

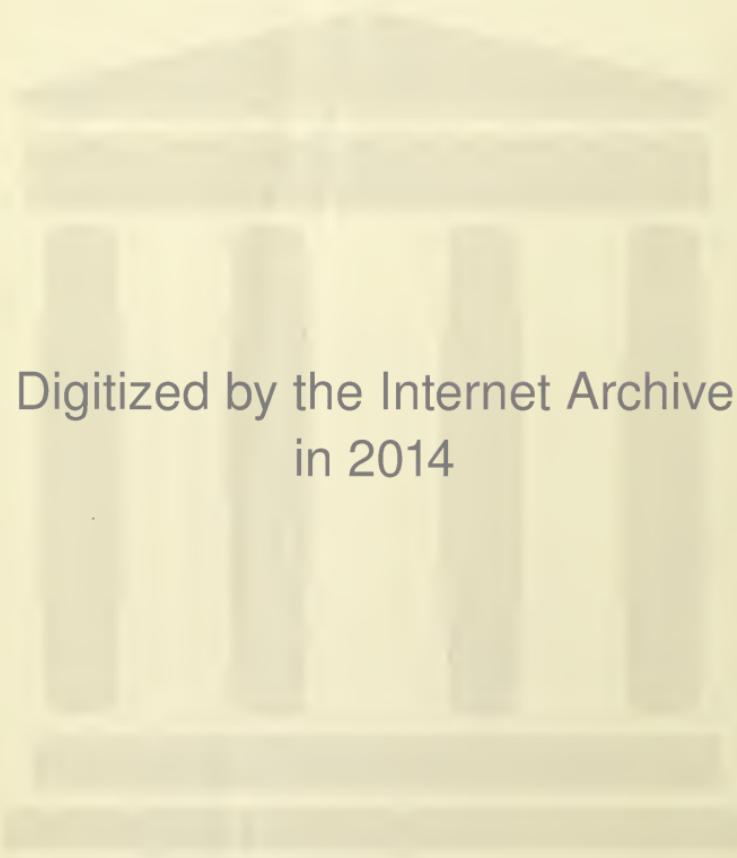
SEX EFFICIENCY  
THROUGH EXERCISES  
SPECIAL PHYSICAL CULTURE  
FOR WOMEN

TH. H. VAN DE VELDE  
M.D.



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# **SEX EFFICIENCY THROUGH EXERCISES**

**SPECIAL PHYSICAL CULTURE FOR WOMEN**



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TH. H. VAN DE VELDE, M.D.  
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# **SEX EFFICIENCY THROUGH EXERCISES**

## **SPECIAL PHYSICAL CULTURE FOR WOMEN**

**WITH 480 CINEMATOGRAPHIC AND 54  
FULL-PAGE ILLUSTRATIONS**

BY

**TH. H. VAN DE VELDE, M.D.**

FORMERLY DIRECTOR OF THE GYNÆCOLOGICAL CLINIC AT HAARLEM  
AUTHOR OF "IDEAL MARRIAGE," "SEX HOSTILITY IN MARRIAGE,"  
"FERTILITY AND STERILITY IN MARRIAGE," ETC.



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## PREFACE

IN order to give readers a clue to the title of this book and an indication of its contents in order that my proffered explanations and suggestions may be received in the spirit which inspires them—let me outline, in advance, the main theme of these pages, although that is also dealt with and summarised in various passages throughout the book itself.

For I lay great emphasis on this book which forms an essential part of the work to which my life is dedicated, namely, *the spread of knowledge and insight into the sphere of conjugal relationships and the increase of human happiness thereby*, with special stress on medical and physiological aspects which have, hitherto, been ignored or despised by the majority. And this book contains a greater amount of work than any of my earlier publications.

It aims at providing a *guide for women and those who help them* (whether as doctors, midwives, nurses and gymnastic instructresses) in the full evolution and utilisation of the feminine sexual capacities and faculties. These capacities and faculties are generally quite inadequate in practice ; they should include both *appropriately active participation* in the act of sexual congress and *appropriate voluntary muscular action* which assists the act of birth. At present, women generally suffer both of these great genital experiences passively and to their great disadvantage, they do not know how to regulate and modulate by sharing them ; for to do so requires a muscular mastery and harmony which is very rare. So this mastery and harmony of muscular action must be taught to women. With this purpose in view, I have worked out a *complete system of pelvic gymnastics* in consultation and co-operation with the gymnastic instructress, *Mrs. Lisa Mar*, of Baden Baden, to whom I express my sincere thanks for her help, which was as efficient as it was indefatigable. This system is described

in the following pages, and then there are detailed the special gymnastic exercises suitable for pregnancy.

