Menstruation and its disorders / by Arthur E. Giles.

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MENSTRUATION

AND ITS DISORDERS

GILES

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With the Author's Kind regards

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EDITOR'S PREFACE

The aim of this series is to sketch in brief compass the chief features of given subjects of everyday interest to students and practitioners.

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MENSTRUATION

AND ITS DISORDERS.

BY

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PREFACE

In this monograph it has been my aim to present a concise and practical exposition of normal menstruation and of the various disorders of the function. It would have been foreign to the scope of the work to burden its pages with references, authorities, and illustrative cases. These I have reserved for a larger treatise on the same subject, in the preparation of which I have been engaged for some years, and my purpose to publish them later on must be my justification for their omission here and for the didactic and sometimes dogmatic treatment of debated matters which the character of the present monograph rendered necessary.

I should like in this place to emphasize the motive that has actuated me in my account of the disorders of menstruation, which is to make it clear that these disorders are to be regarded as symptoms, the cause of which requires investigation and treatment, and not as separate diseases, for the cure of which an empirical therapeutic formula suffices.

ARTHUR E. GILES.

10, Upper Wimpole Street,
Cavendish Square, W.,
October, 1901.

CONTENTS

PART I

PHYSIOLOGY OF MENSTRUATION

PART II

DISORDERS OF MENSTRUATION

PART I

THE PHYSIOLOGY OF MENSTRUATION

CHAPTER I

INTRODUCTORY AND HISTORICAL

From early times menstruation has excited the greatest interest among the people as well as among practitioners of medicine; and few phenomena have been the subject of more fanciful speculation or more divergent theories.

The deep-rooted original idea that it is a process of purification of the blood of some harmful elements finds expression in some of the popular names applied to it, such as 'cleansings' in English, 'épuration mensuelle' in French, and 'monatliche Reinigung' in German. Many Mosaic precepts are concerned with directions as to what a woman may or may not do during the period of her 'uncleanness.' Sexual intercourse at such a time was regarded as dangerous, and was forbidden under pain of death. At the present day there exists a widespread popular idea that when menstruation is arrested it may 'fly to other parts of the body,' giving rise to various disorders.

The old plethora theory was an attempt to give some-

thing like scientific exactitude to the popular belief, and out of this theory arose several others; for example, the view, first propounded by Stadlin, that menstruation consists in a casting-off of unnecessary pabulum, which is retained, if conception occurs, for the nutrition of the fœtus. To make this theory fit in, it was assumed that 16 or 18 ounces of blood were lost at each menstruation, and it was then pointed out that this amount multiplied by 10 (the number of suppressed periods) corresponded with the weight of the child at birth.

The monthly rhythm of the function naturally attracted attention, and gave rise to the supposition that the periodicity was due to the influence of the moon. Faulty theories as a rule find no lack of detail, and of this fact we find an illustration in the lunar theory, which further supposed that older women menstruate more often with the full moon, younger women with the new moon: 'Luna vetus vetulas purgat, nova luna puellas' (Mead).

A step in advance was made when the relation of ovulation to menstruation was discovered. Therefrom arose the ovulation theory, which supposed that the ripening and discharge of an ovum was the immediate cause of the monthly flow. This theory was in great vogue in the second quarter of the nineteenth century, but had to be given up when it was discovered that ovulation and menstruation have not a constant time-relation to one another, and that one may occur independently of the other.

Another explanation was therefore sought, and towards the latter part of the nineteenth century the periodic, cyclical, or wave theory of menstruation had many adherents. This theory supposed that menstruation was the result of periodic variations in the metabolism of the body, and in support thereof attention was called to the

periodic variations that are found in the temperature and pulse and in the metabolism as estimated by urea-excretion. These phenomena are truly found in relation to the menstrual cycle; but they are concomitant variations associated with menstrual activity, and are not the cause of menstruation. Herein lay the error of the cyclical theory.

At about the same time the 'nerve theory of menstruation' was started. This attributed menstruation to periodic changes originating in a 'menstrual centre,' residing presumably in the spinal cord, and discharging their effects along 'menstrual nerves' situated in the broad ligament. That the phenomena of menstruation take place through the medium of the nervous system is highly probable; and this is about all that can be said for the nerve theory. It does not elucidate the origin and nature of menstruation, and whilst it gives us a spinal centre and efferent nerves, it does not suggest a starting-point and an afferent channel in the reflex system.

Aveling's 'nidation theory' was the converse of the ovulation theory, for it supposed that during the intermenstrual period the uterine mucous membrane forms a kind of 'nest,' suitable for the reception of an ovum, and that when this is ready, increased congestion brings about the ripening and discharge of an ovum. If the latter be fertilized in proper time, it descends into its prepared nest, and pregnancy ensues. Otherwise the ovum is discharged from the uterus with the 'nest' itself, and menstruation occurs as a 'denidation.' This theory may be regarded as correct in so far as the 'nidation' and 'denidation' are concerned, but it is manifestly incorrect in its explanation of the cause of ovulation.

Without going into further historical details, enough

has been said to show the variety of the views that have been held on the subject of menstruation. The key to the problem lies in comparative anatomy and physiology; and after the anatomical and physiological features of the process have been outlined as they are observed in the human subject and in animals, a brief summary will be presented of the present view of the origin, nature and meaning of menstruation.

CHAPTER II

ANATOMICAL AND PHYSIOLOGICAL CHARACTERS OF MENSTRUATION

The process of menstruation is associated with certain anatomical and physiological changes in the uterus and ovaries and in the body at large.

Uterine Changes.—For a long time there was much diversity of opinion as to the precise nature and extent of the uterine changes. This was mainly due to the difficulty of obtaining normal specimens of the human uterus at the different stages of menstruation. There is reason, however, to believe that the process in some of the higher apes closely resembles that which occurs in women, and the excellent description of menstruation in 'Semnopithecus Entellus' given by Walter Heape may accordingly be regarded as a sufficiently correct account of the menstrual changes in the human uterus. The complete monthly cycle of events is divided by Heape into four periods, comprising eight stages:

A. Period of Rest.

Stage 1: The resting stage.

B. Period of growth.
  Stage 2: The growth of stroma.
  „ 3: The growth of vessels.
C. Period of Degeneration.
  Stage 4: The breaking down of vessels.
  „ 5: The formation of lacunæ.
  „ 6: The rupture of lacunæ.
  „ 7: The formation of the menstrual clot.
D. Period of Recuperation.
  Stage 8: The recuperation stage.

Clinically, the four periods may be said to correspond broadly to four weeks:

A. The intermenstrual week.
B. The premenstrual week.
C. The menstrual week.
D. The post-menstrual week.

This clinical subdivision must not, however, be taken as representing with any precision the time-limits of Heape's four periods. The changes found in the uterus are as follows: During the period of rest, in the intermenstrual week, the surface of the mucosa is smooth and semi-transparent; microscopically it presents a stroma containing numerous glands and bloodvessels and covered by a single layer of cubical epithelium. With the onset of the period of growth in the premenstrual week the mucosa becomes first swollen and opaque (stage 2), and then flushed (stage 3). These naked-eye appearances are due to marked proliferation of the stroma cells, followed by dilatation of superficial vessels. With increased congestion, the period of degeneration is ushered in, this being the menstrual week. The mucosa is first highly congested, owing to breaking down of vessels

(stage 4); then dark-red spots appear, due to the formation of lacunæ in the superficial parts of the stroma under the epithelium (stage 5); soon the epithelium gives way, and free blood is found in the uterine cavity, derived from the ruptured lacunæ (stage 6). The surface epithelium is cast off, with portions of the stroma and of the glandular epithelium, and the débris is carried away with the blood or forms clots, which are found at first on the inner surface of the uterus (stage 7), and become gradually disintegrated or are discharged whole. The destructive process is now finished, and the uterus enters on the period of recuperation in the post-menstrual week (stage 8). Regeneration of the mucosal surface takes place by reformation of bloodvessels and by the reproduction of epithelium partly from the torn edges of the glands and partly by the transformation of stroma elements. Thus the uterus returns to the resting stage in the intermenstrual week.

Ovarian Changes.—During infancy and early childhood the ovaries are small and inactive; with the onset of puberty they enlarge, and begin to show the periodic changes which constitute ovulation. This means the ripening and discharge (or maturation and dehiscence) of an ovum. Uterine activity begins at about the same time, or soon after, and thus puberty is usually dated from the first menstruation. Henceforth, during the period of sexual maturity ovulation and menstruation both occur periodically. Menstruation usually recurs at regular intervals, but the periodicity of ovulation is not regular. Consequently, ovulation may or may not happen to occur at the same time as menstruation.

The process of ovulation is as follows: An ovum on the surface of the ovary first becomes surrounded by a layer of small cells, consisting of modified surrounding

ova, the group forming an ovarian (or Graafian) follicle. The stroma surrounding the follicle becomes denser, and the ovum sinks more deeply into the substance of the ovary. By proliferation the small cells round the ovum form two layers; they multiply further, and then an eccentrically-placed line of cleavage appears among them, which by enlargement becomes a cavity containing fluid. The ovarian follicle now presents an appearance which has been compared to a signet-ring; the marginal cells receive the name of membrana granulosa, whilst those immediately surrounding the ovum are called the discus proligerus. As the follicle ripens it once more approaches the surface, upon which it finally bulges. The most prominent point of the follicle gives way and the ovum escapes, surrounded by its discus proligerus: this is the dehiscence of the ovum. The cavity of the follicle becomes distended with blood, derived from its vascular capsule; and the capsule itself contracts, so that its walls are thrown into folds. The blood-filled cavity, with its convoluted walls, is called, from its yellow appearance, the corpus luteum. By degrees the liquid part of the blood is absorbed, the corpus luteum becomes paler and shrinks, and is converted into fibrous tissue, whose only ultimate trace is a scar or cicatrix on the surface of the ovary.

When pregnancy occurs, the corpus luteum, instead of reaching its fullest development in three weeks and disappearing in three months, persists in a well-developed condition for three or four months, after which it gradually diminishes, and commonly disappears in two or three months after delivery.

Probably a certain number of ova fail, on their dehiscence, to enter the Fallopian tube, and are lost in the peritoneal cavity. Such as reach the uterus but do not

become fertilized pass out, probably with the menstrual discharges. Ovulation is usually suspended during pregnancy and lactation; and it is only exceptionally that it begins before puberty or continues after the menopause.

Changes in the General System.—The changes in the uterus incidental to menstruation are associated with certain events in the body at large, which are to be regarded, not as the cause or as the consequence of menstruation, but as accompanying phenomena due, like the uterine changes, to rhythmical changes in the nervous system, and brought about mainly through the medium of trophic and vaso-motor nerves.

In the premenstrual period there is a general increase of metabolism, as shown by a slight rise of temperature and blood-pressure, and an increased excretion of urea. The increased blood-pressure leads to a certain degree of congestion in some situations, more particularly in the thyroid gland, which becomes larger; in the breasts, which become fuller and usually rather tender; and in the vulva, which may become hot and swollen; whilst the congestion of the cervix uteri is indicated by increased secretion of cervical mucus (leucorrhœa).

With the onset of menstruation there is a slight diminution in general metabolism; the temperature and blood-pressure fall, the former immediately, and the latter after the first day or two, and the excretion of urea diminishes. The nervous system shows an exalted irritability, which finds expression in reflex disturbances, in general malaise, in depression of spirits, or in irritability of disposition. Hæmatopoiesis is increased during the flow; the white corpuscles, which have a relation of 1 : 405 in the intermenstrual period, show a relation of 1 : 247 during menstruation. The number of red cor-

puscles is greatest just before the appearance of the flow, diminishing with its coming, and again rising on the day after cessation.

The metabolic changes may thus be summarised: in the premenstrual week, increased anabolism; during menstruation, increased katabolism; in the post-menstrual week, gradual return to the normal condition, which persists during the intermenstrual week.

CHAPTER III

THE RELATION OF 'HEAT' OR 'ŒSTRUS' TO MENSTRUATION

In mammals there occur certain seasons at which the generative organs of the female show signs of special activity, such as swelling of the vulva, coloration or flushing of surrounding parts, and a discharge of blood or mucus from the vagina. This is followed by a period, varying from one to several days in duration, during which alone the female is capable of impregnation and will receive the male. This 'period of desire' is properly spoken of as the time of 'heat,' or 'œstrus.' The words have been more indiscriminately used, so as to include the first as well as the second period; and to remedy the confusion resulting therefrom, Heape has suggested the term 'pro-œstrum,' for the first, or the stage of preparatory changes in the generative organs, and proposes to restrict the term 'œstrus,' which means, literally, 'violent desire,' to the second stage. The period that includes both stages is described by Heape as the 'sexual season.'

In such of the mammalia as have been examined, the changes in the uterus found during the pro-œstrum are

fundamentally the same, and consist in a growth of the vessels and stroma of the uterine mucosa, followed by superficial breaking down, varying from sub-epithelial ecchymosis and pigmentation to a more complete denudation of the superficial mucosa. These retrograde changes are accompanied by a discharge, the character of which varies with the extent of destruction, so that in the slighter forms it consists mainly of mucus secreted by the uterine, cervical, and vulvar glands; whilst the greater the amount of destruction, the greater is the proportion of blood in the discharge.

In the simplest type of sexual season the pro-œstrum and œstrus are followed, in the absence of gestation, by the 'metœstrum,' during which the activity of the generative organs gradually subsides; and this in turn is succeeded by a long period of rest—the 'anœstrum.' Such a cycle of events is called by Heape the 'anœstrous cycle.' But the sexual season may have a more complicated character, for in some animals, in the absence of impregnation, the metœstrum is followed by a short quiescent period—the 'diœstrum'—which almost at once gives place to a new pro-œstrum. Heape calls this cycle the 'diœstrous cycle.' The sexual season may thus consist of two or more consecutive diœstrous cycles; in most cases this is followed by a period of rest, which is the anœstrum; but in the higher apes the anœstrum is normally suppressed, and, except for the interference of pregnancy, the whole of the reproductive period is occupied by a series of diœstrous cycles; that is to say, the whole time from puberty to the menopause consists of one long continuous sexual season. According to Heape, two classes of female mammals may be thus distinguished:

Monœstrous mammals are those in which the anœstrous

cycle only occurs; in other words, those which experience a single œstrus during each sexual season.

Polyœstrous mammals are those whose sexual season is occupied by a series of diœstrous cycles; in other words, those which experience a series of recurrent œstri.

In the case of both monœstrous and polyœstrous animals there may be only one sexual season in the course of the year, or more than one. Thus:

(*a*) Among monœstrous animals—

The wolf has usually one anœstrous cycle in the year.

The bitch has usually two anœstrous cycles in the year.

The cat has usually four anœstrous cycles in the year.

(*b*) Among polyœstrous animals—

The mare has one sexual season or series of diœstrous cycles in the year.

The sheep has two sexual seasons or series of diœstrous cycles in the year.

The rabbit has three or four sexual seasons or series of diœstrous cycles in the year.

The monkey has one continuous sexual season or series of diœstrous cycles in the year.

There has been much discussion from time to time as to whether or not there is any homology between the periodic changes in the genital organs of lower mammalia and menstruation in women.

