continuous lines) and the ascent of the Diaphragm and diminution of the Thorax and Abdomen in expiration (dotted lines).

in of air *to* the lungs, immediately followed by **expiration**, or breathing out of air *from* the lungs, followed by a slight pause before the next inspiration is taken.

Under normal conditions of health about one complete respiration is taken to four heart beats.

The act of respiration is carried out in the following way :—

There are certain muscles by the action of which the thorax is enlarged. One of these, the **diaphragm,** forming the floor of the thorax, when not in action, is arched well upwards. When in action, and its fibres contracted, it becomes flattened and so

depressed, pressing downwards on the abdominal viscera, which thus push the abdomen outwards. The cavity of the thorax is thus enlarged downwards. There are other muscles attached to the ribs which raise them up, and so, owing to their shape, outwards at the same time, thus increasing the size of the chest from front to rear and from side to side. While the cavity of the chest is thus being enlarged, the air rushes in through the nostrils or mouth, and passes down the windpipe and bronchial tubes into the lungs.

The air remains long enough in the air cells of the lungs to allow oxygen to pass through the thin walls of the capillaries into the blood.

The lungs are very elastic, and, on the cessation of the act of inspiration, by their elasticity, together with the relaxation of the muscles employed, the cavity of the thorax is diminished and the air is forced out.

356. The muscles which raise the ribs in the act of inspiration are the **intercostals,** which are placed in the spaces between the ribs and connect each rib to the one next below it by fibres which pass diagonally downward.

The cavity of the thorax is therefore enlarged in ordinary normal inspiration by means of the diaphragm and the intercostals. In increased and forced inspiration the muscles which connect the ribs with parts of the spine above them, and with the shoulder bones, are brought into play to assist in raising the ribs, the spine and the shoulder blades being fixed by the muscles of the back. Among the muscles employed in this increased inspiration may be mentioned the **scaleni** and the **pectoralis minor** and, in addition, the **sterno-cleido-mastoid,** which raises the sternum when the head is fixed (*vide* paras. **373, 379** and **374**).

In ordinary normal expiration the cavity of the thorax is diminished, on the relaxation of the muscles employed in inspiration, by the elasticity of the lungs and the cartilages of the ribs, and by the force of gravity drawing the ribs downward. In increased and forced expiration the abdominal muscles assist energetically by pulling the ribs downward, and, at the same time, pressing the abdominal viscera against the under surface of the diaphragm, and so pushing the floor of the thorax upward.

It should be noted that at no time can the lungs be fully emptied of air. The air that still remains in the lungs after a forced expiration is called **residual air,** and that which is breathed in and out of the lungs during an ordinary respiration is called **tidal air.**

It should also be noted that the bellows-like action of the chest in breathing assists to pump the blood from the right side of the heart through the lungs to the left side of the heart.

The Digestive System.

357. The digestive system is made up of a number of organs the function of which is to prepare the food for absorption into the

system. It consists of two portions—a long tube of varying size, called the **alimentary canal,** and the **glands,** which prepare juices to be mixed with the food for the purpose of digesting it.

The alimentary canal begins at the mouth, and ends at the lower opening of the bowel. It is about 30 feet in length.

The different parts of the alimentary canal are the mouth, gullet or œsophagus, stomach, small and large intestines.

The glands or organs which pour juices into this canal are the **salivary glands** in the mouth, the **gastric glands** in the stomach, the **liver** which is connected with the formation of bile, the **pancreas**

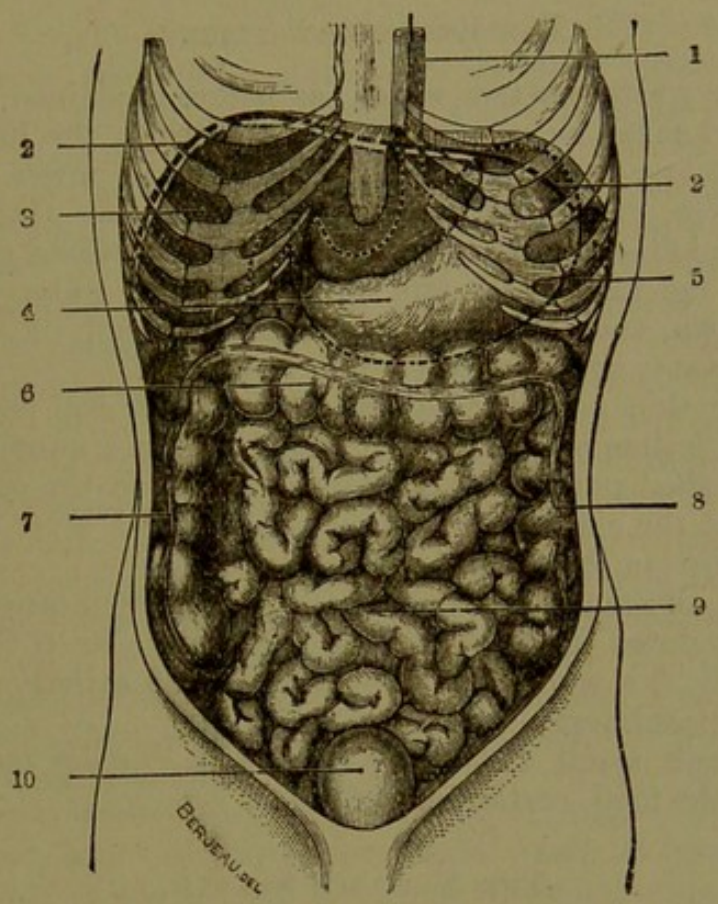


Fig. 117.—The Abdominal Viscera.

1. Gullet. 2, 2. Cut edge of diaphragm. 3. Liver. 4. Stomach. 5. Spleen. 6. Transverse colon. 7. Ascending colon. 8. Descending colon. 9. Small intestines. 10. Bladder.

which forms a strongly acting digestive juice, and other glands in the walls of the intestines.

358. The mastication of the food in the mouth by means of the teeth is the commencement of the digestive process. During mastication the food is not only broken up, but is mixed with the saliva (a most important part of the process), which commences to act upon it chemically. The food thus prepared in the mouth is then swallowed, and passes through the gullet into the stomach, where it is further broken up and somewhat liquefied by the action of the stomach and its juices. From the stomach it passes gradually

into the intestines, where it is mixed with the bile and pancreatic juice, and further digestion takes place; the unused parts being then passed out of the body some hours after having been swallowed.

While it is passing through the stomach and intestines the nutritive portion is dissolved, and part of it is sucked through the walls of the intestines into tubes, called **lymphatics,** through which it is conveyed to the veins in the form of lymph, while part passes direct into the blood through the thin walls of the capillaries on the inside of the stomach and intestines, and passes from thence into the veins, and so into the general circulation for the nourishment of the body.

The Excretory System.

359. The waste matters which, as before explained, accumulate in the blood must be got rid of. The **kidneys,** the **lungs** and the **skin** are the organs of excretion which have the power of gathering these matters, gases and fluids, and eliminating them from the body. The kidneys pass out water containing waste matters from the blood, the lungs pass out foul gases and watery vapour, as already shown, and the skin is continually passing off sweat, which consists of water and impurities from the blood.

360. The skin not only covers and protects the body, and has the sense of feeling and touch, but also has in it a number of minute apertures, called pores, through which sweat and the natural grease which keeps the skin supple pass out. It has a layer of fat under it, which keeps in the heat of the body.

The skin also regulates the heat of the body by means of sweating, which cools down the blood; and, in order to keep the skin, and consequently the whole body, healthy, great attention should be paid to its cleanliness.

The bowels assist the above organs in casting out, with the remains of the food, certain impurities.

The Nervous System.

361. The **nerve-centres** are the brain and spinal cord, which receive all messages from the organs of sense, and send out orders to the muscles to make them move in any desired way. The brain is the organ of thought, and has the power of directing the voluntary movements of the body.

The **nerves** are the connecting threads between the nerve-centres and nerve-endings, and are attached at one end to the brain, or spinal cord, and at the other end terminate in the nerve-endings, whether situated in the organs of sense or muscles. Some few of the nerves are purely *sensory*, *i.e.*, they convey impressions to the brain. Most of them are, however, composed of both *sensory* and *motor* fibres, the former of which convey impressions to the nerve-centres, and the latter convey orders from the nerve-centres to the muscles, directing them to move.

The nervous system thus has a double duty to perform, viz., to receive impressions conveyed through the senses, and to stimulate the muscles, both voluntary and involuntary, to action.

General Considerations Regarding Bodily Exercise.

362. The first object of physical training is, as before stated, the attainment of such a state of health and general physical fitness that all the organs of the body are vigorous and healthy, and capable of performing the work required of them. The only means we have of acting on the internal organs is through the agency of the muscles.

The object, then, of employing the muscles in all physical training and gymnastic exercises is not, as is so often supposed, merely for the sake of muscular development (which, for itself alone, is a matter of secondary importance), but for the effects, direct and indirect, on the harmonious development and co-ordinate action of all the organs of the body and of the body as a whole.

363. Every movement of the body is made by means of the muscles, which are stimulated to action by the nerves. The action of a muscle is accompanied by the combustion of certain materials which are supplied by the blood. The waste products of this combustion (carbonic acid, urea, water, &c.) are eliminated from the system in due course by means of the lungs, kidneys and skin. The loss of the materials oxidised, or burned, in the process of causing the action of the muscles has to be made good by an increase of nourishment. This nourishment (obtained originally from the food) is carried to the muscles and neighbouring parts, including the bones, joints, ligaments, &c., by means of the blood, the circulation of which is automatically increased by the movement of the muscles.

The continued drawing to the muscles of this fresh nourishment gradually strengthens and develops them, providing that the supply of nourishment is kept up by a sufficiency of food.

364. There are three different terms used in gymnastics to denote the way in which work is performed by a muscle, viz. :—

(i) *Concentric* action, *e.g.*, raising a weight (or the body) upward, or *overcoming* resistance. The length of the muscle in this action is continually shortening, until the limit is reached.

(ii) *Eccentric* action, *e.g.*, lowering a weight steadily downward, or *giving up to* resistance. When acting eccentrically, the muscle, although working the whole time, is gradually being lengthened.

(iii) *Static* contraction, *e.g.*, maintaining the weight in a *stationary* position above the ground. In this action the muscle works while maintaining a fixed length somewhere between its greatest and least length.

365. By frequent shortening of a muscle its average length can be diminished, and by frequent stretching its average length

can be increased. It is owing to this law of nature that many of the occupations of daily life (*e.g.*, bending over a desk or work bench, &c.) cause some muscles to become unduly long, and others unduly short; the result being a bad carriage of the body, and possible injurious effect on the skeleton and internal organs. In physical training, advantage is taken of this same law to stretch the unduly shortened muscles and to shorten those which are too long; and by the judicious employment of exercises of varying effects a good average length is obtained for all the important muscles, and a correct carriage of the body is thereby obtained, so that the internal organs are placed under the best possible conditions for performing their particular functions.

366. The increased flow of blood that is drawn to muscles in action necessitates an increased action of the heart to pump the blood through the body. The heart is thus exercised, and gains strength from this exercise in the same way as the other muscles, as long as no undue strain is put upon it. As the heart gains strength it becomes capable of more work, and exercises which would at first have been too severe for it, will, as it becomes stronger, not only be within its capacity, but will serve to further strengthen it. This is one of the reasons why a steady and very gradual progression in the exercises employed in physical training is so important.

367. When a muscle is stimulated the resulting contraction is accompanied by a combustion of some of its material. This combustion, or chemical change, requires a supply of oxygen from the blood, and is accompanied by the production of heat, carbonic acid and other waste products; these are taken up and removed by the blood. Muscular activity is thus accompanied by an increase in the production of carbonic acid and heat, and the breathing is in consequence increased so that the additional carbonic acid and watery vapour, together with the surplus heat, may be discharged from the lungs. The increased breathing also enables the body to obtain more oxygen and the heart beat is at the same time quickened, so that the blood is enabled the more rapidly to pass through the lungs and there give up carbonic acid and take up oxygen.

A good "wind" does not depend on the *size* of the chest, but on the ability of the heart to regulate its beats so that the blood may be sent rapidly through the lungs in accordance with the needs of the body. If the lungs and the heart do not work properly together during exercise, breathlessness is the result, and if the exercise be too prolonged the heart may be overstrained and damaged. The natural free movements of the chest and abdomen help to pump the blood from one side of the heart to the other, and for this reason breathing should never be restricted by attempts to hold the chest in a distended and rigid position. By progressive exercise the harmonious working of the heart and lungs during exercise can be improved and the power of endurance developed.

Over-distension of the chest is injurious, as it is liable to diminish the elasticity of the lungs and render them less efficient. But exercise performed with a good carriage of the spinal column and directed towards securing the co-ordinate working of the heart and lungs is in the highest degree beneficial. The judicious and progressive employment of marching, running, jumping, and kindred exercises is the best means of obtaining this co-ordination.

One of the most marked effects of muscular work is the increased warmth of the body. The excess of heat produced is discharged from the body by sweating and radiation as the warm blood flushes the skin, and by more rapid breathing. If the body becomes too hot, discomfort and over fatigue will result, and injury may even be produced. Light clothing should therefore be worn during exercise so that the loss of surplus heat may be facilitated, but a sufficiency of clothing should be added after exercise to prevent the body from cooling too rapidly (*vide* paras. **33** to **38**).

368. The nervous system regulates the work performed by all the organs of the body. The internal organs perform their work without our being conscious of, or able to directly control, the nervous stimulus; but, with regard to voluntary muscular work, when a new movement is first learned, the brain consciously directs the action of the muscles through the nerves. By frequent practice, such movements, which were at first difficult, become easy, and may even be performed without conscious effort of the brain. In such cases the spinal cord takes the place originally taken by the brain, and communicates the necessary stimulus through the nerves to the muscles by what is called *reflex* action. In walking, for example, which requires the co-ordinate action of a large number of muscles, and which is originally learned with much difficulty, the movements are eventually performed so easily that they can even be executed unconsciously, and while the brain is fully occupied with other matters.

The training of the nervous system is therefore effected by means of physical exercises, and especially by a judicious employment of old and new exercises.

369. From the foregoing remarks it will be seen that all exercise necessitates the combustion of materials contained in the body. This consumption of material produces a want (as shown by the increased appetite) which has to be supplied by means of the food. Muscular exercise, however, not only creates this need for increased food, but also has a stimulating effect on the organs connected with the process of digesting and assimilating it (*vide* also para. **217**).

Action of the Principal Muscles.

Muscles of the Spine.

370. Under this heading are included those muscles situated on the back of the trunk, which directly effect the movements and carriage of the spine.

Erector spinæ is the name given to a deep layer of muscles on the back, the fibres of which run approximately parallel to the spinal column, and have their attachments on the sacrum, the

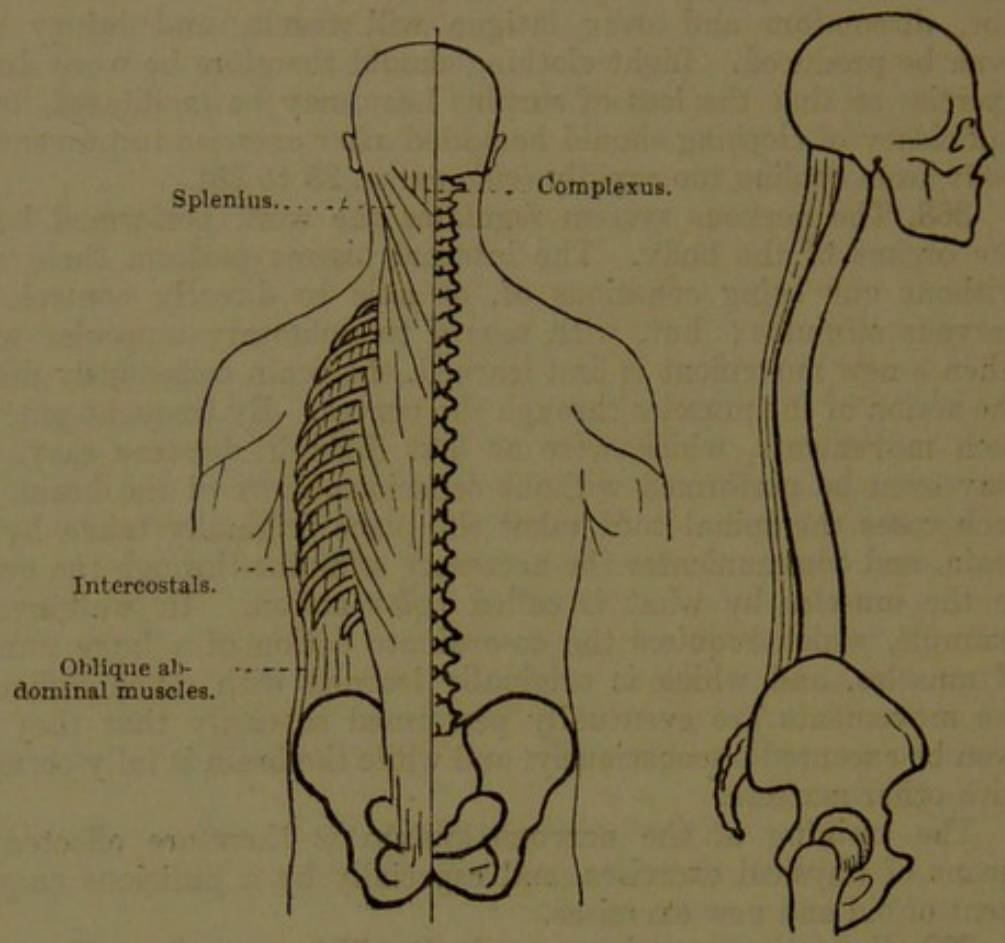


Fig. 118. Fig. 119.