We have a further requisite as well as complete muscular co-ordination for, after the act of birth, the woman's general health and *genital efficiency* must be fully restored. Every expert knows how grievously many individual women and many married couples suffer through the needless impairment or loss of feminine charm in this specific sense. Moreover, the number of women—and men too—who avoid this damage and difficulty by avoiding parenthood itself is greater than might be supposed. The exercises after child-birth described in Chapter XIII., together with previous pelvic physical culture, will make possible timely prevention of such disfigurement and disablement.

Thus, not only will the physical intimacy of marriage be much enhanced for both partners, but the maternal functions of woman—gestation and birth—will be relieved of much pain and fear.

But, indispensable as is the technique of these exercises, I would not wish to lay the main stress on gymnastic methods, nor to write a "treatise on physical culture" in the accepted sense of these terms.

These exercises are means to an end. And this end and aim is the recognition of the dignity and value of sex, its value mentally and emotionally as well as physically. Women should become gladly conscious of this, and so should all whose privilege it is to bring them healing and help. Therefore, I have written in considerable detail and offer my book not only to women themselves and to experts in physical culture, but to all who are occupied or interested in promoting human welfare in this department.

As "Ideal Marriage" taught *men* the technique of physical love, so I hope that this book will give *women* the key to complete erotic satisfaction.

"The woman of to-day has *acquired consciousness of herself as an individual*. Yet she is perturbed and tormented by the need to reconcile the strange contradiction in her being, for she is, biologically and organically, first and foremost, not an isolated independent unit, but linked with

other lives as the vehicle of the race. The message we bring here should help to solve her problem by harmonising the individual need for experience and culture with the instinctive life of the race ; by making the child-bearer more efficient and 'fit' in motherhood and the lover more apt and happy in love ; for that love is, at its best, at once the supreme triumph and the supreme surrender, the quintessence of abandonment and of achievement. These are emotions as profound and as permanent as any of which human nature is capable, but which can only be experienced *through the instrument of a sexually efficient body* in the fullest sense."

TH. H. VAN DE VELDE, M.D.

VAL FONTILE,  
MINUSIO-LOCARNO,  
SWITZERLAND.

*February, 1933.*



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# SEX EFFICIENCY THROUGH EXERCISES

## FIRST SECTION

### PELVIC EXERCISES IN GENERAL

#### CHAPTER I

##### INTRODUCTORY REMARKS. THE VALUE OF PELVIC EXERCISES FOR WOMEN

AFTER reading the available literature on gymnastics for women and realising the large amount and high quality of work already done, the inquirer is inclined to feel that the ground has been thoroughly mapped out and that there is little possibility of fresh contributions.

But the gynaecological specialist, in search of help and light with regard to the service gymnastics can render women's important special functions as mother and as mate, is less satisfied that all that could benefit women from physical culture, in theory and practice, has been utilised.

The special functions of women are often mentioned, and there is certainly constant reference to the need for remembering her particular structures and their treatment, if vigorous gymnastics are to help women rather than harm them.

The *importance of the pelvis* has been recognised, both as the static basis of the trunk and as the framework enshrining the organs of motherhood. Many authors even lay repeated stress on the need to strengthen the pelvic—and especially

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the *perineal*—muscles if harm from difficult and frequent births is to be countered. But, on the whole, these somewhat vague—though indisputable—truths are all that is vouchsafed concerning the functions of women, in sex and maternity, from the point of view of the advocates of “*pelvic exercises.*” *And this is not enough.*

In practice the results of what we know about physical culture and human anatomy are observed and utilised more helpfully in “amateur physical exercises,” than in professional gymnastic displays, games and sports. For, in the latter, there is not sufficient recognition of the woman’s different structure and needs. Women with *particularly powerful and tense muscles in the lower part of the body are apt to suffer excessively, and often incur permanent injury after child-bearing*, for the muscles act as constricting iron bands, through which the child must make its entry into the world. This entry is always painful to some degree, but it is rendered much easier and less exhausting, for both parties to the act of birth, if the maternal muscles are *strong but supple, elastic and under control, both in their contractions and relaxations.* And this is especially the case with the *perineal and perivaginal muscles*, which have been somewhat ignored by gymnastic theory and practice until the immediate present.

This realisation of the possibilities of physical culture is significant and helpful, but largely *negative*—indicating what *not* to aim at—rather than *positive*. But the practical efforts of students of physical culture in relation to the special functions of women have produced a few short manuals on gymnastics during pregnancy, as well as the recognition that some gymnastic exercise of a remedial type is necessary after child-birth. These manuals are, however, elementary, and do not offer anything like the amount of knowledge that is available, nor of help that is requisite. Finally, we must record that medical recognition of the importance of the *pelvic floor* for the position of the female genital organs—or rather, the practical application of this knowledge—has enriched the gymnastic repertory with a number of exercises, supposed to strengthen the muscles of

that region. But this supposition proves mainly mythical in the case of most of these exercises, however useful and beneficial they may be in other respects.