On the one hand, the following points of similarity have been advanced:

1. The periodicity of both.

2. The fact of a discharge (of blood, or mucus, or both) in each case.

3. The similarity of the histological character of the changes in the uterus during pro-œstrum and during menstruation.

On the other hand, it has been maintained that the following differences may be recognised:

1. Ovulation is always coincident with œstrus, but not with menstruation.

2. Heat is the only time when sexual intercourse occurs among lower animals; menstruation is, on the contrary, the one time when intercourse is avoided.

3. Heat may occur only once or twice a year; menstruation occurs every month.

4. The discharge that precedes heat may be nothing but mucus; whilst menstruation is essentially a discharge of blood.

The last two objections may be at once dismissed, inasmuch as all stages of transition are met with as regards both the rhythm and the quantity of the discharge. The second objection is due to a misconception in the use of terms. During the pro-œstrum, which is the stage with which menstruation should be compared, the female animal will not receive the male. This does not occur till the stage of œstrus. Now, if pro-œstrum corresponds to menstruation, the œstrus corresponds to the period that follows menstruation; and it is well known that this is a time favourable to conception in the human race. The objection consequently becomes an argument in favour of the homology of the two processes. The same may be said of the first objection, inasmuch as modifications in ovulation and in the fertile period may be regarded as among the factors which have led to the evolution of menstruation from the pro-œstrum.

The full discussion of this interesting question would lead me beyond the scope of the present work. I will

therefore content myself with saying that careful consideration leads me to accept Heape's contention that menstruation in women and in monkeys is homologous with the pro-œstrum in the lower mammals.

CHAPTER IV

THE NATURE AND ORIGIN OF MENSTRUATION

With the key supplied by the facts stated in the last chapter, we may now approach and endeavour to solve the problem as to the nature and origin of menstruation.

First, as to its nature. It is clear that the pro-œstrum is a preparation made by the uterus for pregnancy. It would appear that the fertilized ovum cannot become ingrafted except on newly prepared soil. In the human subject the essential feature in menstruation is not the flow itself, but the series of changes of which the flow is the final result and outward expression; and these changes, as we have seen, are of the nature of a reconstruction of the uterine mucosa. We may therefore define menstruation as *a periodic uterine preparation for pregnancy*.

Secondly, as to the origin of menstruation. Reverting to the pro-œstrum, we may safely assert that it is in great measure brought about through the medium of variations in metabolism. Heape points out that in sheep the pro-œstrum may be antedated by the process of overfeeding, known to breeders as 'flushing.' Nervous influences may have a similar effect, as when the presence of a horse in a stud-farm hastens the pro-œstrum of the mares. Briefly, the sexual season in animals may be

regarded as a highly specialized evolution of the rhythmic alternation of nutritive and reproductive phases in the life-history of invertebrata.

The question then arises, How is the complex and frequently recurrent phenomenon of menstruation derived from the relatively simple and infrequent pro-œstrum? In tracing the various types of uterine changes during the pro-œstrum, we find that they become progressively more marked in direct relation to the increasing complexity of placentation. The greater the changes which the uterus is about to undergo during pregnancy, the more radical must be the phases of preliminary preparation. Increase in the frequency of these preparations is the sign and expression of increased reproductive capacity; in the causation of the latter, civilization no doubt plays a considerable part, owing both to external conditions and also to increased frequency of habits of sexual intercourse. Indications of these changes may be found even in the lower animals; for domestication, and even captivity, generally lead to greater frequency in the recurrence of the pro-œstrum; in addition to which an abnormal œstrus—that is to say, an œstrus not preceded by pro-œstrum, is not infrequently met with among domesticated animals (Heape).

It is consequently natural that in the human subject, where placentation presents the greatest known complexity, the menstrual changes in the uterus should also show the maximum development. It is equally natural that in association with reproductive capacity and sexual inclination that are practically never completely in abeyance menstruation should recur with the maximum of frequency consistent with the accomplishment of the successive phases in the menstrual cycle.

As to the proximate cause of menstruation, the nature

of the stimulus which initiates the rhythmic variations of uterine activity, the precise relations which subsist between ovarian and uterine changes, the nature of the relation (probably reciprocal) between the genital organs and the central nervous system—all these questions remain for the present unanswered.

CHAPTER V

PUBERTY

PUBERTY is the period that marks the onset of reproductive maturity in the girl; it is the transition-age from the child to the woman. It must, however, be pointed out that, on the one hand, reproductive maturity may be reached before menstruation appears, so that conception may exceptionally take place before the first menstruation ;* and that, on the other hand, the uterus continues to grow until the eighteenth or twentieth year, so that a woman cannot usually be considered to be sexually mature until that time.

It is, however, convenient to regard puberty as dating from the appearance of the first menstruation. Before puberty the girl is physically and sexually undeveloped; the breasts are relatively flat, the vulva is small, the pubic hair is absent or scanty. In her manner the girl is unreserved and unconstrained. With the advent of puberty the figure develops, the breasts become rounded and fuller, the pelvis wider, the pubic hair grows thicker and longer, and the vulva becomes more developed.

* The author has met with a case of a woman who was delivered of her first child at the age of thirteen. She was married on September 11, 1856; on April 27, 1857, was her thirteenth birthday. Her first child was born on September 27, 1857, and her first menstruation was in December, 1857.

The internal sexual organs take part in the change: the uterus enlarges, whilst the ovary becomes the seat of the changes known as ovulation. The manner of the girl is altered: she is dimly conscious of sex, and becomes more shy and retiring. The most conspicuous manifestation of this new development is menstruation. Unless she has been prepared by her mother for what is to occur, the child will probably view the first appearance of the menses with a mixture of fright, bewilderment and shame.

The age of puberty presents many variations.* It is earliest among races living in tropical climates, and presents a remarkably graduated retardation as the country recedes from the Equator and approaches the Pole. Different races living in the same latitude also present some variations, but these are not constant.

When we consider the people of any particular country, we again meet with considerable variations, depending on a variety of circumstances. Thus, puberty is established earlier in towns than in country districts; among the rich than among the poor; among the more cultured and better-educated than under opposite conditions; and it is usually earlier in robust than in delicate children. Other physical peculiarities appear to have an influence; thus, puberty is usually earlier among brunettes and in 'positive blondes' than among children of light and negative colouring. Lastly, diathesis leads to rather striking differences, inasmuch as highly-nervous girls menstruate earlier than usual, and strumous or tuberculous children later.

* For data on which the statements in this chapter and the next are founded, the reader may be referred to a paper by the author on 'The Causes which lead to Variations in the Age of Puberty and in the Clinical Characters of Menstruation,' *Medical Chronicle*, June and July, 1901.

The age of the first menstruation in 1,000 cases investigated was as follows :*

	Cases.			*Cases.*	
At 9 years	5	5·5 per cent.	At 18 years	28	6·1 per cent.
,, 10 ,,	13		,, 19 ,,	18	
,, 11 ,,	37		,, 20 ,,	6	
,, 12 ,,	85	88·4 per cent.	,, 21 ,,	3	
,, 13 ,,	188		,, 22 ,,	3	
,, 14 ,,	211		,, 23 ,,	1	
,, 15 ,,	173		,, 24 ,,	0	
,, 16 ,,	151		,, 25 ,,	1	
,, 17 ,,	76		,, 26 ,,	1	

The average age of 1,000 cases was fourteen and a half; at the age of fourteen one girl in every five first menstruates. A considerable number begin to menstruate at thirteen, fifteen, or sixteen, and still a good many at twelve and seventeen. The total of cases where puberty is established between the ages of twelve and seventeen amounts to 88·4 per cent. of the cases recorded; 5·5 per cent. begin before the age of twelve: these may be considered as cases of 'early menstruation'; and 6·1 per cent. begin from the age of eighteen upwards. These may be classed as 'late menstruation.'

We may denote as 'precocious puberty' those rare cases in which menstruation begins at the age of eight or younger. Some remarkable and authentic cases are on record in which baby girls have started menstruation at ages varying from a few months to several years. In some of these cases the children presented other characteristics of puberty, such as well-developed breasts and abundance of pubic hair.

Instances of the opposite extreme are found in which menstruation appears very late, or even not at all. Some of these patients present all the external signs of mature development, and the pelvic organs also may appear

* Author: 'Primary Amenorrhœa,' *Clinical Journal*, January 30, 1901.

fully formed. In other cases the uterus and appendages are notably under-developed, and the woman may also present some deficiency of the secondary sexual characters.

The onset of the first menstruation is usually characterized by general malaise, pains in the breasts, abdomen, hips or thighs, lassitude and irritability; but some or all of these features may be absent, and the appearance of the flow may be the first indication. There is often irregularity in the rhythm, and variation in the quantity of blood at first. Sometimes there may be no further sign for twelve months, after which menstruation sets in regularly. The first menstruation may be profuse, and subsequent ones scanty; or for some months the quantity may be considerable, after which it assumes a more moderate character.

CHAPTER VI

THE CLINICAL CHARACTERS OF MENSTRUATION

The characters of menstruation that we have now to consider are its periodicity, prodromata and duration, the quantity and character of the blood lost, the local pain, and the general disturbance that it entails. In reference to each point we recognise a type which is the usual one, and we also find considerable variations within the limits of health. Consequently, in respect of detailed features every woman has her own normal menstrual type, in relation to which her departures from the normal must be judged. To this fact further reference will be made, as it is one that must be constantly borne in mind when the disorders of menstruation are under consideration.

Menstrual Periodicity. — As the name implies, menstruation usually recurs every month, and this was found to be the case in 72 per cent. of cases examined. In the majority of these, or 40 per cent. of the whole, menstruation presented the twenty-eight-day, or lunar month, type; in 32 per cent. the periodicity corresponded rather with the calendar month. In about 9 per cent. the rhythm was from twenty-one to twenty-six days, and in 1 per cent. it was every five weeks. In all these cases, or about 82 to 83 per cent., menstruation was regular; that is to say, it had a constant periodicity in the same individual. In 17 to 18 per cent. of cases irregular menstruation was noted.

Prodromata.—In many cases menstruation comes on without any warning of its approach, and the flow of blood is the first notification that the woman receives that the period is due. In other cases the flow is preceded by pain in the back, abdomen, or thighs; by tenderness and swelling of the breasts, which may start a week or more before menstruation is due and be a source of much discomfort, and even suffering; by headache, sleepiness, lassitude; a feeling of swelling in the body generally, or limited to the abdomen or neck; flushes, irritability and depression.

Duration of the Flow.—In nearly 70 per cent. of cases examined the flow lasted from three to six days; in 9 per cent., one or two days; in 20 per cent., a week or more; and in 1 per cent. the duration was variable. Sometimes the flow goes on steadily for three days, then stops altogether for one or two days, after which there is a second but scantier flow for a day or two.

The duration is in direct proportion to the quantity of blood lost, and is subject to the same causes of variation.

The Quantity of Blood Lost. — This has been variously estimated; the average may be given as 4 to 5 ounces, with 2 to 8 ounces as the normal extremes. In order to determine the relative frequency of greater or lesser losses of blood, 1,000 cases were classified in four groups, when it was found that the loss was stated to be 'moderate' in 46 per cent. of the cases; 'little' or 'scanty' in 25 per cent.; 'much' or 'free' in 22 per cent.; and 'profuse' in 7 per cent. These figures are derived from the statements of patients. If data could be obtained from a number of women in perfect health, it is probable that there would be more cases coming under the category of 'moderate' and 'much,' and fewer under that of 'little' and 'profuse.' Wide variations nevertheless occur in health; and in a measure the factors leading to variation in the age of puberty also lead to variation in the amount of the flow. In the main, the conditions that favour early puberty also favour a larger quantity of menstrual blood.

More significant are the changes produced by disease; these we shall consider in detail in later chapters. Meanwhile, the important point to remember is that what constitutes excess for one person may represent the normal condition for another; and that, consequently, the amount of blood lost by a particular patient at any time must be judged of in relation to her individual standard.

Characters of the Menstrual Blood.—Menstrual blood has all the characteristics of ordinary venous blood, except that it does not readily coagulate, owing to admixture with mucus from the cervical canal, and that it contains epithelium derived from the uterus and vagina. It has never been shown that such blood possesses any toxic or otherwise deleterious properties. When abundant it may be bright-red, and may contain clots, owing

to the fact that the mucus is not present in sufficient quantity to hinder coagulation.

Pain during Menstruation.—Normally, menstruation is a painless process; but there are many conditions, hygienic, social and pathological, which tend to disturb the function and to induce pain. In many cases the pain is very slight or moderate; in others it is very severe. I shall have to consider the last group in detail when discussing painful menstruation, or dysmenorrhœa.

Pain is found chiefly in the back (referred to the sacrum) and in the suprapubic region; it not infrequently shoots down the thighs and is sometimes restricted to the iliac or ovarian regions. It may commence some days before the flow; it may be coincident with the onset, or it may continue during the period. Of a thousand cases examined it was found that 35 per cent. had no pain, 36 per cent. had little or moderate pain, and in 29 per cent. the pain was severe. These figures refer to the earlier years of menstruation. In many cases, owing to the incidence of various pathological conditions, menstruation which began painlessly becomes painful later on. When the question of pain is examined with reference to the amount of blood lost, it is found that those who lose little suffer less than those who lose much. For example, among those whose loss was stated to be 'very little,' 40 per cent. were free from pain and 28 per cent. suffered a good deal; whilst among those who were said to lose 'profusely' only 16 per cent. were free from pain, whilst 56 per cent. suffered severely.

It is of interest to point out that pain coming on before the flow is most often sacral, whilst when it occurs during menstruation it is chiefly suprapubic. Some patients who experience pain both beforehand and also at the time state that they feel it in the back until the flow

begins, and subsequently in the abdomen and thighs. These facts give us some clue to the causation of menstrual pain. It is well known that pain due to disease of the cervix is chiefly referred to the sacrum, whilst when due to affections of the body of the uterus it is hypogastric in position. We also know that the essential condition of the uterus before the flow begins is one of congestion, whilst during the period rhythmic uterine contractions form the prevailing feature. Consequently we may infer that pain starting beforehand is due mainly to uterine congestion, probably associated with and aggravated by tonic contraction of its lower pole, the region of the cervix and os internum; on the other hand, pain during the period is principally due to painful uterine contractions, and is analogous to the 'after-pains' of labour, which are likewise referred to the hypogastrium. The practical application of these views will be discussed when considering the treatment of dysmenorrhœa.

Constitutional Disturbance.—Just as menstruation is in many cases painless, so it is, in about the same proportion of cases, unaccompanied by any disturbance of the general health. An examination of cases showed that there was no disturbance in 36 per cent. of cases; 30 per cent. complained of languor, weakness and fatigue; 19 per cent. of headaches; 8 per cent. of sickness, nausea, anorexia, or bilious attacks; 5 per cent. of 'general illness'; and 2 per cent. of various disturbances. Some of these disorders are evidently reflex, and may be compared with the reflex disorders (especially digestive) of pregnancy. Other conditions are due to vaso-motor disturbances; in this category are probably to be included cases of headache, flushes and general disturbance. The thyroid gland is not infrequently enlarged during menstruation owing to vascular engorge-

ment; the breasts are tender and swollen from the same cause. In some cases the vulva becomes swollen. The pigmentation of the face, linea alba and mammary areolæ, found in brunettes, is also, in all probability, of vaso-motor origin.