Figs. 118 and 119.—Muscles of the Spine (back and side view), Erector Spinæ, etc.

pelvis, the vertebræ, the ribs and the skull. They serve to hold the trunk erect, and, when it is inclined or bent forward, they, together with the gluteus maximus and hamstring muscles, prevent it from *falling* forward, hold it in position, and bring it back again to the erect position.

371. The **complexus** and the **splenii** muscles, situated at the back of the neck, are attached to the upper part of the spine and back of the skull. They raise the chin by drawing the back of the skull downward, and, when the spine is inclined or bent forward, they prevent the head and neck from *falling* forward.

Muscles of the Neck.

372. The **longus colli** and **rectus capitis anticus** are situated in front of the cervical portion of the spine. The former is attached to all the vertebræ from the third dorsal vertebra to the atlas; it straightens (or rather lessens) the cervical curve. The latter is attached to the cervical vertebræ and the base of the skull in front of the spine; it lowers the chin, drawing it in towards the spine.

373. The **scaleni** muscles are attached at one end to the two upper ribs, and at the other end to the transverse processes of the cervical vertebræ. When the neck is fixed by other muscles they help to raise the ribs.

374. The **sterno-cleido-mastoid** is attached at one end to the top of the sternum and inner end of the calvicle, and at the other end to the mastoid process of the skull, just behind the ear. When both of these muscles are used they either raise the chest or bend

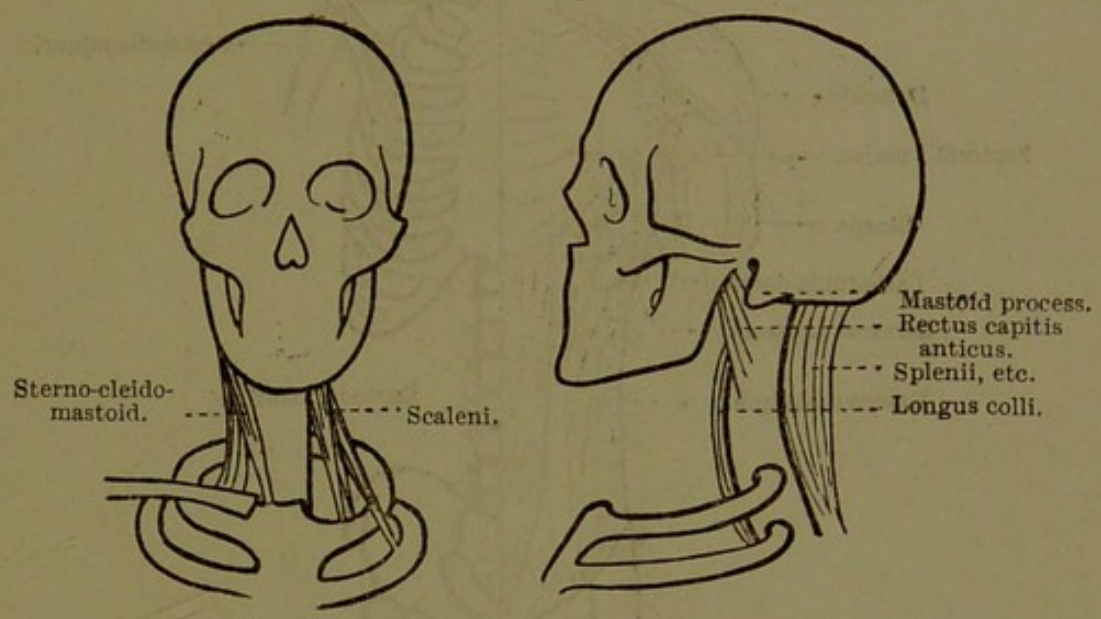


Fig. 120.—Muscles of the Neck (front and side view).

the head and neck forward, according to whether the head or the chest is fixed.

Turning and bending the head sideways is accomplished by the action of the above muscles, together with the complexus and splenii.

Muscles of the Abdomen.

375. The **rectus abdominis** is attached at one end to the lower edge of the front part of the thorax, and at the other end to the front edge of the pelvis. The right and left portions of this muscle are separated by a tendinous substance, called the **linea alba.** The muscle is also intersected by three or more horizontal tendons. When the pelvis is fixed this muscle draws the thorax towards it,

and when the thorax is fixed it raises the front part of the pelvis. In both cases the back is thereby rounded.

376. The **external oblique** (right side) is attached at one end to the outer side of the lower ribs, its rear fibres run downward (some of them almost vertically) and forward to the top outer edge of the pelvis (hip bone), most of the remaining fibres run diagonally forward and downward, and are attached to a tendinous sheath, which surrounds the rectus muscle. The **internal oblique** of the left side (which lies under the external oblique of that side) is attached to the left side of this tendinous sheath of the rectus muscle, and its fibres run from thence diagonally downward and backward to the inner edge of the top left side of the pelvis.

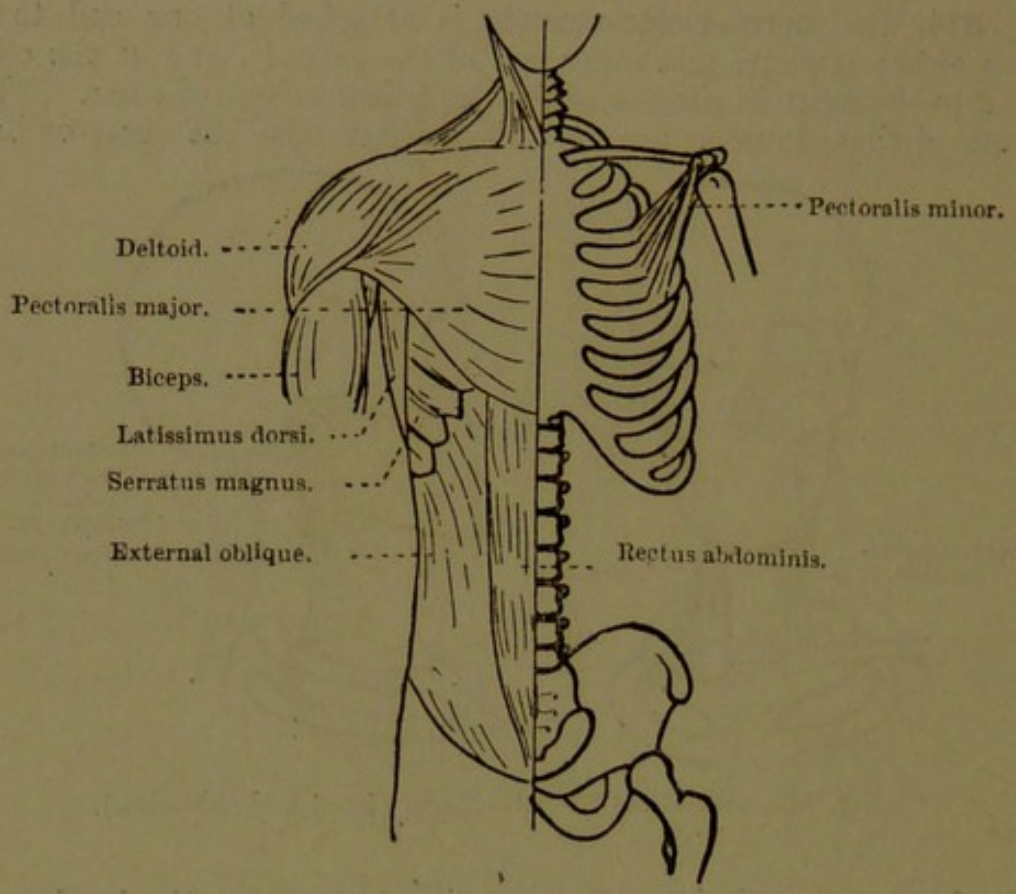


Fig. 121.—Muscles of the Trunk (front view).

The action of these muscles (the right external and left internal oblique), working together, is, when the pelvis is fixed, to draw the thorax forward, downward and sideways to the left. When the external and internal oblique muscles of the same side of the body are together brought into action they bend the trunk sideways.

377. Another abdominal muscle, the **transversalis,** is situated underneath the internal oblique on both sides, its fibres run horizontally with reference to the erect position of the trunk ; and, when it contracts, it exerts a pressure together with the other abdominal muscles on the abdominal viscera.

MUSCLES OF THE SHOULDER AND ARM.

378. The **rhomboid** (lying underneath the trapezius) is attached at one end to the upper dorsal vertebræ; its fibres pass thence diagonally downward to the inner edge of the scapula. Its action is to draw the shoulder blades backwards towards the spine.

379. The **pectoralis minor** (lying underneath the pectoralis major) is attached at one end to the front of three of the upper ribs, and passes upwards from them to the coracoid process of the scapula. When the ribs are fixed it draws the upper part of the scapula forward and downward, and when the scapula is fixed it helps to raise the ribs.

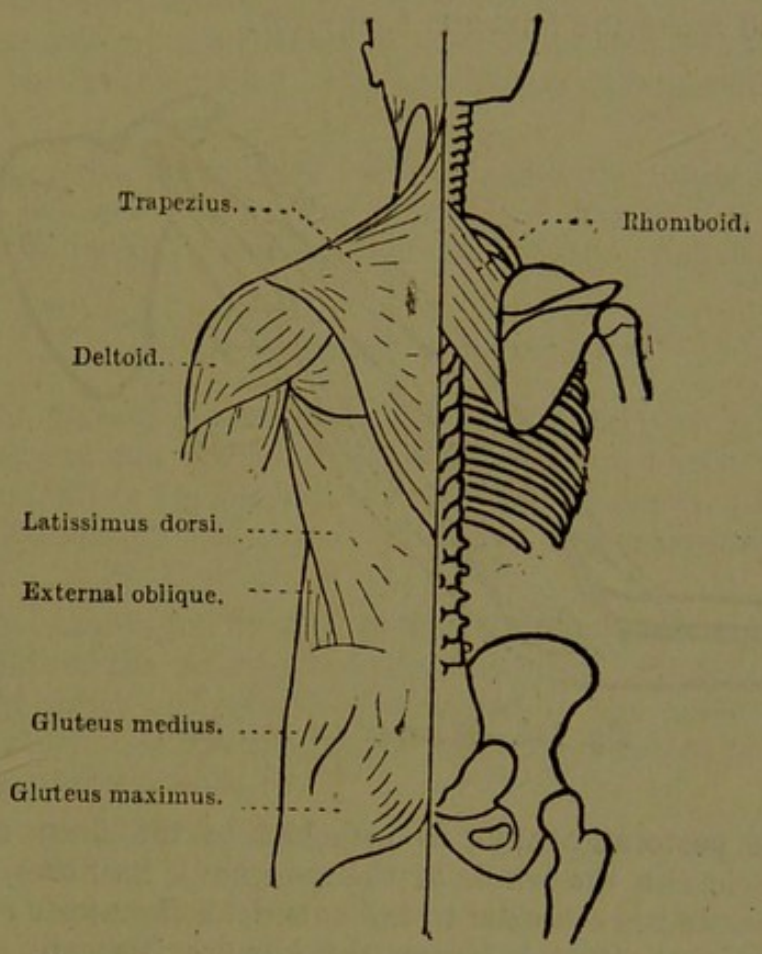


Fig. 122.—MUSCLES OF THE TRUNK (back view).

380. One end of the **trapezius** muscle is attached to the back of the skill, and to the cervical and dorsal vertebræ. From this attachment its fibres converge, and are fixed at the other end to the spine of the scapula and the outer end of the clavicle. The upper fibres pull the outer angle of the scapula upward, the lower fibres draw the inner end of its spine downward; the result, when they act together, being a rotation of the scapula. Some of its fibres assist the rhomboid in drawing the shoulder blades backward towards the spine.

381. One end of the **serratus magnus** is attached to the side of

the upper nine ribs; its fibres pass along the side and back of the thorax underneath the scapula to the inner edge of which they are fixed. It draws the scapula forward away from the spinal column, and, in doing so, rotates it in the same manner as the trapezius.

382. One end of the **deltoid** is attached to the outer end of the clavicle and the spine of the scapula; its fibres converge towards the other end, where they are attached to the middle of the humerus on its outer side. It raises the humerus forward or sideways, level with the shoulder, until stopped by the structure of the joint, and, together with several other muscles which run from the scapula to the humerus, fixes the arm in this position. These last-mentioned muscles also assist in rotating the humerus. The back portion of the deltoid raises the humerus backward.

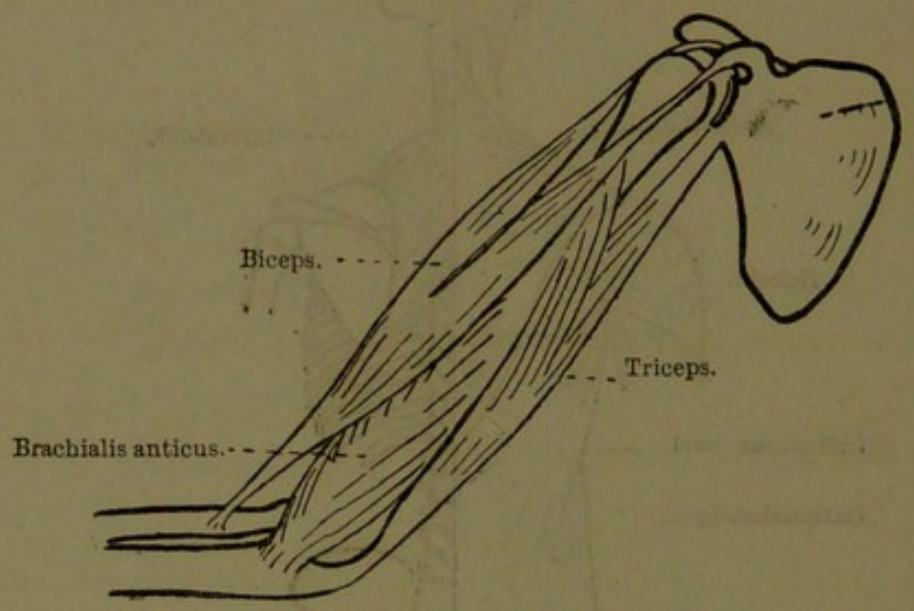


Fig. 123.—Muscles of the Arm.

383. The **pectoralis major** is attached to the front inner half of the clavicle and the whole of the sternum; its fibres converge, and the other end is attached to the outside of the upper part of the shaft of the humerus. It draws the humerus forward across the body, and, when the arm is raised above the shoulder, it draws it down. When the arm is fixed above the shoulder it raises the ribs.

384. One end of the **latissimus dorsi** is attached to the lower dorsal vertebræ, all the lumbar vertebræ, the sacrum and the rear margin of the pelvis; its fibres converge from these attachments, and, running diagonally upward, are joined by some few fibres which are attached to the lower ribs, and the other end is attached to the front of the humerus just inside the pectoral attachment. It draws the humerus downward and backward, and, in doing so, rotates it inwards.