In short, our exact present gains and achievements in physical culture for the genital functions of women are extremely meagre. The direct advantages we offer are microscopic compared with the enormous *indirect benefits to women's genital and maternal functions* through generalised physical culture—as already indicated. So it is not surprising that in many cases justified enthusiasm at what has been done is being superseded by disappointment at what is still to be done. For, indeed, we must not only develop physical culture during pregnancy and after child-birth—building on the rudiments already to hand—but also emphasise the value of gymnastics—and especially of systematic gymnastic of the pelvic region—for the two cardinal functions of coitus and birth ; and, having obtained serious public recognition of this value, we must *investigate and formulate the appropriate exercises into a system.*

The neglect of special genital and maternal physical culture for women, though deeply to be deplored, is not so incomprehensible as may appear at first sight. It is worth while to consider the causes of this neglect, since *the psychological and mental factors are of crucial importance in this whole region of human conduct ; especially as regards the act of coitus.*

The explanation of the neglect of systematic pelvic gymnastics in order to facilitate *the act of birth* is comparatively simple. The only person who knows all the structures and processes involved in birth well enough to realise the benefits which special training might bring is the experienced, scientifically inclined and open-minded obstetrician. But among obstetricians of such quality there are only a few who take a theoretical interest in gymnastics, and hardly any in whom such interest extends to practical details.

The neglect, or rather the repression, of all consideration of the importance of physical culture for coitus is on a

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different plane. It is common to both men and women among physical culturists. It is a part of the inhibition and suppression of this central vital function from public speech, and still largely from public print, and this inhibition prevails to a dangerous degree even in scientific publications and discussions.

I will offer one among many examples of this lacuna in scientific instruction. A medical woman, *Dr. Auguste Hohbaum*, has written a section in a book—"Weibliche Körperförmung und Bewegungskunst" (In "Anatomical Structure and the Art of Movement for Women").<sup>(1)</sup> She treats of gymnastics and touches on sexual functions. She says: "The first genital function of the growing girl is menstruation." And then: "The second genital function of the womanly organism is pregnancy, culminating in birth." Apparently there is NO intermediate act or process! Or, it is not sufficiently important to be specified. Pregnancy might be supposed to supervene without any initial act or process whatever!

This example, which is typical, has not been cited in order to condemn the book in question. It is indeed far from easy to oppose what is still the prevalent trend in public speech and print. Far from easy, but, sometimes, just and necessary; and equally necessary to inquire, however briefly, into the causes and mechanism of this gigantic repression.

It is, of course, undeniable that one of the causes is deliberate hypocrisy and conscious pretence. But there is also a considerable degree of instinctive timidity, of shyness and of inhibition—of the peculiar inhibition and shyness we feel when anything closely interwoven with the powerful and private influences of sex and love, which move us all, however variously, becomes the subject of public discussion. There is a certain revolt of the Ego against any public revelation, or comment, on the most intimate portion of each life and each personality. This instinctive reserve is not wholly identical with sexual modesty, although they are closely interwoven. But to analyse it in detail would afford material for a treatise in itself, and I wish, so far as possible

at present, to avoid psychological and philosophical subtleties. It may, however, be confidently asserted that such mental and emotional inhibitions are not solely due to the influence and ideals of Christianity, as has often been maintained both by advocates and critics. Doubtless *Nietzsche* was partly, at least, justified in his denunciation of the poisoned cup that Christianity served to Eros—for many of the leading fathers of the Church denounced all sexual life as shame, sin and dirt. But we must also admit that any social order demands *some* degree of regulation of the sexual activity of its members as a necessary condition of stability, safety and even progress. Yet such necessary regulation and limitation directly contravene urges and impulses of elemental force, which either dominate or saturate emotional life from childhood. This implies psychic conflict, forcible expression or deflection or conscious dissimulation ; and the result is a profound *dishonesty* in all sexual matters. Such a state of mind fully explains the insincerity and inaccuracy of most of us in these matters, whether to ourselves, or—and especially—towards our fellow-men and women, still more in any sort of publicity. At the same time, so intricate a labyrinth is the human psyche, it is equally certain that *some* degree of modesty, shame or shyness in these matters has become fundamental and spontaneous, at least in the white races.

Perhaps the most striking proofs of this innate and acquired modesty are the automatic convulsive movements with which most women who are losing consciousness—in certain morbid states, or under anesthetics or narcotics—endeavour to conceal their sexual organs.

