In this case the slight downward movement of the diaphragm, consequent on opening the pleura, facilitated the opening of the abscess from below.

I append an account of a case of bilateral perinephric abscess which came under my care in Baghdad two years ago. Such a condition merits recording because of its rarity and difficulty in diagnosis.

Pte. G., of the Highland Light Infantry, came under my care in May, 1918, with the history of a month's continued fever. He had been treated for two weeks as enteric fever. The blood examination showed no malaria parasites but there was a leucocyte count of 23,250. The differential count showed polymorphs 77, lymphocytes 18, large mononuclears 4, transitional 1. When I saw him there was clear evidence of a left perinephric abscess. On May 23rd, 1918, I opened an abscess which lay behind the left kidney. The abscess cavity was bilocular, one small loculus being inside the true capsule of the kidney, indicating a possible origin from a small metastatic cortical renal abscess. The urine had shown no pathological changes.

After operation the patient's condition improved slightly but the fever continued. The sinus was explored on June 6th, 1918, but no other pocket of pus was found. On June 14th the leucocyte count was found to be 26,000, and the patient had become very anaemic and emaciated. For some days he had complained of pain in the right hypochondrium and had a slight cough, and there was evidence of slight basal congestion of the right lung. On June 15th I once more explored the left-sided sinus unsuccessfully. I then needled the liver, the right base of the chest and the right subphrenic region, but found nothing pathological. With the concurrence of Colonel Hugo, I.M.S., I then made a right subcostal incision, and inserted a finger well up under the diaphragm above and behind the kidney, and to my relief opened an abscess in that position. Both abscesses contained staphylococci only. An uninterrupted recovery followed the drainage of the second abscess. In the case of this abscess the only localizing signs were slight tenderness under the right costal margin, and slight congestion of the right lung base.

Summary of Thirteen Cases of Retroperitoneal Perinephric Abscess of Non-renal Origin.

Case.	Cause.	Previously treated as	Time Elapsed before Diagnosis Made.	Position.	Leucocytes.	Micro-organism.
1	? Enteric	Enteric fever	9 wks.	Retro.	—	A bacillus.
2	Dysentery	Hepatitis	2 wks.	Retro.	10,600	Staph.
3	Dysentery	Hepatitis	10 days	Sub.	—	Staph.
4	Whitlow	Pleuritis	2 wks.	Retro.	15,000	Staph.
5 A	?	Enteric fever	5 wks.	Retro. (l.)	23,250	Staph.
5 B	?	Enteric fever	—	Supra. (r.)	26,000	Staph.
6	Whitlow	—	—	Retro.	15,700	—
7	Whitlow	Malaria	4 days	Retro.	14,000	—
8	Diarrhoea	Malaria	2 days	Sub.	—	Staph.
9	?	Influenza pneumonia	4 wks.	Retro.	—	Staph.
10	Diarrhoea and Carbuncle.	Empyema	2½ wks.	Supra.	27,500	Strept.
11	?	?	7 wks.	Retro.	—	Staph.
12	Influenza	Hip disease	4 wks.	Sub.	—	Strept.

All the cases recovered.

MENSTRUATION DURING SCHOOL LIFE.*

BY

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As the medical inspector of a large girls' school I have had the opportunity of obtaining details, over a period of five years, on the menstrual function in 1,200 healthy girls, the larger proportion of them boarders. Owing to my absence abroad during part of the war, the notes were kept for two years by Dr. Eveline Cargill, to whom I am greatly indebted. The girls are examined medically every year, and, in addition to the health chart, a note-sheet on the particulars of menstruation is kept for each girl, dating from the first time she is examined after the onset of the catamenia. In many cases menstruation had begun several years before the first interview. The girls,

* The substance of a paper communicated to the Gloucestershire Branch of the British Medical Association.

whose ages range from 9 to 21 years, are in sound health and are the children of educated parents in easy financial circumstances.

The main objects of these investigations were:

1. To determine the proportion of girls suffering from any disability during menstruation.
2. To inquire into the habits of each girl during her period, with a view to tracing the effects of these habits on her health.
3. To watch the effect of school life on the menstrual function, especially with regard to study, exercise, and general hygiene.

The results of some of the inquiries are shown in Table A, but some of the terms used in it require explanation.

Irregular Menstruation.—Under this are included all those whose periods do not occur every three, four, or five weeks. It therefore includes all cases of amenorrhoea—which subject will be dealt with later.

No Pain or Discomfort.—The proportion of girls free from any disturbance whatever (73 per cent.) is probably larger than the average among girls of the well-to-do classes, but a possible explanation of this is also given below. In this group are included those who state that they are usually free from any discomfort, but have experienced slight pain or discomfort very occasionally.