385. The **biceps** arises (as its name implies) from two attachments, both of which are on the scapula, viz., the coracoid process and a point just above the junction of the humerus with the scapula. Its fibres pass along the front of the humerus, and the other end is attached to a small process on the inside of the radius. It turns the hand into supination and bends the forearm on the upper arm.

386. One end of the **brachialis anticus** is attached to the front lower part of the humerus, and the other end to the front upper end of the ulnar, just below its joint with the humerus. It assists in bending the arm.

387. The **triceps** arises from three attachments, one of which is on the scapula just below the shoulder joint; the other two are on the rear side of the humerus. The other end of this muscle is attached to the olecranon. It straightens the forearm on the upper arm.

388. A number of muscles are situated on the forearm; most of them are connected with the rotation of the radius round the ulna, and the various movements of the hand and fingers.

Muscles of the Leg.

389. The **gluteus maximus** is attached to the back of the pelvis and the sacrum, and the principal portion of this muscle is attached at the other end to the back of the shaft of the femur, a little below the great trochanter. It moves the femur backward and rotates it outward.

390. The upper end of the **gluteus medius** muscle is attached to the outside of the pelvis just below the brim. Its fibres converge towards the other end, which is attached to the great trochanter (on the femur). It raises the leg sideways (abduction), and its front fibres rotate it inwards.

391. The **gluteus minimus** muscle, lying underneath the gluteus medius, is attached at one end to the outside of the pelvis just below the attachment of the gluteus medius. Its fibres converge, and the other end is attached to the great trochanter. Its action is the same as that of the gluteus medius.

392. The **ilio-psoas** is a double muscle consisting of the **psoas magnus** and the **iliacus.** The upper end of the former is attached to the front of the twelfth dorsal and all the lumbar vertebræ, and the upper end of the latter to the inner surface of the back and side of the pelvis. The lower ends of these two muscles run together over the front edge of the pelvis to their attachment on the lesser trochanter (on the inside of the femur). When the pelvis is fixed, the action of this double muscle is to bend the thigh on the pelvis, and, when the femur is fixed, it bends the trunk on the thigh.

393. There are several muscles which are attached at one end to the lower and front part of the pelvis, and at the other end to the inside of the femur, somewhat to the rear side of it. They are called the **adductors of the thigh,** and, as their name indicates, they carry the thigh inwards, at the same time they tend to rotate it outwards.

394. The **quadriceps extensor** (femoris) is a four-headed muscle situated on the front of the thigh. Its heads are attached to the front of the pelvis and to the front and sides of the femur. Its fibres run together into a tendon, which encloses the patella, and thence proceeds to its attachment on the front of the tibia. The principal action of this muscle is to extend the leg on the thigh; it also, owing to its attachment to the pelvis, assists the action of the ilio-psoas.

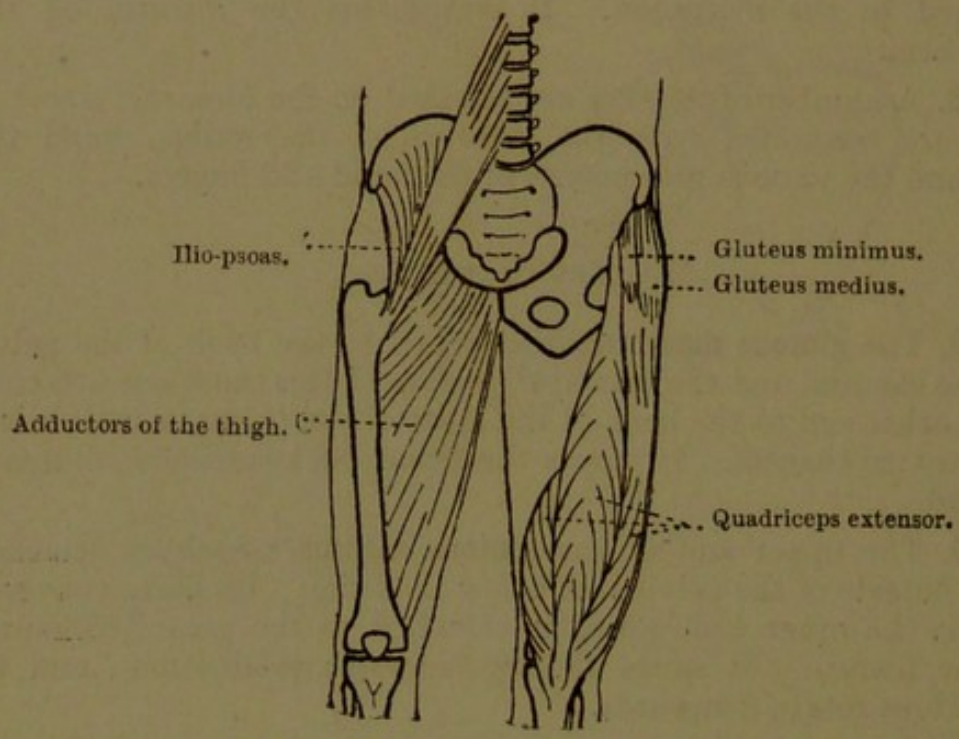


Fig. 124.—Muscles of the Leg (front view).

395. The **hamstring muscles,** situated on the back of the thigh, are attached at one end to the lower back part of the pelvis (one head is attached to the femur), and at the other end to the bones of the lower leg, just below and behind the knee on both sides of the leg. The action of these muscles is to bend the leg on the thigh, and, when the leg is fixed, to rotate the pelvis backwards on the femur. When the leg is extended, they limit the forward rotation of the pelvis on the hip joint, or the forward raising of the leg.

396. The **muscles of the calf** arise from the back part of the lower end of the femur, and from the back of the tibia and fibula, and their fibres are attached at the other end by means of a single strong tendon (the tendo Achillis) to the back of the heel. They

extend the foot on the leg, and if, therefore, the foot is supported on the ground, they raise the body on the toes.

A number of other muscles connected with the various movements of the foot and toes are situated on the leg.

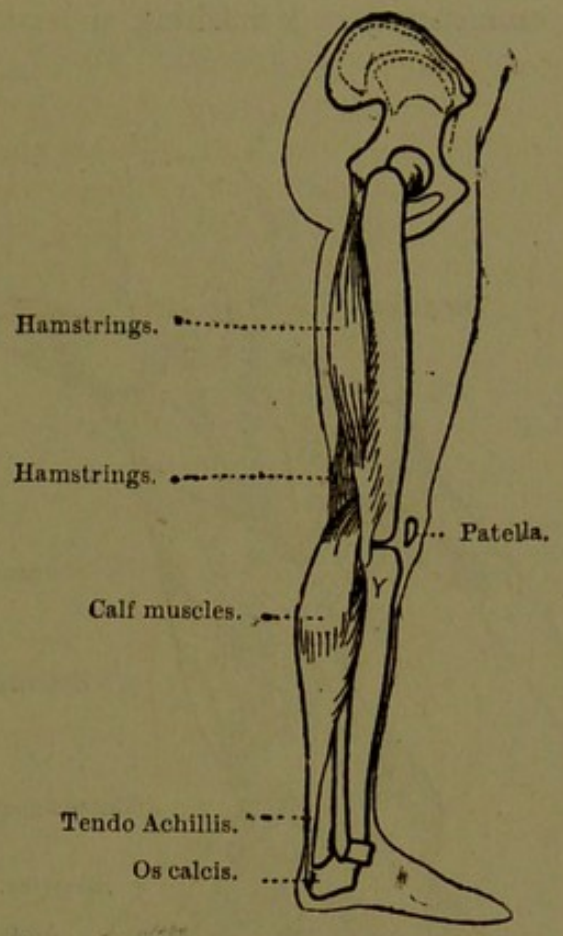


Fig. 125—Muscle of the Leg (side view).

Action of the Muscles in Typical Positions and Exercises, &c.

397. A few typical exercises have been selected and included in the following paragraphs for the purpose of indicating the muscles employed in, and other physiological considerations affecting, the various positions and movements. The descriptions are not intended to be exhaustive, but, if read in conjunction with the explanations of the various exercises and groups of exercises included in Section VII, they should be of some value in assisting the instructor in the application of the different exercises according to the requirements of the training.

Consideration of the Position of Attention.

398. The erect position is maintained partly by the construction of the skeleton and partly by the action of certain muscles. The

muscles employed must be sufficiently strong and of normal average length, in order that the position may be maintained properly and without undue strain. If the muscles do not fulfil these requirements a deviation from the normal erect position will be the result. The position of Attention should be regarded as the correct position to be aimed at in commencing and finishing an exercise, and, in

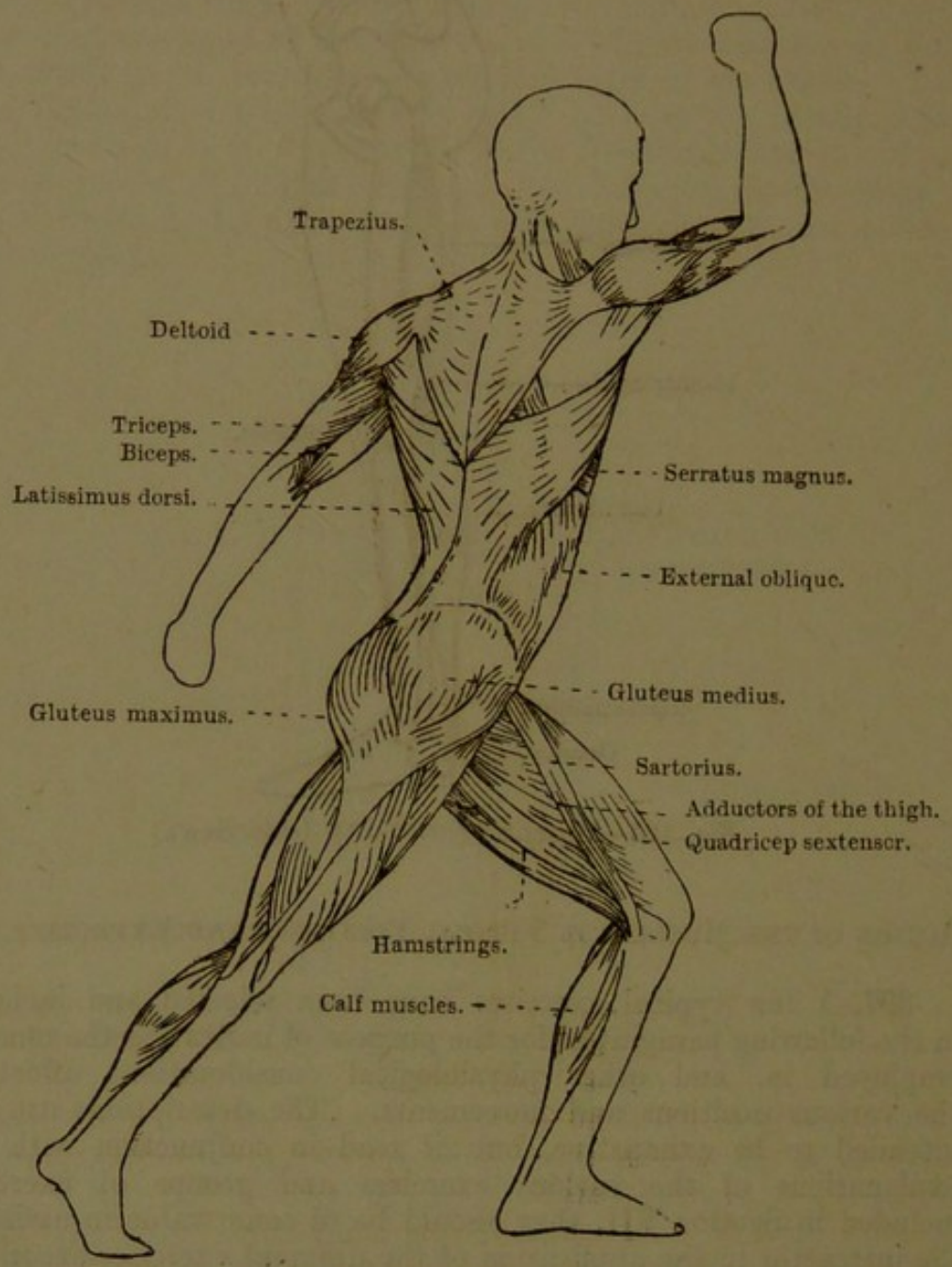


Fig. 126.—Surface Muscles of the Body (general view).

endeavouring to acquire this position, special attention should be paid to the position of the pelvis.

In the erect position the pelvis rests on the heads of the two thigh bones, and can be inclined on these points forward or backward. If it is inclined forward the spine is thrown forward and, in order

to correct the balance, the upper part of the trunk is thrown back, with the result that the back is unduly hollowed in the lumbar region. If it is inclined backward the spine is thrown back, and the correction of the balance is then obtained by bringing the upper part of the trunk forward, and thus rounding the back.

It will thus be seen that an erect position of the spine cannot be obtained without a correct inclination of the pelvis with reference

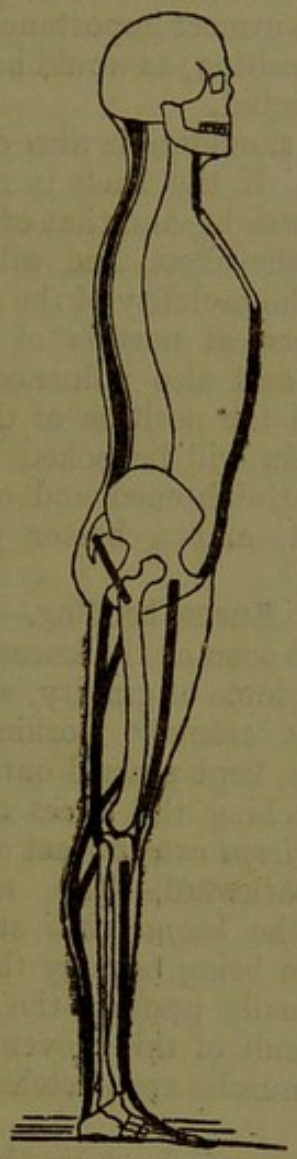


Fig. 127.—Diagram Illustrating the General Action of the Chief Muscles Employed in Maintaining the Position of Attention.

to the hip joints, and that an incorrect inclination of the pelvis is the cause of the two opposite faults of unduly hollow back and round back.

The hamstring muscles influence this inclination. If their tone is not good and they are weak, they allow the pelvis to incline forward, and, as has been shown, produce hollow back. If they are too much contracted, they, by holding the pelvis too far back, produce round back. In the former case the abdominal muscles become slack, and in the latter case they become over contracted.

The above-mentioned faulty positions of the pelvis thus affect the whole spine, and the most harmful results of these faults are felt in the dorsal region. The mobility and capacity of the thorax is, to a great extent, dependent on the mobility and general form of this region of the spine—if it is rounded and stiff the ribs will be permanently depressed, and if it is straightened the chest will be raised, and the walls of the thorax in a better position for free movement. It is therefore of the utmost importance that the spine should not become fixed in a bad position, as would be the case if the above-named faults were not corrected.

A good carriage of the shoulders is also closely connected with the carriage of the spine. If the back is rounded the shoulders will fall forward, and their weight, and that of the arms, will thereby be thrown forward on to the chest, and will tend to still further round the back, and limit the mobility of the ribs.

The carriage of the cervical portion of the spine determines the position of the head, and also influences the carriage of the remainder of the spine and the position of the chest. If the neck is inclined forward, the chin will be poked forward and the back rounded. If the neck is straightened and carried backwards, the back will be straightened, and a better position of the chest obtained.

399. Heels raising and Knees bending.—The heels are raised by the calf muscles, and, as soon as the knees are the least bit bent, the body is lowered by the force of gravity, which is resisted by the action of the *quadriceps extensor* working *eccentrically*. The knees are, at the same time, kept pressed outwards by means of the *gluteal* muscles. In stretching the knees after the bending, the *gluteus maximus* and *quadriceps extensor* act *concentrically*.

400. Head bending backward.—The *rectus capitis anticus* holds the chin in, while the *longus colli* straightens the cervical curve, and prevents it from being bent by the action of the *splenii* and *complexus*, which actually perform the movement of drawing the neck backward. A result of this movement is that the *sterno-cleido-mastoid* and *scaleni* muscles are stretched, and, in consequence, raise the ribs.