Psychical Disturbances are found in a certain proportion of cases, principally in the form of depression and irritability. Thus, while in 52 per cent. there was no psychical disturbance, 18 per cent. complained of depression, 19 per cent. of irritability, and 11 per cent. of both irritability and depression. In two cases the patients stated that they always suffered from loss of memory at those times. Slighter degrees of change may also be found, amounting perhaps to nothing more than alterations of mood, leading to whims and caprice. There is no doubt that in the majority of cases women require to be treated with an extra degree of consideration and indulgence during menstruation, whilst many are temporarily unfitted for arduous work or special exertion.

CHAPTER VII

MENSTRUATION IN RELATION TO CONCEPTION, PREGNANCY AND LACTATION

Menstruation in relation to Conception.—From the comparison that has been made between menstruation in women and the pro-œstrum in lower animals, it might be expected that just as the season of œstrus, or heat, which follows the pro-œstrum is the only time when the female can conceive and will admit the approaches of the male, so in the case of the human subject, the period that just follows menstruation should be the most favourable

for conception. As a matter of fact, experience teaches that of the three weeks that intervene between one menstrual period and another, the first, or post-menstrual, and the third, or premenstrual, are about equally favourable for conception; whilst the second, or intermenstrual, week is the least favourable. It might be argued that if the comparison of pro-œstrum and menstruation were well founded, the likelihood of conception ought to diminish progressively from the first to the third week after the cessation of the period. There is, however, no real difficulty about the matter, for conditions have become so far changed in the human subject that there is no period of anœstrum, or sexual inactivity, such as occurs in the cycle of lower mammals. There is no time in the human cycle when desire is constantly absent or when conception is always impossible. In other words, the whole of the intermenstrual period of three weeks corresponds to the time of œstrus. There are three factors to be borne in mind in relation to conception: First, sexual desire; secondly, the preparedness of the uterus; and, as far as these two factors are concerned, the whole of the intermenstrual period is equally favourable. The third factor is ovulation. Now, although this may occur at any time, it occurs much more frequently in relation to the congestion attendant upon menstruation; that is to say, that the favourable time for ovulation embraces the three weeks of which the menstrual week is the second or middle one, and consequently, the week preceding and the week following menstruation are the most favourable for conception. Heape's comparison of the pro-œstrum with menstruation is therefore in no way invalidated, but is rather supported, by the conditions for conception that obtain in the human being.

Menstruation and Pregnancy. — In certain cases

menstruation is stated to occur regularly during the first few months, or even during the whole term of pregnancy. Up to the present time I have not myself had the opportunity of verifying this interesting phenomenon; and, judging from the evidence that has been alleged in support of the doctrine of vicarious menstruation, it seems probable that some cases of supposed menstruation during pregnancy are susceptible of other explanations; for instance, errors of calculation as to the date of conception, or the mistaking of accidental hæmorrhages for menstruation. Women are naturally apt to regard any limited and periodic hæmorrhage as 'menstruation.' It may be admitted that during pregnancy there is a periodic increase of congestion at the times corresponding to the suppressed menstrual periods, as evidenced by the special liability to abortion at these times. Such extra congestion might readily determine a small degree of hæmorrhage from a limited separation of placenta or membranes, and even some extravasation and hæmorrhage, in the first month or two from areas as yet unoccupied by the ovum. In exceptional cases an explanation may be sought in hæmorrhage from a lacerated cervix, brought about under the conditions just mentioned. It is probable that a true menstruation may occur during pregnancy from the non-gravid half of a double uterus; but, even in the case of such a malformation, it is to be remembered that a decidua usually forms in the empty half, exactly as it does in the uterus in cases of extra-uterine pregnancy.

I must therefore at present hold that the occurrence of menstruation during pregnancy is attested by hearsay rather than supported by scientific evidence.

Menstruation during Lactation.—In the great majority of cases menstruation remains in abeyance

during lactation, at any rate when the nursing period does not extend beyond ten or twelve months. When the child is kept at the breast longer than a year, menstruation usually makes a reappearance. In a minority of cases menstruation begins again a few months after confinement, even when lactation is going on. The reason of this is not understood; and this is not surprising, when we remember that we do not know why menstruation should usually remain in abeyance during this time. The explanation usually given is that ovulation is suspended during lactation; but this is not really an explanation, because we do not know what is the relation of ovulation to menstruation, or whether either holds the position to the other of cause to effect. It is certain that menstruation may occur independently of ovulation; and it is equally well established that conception may occur after pregnancy without any previous return of menstruation. We must therefore be content with recording the facts, leaving their explanation to the results of future investigation.

The question was formerly raised whether the occurrence of menstruation during lactation had any effect on the composition and qualities of the milk. Inquiries directed to this object showed that the milk presented the same analytical results during menstruation as at other times; nor has any special effect on the child been ever observed when it took the breast during menstruation.

CHAPTER VIII

THE MENOPAUSE

JUST as puberty marks the onset of reproductive maturity, so the menopause indicates its termination. The first epoch is characterized by various functional disturbances,

which become still more marked with the second. The age of the menopause, like the age of puberty, is subject to considerable variations in health. The more usual extremes are the ages of forty-four and fifty-two; the most frequent age may be given as forty-eight or forty-nine. The reproductive period of a woman's life therefore averages thirty-four or thirty-five years. There is no constant relation, either direct or inverse, between early puberty and early menopause; nor does the length of the period of maturity appear to depend in any way on the use that has been made of reproductive opportunities during that time, for it does not vary materially in the virgin, in the nulliparous married woman, or in the mother of many children. There are instances on record of exceptionally late menopause; some of these are not authentic cases, inasmuch as there has existed some disease which has led to the uterine hæmorrhages late in life. In order that any case may be accepted as one of late menopause, it must be shown that no such disease was present. The latest age that I have met with under these conditions is fifty-four.

The menopause, or climacteric, as it is also called, is spoken of popularly as 'the change of life,' or simply as 'the change.' The many functional and organic disorders to which women are specially liable at about this time have also led to its being spoken of as 'the critical period.' These will be discussed in a later chapter. Those disturbances that are so slight and so habitual that they may be regarded as normal will be considered here.

The menopause is commonly ushered in by a season of irregularity both in the periodicity of menstruation and in the amount of the discharge. The popular designation of this time, which may last from three months to three

years, is the 'dodging' period. The periodicity is generally interfered with by the omission of one, two, or more periods from time to time; and the last menstruation of all may occur after several months of amenorrhœa. During this period of irregularity, and usually for some time afterwards, the patient is subject to symptoms of vaso-motor origin, such as flushes and subjective feelings of heat, followed often by perspiration and a feeling of cold. These flushes, or 'heats,' may come on many times a day, or they may be relatively infrequent. Disturbances of digestion, with attacks of nausea or sickness, are not infrequent; visual and aural disturbances, with tinnitus or vertigo, are also found. Speaking generally, the woman often feels weak and out of sorts.

There is a great tendency about this time to the deposition of fat; indeed, this may be so pronounced that in view of the amenorrhœa the patient may think herself pregnant, and this opinion may be strengthened by the occurrence of sickness, while the rolling of intestines distended by flatus may simulate fœtal movements. Hence this is the time when the curious condition of pseudocyesis or 'spurious pregnancy,' is most often met with, associated with a 'phantom tumour.'

In a small proportion of cases the menopause supervenes suddenly, that is to say, menstruation continues regularly and without alteration in its character, up to a certain time, and then abruptly ceases. Such patients may experience thereafter some of the general discomforts just mentioned; on the other hand, we meet with cases where there is no disturbance at all. This abrupt and smooth termination of the reproductive period is found not infrequently in cases where the menopause occurs unusually early. In some of these it follows a pronounced nervous shock, such as the sudden death of

the husband; in others the menopause may directly follow a confinement, the last menstrual period experienced being the one preceding pregnancy.

Concurrently with the clinical symptoms incidental to the menopause, anatomical changes occur in the pelvic organs, taking the direction of atrophy. The ovaries gradually diminish in size, till, in an old woman, they may be no larger than the ovaries of a young child. The uterus shares in this diminution; its body becomes reduced to the size of a walnut in extreme cases, while the cervix shrinks to the condition of a little knob and finally disappears, its site being represented only by a little depression and sinus in the vaginal vault. The vagina becomes progressively contracted, both in length and width; the diminution in width affects especially the upper or deeper portion, so that the vaginal fornices, instead of being, as formerly, the widest part, come to form a cone-shaped apex to the vagina. In virgins and widows the orifice of the vagina becomes quite small, so that it will barely admit the tip of the finger, even in women who have borne children. But where marital relations are continued the narrowing of the vaginal orifice may be delayed.

In the absence of any special disease, the post-climacteric period often becomes a time of renewed and improved health, free from those recurring pelvic changes which in so many cases have made the woman a periodic invalid and interfered with her continuous enjoyment, activity, or usefulness.

PART II

THE DISORDERS OF MENSTRUATION

CHAPTER IX

THE DISORDERS OF PUBERTY

Functional Disorders.—A certain amount of functional disturbance is usual at puberty; but in some cases it is sufficiently pronounced to be properly regarded as pathological. The girl is then languid and easily tired, and is unable to exercise any continuous mental effort; she is subject to attacks of faintness which are specially apt to be brought on by the hot air of schoolrooms and of churches. These attacks are often associated with hysteria, the faintness ending in a fit of sobbing, and sometimes beginning in this way. In general terms, the girl is said to be 'delicate,' and her poor health is not uncommonly attributed to her 'growing fast.' Dysmenorrhœa is often, but not invariably, present; the flow is sometimes abundant, but, on the other hand, it may be scanty.

Hygiene of Puberty.—The cause of this condition is to be sought in faulty hygiene. Many factors in modern life are unfavourable to the growing girl: town-life, with its lack of fresh air, fresh food and free exercise; late hours; school-work, with its preparation for examina-

tions, in which girls of very varying physique and mental capacity must practically attain a uniform standard, at the cost of great strain to the weaker ones; the scamping of meals, especially breakfast, for which a cup of tea and a piece of bread-and-butter are often made to do duty; irregular attention to the bowels, owing to hurry or carelessness; all these things are bad for a girl physically, and they impair the stability of her nervous system; so that when the nervous disturbance attendant on the development of the reproductive organs is superadded, the girl is unable to stand the strain. In body she becomes anæmic, and in mind hysterical.

The prevention of this condition is as important as its cure, and rests largely in the hands of mothers and school-teachers. The mother's part is to see that the child goes to bed early, and rises at such an hour that she can get off to school without hurry, and with proper time for a morning bath and a leisurely breakfast; to ascertain that the child gets into the habit of regular attention to the bowels; to insist on meals of proper quantity and quality; and to encourage out-door games and sports. The teacher's work is in the first place to endeavour to gauge the child's standard of mental capacity, so as to avoid cramming and overstudy, and to save the child the worry and anxiety that come from the constant feeling of being behindhand, and of having more to do than can be done. Further, the teacher should see to it that girls are not compelled to work so hard or so continuously just before menstruation and when the period first comes on.

Too much importance can hardly be attached to the habits of life of the girl at puberty, especially in relation to overstudy. Probably the average girl can acquire as much learning as the average boy, but to do this she

requires bodily health and strength equal to his. The boy, after school-hours, commonly gets a large proportion of outdoor play and exercise; on his half-holidays he engages in cricket, football, running, etc. The girl, on the other hand, often fills up her time out of school in the house, sewing or attending to household matters. Consequently the boy at once gains the advantage of a more robust physique. Added to this, the boy and girl work under different conditions, which, if ignored, lead to disaster. The girl is handicapped by a recurrent period of nervous instability and physical weakness. Her studies cannot therefore be kept at the same continuous level as is possible for the boy. Let girls, then, pursue their study, but more leisurely. If they be given the same opportunities of physical culture, they will arrive at the same mental goal as the boy, but possibly a little later. It is also to be remembered that physically and emotionally a girl arrives at womanhood earlier than a boy arrives at manhood. This necessitates a corresponding saving of energy in some direction, and the direction in which this is to be sought is in intellectual activity.

It will not be out of place here to dwell on the importance of the exercise of proper care at the monthly periods. It should be impressed on the developing girl that there are some things that must be specially avoided during the first few days of menstruation. These are getting the feet wet or otherwise catching cold; bathing, when unaccustomed to it; exposure at night in evening dress; arduous exertion, such as dancing, long cycle rides, long day-excursions or sight-seeing, especially in wet weather. For at these times the whole system is in a susceptible state, and many a chill or cold is caught which might have been avoided by proper care. Anxiety not to appear singular or disobliging often leads girls to

indiscretion during menstruation. It should be impressed upon them that if other excuses fail, it is usually better to appear singular or disobliging than to imperil health.

Menstrual Irregularities. — Irregularities in the periodicity of menstruation are not uncommon for the first year, and they are seldom of any importance, unless associated with some constitutional condition such as anæmia, in which case they become important as an index to that condition.

Variations in quantity also occur. Sometimes the loss is profuse for the first few periods, after which it settles down to the normal condition. The consideration of those cases in which the loss continues profuse or becomes so later on will be dealt with in Chapter XIII.

Treatment.—In the curative treatment of the functional disorders of puberty proper hygiene takes the first place. It is useless to give iron pills and leave untouched all the causes that are undermining the child's health. It may be necessary to prescribe some months of absence from school, during which time the child should be sent into the country, if possible, to lead an open-air life and get fresh milk and eggs. Short of this, rest at the time of menstruation should be enjoined. In the main the directions given under the heading of Hygiene of Puberty must be carried out.

As regards medicinal treatment, iron is required in a large proportion of cases, inasmuch as anæmia is frequently present. Of the numerous forms in which iron may be prescribed, the most satisfactory in the writer's experience are Easton's syrup, iron jelloids, iron bipalatinoids, and the syrup of hypophosphites. Small doses of arsenic are often of value in combination with the iron; whilst in the case of excitable and highly-strung girls a combination of bromide of ammonia in 10-grain

doses, with the same dose of the citrate of iron and ammonia, is satisfactory. In addition, weakly girls may be improved by the administration of cod-liver oil, malt extract, or Scott's emulsion.

It is important to remember that iron is of little value unless the bowels act freely and regularly. It is therefore necessary in most cases to give an aperient, either with an iron mixture or separately. For a mixture, sulphate of iron with sulphate of magnesia, combined with small doses of dilute sulphuric acid and a 'bitter' (the usual Mistura ferri aperiens) answers very well. When giving an aperient separately, my preference is for sulphate of soda or of magnesia in a full tumbler of hot water before breakfast.

CHAPTER X

AMENORRHŒA

According to most writers, amenorrhœa is of two kinds, primary and secondary; and the former includes cases of retained menses. For descriptive purposes a further classification is required, since, as a matter of fact, four distinct conditions are commonly included under the term 'amenorrhœa.' One of these conditions—that of retention of the menses—is not one of amenorrhœa, scientifically speaking, although, from the popular point of view, it is necessarily considered as such until the true nature of the case is made out. For by 'menstruation' must be understood not only the flow of menstrual fluid from the vagina, but also the changes in the endometrium preparatory thereto. In cases of atresia of the genital passage, menstruation is indicated by no outward and visible sign; but the essential periodic changes in

the uterus may be going on all the time, though concealed. Hence the condition is not one of amenorrhœa, but is correctly expressed by the term 'crypto-menorrhœa' (*i.e.*, concealed menstruation).