Pain.—This, which is mostly of the congestive type, is difficult to estimate, and at the best can only be roughly classified. The spasmodic type of dysmenorrhoea is very rare, only 4 out of the 1,200 cases being recorded. There was one case of intermenstrual pain or Mittelschmerz.

Incapacitated.—Under this heading are grouped all those who state that, on account of pain, sickness, or headache, they are rendered unable to carry on their ordinary pursuits. In some cases they have to retire merely for half an hour or so.

Malaise.—This term refers to all those who suffer from headache, nausea or lassitude in a mild degree.

Rest during the Period.—It is found that the large majority of those who are in the habit of lying down or resting in bed during the period, do so against their own inclinations by order of the mother.

Baths.—It is surprising to find how the old prejudice against the use of water during the menstrual period still clings even to educated people, who in other respects are most attentive to the laws of personal hygiene. In most families the girls are still taught that it is dangerous to take baths at those times, and that their ablutions should be limited to the face, neck and hands. Very few are allowed to wash their feet until after the flow has ceased. The figure 23.4 given in Table A is much larger than the proportion of girls taught at home to take baths. In this and, in fact, in all the figures the influence of school life and teaching is already manifest.

Games and Exercise.—It was found that most of the children would, if left to themselves, play games, cycle, and take walks as usual throughout the period, but that they have not been allowed to do so. It is amusing, however, to find how many of the elder girls succeed in over-riding their parents' objections if the period happens to coincide with a hockey or tennis match, a dance, or a day's hunting. In no case has any ill effect been acknowledged.

TABLE A.

(Number of girls questioned, 1,200.)

	No.	Percentage.
Regular menstruation	646	53.8
Irregular menstruation	554	46.1
No pain or discomfort	877	73.0
Discomfort or slight pain	294	24.6
Severe pain	29	2.4
Incapacitated	64	5.3
Malaise	109	9.0
Rest during the period	276	23.0
Baths during the period	281	23.4
Games and usual exercise during the period	488	40.7
Constipation during the period	108	9.0

Constipation.—Although this is not a common complaint among school girls some of them have a tendency to it during menstruation, and it seems to be a common belief that aperients should be avoided at these times.

Advice Given to Each Girl.

To every girl I explain that menstruation is not a malady but a natural function, and that the natural and proper thing is for her to feel quite well and free from pain or any unpleasant sensations. I emphasize that it should not be necessary to lie down, and that if she feels too poorly to enter into the ordinary life of the school, she should have advice from her doctor, as any trouble connected with her period can be much more easily put right now than after it has become established for years.

I further explain, usually to her great astonishment, that it is quite safe for her to have a bath, and that she should if possible take one at the onset of the period, hot enough just to flush the skin, and continue to take a warm bath daily throughout the period; that immersion in hot water will relieve, if it does not put a stop to, any slight headache or feeling of local discomfort.

With regard to exercise, I tell her that, provided she feels well, exercise will do good rather than harm, and that there is no need to cut herself off from walking, cycling, horse-riding, outdoor games, dancing, or gymnastics. Swimming, for obvious reasons, cannot be indulged in. I furthermore explain that most unpleasant sensations associated with menstruation are dispelled by a brisk walk, whereas they are prolonged by lying down. In all cases the consent of the parents is obtained before any change in regimen is adopted.

All girls suffering from amenorrhoea associated with ill health, menorrhagia, leucorrhoea, constipation, or the severer forms of malaise and dysmenorrhoea, are referred for treatment to their medical attendants.

As already stated, Table A gives the details elicited at the first interview. Of these 1,200 girls 734 have been seen more than once. In Table B the information obtained at the first and subsequent interviews is tabulated for comparison.

TABLE B.
(Number of girls questioned at each interview, 734.)

	First Interview.		Subsequent Interview.	
	No.	Percentage.	No.	Percentage.
Regular menstruation ...	383	52.2	525	71.5
Irregular menstruation ...	351	47.8	209	28.5
No pain or discomfort ...	498	67.8	625	85.1
Discomfort or slight pain ...	224	30.5	105	14.3
Severe pain... ..	12	1.6	4	0.5
Incapacitated	38	5.1	7	0.9
Malaise	70	9.4	17	2.3
Rest during the period ...	149	20.3	46	6.2
Bath during the period ...	84	11.9	313	42.0
Games and usual exercise during the period	270	35.3	493	67.1
Constipation during the period	52	7.0	19	2.5

It will be observed:—

1. That the percentage of girls who suffer from no disability, or—as they usually express it—"don't feel anything different," has risen from 67 to 85 per cent.
2. That there is a notable diminution in the number of those suffering from various degrees of pain or malaise—a total of 17 per cent. as against 41 per cent.
3. That only 6 per cent. instead of 20 per cent. lie down during the period.
4. That there is a large increase in the number of those taking baths and playing games.
5. That there is a decrease in the number of cases of constipation.