401. Arms bend.—The arm is bent by the *biceps* and *brachialis anticus*, and the humerus is rotated outward by some of the muscles which run from the scapula to the humerus (*vide* para. **382**). To make it possible for these latter muscles to work in this way, the scapula is fixed and drawn towards the spine by means of the *rhomboid*, assisted by the *trapezius*.

402. Arms raising sideways and upward.—The arm is raised to the level of the shoulder by means of the *deltoid*, and the scapula is rotated by the combined action of the *trapezius* and *serratus magnus* (*vide* paras., **380** and **381**). These two movements are performed at the same time, and the action of the muscles is continued, after the forearm is turned into supination, until the arm is fully stretched above the head. Owing to the position of the

attachments of the pectorals, the ribs are raised upward by the upward movement of the arms; the higher the arms are raised, and the more fully they are stretched, the greater will be the raising of the ribs. It is for this reason that the *Arm raising* exercises are used as *Corrective* exercises.

403. Undergr., Overgr., &c.—**Arms bend.**—In the hanging position the grip is maintained by the action of some of the muscles of the forearm. From this position the body is raised partly by means of the *biceps* and *brachialis anticus*, and partly by the *latissimus dorsi* and the *pectorals*. The *rhomboid* also assists the movement by drawing the rotated scapula backward towards the spine. By keeping the elbows well back, as much as possible of the work is thrown on the latissimus dorsi rather than on the pectorals. The head is kept back during this exercise by the action of the muscles employed in **Head bending backward** counteracting the tendency experienced to let the head and chin go forward, and the back to be rounded, as would be the case if the pectorals were allowed full play without the counteraction of the muscles of the back.

404. Trunk bending sideways.—The movement is started by the action of the *external* and *internal oblique* of the side towards which the trunk is bent. As soon as the trunk leaves the upright position, the corresponding muscles on the opposite side, together with the *erector spinæ* of that side, come into play to counteract the force of gravity which would cause the body to fall. In returning to the erect position the same muscles draw the trunk back again by *concentric* action.

405. Trunk bending backward.—The movement is started by the action of the muscles of the back. As soon as the movement is commenced, the *abdominal muscles*, particularly the *rectus abdominis*, are brought into action *eccentrically* to limit the movement, and prevent the trunk from falling. The *concentric* action of the abdominal muscles returns the trunk to the erect position.

406. Leg raising and **Knee raising.**—The action of the *abdominal muscles* prevents the hollowing of the lumbar spine, which would otherwise occur, owing to the weight of the legs when flexed on the pelvis in being raised upward by the action of the *ilio-psoas*.

407. On the Hands.—In this position the skeleton is prevented from collapsing between the two fixed points (hands and feet) by the action of the *abdominal muscles*, the *ilio-psoas* and the *quadriceps-extensor*. The weight of the upper part of the body is carried on the arms by the action of the *serratus magnus* on the shoulder blades.

408. Trunk bending forward.—As the trunk moves forward the *erector spinæ* muscles maintain the position of the spine with reference to the pelvis, while the *hamstring* muscles regulate the forward inclination of the pelvis, and bring it back again to its original position. In the **Forward lying** position, and in the exercises taken from it, the same muscles are in action assisted by the *gluteus maximus*.

SECTION XIII.

METHOD OF USING THE TABLES.

409. The tables included in this Manual are examples of the way in which the system of physical training may be applied to various classes of men under instruction. They must not, however, be looked upon as the *only* means of applying the system.

They have been drawn up as approximately suitable for the men for whom they are intended, and should be modified if required. As it is, however, an extremely difficult matter to draw up a series of really good Tables, those here given should not only be taken as a guide to instructors for training the various conditions of men entrusted to them, but, as a rule, it is advisable that they should be followed fairly closely.

410. It must be realised that each Table of a series is part of a completely organised whole, and has reference to all the other Tables of the series, whether they come before or after it. The exercises of one Table prepare the way for and lead up to those of the following Tables; the instructor should therefore study the whose series before commencing to instruct a class, and also during the course of the instruction, so that he may prepare the men as much as possible, while executing one Table, for the exercises of the various groups in the next and following Tables, by gradually improving the accuracy of performance of the different exercises, slightly increasing the number of times of execution or the difficulty of a particular class of exercise, etc., so that there may be steady progression in the fullest sense of the word from Table to Table.

411. The length of time for which each Table should be used cannot be definitely laid down, as it depends on the capabilities and progress of the men. It rests with the instructor to go from one Table to another when he considers that his class is ready for it. The guiding principle in this respect should be that the men should be able to perform the exercises of one Table, not necessarily perfectly, but as well as can be expected at that stage of their training before proceeding to the next. It is a question for the instructor's judgment.

412. If the progress is too slow the men get bored, and will not improve in proportion to the time spent on the work.

If the progress is too quick the men will not have time to derive full benefit from the exercises, and will consequently not be sufficiently prepared for the next Table. The ill-effects of this are vary hard indeed to rectify; and attempts made to rectify an error of too rapid progression by going back over the old ground are very disheartening to the men.

413. The Tables are arranged so that the passage from one to the other is as gradual as possible, but the instructor must understand that it is his business to make the transition still more gradual whenever necessary by preparing for coming exercises, and his experience after instructing several classes should help him to realise exactly how to do this to the best advantage.

414. When an exercise appears several times in different Tables without further progression being indicated, the instructor must obtain progression in it by requiring improvement in style of execution, by increasing in moderation the number of times it is performed, or, in the case of jumps, by increasing the height without loss of style, etc., as the case may be.

415. *Complementary* and *supplementary leg* exercises are not included in the Tables unless the particular exercise used is a new one, in which case it is placed in brackets after the exercise to which it is complementary. Such exercises should, however, always be introduced by the instructor whenever necessary.

416. When it is stated in a Table that certain exercises are to be "added later," it indicates that such exercises should not be taken when the Table is first commenced, but should be added to that particular Table, according to the progress of the class, before passing on to the next.

Allotment of Time in the Daily Lesson.

417. Each Recruit's Table is intended approximately to represent an hour's work. The exact amount of time devoted to each group of exercises, or part of the Table, must, however, be left to the instructor, who should keep his eye on the clock to see how much time is at his disposal, so that he may apportion it accordingly.

418. The following may be taken as a rough guide for arranging the time in the daily lesson :—

Part A.—About 10 minutes in the earlier stages of instruction to about 5 minutes later on.

Part C.—2 or 3 minutes will, as a rule, suffice.

As regards Part B, it is very important that plenty of time should always be devoted to exercises that promote activity and control, particularly the Jumping and Vaulting exercises. In the earlier stages, 15 minutes is, as a rule, enough time to spend on Jumping and Vaulting, as the necessary activity and control cannot be acquired until the effects of the other exercises begin to be felt. Later on the time devoted to Jumping and Vaulting may be increased to as much as 25 to 30 minutes, and the balance of the time devoted to the other General exercises.

419. When taking new exercises, it is necessary to devote more time to them than is required for old exercises, on account of the explanations, etc., and the time must therefore be adjusted accordingly.

Deviations from the Table.

420. The sequence of the exercises in the daily lesson, as given in the Tables, should, as a rule, be followed; but this can only be managed when the apparatus and space available are sufficient for the classes under instruction, *i.e.*, when about half to a third of the total number can use the apparatus at the same time.

It is of course very desirable that there should be a sufficiency of apparatus, in order to obtain the best results in the most satisfactory manner. It must not, however, be thought that good results cannot be obtained without a full supply of apparatus.

421. If the gymnasium is deficient in this respect, the instructor must modify the Table so that the classes do not have long pauses waiting for apparatus, etc.; but this should be managed, as far as possible, without departing too far from the normal sequence of the exercises.

When short of apparatus, any of the following methods of adjusting the sequence may therefore be adopted as required :—

(*a*) The Span bending and Heaving exercises may be interchanged.

(*b*) The exercises of jumping and vaulting may be interchanged.

(*c*) The marching (but not, as a rule, the running) may be taken after the Balance exercises.

(*d*) The Heaving exercises may be taken immediately before the running, especially if the Heaving exercises are fairly strong ones.

(*e*) The Lateral, Abdominal and Dorsal exercises may be interchanged.

Improvised Arrangements of a Table.

422. When less time than usual is available for the lesson, the following arrangements are suggested :—

(*a*) Omit extra movements when possible by taking one exercise immediately after another from a starting position that has been arrived at during the first exercise, *e.g.*, after *Foot placing sideways* (combined or not), should you require F. sidew. pl. as a starting position for another exercise, then stop the former exercise in this position, and take the latter at once.

(*b*) When using Heaving or Balance exercises, etc., take those exercises which can be used by a large number at the same time.

(*c*) Exceptionally a single group may be omitted altogether, but this should be very exceptional, and, if possible, some equivalent should always be given by introducing the effect of the omitted exercise into some other.

423. When more time than usual is available :—

(*a*) Add extra exercises to Parts A and C.

(*b*) Put an additional exercise into one or more of the groups (especially in the Trunk exercises), or repeat exercises as required.

(*c*) A second Heaving exercise can be taken after Marching and Running, and before the Jumping and Vaulting, and, if necessary, it may be followed by another Balance exercise.

(*d*) Allot more time to the Jumping and Vaulting.

424. When no apparatus is available, improvise apparatus if possible for the exercises requiring it, make use of living support for Span bending, etc., and select exercises without apparatus as nearly as possible of the same degree of difficulty as those for which no apparatus can be improvised. If Heaving apparatus cannot be improvised, use *Arm stretchings* instead.

425. For explanation of abbreviations, etc., used in the Tables, *vide* Section IV.

SECTION XIV.

INFANTRY RECRUITS' PHYSICAL TRAINING TABLES.

426. The following series of thirteen Infantry Recruits' Tables is intended for use throughout a complete course of their physical training of 110 attendances of 1 hour per day for 5 days per week.

The period of time during which each Table is used must depend upon the progress of the men, but as a rule it would be from about seven to ten attendances, or, roughly, between a week and a fortnight.

(For further remarks on the use of the Tables *vide* also Section XIII.)

INFANTRY RECRUITS, TABLE I.

CLASS ARRANGEMENTS.

(*a*) Falling in.
(*b*) Standing at ease.
(*c*) Attention.
(*d*) Dressing.
(*e*) Numbering.
(*f*) Stepping forward, backward, sideways.
(*g*) Opening and Closing ranks.
(*h*) Turnings.

These and other class arrangements to be taken afterwards as necessary.

A.—INTRODUCTORY EXERCISES.

1. L. ex.	(*a*) **Feet close.**
	(*b*) **Heels raise.**
2. N. ex.	**Head bending backward.**
3. A. ex.	(*a*) **Hips firm.**
	(*b*) **Arms bend.**
4. Tr. ex.	F.cl., H.f.—**Trunk turning.**
5. L. ex.	(*a*) H.f., Hl.r.—**Knees bend.**
	(*b*) H.f.—**Foot sideways place.**

B.—GENERAL EXERCISES.

1. Preparation for Sp. b.	**Feet astride Arms upward stretch.** (Taken "free.")
2. Hvg. ex.	**Fall hanging.** (Beam breast high, down to waist high.)
3. Bal. ex.	H.f.—**Knee raise.**
4. Lat. ex.	F.cl., H.f.—**Trunk bending sideways.**
5. Abd. ex.	H.f., F. sidew. pl.—**Trunk bending backward.**
6. Dor. ex.	H.f., F. sidew. pl.—**Trunk bending forward.**
7. Mar. ex.	(*a*) **Quick march . . . Halt.**
	(*b*) **Double march . . . Halt.**
	(*c*) **Quick mark time . . . Halt.**
8. J. & V.	(*a*) **Upward jumping.**
	(*b*) **Class arrangements for jumping over rope.** And add later,—
	(*c*) **Jumping over rope with run.** (Taken "free.")

C.—FINAL EXERCISES.

1. L. ex.	**Heels raise.**
2. Cor. ex.	**Arms raising sideways.**

INFANTRY RECRUITS, TABLE II.

A.—INTRODUCTORY EXERCISES.

1. L. ex.	H.f.—**Heels raising and Knees bending.**
2. N. ex.	**Head bending backward.**
3. A. ex.	(*a*) A.b.—**Arms sideways stretch.** (*b*) A.b.—**Arms upward stretch.**
4. Tr. ex.	H.f., F. sidew. pl.—**Trunk turning.**
5. L. ex.	H.f.—**Feet astride place.**

B.—GENERAL EXERCISES.

1. Preparation for Sp. b.	F. astr. A. upw. str. (taken "free").—**Trunk bending backward** (slight movement only).
2. Hvg. ex.	(*a*) Fall hang.—**Arms bend.** (Beam waist high), and add later, Fall hang.—**Leg raising.** (*b*) **Arch hanging** (a little over head height).
3. Bal. ex.	(*a*) H.f.—**Knee raising.** (*b*) **Mounting beam** (under knee height).
4. Lat. ex.	H.f., F. sidew. pl.—**Trunk bending sideways.**
5. Abd. ex.	(*a*) **On the Hands** (on bench), and add later **Arms bend.** (*b*) Lying, A. upw. r.—**Leg raising.**
6. Dor. ex.	H.f., F. sidew. pl.—**Trunk forward bend,** and add later,— A.b., F. sidew. pl.—**Trunk forward bend.**
7. Mar. ex.	As before and— (*d*) Quick March—**Heels raise.**
8. J. & V.	Previous J. & V. exercises as required and— (*a*) **Forward jumping.** (*b*) **Downward jumping** (from bench, etc.). (*c*) **Long jumping over two chalk lines** (taken "free").

C.—FINAL EXERCISES.

1. L. ex.	H.f.—**Foot placing sideways.**
2. Cor. ex.	**Arms raising sideways.**

INFANTRY RECRUITS, TABLE III.

A.—**INTRODUCTORY EXERCISES.**

1. L. ex.	H.f.—**Heels raising and Knees bending.**
2. N. ex.	**Head turning.**
3. A. ex.	(*a*) A.b.—**Arms stretching sideways.** (*b*) A.b.—**Left Arm upward right Arm downward stretch.**
4. Tr. ex.	H.f., F. sidew. pl.—**Trunk turning quickly.**
5. L. ex.	**Feet astride Arms upward stretch.**

B.—**GENERAL EXERCISES.**

1. Preparation for Sp. b.	F. astr. A. upw. str.—**Trunk bending backward.** (H.f., F. astr.—**Trunk bending forward and downward.**)
2. Hvg. ex.	(*a*) **Arch hanging** (head height). (*b*) **Cross grip.** (*c*) **Over grip.** (*d*) **Position for climbing.**
3. Bal. ex.	(*a*) H.f.—**Leg raising sideways.** (*b*) **Walking forward on beam.** (Up to knee height.)
4. Lat. ex.	On the Hands—**On the left Hand turn** (on bench).
5. Abd. ex.	(*a*) On the Hands—**Arms bend** (on bench). (*b*) Lying, A. upw. r.—**Legs raising.**
6. Dor. ex.	Forw. lying—**Hips firm** (on bench).
7. Mar. ex.	As before and— (*e*) **Change step.**
8. J. & V.	Previous J. & V. ex. as required and— (*a*) **Upward jumping.** (*b*) **Upward jumping with Arms raising sideways.** (*c*) **Downward jumping.** (*d*) **With three paces forward off the left Foot jump.**

C.—**FINAL EXERCISES.**

1. L. ex.	H.f.—**Foot placing sideways.**
2. Tr. ex.	H.f., F. sidew. pl.—**Trunk bending sideways.**
3. Cor. ex.	**Arms raising sideways.**

INFANTRY RECRUITS, TABLE IV.

A.—INTRODUCTORY EXERCISES.

1. L. ex.	H.f.—**Foot placing sideways.**
2. N. ex.	**Head turning.**
3. A. ex.	(*a*) A.b.—**Arms stretching upward.**
	(*b*) A. sidew. r.—**Arms forward bend,** and add later **Arms flinging.**
4. Tr. ex.	A.b., F. sidew. pl.—**Trunk bending forward,** and add later **Arms stretching sideways.**
5. L. ex.	H.f.—**Heels raising and Knees bending quickly.**

B.—GENERAL EXERCISES.