The three remaining conditions are: Secondary amenorrhœa, and the two varieties of primary amenorrhœa, namely, temporary amenorrhœa (or delayed menstruation), and permanent amenorrhœa.

The classification of these conditions is therefore as follows:

A. Amenorrhœa.
   1. Primary amenorrhœa.
      (*a*) Delayed menstruation.
      (*b*) Permanent amenorrhœa.
   2. Secondary amenorrhœa.

B. Crypto-menorrhœa.

The following definitions will serve to show the precise sense in which these terms are used.

Before the age of puberty, and after the time of the menopause, the absence of menstruation is not spoken of as amenorrhœa; hence:

A. *Amenorrhœa means the absence of menstruation during the usual period of sexual maturity.*

1. *Primary amenorrhœa means the absence of menstruation in the case of a woman who, though above the usual age of puberty, has never menstruated.*

It is clear that a case which appears to be one of 'delayed menstruation' may turn out to be one of 'permanent amenorrhœa'; hence the terms may have a prognostic rather than a diagnostic value. A more precise definition of these terms will appear later.

2. *Secondary amenorrhœa means the temporary suppression, during the usual period of sexual maturity, of menstruation after it has been established.*

A case that appears to be one of secondary amenorrhœa may turn out to be one of premature menopause, if the patient does not menstruate again.

B. *Crypto-menorrhœa means that menstruation occurs, but its products are retained owing to atresia of some portion of the genital passages.*

We must now consider in detail the different kinds of amenorrhœa.

1. **Primary Amenorrhœa.**—The causes of variation in the age of puberty have already been discussed in Chapter V. It was found that under normal conditions it was not very unusual for the first menstruation to be delayed till the age of seventeen. Consequently, in the case of a girl of seventeen or younger who has not yet menstruated we do not say that it is a case of amenorrhœa any more than we should apply the term to the absence of menstruation in a child of ten.

When, however, a girl has reached the age of eighteen or upwards without menstruating, some pathological condition is in most cases responsible for the delay. Up to the age of twenty-five there is still a fair chance of menstruation coming on if the pelvic organs are not abnormally small or ill-developed; but in cases of marked under-development, and in practically all cases above the age of twenty-five, whether under-developed or not, menstruation remains permanently absent. It is clear that no hard and fast line can be drawn to define either the lower or the upper age-limits of 'delayed menstruation'; but, in view of the above facts, the following definitions will serve for clinical purposes:

(*a*) *Delayed menstruation is primary amenorrhœa in a patient of eighteen to twenty-five years of age, whose pelvic organs are normal, or only slightly under-developed.*

(*b*) *Permanent amenorrhœa is primary amenorrhœa in a*

patient who is over twenty-five years of age, or in a younger woman whose pelvic organs are markedly under-developed.

Causes of Primary Amenorrhœa—These are:

1. Constitutional conditions, of which the most important are anæmia and tuberculosis, or the strumous diathesis; also some rare conditions, such as cretinism.

2. Pelvic conditions, to wit, various forms of under-development affecting the uterus or ovaries.

3. Pregnancy.

4. Immaturity, without either constitutional disease or pelvic malformation.

In forming a diagnosis, general conditions must be first sought for; if they can be excluded, a pelvic examination should be made to determine the presence of abnormalities. It must be remembered that pregnancy may occur before the patient has menstruated. In the absence of the above conditions, a diagnosis of immaturity is arrived at by exclusion.

Prognosis.—We can formulate some general principles to guide us in a prognosis, when consulted in any given case on account of the non-establishment of menstruation. The two points on which we shall most probably be asked to express an opinion are, first, the likelihood of menstruation coming on; second, the likelihood of child-bearing in case of marriage. With regard to the first point, the coming-on of menstruation, our forecast will depend, in the first place, on the patient's age. We learn from the table in Chapter V. that:

28·8	per cent.	of girls	do not	menstruate	before the age of 16
13·7	,,	,,	,,	,,	17
6·1	,,	,,	,,	,,	18
3·3	,,	,,	,,	,,	19
1·5	,,	,,	,,	,,	20
0·9	,,	,,	,,	,,	21
0·6	,,	,,	,,	,,	22

Even without examination, therefore, we can give a good prognosis in the case of a girl of sixteen or seventeen ; at eighteen or nineteen the prognosis must be more guarded, and the effect of treatment should be watched ; after the age of twenty no opinion should be expressed without making an examination.

In the second place, we shall be guided by the general health of the patient. If she be suffering from anæmia, tuberculosis, or other constitutional condition that may cause amenorrhœa, we shall be able to say (with the proviso of age just considered) that menstruation will probably begin when the general condition has improved.

Supposing the general condition to be good, and the patient to be twenty years of age or older, the development of breasts and pubic hair should be noted. Any marked deficiency in these secondary sexual characters is unfavourable ; nevertheless, too much reliance cannot be placed on them, and an examination of the pelvic organs should be made. For this purpose it is best to give an anæsthetic, especially if the patient is unmarried. In some cases a recto-abdominal examination will give all the information that is necessary ; in others a vaginal examination will be required. If no abnormality can be found, or the uterus is only slightly under the normal size, the prognosis is not unfavourable ; on the other hand, if the uterus is very small or rudimentary, or if the ovaries are very small and infantile in shape, the probability is against the establishment of menstruation.

With regard to the forecast as to child-bearing, the question will probably only arise in the case of a patient of eighteen or over, and the first thing necessary will be to examine the pelvic organs. If these are found to be normal, we can say that if the patient is eighteen the prognosis is still fairly good ; if she is nineteen and has

not menstruated, she is more likely to be relatively, though not absolutely, infertile. If she is twenty or over, the likelihood of child-bearing diminishes rapidly in proportion to the age; and if she is twenty-five or older, she will almost certainly be sterile. If, on the other hand, the uterus is under-developed, the uterine canal measuring 2 inches or less, the patient will be sterile, even though she may menstruate.

Treatment.—When there is any faulty constitutional condition, this should be treated. Anæmia especially requires iron with arsenic and strychnine or nux vomica, and as the anæmia improves menstruation is more likely to be established. As to the action of reputed emmenagogues, such as manganese dioxide, potassium permanganate, senecin, etc., the results, in my experience, have not so far been encouraging. After a reasonable trial of drugs, if no result is obtained, it is usually advisable to examine the pelvic organs, preferably under an anæsthetic; for if a condition of under-development be present, prolonged drug treatment is futile, and is disappointing to the patient. Under these circumstances it is best to explain the condition and leave matters alone. Stimulation by electricity is usually undesirable and unnecessary in the case of single patients, though it may be tried in exceptional cases if the fact of amenorrhœa is a source of worry to the patient. The most effective stimulus is that supplied by marriage, which may bring to rapid maturity an otherwise tardy reproductive development; this is exemplified by several cases that I have met with where the first menstruation took place shortly afterwards. Obviously, however, it does not fall within our province to prescribe matrimony as a remedy for amenorrhœa.

2. **Secondary Amenorrhœa.**—Cessation of menstru-

ation, like primary amenorrhœa, may be temporary or permanent; the latter kind is synonymous with the menopause, and the premature cessation of menstruation will be considered with the disorders of the menopause. The term 'amenorrhœa' is not applicable after the menopause, any more than it is before puberty; this is why the term 'secondary amenorrhœa' is restricted to the temporary condition.

Causes of Secondary Amenorrhœa.—These are:

1. The same constitutional conditions as cause primary amenorrhœa.
2. Pregnancy, lactation, and too-prolonged lactation.
3. Catching cold, as from getting the feet wet during menstruation.
4. Febrile disorders, and some chronic intoxications such as morphiomania.
5. Some forms of insanity.

The *diagnosis* of the cause of secondary amenorrhœa is always of importance, because of the possibility of its being physiological. If menstruation ceases abruptly after it has been going on regularly and in undiminished quantity, pregnancy must be first thought of, even in the case of unmarried women and widows, and whatever the patient's station in life. The mode of onset of amenorrhœa due to anæmia is different; there is a history of a gradual diminution in the quantity of the menstrual flow, which becomes very scanty before disappearing altogether; in addition, there is often a history of irregularity extending over several months or years. The existence of anæmia is readily determined by the history of shortness of breath, languor and ready fatigue, taken in combination with pallor of the mucous membrane of the lips and conjunctivæ. When the symptoms and signs of anæmia co-exist with a history of scanty and irregular

menstruation, it is permissible and often desirable to refrain from making any examination of the pelvic organs in the first instance. In the opposite conditions the breasts and abdomen should be examined, and if such examination is inconclusive, a vaginal examination should be made. It must be remembered that suppression of the menses occurs not infrequently for a few months after the onset of puberty in perfectly healthy girls.

Amenorrhœa from catching cold or from febrile disturbances resembles that due to pregnancy in coming on abruptly, without previous diminution or irregularity; but in this case we have the history of the chill or the fever. A chill contracted at the onset of menstruation may result in the suppression of the flow for the remainder of the period, and in amenorrhœa for two or three months subsequently. In this case some definite condition of pelvic inflammation is usually found. Diphtheria, small-pox, enteric, typhus and scarlet fever may be followed by amenorrhœa of one to several months' duration.

The relation of amenorrhœa to lactation has already been discussed, but here we must add a word as to the effects of too-prolonged lactation. In some cases, as I have said, menstruation begins again some months after pregnancy whether lactation be continued or not. In other cases lactation prolonged beyond a year may lead to superinvolution of the uterus, with the result that after the child has been weaned menstruation still remains in abeyance for some months. It is possible, indeed, that a premature menopause may set in from this cause; but I have not met with an instance of this.

Insanity, especially melancholia, is frequently associated with amenorrhœa, and we may have to correct the im-

pression of the patient's friends that return of menstruation will necessarily be followed by mental improvement. It is true that if the mental condition improves menstruation usually returns, indicating, not that the amenorrhœa is the cause of the insanity, but that nutritive conditions, which were probably responsible for both symptoms, have improved. Return of menstruation without mental improvement makes the prognosis of the insanity unfavourable.

When amenorrhœa has resulted from myxœdema or morphiomania, return of menstruation is usually an indication of general improvement.

Treatment.—This resolves itself into the treatment of the cause of the amenorrhœa; and much that has been said under the head of the treatment of primary amenorrhœa is applicable here. When amenorrhœa is due to a chill, a course of hot douches with glycerine tampons should be ordered, together with hot foot- or hip-baths administered before the period is due. In addition, some of the 'uterine tonics,' such as viburnum prunifolium, apiol, caulophyllin or pulsatilla, may be given. The bowels must be attended to, saline purgatives being the best. The prognosis as to the re-establishment of menstruation is nearly always good, except in some cases of myxœdema, insanity, and morphiomania.

CHAPTER XI

CRYPTOMENORRHŒA

Concealed menstruation, or cryptomenorrhœa, is a condition in which the menstrual products are retained, owing to atresia of some portion of the genital passages. The part most often affected is the vaginal orifice, and

atresia in this position was formerly described as 'imperforate hymen.' This term is not, however, quite correct, inasmuch as the obstructing membrane is not the hymen, but usually has the hymen lying in contact with its under surface. The result of atresia is the accumulation of menstrual products within the closed genital canal, with consequent and successive distension of the vagina, cervix and body of the uterus and Fallopian tubes, giving rise in turn to the conditions known as hæmatocolpos, hæmatotrachelos, hæmatometra and hæmatosalpinx.

The vaginal atresia may be the result of absence of the lower or middle part of the vagina, or the external or internal orifice of the uterus may be the seat of atresia, the vagina being normal. A rare and interesting class of case is also found in which atresia affects some portion of one half of a double uterus and vagina; normal menstruation may then go on from one half of the uterus whilst cryptomenorrhœa exists on the other side.

Secondary Changes.—The dilated walls of the vagina, uterus, or Fallopian tubes become thinned out, and the endometrium suffers atrophy. The thinning may be partly compensated by the deposition of blood-clot on the inner surface and partial organization of the fibrin. If infection occurs, the retained products suppurate, and the vagina, uterus, or Fallopian tubes then become bags of pus, to which the names pyocolpos, pyometra and pyosalpinx are applied.

Symptoms.—Clinically, the noteworthy feature is absence of the menses, which may be described as a pseudo-amenorrhœa. At first there may be nothing else to attract attention; but sooner or later the patient experiences menstrual molimina; that is, she has the subjective symptoms of menstruation without its outward signs. With gradually increasing distension of the

genital passages by menstrual products, pain is felt. It is sometimes experienced from the first, and becomes more and more severe, undergoing exacerbations at the monthly periods. Symptoms of pressure on surrounding organs may also be present.

Physical Signs.—On abdominal examination a tense, fluctuating swelling may be felt rising above the pubes, if the condition has been present for some time; and if the obstruction be at the vulva there is a bulging in the situation of the hymen. When the lower part of the vagina is absent, or if the atresia affects the os externum or internum, a recto-abdominal examination may be required, and a tense cystic swelling is felt bimanually. When the distension is in the vagina, and has not existed long enough to affect the uterus, the latter may sometimes be felt through the abdomen as a solid projection at the summit of the cystic swelling. Occasionally the enlargement of the Fallopian tubes can be recognised on bimanual examination.

Results.—If left alone, the fluid gradually increases in quantity, leading to much discomfort, whilst the pain, which is at first periodic, becomes continuous. Serious injury may result from pressure on the bladder and rectum, and, in addition, the ureters are liable to injurious pressure, leading to renal disorganization, in cases of hæmatocolpos and hæmatotrachelos. Apart from pressure-effects, the two principal dangers are infection, causing suppuration; and rupture of some part of the thinned-out walls of the sac.

Treatment.—There is only one thing to be done in these cases, namely, to make a free opening at the site of the atresia, and allow the escape of the pent-up fluid. The strictest asepsis is necessary, because the chief risk of the operation is septicæmia. No pressure from above

should be exerted; the fluid should be allowed to flow out spontaneously, and when the greater part of it has escaped, as it generally does at once, the remainder should be received on sterilized gauze and wool-pads. By too rapid evacuation, rupture of a hæmatosalpinx may be brought about; but the dangers of this have probably been exaggerated. It is not usually necessary to irrigate the cavity after opening; and in many cases it is better that this should not be done, in order to minimize the risks of infection and of rupture of thin walls by overdistension. But when the walls have contracted, two or three days after operation, gentle irrigation may be employed to clear out the residue of the fluid and prevent decomposition changes from taking place.

The principal feature of the after-treatment is the maintenance of the patency of the channel. This is sometimes a matter of difficulty, and may necessitate the occasional passing of bougies.

When atresia is associated with absence of a part or the whole of the vagina, a difficult dissection may be required in order to reach the retained fluid, and the difficulty of keeping the channel patent is greatly increased. Various operations have been devised for this purpose, for a description of which a larger work should be consulted.

Characters of Retained Menstrual Blood.—The evacuated fluid is a dark chocolate colour, sometimes almost black; it is of the consistence of treacle. It is mixed with mucus and seldom contains clots. Cholesterin may often be recognised in it. Microscopical examination shows the presence of epithelial débris and blood-corpuscles in various stages of disintegration. The viscidity is due to partial absorption of the blood-serum and to admixture with mucin.