It appears to me that these figures bear a relation to one another, and that it is the practice of taking baths, and more especially exercise, which has reduced the number of those suffering from the congestive forms of dysmenorrhoea and constipation. In studying the individual note-sheets this fact has been brought out in a very large number of cases.

The Effect of Baths and Exercise.

Over a hundred former sufferers testified to the beneficial effect of the hot bath, many attributing their freedom from pain entirely to it. Several, however, have not obtained their mothers' consent to try the bath. Two said that they felt faint after the bath, so did not repeat it. Five felt no benefit at all; one of these has since been cured of her dysmenorrhoea by appendicectomy; another, who was formerly free from pain, has had dysmenorrhoea ever since she was operated on for appendicitis.

The verdict in favour of exercise during menstruation is also almost unanimous. Several of the girls had discovered its beneficial effect before the first interview. Many volunteered the information that they had pain or felt poorly during the holidays only; most of these were made to lie down when at home during the first day of the period. Six, of whom two did not like games at any time, stated that exercise did not suit them; two of them said that exercise had the effect of making the next period more profuse. In some of the boarding houses the old regulations still hold, and the girls are forbidden to go to the playing field for the first three days of menstruation. On comparing the records of these girls with those of the houses where freedom of action is allowed, the efficacy of the bath and exercise is very apparent. For the last five years the large majority of the girls have been free to play games or take any other exercise (except swimming) during menstruation, and not one casualty has occurred, nor have any cases of ill effect been reported to the house doctors.

A word of explanation is called for with reference to the apparent discrepancies between the figures in the Tables A and B. In Table A 73 per cent. are stated to be free from any disturbances during menstruation, whereas in Table B the figure is only 67 per cent. I believe both these figures to be above the average; they are certainly higher than those obtained by Dr. Chisholm,¹ who found that, among the school girls she was examining, in "58.6 of the cases there was no disturbance of any kind admitted." The discrepancy is due to the fact that Table A is compiled from a larger number of girls seen recently, and it is found that the percentage of girls free from any menstrual disturbance, when first questioned on the subject, is increasing year by year, as is also the percentage of girls taking baths and exercise during the menstrual period, this practice being adopted from the first by the younger children in some of the boarding houses.

It is agreed by writers on gynaecology that congestion is a large factor in the cause of the commoner types of dysmenorrhoea. This theory is borne out by the effect of the hot bath, which, by dilating the peripheral vessels, reduces the amount of blood in the internal organs. At the onset of menstruation the effect of this on the engorged uterus is especially marked, and the individual becomes conscious of the change. As there is no inflammation in the uterus, the rule of keeping an inflamed organ at rest does not apply here, and it seems only reasonable to expect that exercise, which stimulates the circulation, should prove to be the best remedy for any symptoms arising from the congestion.

This method of dealing with dysmenorrhoea seems to be more practised in America than in England. In Dr. Engelman's presidential address² before the American Gynecological Society in 1900 the beneficial effect on menstruation of exercise and physical training among college students, as revealed by his exhaustive investigations, is brought out very definitely. Dr. Clelia Duel Mosher,³ advocates special exercises of the abdominal muscles for the treatment of dysmenorrhoea, and describes how pain, excessive flow, nausea, and headache have yielded to this treatment in an interesting series of cases. Dr. Mosher does not, however, recommend that schoolgirls should be permitted to continue their regular gymnastics or athletics, though she allows that women with more mature judgement may find that they can do so with impunity.

Periodicity.

Irregularity.—It is striking in what a large proportion of the girls the flow is irregular. When they are first interviewed the number is nearly half (48 per cent.), and it remains high even after one or more years. The figure obtained by Dr. Chisholm is 16.2 per cent. The difference must be largely due to the fact that my investigations are

among girls the large majority of whom are at boarding school, and consequently affected by change of environment. It seems that there may be some advantage connected with an irregularity of the flow in young girls, since dysmenorrhoea is associated with regular menstruation in a greater proportion, 66 per cent., than it is with irregular menstruation, where the percentage is 34.