1. Sp. b.	**Position for Span bending** (taken "free" with F. astr.; and later by word of command).
2. Hvg. ex.	(*a*) Arch hang.—**Arms bend** (head height).
	(*b*) **Oblique grip.**
	(*c*) **Undergrip.**
	(*d*) **Climbing.**
3. Bal. ex.	(*a*) H.f.—**Leg raising backward.**
	(*b*) **Turning about on beam.** (Up to knee height.)
4. Lat. ex.	(*a*) F.cl., 1 A. upw. 1 A. downw. str.—**Trunk bending sideways.**
	(*b*) On the left Hand—**Leg raising.** (On bench.)
5. Abd. ex.	**On the Hands** (on ground), and add later **Arms bend.**
6. Dor. ex.	Forw. lying, H.f.—**Trunk bending backward.**
7. Mar. ex.	As before.
8. J. & V.	Previous J. & V. ex. as required and—
	(*a*) **On the top bar up.**
	(*b*) **Jumping over rope with 3 paces forward off the left Foot.**
	(*c*) Beam grasp—**First position.** And add later with run—**First position.**
	(*d*) **Upward jumping** (2 or 3 jumps without pause).

C.—FINAL EXERCISES.

1. L. ex.	**Feet close and Feet open** (counting 6 or more beats).
2. Tr. ex.	F.cl., H.f.—**Trunk turning.**
3. Cor. ex.	**Arms raising sideways.**

INFANTRY RECRUITS, TABLE V.

A.—INTRODUCTORY EXERCISES.

1. L. ex.	H.f.—**Foot placing sideways.**
2. N. ex.	**Head turning quickly.**
3. A. ex.	**Arms swinging upward.**
4. Tr. ex.	H.f., F. sidew. pl.—**Trunk bending sideways quickly.**
5. L. ex.	H.f.—**Heels raising and Knees bending.**

B.—GENERAL EXERCISES.

1. Sp. b.	Pos. for Sp. b. (F. astr.)—**Heels raise.** (1 foot-length from wall bars.)
2. Hvg. ex.	(*a*) Crossgr.—**Arms bend** (with assistance). (*b*) Undergr.—**Arms bend** (with assistance). (*c*) Overgr.—**Side travelling.**
3. Bal. ex.	(*a*) H.f., K.r.—**Leg forward stretch.** (*b*) **Mounting Beam with run.** (Up to hip height.)
4. Lat. ex.	On the Hands—**On the left Hand turn.** (At wall bars.)
5. Abd. ex.	(*a*) On the Hands—**Arms bend** (on ground). (*b*) F. support, H.f.—**Trunk bending backward.**
6. Dor. ex.	(*a*) F. astr. A. upw. str.—**Trunk bending forward.** (*b*) Forw. lying, H.f.—**Trunk bending backward.**
7. Mar. ex.	As before and— (*f*) H.f.—**With Knee raising quick mark time.**
8. J. & V.	Previous J. & V. ex. as required and— (*a*) **Long jumping with 3 paces forward off the left Foot.** (*b*) **Vault with Foot assisting.** (Beam.) (*c*) **Upward Jumping with Arms raising sideways.**

C.—FINAL EXERCISES.

1. L. ex.	H.f.—**Heels raising and Knees bending quickly.**
2. Tr. ex.	A.b., F. sidew. pl.—**Trunk bending forward.**
3. Cor. ex.	**Arms raising sideways.**

INFANTRY RECRUITS, TABLE VI.

A.—INTRODUCTORY EXERCISES.

1. L. ex.	H.f.—**Foot placing sideways.**
2. N. ex.	**Head bending backward.**
3. A. ex.	**Arms swinging upward.**
4. Tr. ex.	H.f., F. sidew. pl.—**Trunk bending forward.**
5. L. ex.	H.f.—**Heels raising and full Knees bending.**

B.—GENERAL EXERCISES.

1. Sp. b.	Pos. for Sp. b. (F. astr.)—**Heels raise.** (2 foot-lengths from wall bars.)
2. Hvg. ex.	(*a*) Obliquegr.—**Arms bend** (with assistance). (*b*) Obliquegr.—**Backward travelling.**
3. Bal. ex.	(*a*) H.f.—**Leg raising forward.** (*b*) **Walking forward on beam.** (Hip height.)
4. Lat. ex.	On the left Hand—**Leg raising.** (At wall bars.)
5. Abd. ex.	(*a*) On the Hands—**Arms bend.** (On ground.) (*b*) Overgr.—**Knees raising.** (Wall bar or beam.)
6. Dor. ex.	Forw. lying, H.f.—**Trunk bending forward.**
7. Mar. ex.	As before and— (*g*) **Slow march.**
8. J. & V.	Previous J. & V. ex. as required and— (*a*) **Jumping over rope.** (*b*) **Long jumping.** (*c*) **Heaving jump** (side to beam). (*d*) **Upward jumping with Arms raising sideways.** (2 or 3 jumps without pause.)

C.—FINAL EXERCISES.

1. L. ex.	H.f.—**Heels raising and Knees bending quickly.**
2. Tr. ex.	H.f., F. astr.—**Trunk bending backward.**
3. A. ex.	A. forw. b.—**Arms flinging.**
4. Cor. ex.	**Head bending backward.**

INFANTRY RECRUITS, TABLE VII.

A.—INTRODUCTORY EXERCISES.

1. L. ex.	H.f.—**Heels raising and Knees bending quickly.**
2. N. ex.	**Head turning.**
3. A. ex.	A. upw. str.—**Arms swinging downward and backward.**
4. Tr. ex.	A. upw. str.—**Trunk bending backward.**
5. L. ex.	(*a*) **Feet astride Arms sideways stretch.** (*b*) **Feet astride Arms bend.**

B.—GENERAL EXERCISES.

1. Sp. b.	Pos. for Sp. b. (F. astr.)—**Heels raise.** (2 foot-lengths from wall bars.)
2. Hvg. ex.	(*a*) **Twisting to sitting position,** and add later **Twisting about.** (*b*) Overgr.—**Side travelling changing grip.**
3. Bal. ex.	(*a*) H.f.—**Leg raising forward.** (*b*) **Walking backward on beam** (up to hip height).
4. Lat. ex.	H.f., F. support.—**Trunk bending sideways.**
5. Abd. ex.	**On the hands** (feet on bench or beam).
6. Dor. ex.	Forw. lying, H.f.—**Trunk bending backward and forward.**
7. Mar. ex.	As before and— (*h*) H.f.—**With Knee raising quick march.**
8. J. & V.	Previous J. & V. ex. as required and— (*a*) **Heaving jump** (side to beam), **2 jumps.** (*b*) **On the Knees.** (*c*) **On the Feet to Attention.** (*d*) **Forward jumping.**

C.—FINAL EXERCISES.

1. L. ex.	H.f.—**Heels raising and full Knees bending.**
2. Tr. ex.	F. astr. H.f.—**Trunk turning.**
3. Cor. ex.	**Arms raising sideways and upward.**

INFANTRY RECRUITS, TABLE VIII.

A.—INTRODUCTORY EXERCISES.

1. L. ex.	H.f.—**Foot placing sideways.**
2. N. ex.	**Head bending sideways.**
3. A. ex.	A.b.—**Arms stretching sideways and upward.**
4. Tr. ex.	A. upw. str.—**Trunk bending backward.**
5. L. ex.	H.f.—**Heels raising and full Knees bending quickly.**

B.—GENERAL EXERCISES.

1. Sp. b.	Pos. for Sp. b. (F. astr.)—**Heels raise.** (2 foot-lengths from wall bars.)
2. Hvg. ex.	(*a*) Overgr.—**Side travelling with swing.** (*b*) Crossgr., A.b.—**Backward travelling.**
3. Bal. ex.	**Turning about on beam** (up to hip height).
4. Lat. ex.	F. support, 1 A. upw. 1 Hand H.f.—**Trunk bending sideways.**
5. Abd. ex.	On the Hands—**Leg raising.** (On ground.) And add later— On the Hands, A.b.—**Leg raising.** (On ground.)
6. Dor. ex.	Forw. lying. A.b.—**Trunk bending backward and forward.**
7. Mar. ex.	As before.
8. J. & V.	Previous J. & V. ex. as required and— (*a*) **On the Feet and splits off.** (Horse lengthways.) (*b*) **On the Feet and off.** (*c*) **High and long jump, over benches, etc.** (*d*) **With 3 paces forward off the left Foot jump.**

C.—FINAL EXERCISES.

1. L. ex.	A.b.—**Heels raising.**
2. Tr. ex.	H.f., F. sidew. pl.—**Trunk bending sideways.**
3. Cor. ex.	**Arms raising sideways and upward.**

INFANTRY RECRUITS, TABLE IX.

A.—INTRODUCTORY EXERCISES.

1. L. ex.	A.b.—**Heels raising and Knees bending.**
2. N. ex.	**Head bending sideways.**
3. A. ex.	A. upw. str.—**Arms swinging downward and backward.**
4. Tr. ex.	F. astr. A. sidew. str.—**Trunk bending sideways.**
5. L. ex.	(*a*) H.f., F.cl.—**Feet full open.** (*b*) H.f., F. full o.—**Foot outward place.**

B.—GENERAL EXERCISES.

1. Sp. b.	Pos. for Sp. b. (Hl. together).—**Heels raise** (2 foot-lengths from wall bars).
2. Hvg. ex.	(*a*) Fall hang., A.b.—**Leg raising.** (*b*) Undergr.—**Upward circling.** (Beam neck high.)
3. Bal. ex.	(*a*) H.f.—**Leg raising backward.** (*b*) **Mounting beam** (from hip to shoulder height).
4. Lat. ex.	On the Hands—**On the left Hand turn.** (On ground.)
5. Abd. ex.	Sit., H.f.—**Trunk bending backward** (45°).
6. Dor. ex.	(*a*) Forw. lying., A.b., Tr. backw. (forw.) b.—**Arms stretching sideways.** (*b*) F. astr. A. upw. str.—**Trunk bending forward.**
7. Mar. ex.	As before.
8. J. & V.	Previous J. & V. ex. as required and— (*a*) **Upward jumping with turning.** (*b*) **Jumping over rope.** (*c*) With run—**First position.** (*d*) **Vault with Foot assisting.**

C.—FINAL EXERCISES.

1. L. ex.	H.f.—**Heels raising and fuil Knees bending.**
2. Tr. ex.	H.f., F. sidew. pl.—**Trunk bending backward.**
3. Cor. ex.	**Arms raising sideways and upward.**

INFANTRY RECRUITS, TABLE X.

A.—INTRODUCTORY EXERCISES.

1. L. ex.	H.f., F. full o.—**Foot placing outward.**
2. N. ex.	**Head bending backward.**
3. A. ex.	A.b.—**Arms stretching sideways and upward.** (Twice in each direction.)
4. Tr. ex.	A.b., F. sidew. pl.—**Trunk turning.**
5. L. ex.	H.f., F. full o.—**Outward lunge.**

B.—GENERAL EXERCISES.

1. Sp. b.	Pos. for Sp. b. (Hl. together)—**Heels raise** (2 foot-lengths from wall bars).
2. Hvg. ex.	(*a*) Undergr.—**Upward circling.** (*b*) Crossgr.—**Arms bend.**
3. Bal. ex.	**Walking forward on beam** (from hip to shoulder height).
4. Lat. ex.	(*a*) F. astr. A. sidew. str.—**Trunk bending sideways quickly.** (*b*) On the left Hand—**Leg raising.** (On ground.)
5. Abd. ex.	Sit., H.f.—**Trunk bending backward.**
6. Dor. ex.	F. astr. A. upw. str., Tr. forw. b.—**Arms swinging downward and backward.**
7. Mar. ex.	As before and— (*i*) **On alternate Feet hop.**
8. J. & V.	Previous J. & V. ex. as required and— (*a*) **Upward jumping with turning.** (*b*) **Long jumping.** (*c*) **Vault over double beam.** (*d*) **Mounting shelf with assistance and circling down.**

C.—FINAL EXERCISES.

1. L. ex.	H.f.—**Heels raising and full Knees bending.**
2. Tr. ex.	H.f., F. sidew. pl.—**Trunk bending forward.**
3. Cor. ex.	**Arms raising sideways and upward.**

INFANTRY RECRUITS, TABLE XI.

A.—INTRODUCTORY EXERCISES.

1. L. ex. 2. N. ex.	H.f. (and later A.b.), full K.b.—**Head turning quickly.**
3. A. ex.	A.b.—**Arms stretching sideways and upward** (twice in each direction).
4. Tr. ex.	(*a*) F. astr. H.f.—**Trunk bending backward.** (*b*) F. astr. H.f.—**Trunk bending forward.**
5. L. ex.	A.b., F. full o.—**Lunging outward.**

B.—GENERAL EXERCISES.

1. Sp. b.	**Fall hanging to Span bending.** (Beam breast high.) (A. upw. str., F. sidew. pl.—**Trunk bending forward and downward.**)
2. Hvg. ex.	(*a*) Undergr.—**Upward circling.** (*b*) Undergr.—**Arms bend.**
3. Bal. ex.	**Turning about on beam** (up to shoulder height).
4. Lat. ex.	A. b., F. sidew. pl., Tr. turn.—**Arms stretching upward.**
5. Abd. ex.	(*a*) Overgr.—**Legs raising.** (*b*) Sit., H.f.—**Trunk bending backward.**
6. Dor. ex.	(*a*) F. full o., H.f. (and later A.b.)—**Toe support backward lunge.** (*b*) A.b., F. sidew. pl., Tr. forw. b.—**Arms stretching sideways.**
7. Mar. ex.	As before and— (*j*) **On the left Foot hop.**
8. J. & V.	Previous J. & V. ex. as required and— (*a*) **Vault to left over beam.** (*b*) **Left Hand vault.** (*c*) **Heaving jump.** (Facing beam.) (*d*) **Mounting Shelf with assistance and jumping down.** (*e*) **Mounting wall with assistance from below,** and add later **with assistance from above.** (*f*) **Obstacle course.**

C.—FINAL EXERCISES.

1. L. ex.	H.f., F. full o.—**Foot placing outward.**
2. Tr. ex.	F. cl., H.f.—**Trunk bending sideways.**
3. Cor. ex.	**Arms raising forward upward sideways and downward.**

INFANTRY RECRUITS, TABLE XII.

A.—INTRODUCTORY EXERCISES.

1. L. ex.	A.b., F. full o.—**Foot placing outward.**
2. N. ex.	**Head bending sideways.**
3. A. ex.	**Arms swinging upward.**
4. Tr. ex.	H.f., F. outw. pl.—**Trunk turning.**
5. L. ex.	(*a*) A.b., full K.b.—**Arms stretching sideways.**
	(*b*) H.f.—**Foot placing forward.**

B.—GENERAL EXERCISES.

1. Sp. b.	**Fall hanging to Span bending.**
2. Hvg. ex.	(*a*) Undergr.—**Upward circling.**
	(*b*) Obliquegr.—**Arms bend.**
	(*c*) Obliquegr.—**Backward travelling with Arms bending between each pace.**
3. Bal. ex.	(*a*) **Mounting beam with run.**
	(*b*) H.f.—**Leg raising forward, sideways and backward.**
4. Lat. ex.	A.b., F. full o.—**Lunging outward with one Arm upward one Arm downward stretching.**
5. Abd. ex.	(*a*) Overgr., Ks. r.—**Leg forward stretch.**
	(*b*) Sit., H.f.—**Trunk bending backward.**
6. Dor. ex.	(*a*) A.b., Toe support backw. lunge.—**Arms stretching sideways.**
	(*b*) Forw. lying, A.b., Tr. backw. b.—**Arms stretching upward.**
7. Mar. ex.	As before and—
	(*k*) H.f.—**With Knee raising double march.**
8. J. & V.	Previous J. & V. ex. as required and—
	(*a*) **Between the Hands.**
	(*b*) **Splits over** (horse lengthways).
	(*c*) **Mounting wall.**
	(*d*) **Obstacle course.**

C.—FINAL EXERCISES.

1. L. ex.	H.f.—**Foot placing sideways.**
2. Tr. ex.	(*a*) H.f., F. sidew. pl.—**Trunk bending backward.**
	(*b*) H.f., F. sidew. pl.—**Trunk bending forward.**
3. Cor. ex.	**Arms raising forward upward sideways and downward.**

INFANTRY RECRUITS, TABLE XIII.