CHAPTER XII

OLIGOMENORRHŒA—LATE MENSTRUATION

Oligomenorrhœa, or Scanty Menstruation, occurs normally with some women, quite apart from any general or local pathological condition. More often, however, it is due to a minor degree of such constitutional disorders or local under-development as result in amenorrhœa, when more marked. When due to anæmia, the quantity increases with improvement in the general health.

When oligomenorrhœa is due to insufficient uterine development it cannot usually be remedied; nor is this a matter of consequence, as the general health is not affected thereby. Such importance as the condition possesses is then derived from the fact that it serves as an indication of lessened fertility or of complete sterility, according to the degree of under-development.

Oligomenorrhœa is unaccompanied by pain in a larger proportion of cases than is found in normal menstruation. There is, however, a variety of menstruation that is both scanty and painful. This will be discussed in the chapter on dysmenorrhœa.

Late Menstruation.—This subject is to be regarded as the complement or sequel to what has been said with reference to that variety of primary amenorrhœa already described as delayed menstruation; for here we have to consider the characters and prognosis of menstruation when it does come on after a delayed onset. By 'late menstruation' I understand those cases in which the

patient is eighteen years or older when the function is established.

What is said here as to the characters of late menstruation and the relation between this and child-bearing is based on an investigation of 52 cases where menstruation started between the ages of eighteen and twenty-six.*

Characters of Late Menstruation.—Rhythm.—In 8 cases this was not noted, whilst 2 patients had only menstruated once; of the remaining 42, menstruation was regular in 22 and irregular in 20. Thus the percentage of cases of irregular menstruation is 47, against 17 to 18 per cent. found among cases of normal menstruation (Chapter VI.).

Quantity.—Of 49 cases in which particulars were given, in 24 the amount was very little, in 15 moderate, in 5 much, and in 5 profuse. Comparing these figures with those given for ordinary menstruation in Chapter VI., we find that the percentages are as follows:

	Ordinary Menstruation.	*Late Menstruation.*
Very little ...	25	49
Moderate ...	46	31
Much	22	10
Profuse ...	7	10

Pain.—In 21 out of 47 cases there was no pain at all, in 22 it was little or moderate, and in 4 very bad. Comparing again the percentages with those of ordinary menstruation and also with those of very little loss among ordinary cases, we find as follows:

	Ordinary Menstruation.	*Ordinary Scanty Menstruation.*	*Late Menstruation.*
No pain	35	40	44·5
Little or moderate pain	36	32	47
Severe pain ...	29	28	8·5

Thus the prevailing characters of late menstruation are

* *Clinical Journal*, January 30, 1901.

that it is irregular, scanty, and accompanied by little or no pain.

The Condition of the Pelvic Organs.—Excluding 14 cases of single women where no vaginal examination was made, among the remaining 38 patients, 25 (21 married and 4 single) were, or had been, pregnant; 7 (4 married and 3 single) had not been pregnant, but presented no objective signs of under-development; whilst 6 (3 married and 3 single) presented degrees of under-development of the uterus varying from the condition of a normal-sized uterus with pin-hole os to a mere rudiment of the uterus.

It is at first rather surprising to find that, whilst 6 cases out of 38 show under-development, 25 should be capable of bearing children. The proportion of miscarriages is, however, a large one, amounting to 37 out of 122 pregnancies, or 30 per cent. Moreover, it is clear that late menstruation is not simply a question of uterine under-development; the fault may lie in some cases in badly-developed ovaries. In other cases, again, the ovary may be anatomically normal, whilst the function of ovulation begins late, and is carried on infrequently. The latter explanation is the one to which we must resort to explain 4 of the cases where menstruation occurred very infrequently; whilst it may also account for 3 cases in which the first menstruation was followed by twelve months' amenorrhœa, and for 3 other cases in which menstruation went on for only seventeen, fourteen and six years respectively.

The Relation of Late Menstruation to Child-bearing.—That late menstruation does not necessarily result in sterility is shown by the fact that 25 patients became pregnant out of 32 who had the chance of becoming so. This gives a proportion of 22 per cent. of sterile patients. This is a higher percentage than exists for

married women in general, and, as previously stated, there was among the pregnancies an unusually high proportion of miscarriages, viz., 30 per cent.

As the age of the first menstruation rises, the likelihood of the birth of living children diminishes. Thus, of 10 patients who did not menstruate till the age of twenty or later, there were 6 who married, and between them they had 9 children and 14 miscarriages.

In order to determine upon a somewhat more extended scale the relation of fertility to the age of the first menstruation, 300 cases have been investigated. To enable comparisons to be made with a fair amount of accuracy, and exclude as far as possible sources of error, the cases considered had been married at least four years, and were married under the age of thirty. They had not suffered from inflammatory conditions of the pelvic organs, such as might in themselves cause sterility.

The cases are divided into groups, according to the age of the first menstruation, and in each group the proportion of fertile, relatively infertile, and sterile cases is noted. I define as 'sterile' cases those that have been married at least four years without having been pregnant; for the other two classes I have adopted an 'index of parity.' Taking the number of years married as y, and the number of pregnancies as p, then $y \div p$ is the index of parity. Fertile cases are those where $y \div p$ is four or under, or where there have been at least four pregnancies. Relatively infertile cases are those where $y \div p$ is five or over. It is not, of course, pretended that this standard is of any value except for purposes of comparison. Further, there is an element of fallacy in the fact that in some cases means may have been employed to prevent conception after the birth of one or two children; but as this applies to all the groups, the error

may be regarded as a negligible quantity when comparing them with one another. The results are shown in the following table:

A Table to show the Relation between the Age of Puberty and Sterility.

(Percentages are in *italics*.)

Age at First Menstruation.	9 *to* 12.		13 *to* 15.		16 *to* 17.		18 *to* 19		20 *or over.*	
Fertile ...	50	*74·6*	100	*74·6*	60	*80*	12	*66·6*	2	*33·3*
Relatively infertile ...	10	*15*	19	*14·2*	9	*12*	4	*22·2*	1	*16·7*
Sterile ...	7	*10·4*	15	*11·2*	6	*8*	2	*11·1*	3	*50*
Total, 300 ...	67	*100*	134	*100*	75	*100*	18	*100*	6	*100*

Up to the age of fifteen for the first menstruation there is little difference to be noted in the subsequent fertility. The ages of sixteen to seventeen give the best result for child-bearing; at eighteen and nineteen the relative infertility increases, and at twenty or over fertility is low and sterility high.

CHAPTER XIII

MENORRHAGIA AND METRORRHAGIA

Menorrhagia means excessive bleeding at the menstrual periods, and is a relative term. What is an ordinary menstrual flow in one woman may constitute menorrhagia in another; moreover, some lose more in three days than others in seven or eight. So the loss sustained

by a patient must be judged of in relation to the standard of her habitual menstrual type.

Metrorrhagia means a discharge of blood from the uterus, independent of menstruation. Menorrhagia passes insensibly into metrorrhagia, and it is therefore convenient to consider the two conditions together. Many diseases lead at first to menorrhagia, and subsequently to metrorrhagia.

It is important to remember that menorrhagia and metrorrhagia are symptoms, not diseases; consequently no treatment should be attempted without endeavouring to ascertain their cause.

An abundant menstrual discharge occurring once and limited to the period need cause no anxiety; but repetition of such hæmorrhage, or its prolongation into the intermenstrual period, necessitates an examination of the pelvic organs. The only admissible exception to this rule is in the case of young and unmarried girls and women; with them, if the hæmorrhage be not very severe and has not lasted long, it is permissible to postpone examination until drugs have had a trial. In all other cases the rule is urgent and imperative: *In all cases of uterine hæmorrhage a careful vaginal examination must be made.* The non-observance of this rule has often enabled uterine cancer to make such progress that when at last it is discovered there is no possibility of cure; whilst in other cases a polypus, whose removal at any time would have been most easy, has been allowed to blanch a woman to such an extent that months or years have been required to make up the lost ground.

Causes.—These may be enumerated as follows:

Menorrhagia.—1. *Constitutional Causes.*—Purpura, scorbutus, hæmophilia, hepatic cirrhosis, over-indulgence in food and alcoholic drinks, and warm climates.

2. *Local Causes.* — Uterine congestion and displacements; endometritis, especially hæmorrhagic and polypoid endometritis; subinvolution, and retention of products of conception; uterine fibrosis; new growths of the uterus, such as mucous and fibroid polypus, adenoma, fibro-myoma, sarcoma (including 'deciduoma malignum') and carcinoma; tubo-ovarian inflammation, especially when suppurative; some ovarian tumours.

Metrorrhagia.—There are no constitutional causes for metrorrhagia, which is always due to some disease of the uterus or appendages.

Local Causes.—Mucous or fibroid polypus; retention of products of conception; extra-uterine gestation; hæmorrhages connected with pregnancy; new growths of the uterus, as above.

It may be remarked, incidentally, that hæmorrhages occurring during pregnancy, whether intra-uterine or extra-uterine, do not properly come under the category of metrorrhagia; for although etymologically the term means 'flow from the womb,' it has come to be used to indicate 'intermenstrual' as distinguished from 'menstrual' bleeding; and hæmorrhages during pregnancy cannot be described as 'intermenstrual.' It is, however, convenient to include such hæmorrhages here for the sake of completeness. Menorrhagia is an exaggeration of a physiological phenomenon; metrorrhagia, on the contrary, is essentially pathological.

Of the causes above enumerated, some never lead to anything more than menorrhagia; this is true of all the constitutional causes, and of some of the local ones, namely uterine congestion and displacements, subinvolution, and some pathological conditions of the uterine appendages. In all these cases the proximate cause of menorrhagia is congestion, resulting in more extensive

growth and breaking down of vessels, and more complete denudation of the uterine mucosa; in other words, the menstrual changes in the uterus are exaggerated from Stage 3 to Stage 7 (see Chapter II.). In all these conditions there is primarily no disease of the endometrium; later on the endometrium may become diseased owing to the constant repetition of excessive congestion, and it becomes thickened and hyperplasic. It is probable that marked retroversion of the uterus leads to twisting of the broad ligaments on their transverse axis, and consequent pressure on the veins contained therein, whilst the arteries are not affected; and congestion is increased by this means.

Menorrhagia brought about by other causes is from the first due to disease of the endometrium; among such causes we may enumerate endometritis in all its forms—gonorrhœal, hæmorrhagic, glandular and polypoid; uterine fibrosis; retention of products of conception; and new growths. The mode of action of these varies; in some of them the uterus cannot properly contract and retract, owing to the presence of a foreign body in its interior—a good example of which is the retention of a piece of placenta. In other cases the muscular structures of the uterus are at fault; for instance, in uterine fibrosis the muscle-tissue of the walls is largely replaced by fibrous tissue, and the vessels themselves are found thickened and fibrotic; consequently the vessels cannot be properly closed, and they go on bleeding just as they do in the case of a scalp-wound. In other cases the superficial vessels are in a hæmorrhoidal condition, and are not adequately supported, so that they readily rupture; polypi and myomata, whether intramural or submucous, probably lead to menorrhagia in this way. Lastly, the bleeding may be due to ulceration exposing vessels, as in the case of malignant growths.

Menorrhagia that is due to pathological conditions of the endometrium may pass on, almost insensibly, into metrorrhagia. That is to say, the monthly flow becomes at first prolonged; from four or six days it may extend to ten or twelve, and ultimately the hæmorrhage may become constant, with the exception, perhaps, of a few clear days here and there, which bear no sort of relation to the monthly periods.

Diagnosis.—The diagnosis of the existence of menorrhagia or metrorrhagia rests upon the statements of the patient, for it is seldom that we have the opportunity of determining this point for ourselves. If there be any doubt as to a patient's accuracy, it may be necessary to keep her under observation in a hospital or nursing home. If the bleeding be severe, it will of course leave its traces on the health and appearance of the patient. Usually, however, the fact of menorrhagia or metrorrhagia may be accepted, with the proviso that careful inquiry should be made to ascertain how far the patient's own type of menstruation has changed.

Diagnosis then resolves itself into the determination of the cause of the bleeding. This point is discussed fully in Chapter XIX., and need not now detain us. Let it suffice to say that examination will in nearly every case make the matter plain.

It is sometimes possible and permissible to make a diagnosis as to the cause of menorrhagia from the history and symptoms; in unmarried girls this is, in the first instance, even desirable.

In the case of metrorrhagia a diagnosis without examination is not possible, nor is the attempt permissible. Moreover, the treatment of menorrhagia on a theoretical diagnosis should not be continued long if ineffective.

Treatment.—When menorrhagia is due to constitutional

conditions or to subinvolution, or when no definite local cause other than congestion can be assigned for it, medicinal measures are indicated. These, of course, include the special treatment of any defective general condition.

General hygiene must be considered. This includes moderation in food and drink, the avoidance of excessive fatigue, hot and badly-ventilated rooms, and too frequent sexual intercourse. The last is a frequent cause of uterine congestion and resulting menorrhagia.

Among uterine hæmostatics we may mention, in the first place, ergot and ergotin. The former is given in the form of liquid extract; usually drachm doses should be prescribed, as smaller doses may have very little effect. Ergotin is given in 3-grain doses, either in tabloid form or hypodermically. It is often useful to combine ergot with the tincture of hydrastis, or of hamamelis, in 15 to 20 minim doses; or these two drugs may be given together, without ergot. A relatively recent uterine hæmostatic of great value is stypticin (cotarnine hydrochlorate), which may be given alone in 1-grain doses, or combined as in the following prescription, made up in palatinoid form: hydrastin hydrochlorate, $\frac{1}{3}$ grain; ergotin, $\frac{3}{4}$ grain; cannabin tannatis, $\frac{1}{2}$ grain; stypticin, $\frac{1}{4}$ grain. Any of these preparations may be administered three times a day. It is advisable for the patient to begin taking the medicine two or three days or for a week, according to circumstances, before menstruation is expected. The same treatment may be carried out, at any rate as an adjunct or as a temporary expedient, in cases of metrorrhagia; but it must be remembered that whereas some cases of menorrhagia are due to conditions of congestion, and so yield to drugs, the great majority of cases of metrorrhagia are due to some definite pathological condition which requires operative treatment.

Among accessory measures in the treatment of menorrhagia an important place must be given to rest in bed, which should be maintained for the first two or three days of the flow, and to free purgation, which should be carried out before the period is due. Constipation is a potent factor in increasing pelvic congestion.

When drug treatment fails, other means have been advocated, such as the application of electricity, the positive electrode of a constant current being used inside the uterus. This is carried out in the intervals of menstruation, and may have to be continued for several months. The injection of hot air or steam into the uterine cavity has also been tried; but this plan is not devoid of serious risks.

Menorrhagia caused by retroversion, retroflexion and procidentia requires to be treated by replacement of the uterus and the introduction of a properly fitting pessary; and this will in most cases effect a cure. In some obstinate retroflexions of the uterus pessaries will not suffice, as the flexion is apt to persist even when the uterus as a whole is no longer retroverted. If symptoms are troublesome, then some kind of operation is indicated, such as ventrofixation, or the shortening of the round ligaments.