The Effect of Study on the Regularity of the Flow.—It is still a matter of common belief that education in girls has a harmful effect on the functions of the generative organs, and that the amenorrhoea which so often occurs as soon as a girl goes to school or college, after perhaps years of regular menstruation at home, is an indication that she is using her brain to the detriment of her health, the first organs to suffer being the generative organs. It certainly is a very common thing for amenorrhoea to set in for three months or more after a girl arrives at the school which supplies me with my data. But it is also a common occurrence among servant girls going from the country to situations in a town, and occurred frequently among hospital nurses who went abroad during the war; yet in both these cases there is no change in the character of the work, nor any greater mental strain. In connexion with this point it was of interest to compare the frequency of the occurrence of amenorrhoea among the boarders and the day girls. It was found that whereas it occurred during the first term in 24 per cent. of the boarders, it was only present in 5 per cent. of the day girls, although the mental strain is no greater for the boarders, but is, in fact, undoubtedly less on the whole, owing to the stricter régime allotting fixed hours for recreation and sleep. The only girls in whom there is a tendency to overwork are those studying for an examination, and from this point of view a record has been kept as to the nature of each girl's work. The total number of girls reading for public examinations was 297; of these the number who developed amenorrhoea during their period of study was eight—that is, 2.6 per cent.—and these, with one exception, were boarders, some of whom began examination work on entering the school, and were therefore liable to temporary amenorrhoea owing to change of environment. Hence we may conclude that whatever the cause of the amenorrhoea in the 29 per cent. of the cases examined may have been, it was not due to mental strain. In a few cases the amenorrhoea was associated with chlorosis or other signs of ill health, but this was very exceptional, only two cases being noted among the candidates for examination.

Dysmenorrhoea.

Whereas the boarders are more subject to amenorrhoea, dysmenorrhoea is relatively more frequent among the day girls. If under the term dysmenorrhoea are included all conditions of pain, discomfort, and malaise, the percentage of cases among those who have been a year or more in the school is 3.7 among the boarders and 11.3 among the day girls.

The Relation between Dysmenorrhoea and Study.—Of the 297 girls working for examinations there were seventeen—that is, 5.7 per cent.—in whom dysmenorrhoea began, or was accentuated, during the period of study. From this it cannot be concluded that study *per se* is the cause of the dysmenorrhoea, especially in view of the fact that the proportion of sufferers among the examination candidates is smaller than that among the total number of girls in the school who have reached the age of puberty, the relative figures being 13 per cent. and 15 per cent. It must be remembered, too, that if a girl is pressed for time, the first things she gives up are her games and walks. This is followed at once in some cases by constipation, pelvic congestion, and dysmenorrhoea. Among those who are my own patients the dysmenorrhoea has yielded at once to the taking of more exercise without any alteration in the course of the study. I would suggest, therefore, that pressure of brain work affects menstruation adversely only in so far as it encourages sedentary habits.

Relation of Dysmenorrhoea to Social Position.—That painful menstruation is more complained of among women of the leisured and educated classes than among those of the working classes is doubtless the experience of most general practitioners. The reason generally given is the increased susceptibility to pain brought about by careful nurture, and it is suggested that this increased sensitiveness is one of the prices paid for higher civilization. It is said

that dysmenorrhoea is unknown among savages. Statistics verifying this statement are not available, but since such a large proportion of carefully brought up girls menstruate without pain, dysmenorrhoea is clearly not a necessary accompaniment of civilization.

I would suggest that the greater frequency of dysmenorrhoea among the well-to-do is the result of the enforced inactivity to which so many of the children have to submit, owing to the anxiety of the mothers to "take every care" of their daughters during the period. In the poorer homes the natural activity of the girls is seldom interfered with, hence their relative freedom from dysmenorrhoea.

Date of Onset of Menstruation.

It is also stated that menstruation begins somewhat later among girls where the conditions of life are not good. The following table summarizes the data I obtained on this point, which, though having no direct bearing on the subject of this paper, may be of interest as it refers only to girls in whom health is a matter of primary consideration.

TABLE C.

Age of Onset of Menstruation.	Number of Girls.
9	1
10	12
11	69
12	224
13	357
14	309
15	125
16	40
17	7
18	4

CONCLUSIONS.

1. That the majority of schoolgirls are free from any menstrual disturbance.
2. That, if no unnatural restrictions are imposed, the proportion of girls free from any menstrual disturbance tends to increase.
3. That girls in normal health should be encouraged to take baths and exercise during the menstrual period.
4. That the amenorrhoea to which schoolgirls are subject is not caused by mental strain.
5. That study *per se* is not a cause of dysmenorrhoea, although if pursued to the exclusion of daily exercise it may be indirectly a contributory factor.

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THE PLACE OF MUSCLE RE-EDUCATION IN THE TREATMENT OF ANTERIOR POLIO-MYELITIS (INFANTILE PARALYSIS).

BY

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SINCE the necessity became apparent for a specialized form of muscle treatment in the after-treatment of the loss of muscle function caused by war injuries, the expression "re-education of muscle" has become very familiar. The modern conception of muscle re-education as a therapeutic measure is not, however, a war product; the principles on which it is based had been elaborated and applied to the treatment of infantile paralysis several years before the war. Muscle re-education is an entity quite distinct from the routine physical therapeutic procedures of massage, electricity, passive movements, and Swedish remedial exercises. In all cases of muscle weakness it is, in my opinion, the essential procedure, and any other methods used in conjunction with it are subsidiary. It is important, therefore, that a clear conception should be held of the meaning of the term "muscle re-education."