A.—INTRODUCTORY EXERCISES.

1. L. ex.	H.f.—**Foot placing sideways.**
2. N. ex.	**Head bending backward.**
3. A. ex.	A.b.—**Arms stretching sideways and upward.**
4. Tr. ex.	(*a*) F. astr. A. upw. str.—**Trunk bending backward.**
	(*b*) F. astr. A. upw. str., Tr. forw. b.—**Arms swinging downward and backward.**
5. L. ex.	**Heels raising and full Knees bending with Arms raising sideways and upward.**

B.—GENERAL EXERCISES.

1. Sp. b.	Pos. for Sp. b. (F. astr.)—**Heels raise.** (2 foot-lengths from wall bars.)
2. Hvg. ex.	(*a*) Fall. hang.—**Arms bending with Leg raising.**
	(*b*) Arch. hang.—**Arms bend.**
	(*c*) **Climbing.**
3. Bal. ex.	*vide* N.B. below.
4. Lat. ex.	F. astr. A. upw. str.—**Trunk bending sideways.**
5. Abd. ex.	Sit., H.f.—**Trunk bending backward.**
6. Dor. ex.	Forw. lying, A.b., Tr. backw. b.—**Arms stretching upward.**
7. Mar. ex.	*vide* N.B. below.
8. J. & V.	**Obstacle training,** etc.

C.—FINAL EXERCISES.

1. L. ex.	F. full o., H.f.—**Foot placing outward.**
2. Tr. ex.	H.f., F. outw. pl.—**Trunk turning.**
3. Cor. ex.	**Arms raising forward upward sideways and downward.**

N.B.—Balancing, marching, running, jumping and vaulting should be included in the **Obstacle training** and additional exercises of these groups may also be taken as required. The Obstacle training (taken without and with rifles) should include :—Obstacle course, shelf, wall and any additional obstacles available, besides obstacles formed with apparatus arranged in various ways according to local facilities.

CAVALRY AND ARTILLERY RECRUITS' PHYSICAL TRAINING TABLES.

427. The following series of nine Tables is intended for use during a complete three months' course of physical training of 60 attendances (1 hour per day for 5 days per week).

The period of time during which each Table is used should be, as a rule, from about 6 to 9 days, or, roughly, between a week and a fortnight, according to the progress of the men.

(*Vide* also remarks on the method of using the Tables in Section XIII.)

CAVALRY & ARTILLERY RECRUITS, TABLE I.

CLASS ARRANGEMENTS.

(*a*) Falling in.
(*b*) Standing at ease.
(*c*) Attention.
(*d*) Dressing.
(*e*) Numbering.
(*f*) Stepping forward, backward, sideways.
(*g*) Opening and closing ranks.
(*h*) Turnings.

These and other class arrangements to be taken afterwards as necessary.

A.—INTRODUCTORY EXERCISES.

1. L. Ex.	(*a*) **Feet close.**
	(*b*) **Heels raise.**
2. N. ex.	**Head bending backward.**
3. A. ex.	(*a*) **Arms bend.**
	(*b*) A.b.—**Arms sideways stretch.**
	(*c*) **Hips firm.**
4. Tr. ex.	F.cl., H.f.—**Trunk turning.**
5. L. ex.	(*a*) H.f., Hl.r.—**Knees bend.**
	(*b*) **Foot sideways place.**

B.—GENERAL EXERCISES.

1. Preparation for Sp. b.	**Feet astride Arms upward stretch.** (Taken "free.")
2. Hvg. ex.	(*a*) **Fall hanging.** (Beam breast high down to waist high.)
	And add later—
	(*b*) Fall hang.—**Arms bend.**
	(*c*) Fall hang.—**Leg raising.**
3. Bal. ex.	H.f.—**Knee raise.**
4. Lat. ex.	F.cl., H.f.—**Trunk bending sideways.**
5. Abd. ex.	H.f., F. sidew. pl.—**Trunk bending backward.**
6. Dor. ex.	H.f., F. sidew. pl.—**Trunk bending forward.**
7. Mar. ex.	(*a*) **Quick March . . . . Halt.**
	(*b*) **Double March . . . . Halt.**
	(*c*) **Quick mark time . . . . Halt.**
8. J. & V.	(*a*) **Upward jumping.**
	(*b*) **Class arrangements for jumping over rope.**
	And add later—
	(*c*) **Jumping over rope with run.** (Taken "free.")

C.—FINAL EXERCISES.

1. L. ex.	**Heels raise.**
2. Cor. ex.	**Arms raising sideways.**

CAVALRY & ARTILLERY RECRUITS, TABLE II.

A.—INTRODUCTORY EXERCISES.

1. L. ex.	H.f.—**Heels raising and Knees bending.**
2. N. ex.	**Head bending backward.**
3. A. ex.	(*a*) A.b.—**Arms sideways stretch.**
	(*b*) A.b.—**Arms upward stretch.**
4. Tr. ex.	H.f., F. sidew. pl.—**Trunk turning.**
5. L. ex.	(*a*) H.f.—**Foot placing sideways.**
	(*b*) H.f.—**Feet astride place.**

B.—GENERAL EXERCISES.

1. Preparation for Sp. b.	F. astr. A. upw. str. (taken "free")—**Trunk bending backward.** (Slight movement only.)
2. Hvg. ex.	(*a*) Fall hang.—**Arms bend.** (Beam waist high.)
	(*b*) **Arch hanging.** (A little over head height.)
	And add later—
	(*c*) Arch hang.—**Arms bend.**
3. Bal. ex.	(*a*) H.f.—**Knee raise.**
	(*b*) **Mounting beam.** (Under knee height.)
4. Lat. ex.	H.f., F. sidew. pl.—**Trunk bending sideways.**
5. Abd. ex.	(*a*) **On the Hands** (on bench) and add later **Arms bend.**
	(*b*) Lying, A. upw. r.—**Leg raising,** and later **Legs raising.**
6. Dor. ex.	(*a*) H.f., F. sidew. pl.—**Trunk bending forward and downward.**
	And add later—
	(*b*) A.b., F. sidew. pl.—**Trunk bending forward.**
	(*c*) Forw. lying—**Hips firm.** (On bench.)
7. Mar. ex.	As before and—
	(*d*) Quick march—**Heels raise.**
8. J. & V.	Previous J. & V. ex. as required and—
	(*a*) **Forward jumping.**
	(*b*) **Downward jumping.** (From bench, etc.)
	(*c*) **Long jumping over two chalked lines.** (Taken "free.")

C.—FINAL EXERCISES.

1. Lat. ex.	(*a*) **Feet close.**
	(*b*) **Heels raise.**
2. Cor. ex.	**Arms raising sideways.**

CAVALRY & ARTILLERY RECRUITS, TABLE III.

A.—INTRODUCTORY EXERCISES.

1. L. ex.	H.f.—**Heels raising and Knees bending.**
2. N. ex.	**Head turning.**
3. A. ex.	A.b.—**Left Arm upward right Arm downward stretch.**
4. Tr. ex.	H.f., F. sidew. pl.—**Trunk turning quickly.**
5. L. ex.	(*a*) **Feet astride Arms upward stretch.** (*b*) **Feet astride Arms sideways stretch.**

B.—GENERAL EXERCISES.

1. Preparation for Sp. b.	F. astr. A. upw. str.—**Trunk bending backward.**
2. Hvg. ex.	(*a*) **Over grip.** (*b*) **Cross grip.** (*c*) **Oblique grip.** (*d*) **Position for climbing.**
3. Bal. ex.	(*a*) H.f.—**Leg raising sideways.** (*b*) **Walking forward on beam.** (Up to knee height.)
4. Lat. ex.	On the Hands—**On the left Hand turn** (on bench) and add later **Leg raising.**
5. Abd. ex.	**On the Hands** (on ground) and add later **Arms bend.**
6. Dor. ex.	Forw. lying, H.f.—**Trunk bending backward.**
7. Mar. ex.	As before and— (*c*) **Change step.**
8. J. & V.	Previous J. & V. ex. as required and— (*a*) **Upward jumping with Arms raising sideways.** (*b*) **With three paces forward off the left Foot jump.** (*c*) **On the top bar up.**

C.—FINAL EXERCISES.

1. L. ex.	H.f.—**Foot placing sideways.**
2. Tr. ex.	H.f., F. sidew. pl.—**Trunk bending forward.**
3. Cor. ex.	**Arms raising sideways.**

CAVALRY & ARTILLERY RECRUITS, TABLE IV.

A.—INTRODUCTORY EXERCISES.

1. L. ex.	H.f.—**Foot placing sideways.**
2. N. ex.	**Head turning.**
3. A. ex.	**Arms swinging upward.**
4. Tr. ex.	H.f., F. sidew. pl.—**Trunk bending sideways.**
5. L. ex.	H.f.—**Heels raising and Knees bending quickly.**

B.—GENERAL EXERCISES.

1. Sp. b.	Position for Span bending (taken "free" with F. astr.; and later by word of command).
2. Hvg. ex.	(*a*) **Under grip** and add later **Arms bend** (with assistance).
	(*b*) Crossgr.—**Arms bend.** (With assistance.)
	(*c*) **Climbing.**
3. Bal. ex.	(*a*) H.f.—**Leg raising backward.**
	(*b*) **Turning about on beam.**
4. Lat. ex.	(*a*) F. cl., 1 A. upw. 1 A. downw. str.—**Trunk bending sideways.**
	(*b*) **On the left Hand** (at wall bars) and add later **Leg raising.**
5. Abd. ex.	(*a*) Overgr.—**Knees raise** (wall bars or beam).
	(*b*) Sit., H.f.—**Trunk bending backward** (45°).
6. Dor. ex.	(*a*) A.b., F. sidew. pl.—**Trunk bending forward** and add later **Arms stretching sideways.**
	(*b*) Forw. lying, H.f.—**Trunk bending forward.**
7. Mar. ex.	As before and—
	(*f*) **With Knee raising quick mark time.**
8. J. & V.	Previous J. & V. ex. as required and—
	(*a*) **Jumping over rope with three paces forward off the left Foot.**
	(*b*) **Long jumping.**
	(*c*) Beam grasp—**First position.** And add later—
	(*d*) With run—**First position.**
	(*e*) **Vault with Foot assisting.**

C.—FINAL EXERCISES.

1. L. ex.	H.f.—**Heels raising and Knees bending.**
2. A. ex.	A. sidew. r.—**Arms forward bend** and add later **Arms flinging.**
3. Tr. ex.	H.f., F. sidew. pl.—**Trunk bending backward.**
4. Cor. ex.	**Head bending backward.**

CAVALRY & ARTILLERY RECRUITS, TABLE V.

A.—INTRODUCTORY EXERCISES.

1. L. ex.	H.f.—**Foot placing sideways.**
2. N. ex.	**Head turning quickly.**
3. A. ex.	A. upw. str.—**Arms swinging downward and backward.**
4. Tr. ex.	H.f., F. sidew. pl.—**Trunk bending sideways quickly.**
5. L. ex.	H.f.—**Heels raising and full Knees bending.**

B.—GENERAL EXERCISES.

1. Sp. b;	Pos. for Sp. b. (F. astr.)—**Heels raise.** (1 foot-length from wall bars.)
2. Hvg. ex.	(*a*) Undergr.—**Arms bend.** (*b*) Obliquegr.—**Arms bend.** (*c*) Overgr.—**Side travelling with swing.**
3. Bal. ex.	(*a*) H.f., K.r.—**Leg forward stretch.** (*b*) **Mounting beam with run.** (Up to hip height.)
4. Lat. ex.	On the left Hand—**Leg raising.** (At wall bars.)
5. Abd. ex.	(*a*) **On the Hands.** (Feet on bench or beam.) (*b*) Sit., H.f.—**Trunk bending backward** (45°).
6. Dor. ex.	Forw. lying, A.b.—**Trunk bending backward and forward.**
7. Mar. ex.	As before and— (*g*) **Slow march.**
8. J. & V.	Previous J. & V. ex. as required and— (*a*) **On the Knees.** (*b*) **On the Feet to Attention.** (*c*) **Heaving jump.** (Side to beam.) (*d*) **Upward jumping.**

C.—FINAL EXERCISES.

1. L. ex.	H.f.—**Heels raising and Knees bending quickly.**
2. A. ex.	A. forw. b.—**Arms flinging.**
3. Tr. ex.	H.f., F. sidew. pl.—**Trunk turning.**
4. Cor. ex.	**Head bending backward.**

CAVALRY & ARTILLERY RECRUITS, TABLE VI.

A.—INTRODUCTORY EXERCISES.

1. L. ex.	H.f.—**Foot placing sideways.**
2. N. ex.	**Head bending backward.**
3. A. ex.	A.b.—**Arms stretching sideways and upward.**
4. Tr. ex.	(*a*) H.f., F. sidew. pl.—**Trunk bending backward.** (*b*) H.f., F. sidew. pl.—**Trunk bending forward.**
5. L. ex.	H.f.—**Heels raising and full Knees bending quickly.**

B.—GENERAL EXERCISES.

1. Sp. b.	Pos. for Sp. b. (F. astr.)—**Heels raise.** (2 foot-lengths from wall bars.)
2. Hvg. ex.	(*a*) Obliquegr.—**Backward travelling.** (*b*) Overgr.—**Side travelling.**
3. Bal. ex.	(*a*) H.f.—**Leg raising forward.** (*b*) **Walking backward on beam.** (Up to hip height.)
4. Lat. ex.	(*a*) H.f., F. support.—**Trunk bending sideways.** (*b*) On the Hands—**On the left Hand turn.** (On ground.)
5. Abd. ex.	(*a*) On the Hands—**Leg raising.** (On ground.) (*b*) Sit., H.f.—**Trunk bending backward.**
6. Dor. ex.	Forw. lying, A.b., Tr. backw. (forw.) b.—**Arms stretching sideways.**
7. Mar. ex.	As before and— (*h*) H.f.—**With Knee raising quick march.**
8. J. & V.	Previous J. & V. ex. as required and— (*a*) **Heaving jump** (side to beam) **2 jumps.** (*b*) **On the Feet and splits off.** (Horse lengthways.) (*c*) **On the Feet and off.** (*d*) **Forward jumping.**

C.—FINAL EXERCISES.

1. L. ex.	H.f.—**Heels raising and Knees bending.**
2. Tr. ex.	H.f., F. sidew. pl.—**Trunk turning.**
3. Cor. ex.	**Arms raising sideways and upward.**

CAVALRY & ARTILLERY RECRUITS, TABLE VII.

A.—INTRODUCTORY EXERCISES.

1. L. ex.	(*a*) H.f.—**Foot placing sideways.** (*b*) H.f., F. full o.—**Foot outward place.**
2. N. ex.	**Head turning.**
3. A. ex.	A.b.—**Arms stretching sideways and upward.**
4. Tr. ex.	F. astr. A. upw. str.—**Trunk bending forward.**
5. L. ex.	H.f.—**Heels raising and full Knees bending quickly.**

B.—GENERAL EXERCISES.

1. Sp. b.	Pos. for Sp. b. (F. astr.)—**Heels raise.** (2 foot-lengths from wall bars.)
2. Hvg. ex.	(*a*) Crossgr., A.b.—**Backward travelling.** (*b*) Undergr.—**Upward circling.**
3. Bal. ex.	**Mounting beam** (over hip height).
4. Lat. ex.	F. support, 1 A. upw. 1 Hand H. f.—**Trunk bending sideways.**
5. Abd. ex.	(*a*) On the Hands—**Leg raising.** (On ground.) (*b*) On the Hands—**Arms bend.** (On ground.)
6. Dor. ex.	Forw. lying, A.b., Tr. backw. (forw.) b.—**Arms stretching sideways.**
7. Mar. ex.	As before and— (*i*) **On alternate Feet hop.**
8. J. & V.	Previous J. & V. ex. as required and— (*a*) **Upward jumping with turning.** (*b*) **Vault over double beam.** (*c*) **Mounting pommel horse.** (*d*) **Obstacle course.**

C.—FINAL EXERCISES.

1. L. ex.	H.f.—**Heels raising and Knees bending quickly.**
2. Tr. ex.	(*a*) H.f., F. sidew. pl.—**Trunk bending backward.** (*b*) H.f., F. sidew. pl.—**Trunk bending forward.**
3. Cor. ex.	**Arms raising sideways and upward.**

CAVALRY & ARTILLERY RECRUITS, TABLE VIII.