When hæmorrhage is due to some intra-uterine condition, the nature of which is not clear—for example, in cases where the uterus is only slightly enlarged and the cervix is normal—the best treatment is dilatation of the uterine canal and examination of the interior with the finger. As a rule, the more objective the pathological condition in its interior the easier will dilatation be. In this way a polypus may be discovered and removed; or, if the endometrium generally is diseased, thorough curetting should be carried out. It may here be remarked that the less there is to be got away by this

means, the worse is the prognosis as regards hæmorrhage. In some cases the polypus is partly or wholly extruded from the cervical canal, and its removal is an easy matter; if the pedicle is narrow it can be twisted off; if wider it can be snipped through with scissors. When the bleeding is kept up by a piece of retained placenta or membrane, curetting is necessary; and the same procedure is to be adopted in some cases of uterine adenoma.

Uterine fibrosis is often a troublesome condition to deal with; drugs are usually ineffectual, and repeated curettings fail to arrest the bleeding. Favourable results have been reported from the use of electricity. If the hæmorrhage continues despite of all treatment, the health of the patient may become so seriously threatened that hysterectomy has to be performed.

Uterine myoma, sarcoma and carcinoma, and new growths or suppurative disease of the tubes and ovaries, require surgical treatment, according to the particular features of the case. Intra-uterine myomata can sometimes be dealt with by vaginal or abdominal myomectomy, the uterus being left behind. Oöphorectomy for bleeding myomata has been superseded by methods of operation which aim at removing diseased structures and leaving healthy ones.

CHAPTER XIV

DYSMENORRHŒA

DYSMENORRHŒA means 'painful menstruation'; but the term is usually restricted to severe or disabling pain, in which sense dysmenorrhœa may be said to be present

in not more than 10 per cent. of women, whilst about 65 per cent. of women suffer more or less pain.

Dysmenorrhœa affects different women in different ways. In some the pain is abdominal, being referred more especially to the umbilicus and the hypogastric region below it; and it is then usually a kind of colic—a sharp 'doubling-up' pain. With this is often associated pain shooting round the hips and down the thighs nearly to the knees, mainly in the area of distribution of the obturator nerve; that is, the inner side of the thigh. With others the pain is mainly or entirely sacral—a dull, aching pain low in the back, described sometimes 'as if the back were going to break in two,' and leading to a feeling of marked lassitude and weakness and a desire to sit or lie down. Or, again, the pain may be limited to one or other side of the abdomen in the iliac region, the position to which ovarian pain is referred. Lastly, the pain may be felt in all these regions at once, being described as 'all round the lower part of the body.'

The successful treatment of dysmenorrhœa depends in great measure on a recognition of its proximate cause; and tabulating the varieties of dysmenorrhœa on the basis of their origin, we can adopt the following simple classification:

A. Constitutional.
B. Local.
    1. Pelvic congestion.
    2. Faults of conformation.
    3. Faults of position.
    4. Pelvic inflammation.

A. *Constitutional Causes.* — These are to be regarded mainly as predisposing causes, and fall into two main divisions, malnutrition and neurosis. In cases of malnutrition the patient shows general debility, and not in-

frequently the uterus is found to be smaller than normal. Overworked servants, shop-girls and waitresses, who are liable to long hours of standing; underfed girls who live in unhealthy conditions of overcrowding and bad ventilation, are liable to this form of dysmenorrhœa. The neurotic form is found in neurasthenic girls, in overworked students and teachers, and in those of indolent habit of life, who supply a large proportion of the subjects of hysteria.

In the absence of local causes, dysmenorrhœa of constitutional origin is spoken of as 'functional.' It is probably in reality akin to neuralgia, and arises from inadequate nerve-nutrition. We might consequently very well call it neurasthenic dysmenorrhœa, whether the subjects of it are neurotic or otherwise ill-nourished.

The effect of hygienic conditions is illustrated by cases where a girl suffers from dysmenorrhœa in London, though she menstruated painlessly when living in the country.

B. *Local Causes.*—1. *Pelvic Congestion.*—Dysmenorrhœa due to this cause is generally of the kind in which the pain is said to be all round the lower part of the body—in the back, sides, abdomen and thighs. It generally begins a day or two before the onset of menstruation, and continues for the first day, or two days, of the flow. It is accompanied by a feeling of weight and bearing-down. The congestion is in many cases otherwise indicated by leucorrhœa in the intervals of menstruation, and the subjects of it nearly always suffer from chronic constipation. On examination, marked pulsation of vessels in the vaginal vault may be felt; the uterus is often heavy and rather bulky, and the vulva is apt to become swollen during menstruation.

2. *Faults of Conformation.*—In cases of under-develop-

ment, when the uterine canal is narrow and the walls unduly rigid, the swelling of the endometrium that precedes and accompanies menstruation may lead to pain. A uterus of this type is, in addition, not infrequently acutely flexed, either backwards or forwards, and there is stenosis of the os internum, due to 'kinking.' Two other forms of stenosis are found in association with these uterine conditions, namely, anatomical stenosis, due to cicatrization after inflammation or to fibroid induration; and spasmodic stenosis, due to muscular contractions. In cases of stenosis, when the uterine sound is introduced, the patient sometimes complains of pain in the back, which she says is just like her menstrual pain, at the moment the sound is passing the os internum. Probably the passage of the sound induces reflex spasm, and so leads to pain. This form is sometimes called 'spasmodic dysmenorrhœa.' The term 'obstructive dysmenorrhœa' has also been employed; but it is probably incorrect. If the stenosis were sufficient to cause 'obstruction' we should expect to find accumulation of menstrual products behind the obstruction, with dilatation of the body of the uterus. I doubt whether either of these conditions is ever found; certainly I have never been able to find any evidence of their presence. It is accordingly more probable that the pain is to be explained, partly by the compression of the swollen mucosa as above stated, and partly by the occurrence of painful uterine contractions, especially when there is marked flexion. This view is supported by the analogy of labour pains, which are also referred to the back. It is to be noted that many women menstruate painlessly in whom the uterus is markedly flexed; and, further, that dysmenorrhœa of this kind often supervenes some years after the onset of menstruation, the early years being

quite free from pain; so the cause is probably complex. But, whatever explanation we adopt, the fact remains that correction of a flexion is followed by relief of the menstrual pain in a considerable proportion of cases.

3. *Faults of Position.*—Prolapse and retroversion of the uterus are frequently associated with dysmenorrhœa, and it is probable that the pain is in a considerable measure due to congestion. For in either case the free return of blood through the veins is hindered, as explained in the previous chapter. The pain is more constant when retroversion or prolapse is associated with prolapse of the ovaries into the pouch of Douglas; we may then get the typical ovarian pain superadded to the pain referable to the uterus. *A fortiori*, the pain is more acute when congestion or inflammation complicates the prolapse of the ovaries. This variety has been called 'ovarian dysmenorrhœa.'

4. *Pelvic Inflammation.*—This is a frequent cause of dysmenorrhœa in married women, and it may be intra-uterine and due to endometritis and metritis, or peri-uterine when it is the result of salpingitis, ovaritis, and pelvic peritonitis. In the peri-uterine variety the uterus is more or less fixed in the midst of an inflammatory mass, and the increased uterine congestion of the menstrual periods and the hampered uterine contractions are alike sources of pain. Added to this, there is the pain due directly to ovarian and peritonitic inflammation. Intra-uterine inflammation as a cause of dysmenorrhœa is easily understood, for the uterine mucosa becomes very sensitive when inflamed; the swelling of the menstrual mucosa causes pressure on the nerve-endings, and this is exacerbated by the uterine contractions.

Diagnosis.—In the case of girls and unmarried women with no other symptom but pain, it is undesirable to

make a vaginal examination in the first instance as a matter of routine; this should be reserved for cases in which medical treatment fails to give relief. Meanwhile, the character of the pain and the quantity of blood lost will assist in the diagnosis. Thus, painful and profuse menstruation is generally associated with great congestion before the flow begins, and the pain generally occurs during the congestive period—the commencement of the flow is then accompanied by a feeling of relief. When menstruation is painful and scanty, the pain more often occurs during the flow, and has its origin in painful uterine contractions. The situation of the pain has also its significance; when this is in the back, the cervix is generally at fault, and stenosis of the os internum, acute flexion, or cervical endometritis may be suspected. On the other hand, pain referred to the umbilicus is related to disturbance in the body of the uterus, especially in the fundus; it is analogous to after-pains, and is often associated with the passage of clots. Pain in the iliac fossæ is suggestive of ovarian inflammation or irritation, or of salpingitis. In the case of married women, and single women who have not been relieved by medicinal measures, an examination should be made in order to determine the presence of some anatomical cause for the dysmenorrhœa, such as those previously enumerated, namely, endometritis, flexions or displacements of the uterus, prolapse of the ovaries, inflammation or cystic growths of the ovaries, salpingitis, pyosalpinx, or general pelvic peritonitis with adhesions.

Treatment.—For constitutional or functional dysmenorrhœa the remedy lies in improved hygienic conditions, more exercise, plain and sufficient food, early hours, regularity of habits, with a definite occupation in some cases and restricted mental work in others. Among the

medicinal measures for the relief of menstrual pain, a foremost place must be given to aperients and purgatives, which should be administered a day or two before menstruation is expected. By this means congestion is much reduced. Hot foot-baths and sitz-baths are useful adjuncts. With regard to drugs, diffusible stimulants are useful in congestive cases, and they may be combined with sedatives, as in the following mixture: bromide of ammonium, 10 grains; solution of acetate of ammonia, 1 drachm, or aromatic spirits of ammonia, 20 minims; tincture of hyoscyamus, 1 drachm; chloroform water to 1 ounce; a few doses at intervals of three to four hours will usually give relief. Or the hyoscyamus may be combined with 10-minim doses of tincture of cannabis indica. A useful preparation is the Liquor caulophyllin et pulsatillæ co., in drachm doses; two or three doses will usually suffice. Alcoholic stimulants, and especially gin, taken in hot water, nearly always give relief; but for obvious reasons, they must be ordered with great circumspection, and the same may be said of the preparations of opium; for the fostering of an alcohol or opium habit is a heavy price to pay for relief from dysmenorrhœa. Painful uterine contractions can be very satisfactorily relieved by phenacetin in 10 or 15 grain doses. The proprietary preparations Ammonol and Antikamnia act in much the same way. The action of these drugs is best obtained when the patient lies down for half an hour afterwards. Although medicinal treatment generally gives relief, it is seldom curative; that is to say, it will usually require to be repeated at successive monthly periods.

Passing on to the treatment of local causes of dysmenorrhœa, we may consider first the case of faults of conformation, stenosis and flexions. Dysmenorrhœa from these causes can often be relieved by dilatation and

straightening of the uterine canal, by means of graduated uterine sounds, such as Matthew Duncan's dilators. The dilatation should be done a few days before the period is expected, and does not require an anæsthetic. It may require to be repeated once, or perhaps twice, at intervals of a month. If the condition is more pronounced, or shows a tendency to return, permanent relief will sometimes follow the introduction of an intra-uterine stem; it should be left in for four or five days, during which time the patient should remain in bed. In other cases a more thorough dilatation under an anæsthetic is indicated, or some plastic operation for the permanent curing of a flexion may be required. When pain is caused by prolapse or retroversion of the uterus, a well-fitting pessary will usually give relief. An obstinate retroversion, combined with retroflexion, that does not yield to pessaries, should be treated by ventrofixation of the uterus; this often gives brilliant results, especially when the uterus has been held down by adhesions. Endometritis requires local applications to the endometrium, or curetting, according to its character and severity.

Congestion and the milder degrees of pelvic inflammation should be treated by hot douches given twice daily, and the introduction of glycerine tampons two or three times a week. The local applications must be supplemented by plenty of rest and regular attention to the bowels. This treatment, followed by the insertion of a soft rubber ring pessary, will often give relief in cases of prolapsed and tender ovaries. In the severer kinds of pelvic inflammation the dysmenorrhœa is an incident, rather than a leading feature; and the mode of treatment, whether medicinal, surgical, or expectant, will depend on the exact nature of the case, so that no general rules can be laid down.

In conclusion, it must be remembered that dysmenorrhœa, like menorrhagia and metrorrhagia, is in most cases only a symptom, the origin of which requires to be investigated; it is only in a minority of cases that it is present without any constitutional disturbance or anatomical pelvic condition to account for it.

CHAPTER XV

MEMBRANOUS DYSMENORRHŒA; INTERMENSTRUAL PAIN; VICARIOUS MENSTRUATION

Membranous Dysmenorrhœa is the name given to a condition in which menstruation is very painful and is characterized by the discharge of membrane from the uterus.

Nothing is known respecting its cause.

Pathological Anatomy.—When complete, the membrane is a hollow cast of the interior of the uterus; it is the shape of an isosceles triangle, the base of which corresponds to the fundus of the uterus. At each of the truncated angles there is an opening, the small ones at the base indicating the position of the uterine ostia of the Fallopian tubes, and the larger apical opening marking the site of the os internum. A menstrual decidua is usually 2·3 centimetres in length, and 2 millimetres in thickness. The inner surface is smooth, and dotted with minute pits, the orifices of the uterine glands. The outer surface is shaggy, as is best seen when the membrane is floated out in water. Histologically, the membrane consists of recent blood-clot, characterized by the presence of a large excess of leucocytes; fragments of

organized tissue are found, consisting of small round cells with a small amount of delicate fibrous stroma, and sometimes portions of shed and partially disintegrated epithelium. No glands are found, nor are the large decidual cells characteristic of the decidua of pregnancy present. The condition is best described as one of exfoliative menstrual endometritis.

Symptoms.—The patient complains of severe intermittent pain, beginning with the onset of the menstrual period, and reaching a maximum just before the expulsion of the membrane, after which the pain usually ceases. The membrane may come away whole, in several pieces, or in numerous shreds, and is usually discharged within forty-eight hours of the commencement of the menstrual flow.

Diagnosis.—The membranous cast must be distinguished from the decidua that comes away in cases of tubal pregnancy, or from the unimpregnated horn of a gravid uterus, and from the products of early abortion. The histological appearances will usually be decisive; in addition to which, the history will generally serve for a diagnosis. In cases of deciduæ associated with pregnancy within or without the uterus there is always a history of one or more missed periods, except in some few cases of tubal gestation; the hæmorrhage in cases of membranous dysmenorrhœa is limited to the usual few days; whilst in the other cases it may go on for one or several weeks. When the case has been under observation some time, the regular painful discharge of membranes at monthly intervals is absolutely characteristic.

Treatment.—No drugs affect the formation of the membrane, although pain may be relieved by this means, as described in the previous chapter. The incidence of pregnancy sometimes effectually arrests the membranous

formation, but not always. The best results are obtained from curetting, which affords at least a temporary relief; but it may require to be repeated once or twice.

Intermenstrual Pain.—This name has been given to a special condition, described by German writers as *mittelschmerz*, in which pain is experienced regularly in the intervals of menstruation, whilst the period itself may or may not be accompanied by pain. The date of the recurrence of pain after the cessation of menstruation varies in different patients; but it commonly recurs on the same date in the same patient. In a certain proportion of cases the pain is followed by a mucous, watery, or blood-stained discharge.

Causation and Pathology.—These are by no means clear; various lesions have been described in association with the condition, but the cases observed are too few to allow of any generalizations at present. One fact that has come out is that in a rather large proportion of cases some tubal disease is found, and some writers are disposed to regard this as the cause of the recurrent pain, explaining the latter as brought about by periodic distension of the tubes, the so-called 'intermittent hydrosalpinx.' Other authorities deny the existence of this occurrence. Another explanation is that it is due to recurrent intermenstrual ovulation; and yet another supposes that there is an inter-monthly cycle as well as a menstrual one. The last two explanations are purely theoretical; and as the first one is not sufficiently supported to command acceptance, the matter must be left undecided, pending further observations.

Diagnosis rests upon the central feature of regularly recurring pain in the intervals of menstruation. If tubal disease is discovered on examination, it may provisionally be regarded as confirmatory.

Treatment.— Abnormal conditions of the tubes may require to be dealt with surgically. In any case, the pain should be relieved by drugs.

Vicarious Menstruation.— I may here say a few words about the condition to which this name has been applied. It is a condition in which the patient is stated to exhibit a regular discharge of blood at the menstrual periods from situations other than from the uterus. Thus it may be from the nose, lungs, stomach, bowels, breast, or from some open wound present at the time, and it may supplement or replace the loss of blood from the uterus.

Now, in the first place, it is clear that, inasmuch as menstruation is the expression of rhythmic preparations of the uterus for pregnancy, it is quite impossible for any other organ to take on vicariously the menstrual function. Consequently, the name is incorrect and misleading, and should be abandoned. As a matter of fact, it is a relic of the old plethora theory, it being then supposed that some excess of blood must be got rid of somehow, and that if it did not come from the uterus it would be discharged in some other way. French writers have recognised the inapplicability of the name, and describe hæmorrhages occurring at the time of menstruation as 'supplementary.' In the next place, it must be remarked that statements of patients as to a regularly recurring hæmorrhage other than uterine must be accepted with the greatest reserve. I have not infrequently been told that 'the monthlies come away' by the nose or mouth, or in other ways; but careful inquiry has invariably resulted in showing that there was no definite periodicity about the hæmorrhage, and that in most cases it did not even once correspond to the time of menstruation. Further inquiry, in my own cases and in those of others,

has almost always shown that in cases where the recurrence of hæmorrhage has been correctly stated there is some definite pathological condition to account for it. Hæmoptysis has been found in phthisical cases, hæmatemesis with gastric ulcer, melæna with hæmorrhoids, hæmorrhage from the nipple with malignant disease, etc.

A possible explanation is that in profoundly hysterical subjects a monthly discharge of blood other than uterine might occur as the result of auto-suggestion, in the same way as the classical stigmata have been observed. But I do not know that this explanation has been called into requisition in any individual instance.

This much, at least, may be conceded—that in view of the rise of blood-pressure and general congestion that are associated with menstruation, it is not surprising if, in any lesion that has a tendency to bleed, this tendency becomes accentuated at some menstrual epoch, so that actual bleeding happens to coincide with menstruation.

Apart from this, the whole subject of vicarious menstruation must be relegated to the domain of myths.

CHAPTER XVI

DISORDERS OF THE MENOPAUSE—PREMATURE MENOPAUSE

The disorders associated with the climacteric period may be conveniently considered in two divisions, according as they are functional or organic.

Functional Disorders of the Menopause are, for the most part, of vasomotor and nervous origin. In describing the normal menopause, I have spoken of the heats and flushes, the perspirations and the feeling of

chilliness so constantly met with; these may be so pronounced and so frequent as to become a source of serious distress to the patient. Emotional disturbances are common; the milder manifestations are irritability and attacks of crying, and between these and actual mania and melancholia all gradations are met with. Of these serious mental disorders melancholia is the one usually found in connection with the menopause, and with it there may be present some disturbance of the sexual function, either erotism or the reverse.

Many patients complain of headaches, taking the form of supra-orbital or temporal neuralgia, or referred to the vertex and occiput, as in neurasthenia, or it may be a regular migraine, associated with bilious attacks.

It is not surprising that among vasomotor disturbances cardiac disorders should exist, and we find accordingly that many women at this time suffer from attacks of faintness and palpitation. These are no doubt favoured by the distension due to flatulence, to which these patients are specially liable. Flatulence is only one of many digestive disorders met with. We may mention, besides, constipation, nausea, vomiting, flushing after meals and biliousness.

Temporary subjective disorders of sight and hearing are sometimes found, such as amblyopia, amaurosis, deafness and tinnitus aurium. With the latter may be associated attacks of giddiness. Among tactile and sensory disturbances may be mentioned numbness, feelings of coldness in the limbs, back, or abdomen, shooting pains, and loss of power in the limbs. Pruritus may affect the body generally, though it is more often localized to the region of the vulva and perineum.

The trophic nerves may share in the general disturbance, and lead to various skin affections, principally

eczema and herpes. I have also seen purpuric patches on the limbs as a transient condition just following the menopause.

It will thus be seen that there are hardly any functional disturbances to which women at the menopause are not liable, and many of them are common. Indeed, it may be said that in the instability of her emotional and nervous system the woman at the climacteric vies with, and even surpasses, the girl at puberty.

Organic Diseases of the Menopause. — With regard to organic disease in the body at large, there is no reason to regard women as being more vulnerable at the time of the menopause than at any other time. An apparent exception is found in the fact that the special predisposing age for cancer corresponds with the climacteric period; but there is no causal relation between the two. A more valid exception may be instanced in the case of rheumatic arthritis, to which women who have reached or just passed the menopause appear to be exceptionally liable.

We are, however, more concerned here with organic diseases of the generative organs in relation to the menopause. The uterus is specially subject at this time to a form of inflammation which has been called senile endometritis. It differs from the endometritis of younger subjects chiefly in the fact that there is less glandular proliferation than is found in the latter cases. Hæmorrhagic endometritis also occurs in connection with the menopause; the mucosa often presents polypoidal changes in this condition, and microscopically there is much dilatation and proliferation of bloodvessels, but little or no gland-proliferation. Clinically it requires to be carefully distinguished from malignant disease of the body of the uterus.

In the main the changes in the pelvic organs at the menopause are atrophic, and there is a special form of atrophy of the vulva which is met with at this time, viz., kraurosis vulvæ. The principal feature of this is a most distressing itching. Pruritus may also result from a chronic form of vulvitis, which has been named on this account 'vulvitis pruriginosa.'

Reference has been made to irregular hæmorrhage at the climacteric. This may be due to a polypus, to hæmorrhagic endometritis, or to mere temporary congestion. But there are two important causes of hæmorrhage at this time that must never be lost sight of, viz., myoma and carcinoma. For a long time it was taught that myomata tend to spontaneous improvement and diminution at the time of the menopause. The statement has been copied from one book to another. More exact observation has demonstrated that this is an exceptional occurrence. Patients with myomata, at least of the interstitial and intra-uterine varieties, go on losing blood far past the normal age of the menopause. It is probable that in many cases true menstruation, in the sense of a periodic preparation for pregnancy, really ceases, together with ovulation, at about the usual time, whilst hæmorrhage is kept up by the tumour for years later. In cases where no vital complications have meanwhile supervened, the myoma may then at length cease to grow and undergo some atrophy, with the result that hæmorrhage ceases. This is called the menopause, and it is then said that the menopause has brought about the cure of the tumour, which is, to say the least of it, begging the question. The view here expressed, that the menopause may take place without arrest of the hæmorrhage, receives support from those cases where an artificial menopause has been induced by double oöphorectomy for myomata, and

where the bleeding nevertheless continues because the growth is polypoid or intramural. One of the reasons why this operation has been given up in the treatment of myoma is that its results are so doubtful.

With regard to cancer of the uterus, I may say, as I said of cancer generally, that it is in no way due to or dependent upon the menopause; but the age of incidence of the two conditions is much about the same, and, consequently, *no case in which there is irregular or profuse hæmorrhage at the time of the climacteric, or in which there is any hæmorrhage at all, however slight, after the periods have ceased, should be allowed to pass without examination*, in case it be due to cancer, which, peradventure, may be cured by timely intervention. All who appreciate the facts of the case will admit that infringement of this rule amounts to criminal neglect.

Treatment.—I need not enter in detail into the treatment of all the functional disorders of the menopause, for it is clear that to do this would require a treatise on medicine. I will therefore confine myself to a few remarks on the treatment of the specially characteristic vasomotor and nervous phenomena. Three principles of treatment must here guide us: First, to overcome constipation and flatulence; secondly, to calm the nervous system; thirdly, to support strength by tonic treatment. For the first indication I have found the most satisfactory results from saline purgatives in combination with antispasmodics such as capsicum, ginger and cardamoms. For nerve-sedatives at this time the bromides, in my experience, answer best; and the third indication is met by bitter tonics such as cinchona, given before meals, combined, if desirable, with ammonia in some form. A sample prescription is as follows: Bromide of ammonium or potassium, 10 to 15 grains; aromatic spirits of am-

monia, 15 minims; compound tincture of cinchona, 20 minims; chloroform water, to 1 ounce. For the constipation, tincture of capsicums, 3 to 5 minims; 'white mixture,' 1 ounce; to be taken once or twice a day. Under this treatment the flushes, perspirations, irritability and depression will generally show considerable improvement. Alcohol in any form is best avoided at this time, and this remark applies especially to spirits. Frequent resort to tea should also be discouraged.

With regard to the treatment of organic pelvic conditions, senile or hæmorrhagic endometritis requires curetting; and if there be any doubt as to the benign or malignant character of the latter condition, microscopic examination of the scrapings should be made. Vulvitis pruriginosa is met at first by sedative applications; in many cases the irritation is markedly relieved by applications of a lotion composed of 1 ounce each of dilute acetic acid and glycerine to 8 or 10 ounces of water. In obstinate cases, or where the disease appears to be passing over into the condition of kraurosis vulvæ, relief may be obtained, at least for a time, by the thorough application under an anæsthetic of phenol of the strength of 20 per cent. in glycerine. In extreme cases kraurosis has to be dealt with by excision of the affected parts.

Malignant disease should of course be dealt with by thorough removal when it is met with early enough; otherwise palliative treatment should be adopted. For details of this and of the treatment of uterine myomata a work on the diseases of women should be consulted.

Premature Menopause. — The conditions under which the menopause sets in prematurely are as follows:

1. *Conditions of Under-development.*—In cases of marked under-development of the uterus and ovaries, if menstruation takes place at all, it not infrequently ceases very

early; it may be before the age of thirty, or in some cases only a very few years after puberty. In three of my cases of 'late menstruation,' the function lasted only seventeen, fourteen and six years respectively.

2. *Conditions of Exhausted Fertility.*— Usually women who have had large families continue to menstruate up to the usual time; but in some cases the birth of a child marks the termination of the period of reproductive maturity, and menstruation does not come on again. In some cases this is associated with superinvolution of the uterus; in others no change in the uterus can be detected, and it must be assumed that ovarian activity has ceased.

3. *Conditions of Severe Mental Shock or Bodily Illness.*— In a certain number of cases menstruation ceases abruptly after such a shock as the witnessing of a horrible accident, the sudden news of the death of the husband, or a great fright. In other, but fewer, cases a long and exhausting illness is followed permanently by amenorrhœa.

4. *Certain Operations*, such as hysterectomy and double ovariotomy, are usually followed by complete cessation of menstruation. This subject is treated in further detail in Chapter XVIII.

5. *Undetermined Conditions.*—Lastly, the menopause in exceptional cases sets in prematurely when none of the above causes have been at work; that is to say, the woman is in her usual health, she has had neither shock nor recent pregnancy nor severe illness, and her pelvic organs show no signs of under-development.

CHAPTER XVII

EFFECTS OF GENERAL DISEASE ON MENSTRUATION

I SHALL here briefly enumerate the effects of some systemic diseases on the menstrual function.

1. **General Diseases.**—The more severe *fevers*, such as small-pox, typhus, enteric, scarlet fever and diphtheria, may be followed by amenorrhœa for one or several months; whilst a period that is due in the course of the acuter stages of the fever may be suppressed.

General tuberculosis is associated with delay in the establishment of menstruation, and when it comes on the flow is usually scanty.

Chronic intoxications, as by alcohol, lead, or opium are accompanied by oligomenorrhœa or amenorrhœa.

Cretinism and myxœdema are associated with amenorrhœa.

Anæmia, *chlorosis*, and *pernicious anæmia* lead at first to scanty and irregular menstruation, and later to amenorrhœa.

Hæmophilia, *purpura*, and *scurvy*, on the contrary, lead to profuse menstruation.

2. **Diseases of the Nervous System.**—*Brain tumours* may be associated with amenorrhœa.

In *neurasthenia* and *hysteria* dysmenorrhœa is commonly found; the quantity varies. Puberty is often established early in these cases.

With *insanity* in its various forms, amenorrhœa is usually present. This is especially the case with the melancholia of puberty, with puerperal melancholia, and with congenital idiocy.

Great nervous shocks often lead to amenorrhœa, which may be permanent (premature menopause).

3. **Diseases of the Vascular System.**—*A priori*, one would expect that heart disease would frequently lead to menorrhagia. An analysis of 50 cases by Gow led, however, to the following general results:

Mitral disease, 44 cases; in 23 cases, or just over half, there was no alteration; in 10 cases menstruation became more scanty; in 6 cases there was amenorrhœa in 5 cases the loss was increased.

Aortic disease, 5 cases; in all there was no alteration.

Aortic and mitral disease, 1 case; the loss was more scanty than before.

4. **Diseases of the Respiratory System.**—*Pneumonia*, like other fevers, may be followed by scanty menstruation and amenorrhœa.

Pulmonary tuberculosis is almost always associated with late, irregular, and scanty menstruation. In the later stages there may be amenorrhœa.

5. **Digestive Diseases.**—*Gastric ulcer* being nearly always found in conjunction with anæmia, is characterized by scanty menstruation or amenorrhœa.

Hepatic cirrhosis usually leads to menorrhagia; and the same result may follow in patients who have no actual hepatic cirrhosis, but who consume large quantities of alcohol and nitrogenous food and lead sedentary lives.

6. **Diseases of the Skin.**—*Obesity* hardly ranks, in most cases, as a disease. It is nearly always associated with scanty menstruation, especially when it occurs in young women.

This list does not pretend to be exhaustive. It may, however, be said broadly, that the majority of general diseases other than those above enumerated have no special influence on the menstrual function.

CHAPTER XVIII

EFFECTS OF PELVIC DISEASE ON MENSTRUATION

The effects of pelvic disease on the menstrual function have been touched on incidentally when discussing the various disorders of menstruation. Here I propose to briefly review some of the pathological conditions of the generative organs, noting the menstrual features usually associated with each.

1. **The Vulva and Vagina.**—Malformation of these parts of the nature of atresia leads to cryptomenorrhœa; otherwise diseases of the vulva and vagina have no influence on menstruation.

2. **The Uterus.** — *Under-development* leads to oligomenorrhœa or amenorrhœa, according to its degree. Atresia of the os externum or internum causes retention of menstrual products.