A.—INTRODUCTORY EXERCISES.

1. L. ex.	H.f., F. full o.—**Foot placing outward.**
2. N. ex.	**Head bending sideways.**
3. A. ex.	A.b.—**Arms stretching sideways and upward** (twice in each direction).
4. Tr. ex.	F. astr. A. sidew. str.—**Trunk bending sideways.**
5. L. ex.	H.f., F. full o.—**Outward lunge.**

B.—GENERAL EXERCISES.

1. Sp. b.	Pos. for Sp. b. (F. astr.)—**Heels raise.** (2 foot-lengths from wall bars.) (F. astr. A. upw. str.—**Trunk bending forward and downward.**)
2. Hvg. ex.	(*a*) Fall hang., A.b.—**Leg raising.** (*b*) Undergr.—**Upward circling.**
3. Bal. ex.	**Walking forward on beam** (over hip height).
4. Lat. ex.	F. support, 1 A. upw. 1 Hand H.f.—**Trunk bending sideways.**
5. Abd. ex.	Overgr.—**Legs raising.**
6. Dor. ex.	Forw. lying, A.b., Tr. backw. b.—**Arms stretching upward.**
7. Mar. ex.	As before and— (*j*) **On the left Foot hop.**
8. J. & V.	Previous J. & V. ex. as required and— (*a*) **Left Hand vault.** (*b*) **Heaving jump.** (Facing beam.) (*c*) **Mounting shelf with assistance and circling down,** and later **jumping down.** (*d*) **Mounting pommel horse.** (*e*) **Obstacle course.**

C.—FINAL EXERCISES.

1. L. ex.	**Heels raising and Knees bending quickly.**
2. Tr. ex.	A.b., F. sidew. pl.—**Trunk turning.**
3. Cor. ex.	**Arms raising forward upward sideways and downward.**

CAVALRY & ARTILLERY RECRUITS, TABLE IX.

A.—INTRODUCTORY EXERCISES.

1. L. ex.	H.f.—**Heels raising and full Knees bending.**
2. N. ex.	(*a*) **Head bending backward.** (*b*) **Head bending sideways.**
3. A. ex.	A.b.—**Arms stretching sideways and upward.** (Twice in each direction.)
4. Tr. ex.	(*a*) F. astr. A. upw. str.—**Trunk bending backward.** (*b*) F. astr. A. upw. str.—**Trunk bending forward.**
5. L. ex.	H.f., F. full o.—**Lunging outward.**

B.—GENERAL EXERCISES.

1. Sp. b.	**Fall hanging to Span bending.** (Beam breast high.)
2. Lvg. ex.	Obliquegr.—**Backward travelling with Arms bending between each pace.**
3. Bal. ex.	**Walking forward on beam.** (Over hip height.)
4. Lat. ex.	A.b., F. sidew. pl., Tr. turn.—**Arms stretching upward.**
5. Abd. ex.	Overgr., Ks.r.—**Leg forward stretch.**
6. Dor. ex.	Forw. lying, A.b., Tr. backw. b.—**Arms stretching upward.**
7. Mar. ex.	As before and— (*k*) H.f.—**With Knee raising double march.**
8. J. & V.	Previous J. & V. as required and— (*a*) **Between the Hands.** (*b*) **Splits over.** (*c*) **Obstacle training,** etc.

C.—FINAL EXERCISES.

1. L. ex.	H.f., F. full o.—**Foot placing outward.**
2. Tr. ex.	F. astr. A. sidew. str.—**Trunk bending sideways.**
3. Cor. ex.	**Arms raising forward upward sideways and downward.**

Trained Soldiers' Physical Exercise Tables.

428. The following Tables are intended for the use of trained soldiers as indicated in paras. **39** to **45.**

There are three Tables in the series. No. I is fairly easy, No. II a little harder, and No. III harder than No. II.

In each Table there are alternative exercises for use, according to whether apparatus is available or not, marked as follows :—

* Exercises to be used when no apparatus is available.
† ,, ,, ,, barrack forms only are available.
§ ,, ,, ,, ,, ,, and beam are available.

Each set of alternative exercises forms a complete lesson, comprising a full range of exercises for the whole body. The alternative sets of exercises in each Table also vary in difficulty, that without apparatus (marked *) being the easiest of the three and that with forms and beam (marked §) being the hardest.

The time occupied in performing each alternative set of exercises in a Table is reckoned to be about 15, 20 and 25 minutes respectively, according to the apparatus available. This time is, of course, calculated on the supposition that the exercises are familiar to the men.

The set of exercises without apparatus has not the same value for trained men as the other sets ; apparatus should therefore be used whenever possible.

The particular Table selected at any time should be according to the state of physical fitness of the men, and although regular progression from Table to Table cannot be expected as in a continuous course of training, nevertheless the same principles should be kept in view, and endeavours made to obtain reasonable progression whenever possible. The main object, however, of these Tables is to *keep* the men in good condition, and this object may easily be attained by the judicious use of the Tables.

As regards the details of progression, it may happen after No. I Table without apparatus (*) has been taken for some days, that apparatus becomes available ; the next step would then be, not to take Table II, but to take Table I with apparatus († and then §) and so on.

The annexed tabulated arrangement of the Tables will roughly illustrate their progressive difficulty. It will thus be seen that by the judicious employment of these Tables most of the ordinary requirements of exercise with reasonable progression can be obtained.

*	†	§
I		
	I	
II		I
	II	
III		II
	III	
		III

TRAINED SOLDIERS' PHYSICAL EXERCISE,

TABLE I.

1. L. ex.	* † §	H.f.—**Heels raising and Knees bending.**
2. N. ex.	* † §	**Head bending backward.**
3. A. ex.	* † §	A.b.—**Arms stretching sideways and upward.**
4. Tr. ex.	† §	H.f., F. sidew. pl.—**Trunk turning.**
5. L. ex.	† §	H.f.—**Foot placing sideways.**
6. Sp. b.	§	Pos. for Sp. b. (F. astr.)—**Heels raise.**
7. Abd. ex.	* †	F. astr. A. upw. str.—**Trunk bending backward.**
8. Dor. ex.	* †(§)	H.f., F. astr.—**Trunk bending forward and downward.**
9. Hvg. ex.	§	(*a*) Crossgr.—**Arms bend.** (*b*) Overgr.—**Side travelling.**
10. Bal. ex.	* † §	H.f.—**Knee raising.**
11. Lat. ex.	*	(*a*) A.b., F. sidew. pl.—**Trunk turning.**
	†	(*b*) F. cl., 1 A. upw. 1 A. downw. str.—**Trunk bending sideways.**
	§	(*c*) F. support, 1 A. upw. 1 Hand H.f.—**Trunk bending sideways.**
12. Abd. ex.	† §	Sit., H.f.—**Trunk bending backward.**
13. Dor. ex.	† §	Forw. lying, H.f.—**Trunk bending backward.**
14. Mar. ex.	* † §	(*a*) **Quick march.** (*b*) **Double march.**
	§	(*c*) Double march—**Knees raise.**
15. J. & V.	* † §	(*a*) **Upward jumping.**
	* † §	(*b*) **Long jumping.**
	† §	(*c*) **Jumping over benches.**
16. L. ex.	† §	H.f.—**Heels raising and full Knees bending.**
17. Tr. ex.	§	H.f., F. sidew. pl.—**Trunk bending forward.**
18. Cor. ex.	* † §	**Arms raising sideways.**

* For use when no apparatus is available.
† For use when barrack forms only are available.
§ For use when barrack forms and beam are available.

TRAINED SOLDIERS' PHYSICAL EXERCISE,

TABLE II.

1. L. ex.	* † §	H.f., F. full o.—**Foot placing outward.**
2. N. ex.	* † §	**Head turning.**
3. A. ex.	* † §	A.b.—**Arms stretching sideways and upward.**
4. Tr. ex.	† §	A.b., F. sidew. pl.—**Trunk turning.**
5. L. ex.	†	(*a*) H.f.—**Heels raising and full Knees bending.**
	§	(*b*) H.f., F. full o.—**Lunging outward.**
6. Sp. b.	§	Pos. for Sp. b. (F. astr.)—**Heels raise.**
7. Abd. ex.	* †	F. astr. A. upw. str.—**Trunk bending backward.**
8. Dor. ex.	* †(§)	F. astr. A. upw. str.—**Trunk bending forward.**
9. Hvg. ex.	§	(*a*) Crossgr., A.b.—**Backward travelling.**
	§	(*b*) Overgr.—**Side travelling changing grip.**
10. Bal. ex.	* † §	H.f., K.r.—**Leg forward stretch.**
11. Lat. ex.	*	(*a*) F. cl., 1 A. upw. 1 A. downw. str.—**Trunk bending sideways.**
	†	(*b*) F. support, 1 A. upw. 1 Hand H.f.—**Trunk bending sideways.**
	§	(*c*) F. astr. A. upw. str.—**Trunk bending sideways.**
12. Abd. ex.	† §	Sit., H.f.—**Trunk bending backward.**
13. Dor. ex.	†	(*a*) Forw. lying, H.f.—**Trunk bending backward.**
	§	(*b*) Forw. lying, A.b.—**Trunk bending backward.**
14. Mar. ex.	* † §	(*a*) **Quick march.** (*b*) **Double march.** (*c*) H.f.—**With Knee raising quick march.**
	§	(*d*) Quick march, H.f.—**On alternate Feet hop.**
15. J. & V.	* † §	(*a*) **Upward Jumping with Arms raising sideways**
	* † §	(*b*) **Leap frog.**
	† §	(*c*) **Jumping over benches.**
16. L. ex.	† §	H.f.—**Heels raising and Knees bending quickly.**
17. A. ex.	§	A. forw. b.—**Arms flinging.**
18. Tr. ex.	† §	H.f., F. outw. pl.—**Trunk turning.**
19. Cor. ex.	* † §	**Arms raising sideways and upward.**

* For use when no apparatus is available.
† For use when barrack forms only are available.
§ For use when barrack forms and beam are available.

TRAINED SOLDIERS' PHYSICAL EXERCISE,

TABLE III.

1. L. ex.	* † §	H.f.—**Foot placing forward.**
2. N. ex.	* † §	**Head bending sideways.**
3. A. ex.	* † §	**Arms swinging upward.**
4. Tr. ex.	† §	F. astr. A. sidew. str.—**Trunk bending sideways.**
5. L. ex.	†	(*a*) H.f., F. full o.—**Lunging outward.**
	§	(*b*) H.f.—**Heels raising and full Knees bending.**
6. Sp. b.	§	Pos. for Sp. b. (F. astr.)—**Heels raise.**
7. Abd. ex.	* †	F. astr. A. upw. str.—**Trunk bending backward.**
8. Dor. ex.	* †(§)	F. astr. A. upw. str.—**Trunk bending forward and downward.**
9. Hvg. ex.	§	(*a*) Undergr.—**Upward circling.**
	§	(*b*) Obliquegr.—**Backward travelling.**
10. Bal. ex.	* † §	H.f.—**Leg raising forward, sideways and backward.**
11. Lat. ex.	*	(*a*) F. astr. A. sidew. str.—**Trunk bending sideways.**
	†	(*b*) A.b., F. sidew. pl., Tr. turn—**Arms stretching upward.**
	§	(*c*) F. full o., A.b.—**Lunging outward with one Arm upward one Arm downward stretching.**
12. Abd. ex.	† §	Sit., H.f.—**Trunk bending backward.**
13. Dor. ex.	†	(*a*) Forw. lying, A.b.—**Trunk bending backward.**
	§	(*b*) Forw. lying, A.b., Tr. back. (forw.) b.—**Arms stretching sideways.**
14. Mar. ex.	* † §	(*a*) **Quick march.** (*b*) **Double march.** (*c*) Quick march, H.f.—**On alternate Feet hop.**
	§	(*d*) Quick march, H.f.—**On the left Foot hop.**
15. J. & V.	* † §	(*a*) **Upward jumping with turning.**
	* † §	(*b*) **Leap frog.**
	§	(*c*) **Jumping and Vaulting, etc., with any improvised apparatus.**
16. L. ex.	† §	H.f., F. full o.—**Foot placing outward.**
17. A. ex.	† §	A. forw. b.—**Arms flinging.**
18. Tr. ex.	† §	A.b., F. outw. pl.—**Trunk turning.**
19. Cor. ex.	* † §	**Arms raising forward upward sideways and downward.**

* For use when no apparatus is available.
† For use when barrack forms only are available.
§ For use when barrack forms and beam are available.

APPENDIX.

COMPILING TABLES.

1. The following instructions will be found useful to those who may require to compile Tables to suit special cases.

2. Every Table of a series must be drawn up with reference to all the other Tables of that series. The whole series should therefore be compiled together.

3. The principles of the arrangement of the daily lesson (*vide* paras. **14** to **19**), and of the progression from week to week (*vide* para. **22**), must be carefully observed.

4. The exercises should be selected with a view to the following :—

(i) Apparatus and space available.
(ii) Length of course.
(iii) Age, sex, number, ability and previous training of the pupils.

5. The following successive steps are then recommended for adoption :—

(i) Arrange the selected exercises in progressive order under each group heading, cutting out any exercise which cannot be led up to on account of want of apparatus, &c. (the progressive list of exercises at the end of Appendix will be found useful for this purpose).

(ii) Decide on the number of Tables according to the length of the course (but not, as a rule, more than six months to a year ahead).

(iii) Rule a large sheet of paper into 13 columns, heading them from left to right—

No. of Table, L. ex., N. ex., A. ex., Sp. b., and so on up to Cor. ex. ;—

And also rule enough horizontal lines to give one line for each Table, leaving sufficient space in each line to enter several exercises in each column (*vide* following specimen sheet).

(iv) Enter in each square of the ruled sheet the new exercises of each group proposed to be taken in each Table. It will then be seen at a glance that no exercise is taken before it has been properly prepared for.

(v) Prepare a sheet of paper or a card for each Table with the skeleton framework of the order of the exercises in the Table arranged down the left side, using abbreviations to economise space (for skeleton Table *vide* para. **15**).

(vi) Fill in the exercises for each Table on the prepared sheets or cards in accordance with the recognised principles.

(vii) Should it be found in using the Tables that the exercises are too difficult or too easy, *i.e.*, progression too quick or too slow, re-adjust the ruled sheet and the Tables accordingly, remembering that the object of the training is to obtain a definite physical result, and not merely to go through the series of Tables.

(viii) *Complementary* and *supplementary leg* exercises should not as a rule (as before stated), be entered in the Tables, but must be taken as required ; and consequently it should be noted that the exercises which are used for this purpose have not been forgotten because they are not included in the Tables.

SPECIMEN SHEET SHOWING METHOD OF ARRANGING EXERCISES FOR USE IN COMPILING TABLES.

(This sheet includes all the exercises taken in the first eight Infantry Recruits' Tables, each exercise being entered once only, i.e., in the Table in which it is first taken.)