Flexions and Displacements.—In so far as flexions occur in connection with under-development, they lead to scanty menstruation; retroflexion of a normal-sized uterus, on the other hand, is generally associated with increase of the menstrual flow. All flexions predispose to dysmenorrhœa. Retroversion is commonly accompanied by menorrhagia and dysmenorrhœa; and these disorders are more marked when retroversion is complicated by adhesions and fixation. Prolapse and procidentia do not necessarily affect the characters of menstruation; but any alteration is in the direction of increase in both loss and pain.

Inflammatory conditions of the uterus nearly always cause dysmenorrhœa and menorrhagia; in the case of polypoid endometritis, metrorrhagia is usually found.

Diseases resulting from Gestation.—We need not here consider the hæmorrhages of pregnancy—they are in no sense menstrual. Retention of the products of conception causes menorrhagia and metrorrhagia. There is not necessarily any alteration in respect of pain, but dysmenorrhœa is not infrequent. Subinvolution leads to menorrhagia, but not usually to metrorrhagia. Superinvolution is associated with scanty and irregular menstruation, and in extreme cases with premature cessation of the function.

New Growths.—Subperitoneal myomata do not usually cause any alteration in the characters of menstruation. Interstitial myomata cause increase in the menstrual loss, but do not usually cause intermenstrual bleeding. Submucous myomata invariably lead first to menorrhagia and then to metrorrhagia, and ultimately to a continuous hæmorrhage, in which the indications of periodicity may be obliterated.

Sarcoma leads to irregular hæmorrhage. This is equally true of the variety of sarcoma known as deciduoma malignum; in both kinds hæmorrhage may become continuous.

Cancer of the uterus may first manifest itself by increased loss at the periods. In the later stages, and in many cases from the first, hæmorrhage may occur at any time, or continuously.

In the case of all new growths of the uterus, painful menstruation is by no means a constant feature; but in cases where the growth is so large as to fill the pelvis, pain is usually present.

3. **The Ovaries.**—*Ovaritis* and *ovarian congestion* always cause dysmenorrhœa; they do not usually affect the amount of blood lost.

Prolapsed ovaries do not necessarily affect the characters

of menstruation unless inflamed, or involved in a mass of adhesions. Pain is then present.

New Growths.—Cystic ovarian tumours are usually associated with diminution in the menstrual flow; in other cases there is no alteration in either quantity or pain. If, however, the pedicle of such a tumour undergoes torsion, menorrhagia or metrorrhagia may result. Dysmenorrhœa may also supervene, but only as part of a constant pain. With benign solid tumours of the ovary menstruation is usually diminished or unaltered; on the other hand, sarcoma and carcinoma of the ovary may lead to excessive menstrual or to intermenstrual loss.

4. **The Fallopian Tubes.**—*Inflammatory conditions* of the tubes lead to menorrhagia; this is especially the case in suppurative salpingitis. Tuberculosis of the tubes may be associated with diminished menstruation; but if tuberculous suppuration supervenes, menorrhagia may come on. Dysmenorrhœa occurs in all forms of salpingitis.

Tubal gestation nearly invariably results in irregular uterine hæmorrhage, usually following on a period of amenorrhœa.

5. **The Pelvic Peritoneum and Connective Tissue.**—*Hydroperitoneum* does not commonly lead to any alteration in menstrual characters.

Pelvic peritonitis has the same effects as inflammatory conditions of the tube and ovaries, with which it is almost invariably associated.

Pelvic cellulitis and *pelvic abscess* usually result in menorrhagia and dysmenorrhœa.

Tuberculous peritonitis is commonly accompanied by scanty menstruation; pain is often, but not invariably, absent.

The Effect of Operations on Menstruation.—Only operations on the uterus and appendages are considered here.

Total hysterectomy is necessarily and invariably followed by permanent and complete amenorrhœa.

Abdominal supra-vaginal hysterectomy, with removal of the ovaries, is also followed by amenorrhœa.

When the ovaries are left, menstruation may continue after hysterectomy if only a small portion of the body of the uterus above the os internum has been left; but if the amputation of the uterus has been effected below this level, menstruation does not recur.

One-sided ovariotomy has no effect on the menstrual function.

Double and complete ovariotomy is followed by permanent amenorrhœa. Some apparent exceptions to this rule have been known, and the following explanations have been advanced:

1. The continuance of menstruation is due to the presence of a third, or accessory, ovary. This is hypothetical. As a matter of fact, the presence of a third ovary has never been incontrovertibly demonstrated.

2. The continuance of menstruation depends on a portion of one or both Fallopian tubes being left behind. This is also theoretical; and, if it were a fact, menstruation should hardly ever be arrested by removal of the ovaries, since a part of the tubes is invariably left behind with the uterus.

3. A portion of one ovary has been left behind. This is certainly the correct explanation of many cases. When ovaries are involved in an inflammatory mass it is very difficult to be sure that they have been completely removed, and when the ligature has been undoubtedly tied between the ovary and the uterus a small portion of

ovarian tissue may have been left on the distal portion of the stump. This fact has been demonstrated in cases where the abdomen has been opened a second time.

4. When menstruation has continued after double oöphorectomy in cases of myoma, it is usually found to be due to a polypus or submucous myoma lying in or projecting into the uterine cavity.

CHAPTER XIX

THE DIAGNOSTIC IMPORTANCE OF THE DISORDERS OF MENSTRUATION

I HAVE said, and the statement cannot be too much emphasized, that the disorders of menstruation are symptoms, not separate diseases, and that in treating them it is necessary to look for and treat the underlying cause of which these disorders are useful indications.

In this chapter I propose to review menstrual disorders briefly, and by way of recapitulation, from this point of view.

Amenorrhœa.— We shall first learn from the history whether this is primary or secondary.

If primary, the age of the patient must be taken into consideration. In the case of a girl of seventeen or younger whose health is good, we may conclude that she has not yet arrived at puberty. If eighteen or over, we shall investigate the case to see if some constitutional disease be present, such as anæmia, tuberculosis, or myxœdema. In the absence of any such cause, we shall examine the secondary sexual characters, such as growth of the breasts and the pubic hair, and then the primary ones, such as the condition of the vulva, vagina, uterus and ovaries, to ascertain whether the absence of men-

struation is due to inadequate development. If the general health and the development of organs are alike satisfactory, we shall return to the first assumption, namely, that we have to deal with delayed puberty; whilst in the case of marked under-development we may have to consider it as an instance of permanent amenorrhœa. If the absence of the menses is associated with monthly molimina and with the symptoms and signs of an abdominal swelling, and the girl has passed the usual age of puberty, we must be prepared to find that it is a case of cryptomenorrhœa, with retention of menstrual products owing to the presence of some obstruction. Lastly, we shall have to remember that pregnancy may occur before the patient has menstruated.

When amenorrhœa is secondary, pregnancy must invariably be thought of as the cause; but in the case of an unmarried girl it may be the result of constitutional weakness, which must therefore be inquired into. Amenorrhœa due to lactation will not usually present any difficulties; but here also it is to be noted that the patient may become pregnant again before the resumption of the menstrual function. Secondary amenorrhœa as the result of anæmia is uncommon in married women, but it may occur; and other constitutional conditions, such as tuberculosis, myxœdema, insanity and chronic morphiomania, may lead to the same result.

Persistent amenorrhœa following confinement may be due to superinvolution, and may turn out to be in reality a premature menopause. Apart also from recent pregnancy, amenorrhœa may indicate a premature menopause, especially when it supervenes on some severe bodily illness or mental shock.

Late Menstruation, when the flow is scanty and irregular, will lead us to suspect under-development and

relative or absolute sterility; and the older the patient when menstruation commences, the better founded will be the suspicion.

Menorrhagia and Metrorrhagia are of the greatest possible importance as symptoms of organic disease. From the point of view of diagnosis, the age and sexual history of the patient will materially assist us. Accordingly, cases of menorrhagia and metrorrhagia may conveniently be considered in two main groups, with minor subdivisions, according to certain salient features, which would be readily recognised if the inquiry were being conducted in the presence of an actual case.

Group 1.—*Cases in which the Patient is a Virgin.*—Below the age of twenty-five, increase of the menstrual flow is most often the result of uterine congestion, which in turn may be due to cold or exposure during a period. Sometimes a mucous or glandular polypus will lead simply to menorrhagia, but much more frequently it produces metrorrhagia. This fact usually serves to distinguish hæmorrhage due to congestion from that which is due to a polypus.

At any age menorrhagia may be due to a congenital or acquired retroflexion of the uterus, combined with retroversion. I have met with some instances of this association in quite young girls.

Above the age of twenty-five uterine fibro-myoma begins to be an important factor, though it is not very often found before the age of thirty or thirty-five. At first uterine myoma causes simply an increase in the quantity and duration of the monthly flow; and in the case of an interstitial myoma this characteristic may remain even when the tumour is large. On the other hand, increase of size is often accompanied by intermenstrual hæmorrhage, and this is almost invariably

the case when the tumour is sub-mucous or polypoid. A sub-serous myoma does not commonly affect the character of menstruation. Uterine congestion, or endometritis, may also lead to menorrhagia, and a mucous polypus to metrorrhagia at the age that we are considering.

Above the age of forty any of the above causes may be operative, and in addition we have to think of the possibility of malignant disease, especially carcinoma or sarcoma of the body of the uterus. Epithelioma of the cervix, on the other hand, is very rare in virgins. Malignant disease may develop before the age of forty, and this is especially the case with sarcoma. Hæmorrhage due to malignant disease takes the form of metrorrhagia.

We may sum up the above facts in a table as follows, the conditions put in brackets being rarer ones :

Age.	*Menorrhagia.*	*Metrorrhagia.*
Under 25	Uterine congestion Retroflexion and retroversion (Interstitial myoma)	Mucous polypus (Submucous myoma)
25 to 40	Uterine congestion Endometritis Retroflexion and retroversion Interstitial myoma	Mucous polypus Submucous myoma (Carcinoma or sarcoma of the body of the uterus)
Above 40	Interstitial myoma Endometritis Uterine congestion Retroflexion and retroversion	Submucous myoma Mucous polypus Carcinoma of the body Sarcoma of the body (Epithelioma of the cervix)

The diagnosis must of course be reserved until the

physical signs have been investigated, and this will be done either by bi-manual examination or by exploration of the uterine cavity.

Group 2.—Cases in which the Patient is not a Virgin.—In this group we have two new factors introduced which may lead to hæmorrhage, namely, gonorrhœal infection and pregnancy and its sequelæ. To simplify the matter, this group may be considered under three heads :

(*a*) *The Patient has never been Pregnant.*—When a patient who has been married but a short time gives a history of menorrhagia following on symptoms of gonorrhœal infection, such as purulent discharge and scalding micturition, she is probably suffering from pyosalpinx. In the absence of such infection, menorrhagia, accompanied by backache and leucorrhœa, points to uterine congestion, probably brought on by want of moderation in the sexual functions. Metrorrhagia coming on in the absence of any signs of pregnancy points to a polypus; slight metrorrhagia, accompanied by severe lateral pain, especially when following on a short period of amenorrhœa, must lead one to look for extra-uterine pregnancy. Menorrhagia, followed by metrorrhagia, in a woman over thirty-five, will suggest uterine myoma; whilst hæmorrhage occurring after forty is suspicious of malignant disease. In their tendency to the last two conditions, married nulliparæ resemble single women; that is, they are prone to myoma and to carcinoma or sarcoma of the body of the uterus, whilst they are relatively exempt from epithelioma of the cervix.

(*b*) *The Patient is Pregnant.*—As a rule, hæmorrhage coming on after a few months of amenorrhœa points to a threatened abortion ; and if profuse and accompanied by rhythmic pains, the miscarriage may be regarded as inevitable. The possibility of a hydatid mole must also be

remembered. Irregular hæmorrhage, small in quantity and dark in colour, following on a short period of amenorrhœa, may be due to tubal pregnancy. From the middle of the term of pregnancy onwards, hæmorrhage may be due to placenta prævia or to partial detachment of the placenta. Occasionally carcinoma of the cervix complicates pregnancy, and causes metrorrhagia.

(*c*) *The Patient has been Pregnant.*—In cases of recent pregnancy, menorrhagia may be due to subinvolution; but when associated with metrorrhagia, the cause is often a piece of retained placenta. It must be remembered that the condition known as deciduoma malignum is characterized by metrorrhagia. When the patient is a multipara, and is over forty years of age, the bleeding may be due to cancer of the cervix or to endometritis. Multiparæ are also subject to uterine myoma, but less frequently than nulliparæ. Irregular and profuse bleeding sometimes marks the onset of the menopause. This simple explanation must never be assumed, however, till other conditions have been excluded. When hæmorrhage sets in some months or years after the menopause, it is almost invariably due to carcinoma, but occasionally it arises from a senile endometritis.

In both single and married women solid tumours of the ovary, especially carcinoma and sarcoma, may lead to menorrhagia; and the same result may occur when the pedicle of a benign tumour, cyst, or dermoid becomes twisted.

Traumatic hæmorrhages from the genital tract require no more than mention.

The hæmorrhages met with in married women may also be stated in tabular form, as follows:

	Menorrhagia.	*Metrorrhagia.*
Nulliparæ	Uterine congestion Pyosalpinx Uterine myoma	Uterine polypus Uterine myoma Carcinoma or sarcoma of the body Extra-uterine pregnancy (Epithelioma of the cervix)
During pregnancy	Menstruation during pregnancy (?)	Threatened miscarriage Accidental hæmorrhage Placenta prævia Hydatid mole Tubal gestation (Carcinoma of the cervix)
After pregnancy	Subinvolution Endometritis Uterine myoma Senile endometritis Irregular hæmorrhage of the menopause	Placental polypus Carcinoma of the cervix Uterine myoma (Carcinoma or sarcoma of the body of the uterus)

I need not here enter further into the question of diagnosis or discuss the physical signs of the various conditions enumerated as causing menorrhagia and metrorrhagia; for these a text-book on the diseases of women should be consulted.

Dysmenorrhœa.—In exceptional cases, painful menstruation may be considered as 'idiopathic,' by which I mean that it may be present when there is neither constitutional neurosis nor discoverable organic pelvic condition to account for it. But it must be admitted that in such cases the underlying cause may be not 'non-existent,' but simply 'undiscoverable.'

When menstruation becomes painful shortly after its onset, and is scanty, the most probable cause is acute anteflexion or stenosis, or both conditions combined. If, on the other hand, the flow is abundant, the pain may be attributed to congestion or to a backward displacement. When dysmenorrhœa follows an attack of gonorrhœa, it is usually the result of endometritis or pyosalpinx; and in the later stages it may be due to more generalized pelvic cellulitis or peritonitis. In the absence of any pelvic inflammation, dysmenorrhœa following child-bearing is often brought about by backward displacements of the uterus, or by prolapse and congestion of the ovaries. In these conditions, and in all forms of pelvic inflammation, dyspareunia is generally present, as well as dysmenorrhœa.

Whilst pelvic tumours, whether uterine or ovarian, not infrequently lead to increase in the menstrual flow (this being especially the case with uterine tumours), dysmenorrhœa is by no means a constant or characteristic feature of such growths. But if the tumour is large enough to cause pressure on surrounding organs, menstruation is apt to become painful.

Monthly pain associated with absence of a menstrual flow in a patient above the age of puberty should always lead to an examination to determine if it be a case of concealed menstruation.

INDEX

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