Number of Table.	L. ex.	N. ex.	A. ex.	Sp. b.	Hvg. ex.	Bal. ex.	Lat. ex.	Abd. ex.	Dor. ex.	Mar. ex.	J. and V.	Cor. ex.
I.	i. F. cl. ii. Hl. r. iii. H.f., Hl.r., K.b. iv. H.f., F. sidew. pl.	i. Head b. backw.	i. H.f. ii. A.b. iii. A.r. sidew.	i. F. astr. A. upw. str. (taken "free").	i. Fall hang.	i. H.f., K.r.	i. F. cl., H.f., Tr. turn. ii. F.cl., H.f.,Tr.b. sidew.	i. H.f., F. sidew. pl. Trr. b. backw.	i. H.f., F. sidew. pl.,Tr.b.forw.	i. Quick mar.—Halt. ii. Double mar.—Halt. iii. Quick mark time.	i. Upw. J. ii. Class arrgts. for J. over rope. iii. J. over rope (taken "free").	i. A.r. sidew.
II.	v. H.f., Hl.r. and K.b. vi. H.f., F. astr. pl. vii. H.f., F. pl. sidew.		iv. A.b., A. sidew. str. v. A.b., A. upw. str.	ii. F. astr. A. upw. str. (taken "free") Tr. b. backw. (slight movement only).	ii. Fall hang, A.b. iii. Fall hang, L.r. iv. Arch hang.	ii. H.f., K. raising. iii. Mounting beam.	iii. H.f., F. sidew. pl., Tr. turn. iv. H.f., F. sidew. pl. Tr.b. sidew.	ii. On the Hands (on bench),and add later A.b. iii. Lying, A. upw. r., L.r.	ii. A.b., F. sidew. pl., Tr. b.forw.	iv. Quick mar., Hl.r.	iv. Forw. J. v. Downw. J. vi. Long J. (taken "free").	
III.	viii. F. astr. A. upw. str.	ii. Head turn.	vi. A.b., A. str. sidew. vii. A.b., 1 A.upw. 1 A. downw. str.		v. Crossgr. vi. Overgr. vii. Pos. for climb.	iv. H.f., L.r. sidew. v. Walking forw.on beam (up to knee height).	v. H.f., F. sidew. pl., Tr. turn quickly. vi. On the left Hand (on bench).	iv. Lying, A. upw. r., L.r.	iii. Forw. lying,H.f. iv. H.f., F.astr.,Tr. b. forw. and downw.	v. Change step.	vii. Upw. J. with A.r. sidw. viii. With 3 paces forw. off left F.J.	
IV.	ix. H.f., Hl.r. and K.b. quickly. x. F. cl. and F. o. (counting 6).		viii. A.b., A. str. upw. ix. A. sidew. r., A. forw. b. and add later A. fling.	iii. Pos. for Sp. b. (F. astr.).	viii. Arch hang, A.b. ix. Obliquegr. x. Undergr. xi. Climbing.	vi. H.f.,Lr. backw. vii. Turning about on beam.	vii. F. cl., 1 A. upw. 1 A. downw. str., Tr. b. sidew. viii. On left Hand,L. r. (on bench).	v. On the Hands (on ground), and add later A.b.	v. A.b., F. sidew. pl.,Tr. forw. b., A. str. sidew. vi. Forw. lying,H.f., Tr. b. backw.		ix. On the top bar up. x. J. over rope with 3 paces forw. xi. First pos. (beam). xii. Upw.J.(2 or 3 jumps without pause).	
V.		iii. Head turn quickly.	x. A. swg. upw.	iv. Pos. for Sp. b. (F. astr.) Hl.r.	xii. Crossgr., A.b. xiii. Underfr., A.b. xiv. Overgr., side travelling.	viii. H.f., K.r., L. forw. str. ix. Mounting beam with run.	ix. H.f., F. sidew. pl. Tr.b.sidew. quickly. x. On the left Hand (at wall bars).	vi. F. support, H.f., Tr. b. backw.	vii. F. astr. A. upw. str., Tr. b. forw.	vi. H.f.,with K.r. quick mark time.	xiii. Long J.with 3 paces forw. xiv. V. with F. assisting.	
VI.	xi. H.f., Hl.r. and full K.b.				xv. Obliquegr., A.b. xvi. Obliquegr., backw. travelling.	x. L.r. forw. xi. Walking forw. on beam (up to hip height).	xi. On left Hand, L.r. (at wall bars).	vii. Overgr., K.r.	viii. Forw.lying, H.f. Tr. b. forw.	vii. Slow mar.	xv. Hvg. J. side to beam. xvi. Upw. J. with A.r. sidew. (2 or 3 jumps without pause).	ii. Head b. backw.
VII.	xii. F. astr. A.sidew. str. xiii. F. astr. A.b.		xi. A.upw.str.,A. swg. downw. and backw. xii. A.r. sidew. and upw.		xvii. Overgr., side travelling changing grip. xviii. Twisting to sit. pos. and add later Twisting about.	xii. Walking backw. on beam (up to hip height).	xii. F. support, H.f., Tr. b. sidew.	viii. A upw. str.,Tr. b. backw. ix. On the Hands (feet on bench).		viii. H.f. with K.r. quick mar.	xvii. Hvg.J. side to beam (2 jumps). xviii. On the K. xix. On the F. to Attention.	iii. A.r. sidew. and upw.
VIII.	xiv. H.f., Hl.r. and full K.b. quickly.	iv. Head b. sidew.	xiii. A str. sidew. and upw.		xix. Overgr., side travelling with swg. xx. Crossgr.,A.b.,backw. travelling.	xiii. Turning about on beam (up to hip height).	xiii. F. support, 1 A. upw., 1 Hand H.f., Tr. b. sidew.	x. On the Hands,L. r. (on ground) and add later ditto A.b.,L.r.	ix. Forw. lying,A.b. Tr. b. backw. and forw.		xx. On the F. and splits off. xxi. On the F. and off. xxii. J. over benches and obstacles.	

LIST OF EXERCISES IN PROGRESSIVE ORDER.

1. The following is a progressive list of the exercises which are explained in detail under the various group headings in Section VII. It is not intended to be anything like a complete list of all the possible exercises of the system, but it comprises all the exercises recommended for use in the physical training of recruits and the physical exercise of trained soldiers, besides a number of more advanced exercises suitable for advanced classes (*e.g.*, N.C.O.'s under training as instructors).

2. It is impossible to compare exactly as regards difficulty and strength all the exercises of a group, as some of them vary considerably in their nature. The exercises of a different nature in each group are therefore placed in different columns.

3. The exercises in each column of each group are arranged in progressive order, the easiest at the top. Exercises entered on the same level, but in different columns, are only approximately of the same degree of difficulty.

4. A line is drawn in each group after certain exercises. All the exercises above this line are suitable, in their proper place, for recruits' physical *training* and trained soldiers' physical *exercise*, and are so used in the Tables. The more advanced exercises are entered below the line.

5. This list will be found of great assistance in drawing up Tables suitable for special cases.

GROUP A.—LEG EXERCISES.

1.	Feet close Feet open	Heels raise	H.f.—Foot sideways place H.f.—Feet astride place
2.	....	H.f., Hl.r.—Knees bend	
3.	....	H.f.—Heels raising and Knees bending	H.f.—Foot placing sideways
4.	....	H.f.—Heels raising and Knees bending quickly	Feet astride Arms upward (sideways) stretch
5.	....	H.f.—Heels raising and full Knees bending	
6.	Feet full open	H.f.—Heels raising and full Knees bending quickly	H.f., F. full o.—Foot outward place
7.	....	....	H.f., F. full o.—Foot placing outward
8.	....	....	H.f., F. full o.—Outward lunge
9.	....	....	H.f., F. full o.—Lunging outward
10.	....	H.f., full K.b.—Head turning quickly A.b., full K.b.—Arms stretching sideways	
11.	....	Heels raising and full Knees bending with Arms raising sideways and upward	
12.	....	....	H.f.—Foot forward place
13.	....	....	H.f.—Foot placing forward
14.	....	Heels raising and Knees bending quickly with Arms stretching upward	H.f.—Foot placing sideways and Heels raising
15.	....	....	H.f.—Foot placing sideways and Heels raising and Knees bending
16.	....	....	A.b.—Foot placing sideways with Arms stretching sideways (upward)
17.	....	....	A. forw. b.—Foot placing sideways with Arms flinging
18.	....	....	H.f., F. full o.—Forward (backward) lunge
19.	....	....	H.f., F. full o.—Lunging forward (backward)

GROUP B.—NECK EXERCISES.

1. Head bending backward		
2.	Head turning	
3.	Head turning quickly	Head bending sideways
4.	....	Head bending forward

GROUP C.—ARM EXERCISES.

1. Hips firm			
2. Arms bend	A.b.—Arms sideways stretch	Arms raising sideways	
3. A. sidew. r.—Arms forward bend	A.b.—Arms upward stretch	Arms raising sideways and upward	A. forw. b.—Arms flinging
4.	A.b.—Left Arm upward right Arm downward stretch	....	Arms swinging upward
5.	A.b.—Arms stretching sideways and upward	Arms raising forward, upward, sideways and downward	A. upw. str.—Arms swinging downward and backward
6.	A.b.—Arms forward stretch		
7. Neck rest	A.b.—Arms stretching forward, sideways and upward		

GROUP D.—SPAN BENDING.

1. Position for Span bending			
2.	Pos. for Sp. b. (F. astr.)—Heels raise		
3.	Pos. for Sp. b. (Hl. together)—Heels raise		
4.	....	....	Fall hanging to Span bending
5.	....	Pos. for Sp. b., Hl. r.—Knee raise	
6.	....	Pos. for Sp. b., Hl. r.—Leg raising forward	
7.	....	Pos. for Sp. b., Hl. r., K.r.—Leg forward stretching	

GROUP E.—HEAVING EXERCISES.

1. **Fall hanging**			
2. Fall hang.—**Leg raising**			
3. **Arch hanging**			
4. **Cross grip**	Fall hang.—**Arms bend**		
5. **Over grip**	Arch hang.—**Arms bend**		
6. **Oblique grip**	Crossgr.—**Arms bend**	Overgr.—**Side travelling**	
7. **Under grip**	Undergr.—**Arms bend**	Obliquegr.—**Backward travelling**	
8. **Position for climbing**	....	Overgr.—**Side travelling changing grip**	**Climbing**
9.	Obliquegr.—**Arms bend**	Overgr.—**Side travelling with swing**	**Twisting to sitting position**
10.	....	Crossgr., A.b.—**Backward travelling**	**Twisting about**
11.	Fall hang., A.b.—**Leg raising**	Obliquegr.—**Backward travelling with Arms bending between each pace**	Undergr.—**Upward circling**
12.	....	Undergr.. A.b.—**Side travelling**	**Side travelling from rope to rope**
13. **Changing between fall hanging and arch hanging**	Overgr.—**Arms bend**	....	Overgr.—**Upward circling**
14.	....	Obliquegr., A.b.—**Backward travelling**	**Climbing inclined rope**
15.	....	Overgr., A.b.—**Side travelling**....	**Climbing inclined rope with turning**

GROUP F.—BALANCE EXERCISES.

1. H.f., &c.—**Knee raise**	
2. H.f., &c.—**Knee raising**	
3. H.f., &c.—**Leg raising sideways**	**Mounting beam** (under knee height)
4. H.f., &c.—**Leg raising backward**	**Walking forward on beam** (up to knee height)
5. H.f., &c.—**Leg raising forward**	**Turning about on beam** (up to knee height)
6. H.f., &c., K.r.—**Leg forward stretch**	**Mounting beam with run**
7.	**Walking forward on beam** (over knee height) **Turning about on beam** (over knee height)

8.	**Walking backward on beam**
9. H.f., &c.—**Combinations of Leg raisings**	**Mounting beam** (up to shoulder height)
10.	**Walking on beam with Knee raising**
11.	**Mounting beam** (over shoulder height)

GROUP G.—LATERAL EXERCISES.

1. F.cl., H.f.—**Trunk turning**	F.cl., H.f.—**Trunk bending sideways**	**On the left Hand** (on bench)
2. H.f., F. sidew. pl.—**Trunk turning**	H.f., F. sidew. pl.—**Trunk bending sideways**	On the left Hand (on bench)—**Leg raising**
3. H.f., F. sidew. pl.—**Trunk turning quickly**	F.cl., 1 A. upw. 1 A. downw. str.—**Trunk bending sideways**	**On the left Hand** (at wall bars)
4.	H.f., F. sidew. pl.—**Trunk bending sideways quickly** .... F. support, H.f.—**Trunk bending sideways**	On the left Hand (at wall bars)—**Leg raising**
5. A.b., F. sidew. pl.—**Trunk turning**	F. support, 1 A. upw. 1 Hand H.f.—**Trunk bending sideways**	
6. A.b., F. sidew. pl. Tr. turn.—**Arms stretching upward**	F. astr. A. sidew. str.—**Trunk bending sideways**	**On the left Hand** (on ground)
7.	F. astr. A. sidew. str.—**Trunk bending sideways quickly**	On the left Hand (on ground)—**Leg raising**
8. H.f., F. outw. pl.—**Trunk turning**	F. astr. A. upw. str.—**Trunk bending sideways**	F. full o., A.b.—**Lunging outward with one Arm upward one Arm downward stretching**
9. H.f., F. forw. pl.—**Trunk turning**	D. support, A. upw. str.—**Trunk bending sideways**	
10. F.cl., N.r.—**Trunk turning**		
11. N.r., F. sidew. pl.—**Trunk turning**	N.r., F. sidew. pl.—**Trunk bending sideways**	
12. N.r., F sidew. pl.—**Trunk turning quickly**		
13.	F. support, N.r.—**Trunk bending sideways**	
14.	H. support, 1 A. upw. 1 Hand H.f.—**Trunk bending sideways with Leg raising**	

GROUP H.—ABDOMINAL EXERCISES.

1. H.f., F. sidew. pl.—**Trunk bending backward**	**On the Hands** (on bench or beam)	
2. F. astr. A. upw. str.—**Trunk bending backward**	On the Hands (on bench or beam)—**Arms bend**	Lying, A. upw. r.—**Leg raising**
3. F. support, H.f.—**Trunk bending backward**	**On the Hands** (on ground) On the Hands (on ground)—**Arms bend**	Lying, A. upw. r.—**Legs raising**
4. A. upw. str.—**Trunk bending backward**	**On the Hands** (feet on bench or beam) .... On the Hands (on ground)—**Leg raising**	Overgr.—**Knees raising**
5. Sit. H.f.—**Trunk bending backward**	On the Hands (on ground), A.b.—**Leg raising**	Overgr.—**Legs raising**
6.	....	Overgr., Ks.r.—**Leg forward stretch**
7. Sit., A.b.—**Trunk bending backward**		
8. H.f., F. forw. pl.—**Trunk bending backward**	On the Hands (feet on bench or beam)—**Arms bend**	
9. Sit., A. upw. str.—**Trunk bending backward**	On the Hands—**Arm forward and upward** raise	Overgr., Ks.r.—**Legs forward stretch**
10. F. support, H.f.—**Trunk bending backward with Knee bending**		

GROUP I.—DORSAL EXERCISES.

1. H.f., F. sidew. pl.—**Trunk bending forward**		
2. A.b., F. sidew. pl.—**Trunk bending forward**		
3. A.b., F. sidew. pl., Tr. forw. b.—**Arms stretching sideways**	Forw. lying—**Hips firm**	
4. H.f., F. sidew. pl., Tr. forw. b.—**Trunk downward bend**	Forw. lying, H.f.—**Trunk backward bend**	
5.	Forw. lying, H.f.—**Trunk forward bend**	
6.	Forw. lying, A.b.—**Trunk backward (forward) bend**	
7. F. astr. A. upw. str.—**Trunk bending forward**	Forw. lying, A.b., Tr. backw. (forw.) b.—**Arms stretching sideways**	

8. F. astr. A. upw. str., Tr. forw. b.—**Arms swinging backward and downward**	....	F. full o., H.f.—**Toe support backward lunge**
9. F. astr. A. upw. str., Tr. forw. b.—**Trunk downward bend**	Forw. lying, A.b., Tr. backw. b.—**Arms stretching upward**	A.b., Toe support backw. lunge.—**Arms stretching sideways**
10. H.f., F. forw. pl.—**Trunk bending forward**		
11. A.b., F. sidew. pl., Tr. forw. b.—**Arms stretching upward**		
12.	Forw. lying, A. upw. str.—**Trunk bending backward (forward)**	A.b., Toe support backw. lunge—**Arms stretching upward**
13.	....	Toe support backw. lunge, A. upw. str.—**Arms swinging downward and backward**
14.	....	F. support, H.f.—**Lunging forward**
15.	....	F. support, A.b. forw. lunge.—**Arms stretching sideways**
16.	....	F. support, A.b. forw. lunge.—**Arms stretching upward**
17.	....	F. support, forw. lunge, A. upw. str.—**Arms swinging downward and backward**

GROUP J.—MARCHING AND RUNNING.

1. **Quick march**	**Double march**
2. **Quick mark time**	
3. Quick march—**Heels raise**	
4. **Change step**	
5. H.f.—**With Knee raising quick mark time**	
6. **Slow march**	
7. H.f.—**With Knee raising quick march**	
8. Quick march, H.f.—**On alternate Feet hop**	H.f.—**With Knee raising double march**
9. Quick march, H.f.—**On the left Foot hop**	
10. H.f.—**In quick time sideways to the left march**	
11.	H.f.—**In double time sideways to the left march**

GROUP K.—JUMPING AND VAULTING.

1. **Upward jumping**		
2. **Forward jumping** .... / **Downward jumping**	**Jumping over rope** (taken "free")	
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