Then there is the opposite emotional pole, *the conscious repeal of inhibition*, which takes place in certain situations and between certain persons ; at its unwise and unloveliest perhaps between certain married partners in the course of their daily or nightly toilettes, out of sheer laziness, apathy and gross lack of mutual consideration and individual self-respect.

Sexual modesty in itself is concerned rather with the *functions* of the organs of sex than with the organs themselves. “Functional modesty” is a common human

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attribute, whereas many primitive peoples do not cover the genitalia and perineum.

And there is yet another form of modesty, more rarefied and complicated than either organic or functional shame-facedness, which we might term *erotic shyness*. This applies to the emotions, and is often undiminished even when law, custom and religion approve, as in marriage. Such intense and intricate sensitiveness is associated with *reverence* and with the desire to keep the soul's inmost sanctuary from all unwelcome touch, word—or *thought*.\* Moreover, even to-day, many men believe that any mention or discussion of such matters degrades and stains the woman they love ; and this—in itself extremely complex—trend of thought and feeling contributes a further quota to the deliberate suppression and dissimulation of all sexual activity within marriage.

In my youth, I experienced a striking and memorable example of this inhibition in thought and speech, especially as concerns third parties, and even when the possibility of offspring was the chief subject to which allusion was made. I was present at a wedding breakfast ; the host, a man respected by all, was the adoptive father of the bride, and in his speech of goodwill and congratulation to his foster-daughter and her bridegroom, he wished them the blessing of children in terms of touching emotion, for he had himself suffered deeply because this blessing had been denied to him. Among the younger guests, many of them medical men with their *fiancées*, there was general indignation and resentment at such freedom of speech ! Reference to the natural results of married union was considered indecent ! We may shake our heads in regretful disapproval of this and prefer the more direct and spontaneous speech of the common people ; for in spite of the freedom and modernism of certain sections of our young people to-day, the climate of thought is unchanged among the majority of the responsible highly educated, hard-working, professional classes who form so valuable—I would even say, *indispensable*—an element of the community.

\* See the more detailed studies by *Alfred Vierkandt* (2), *Havelock Ellis* (3) and *Adolf Gerson* (4).

Only a few years ago, I experienced a very similar scene, though in a different setting and circumstances, which was received with a precisely similar embarrassment and resentment by the young people who took part in it. And quite recently I have had written or oral statements from several young married women to the effect that they had hitherto prevented pregnancy, simply and solely because the fact of public proof of their intimate erotic life was intolerable to them.

I cannot agree that sexual modesty should be so generally disregarded, denied and cancelled as, *e.g.*, certain advocates of extreme Nudism recommend. Sexual modesty has its appropriate times and places and should not shroud the whole of life. But in my opinion a woman who reveals her whole body to her husband, in any and every circumstance and as a matter of course, is as unwise, indelicate and erotically callous and clumsy as the frigid prude who never abandons herself, without veils or reserves, to love-play. And it is just as fatal an error to think of marriage, and deny its sexual aspects, as it is to regard marriage as a succession of sexual encounters and nothing else. The act of union between man and woman is important and fundamental to the whole of life. It is a deplorable mistake to speak of it only in terms of flippancy and lubricity, or to approach it only with irresponsible desire ; it is an equally deplorable mistake to depreciate the significance of the central coital act itself, and of the necessary actions and emotions, both for the individuals and the social institution of marriage.

*This act and its emotional superstructure are, in fact, depreciated and degraded if we do not endeavour to make it as satisfactory and successful as possible in every way.*

In "Ideal Marriage,"<sup>(5)</sup> I endeavoured to give men the necessary knowledge and guidance to that end. I shall now suggest and indicate to women how they may best co-operate in what should always be *reciprocal*. The need for light and help here is great, and therefore, the inhibitions aforesaid, as well as many other inconveniences and hindrances, must be

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overcome and we must face facts and estimate their value. For—just as in numerous cases of masculine deficiency in erotic technique—here, too, the happiness of many homes is at stake.

We modern persons of Western civilisation have achieved and attained much in various directions ; but, in respect to our most primitive and indispensable vital functions, we are bunglers for the most part. Almost everything which we regard as a matter of course, we do inadequately or in a harmful manner. We must learn, through years of physical evolution and education, how to eat wholesomely, how to *masticate, choose and space our food*. Similarly, we must learn how to stand upright and how to move well ; otherwise our movements are awkward and ugly. Hardly anyone knows how to use his muscles to the best advantage ; how to achieve the *maximum of result* with the *minimum of strain*. We have to be taught the distinctive human attribute of speech. We do not even *breathe correctly* by instinct and reflex action ! At least we do not, as a rule, understand how to make the best use of our respiratory organs, any more than of our muscles.

And the same is true of the proficiency of most human beings (of our age and clime)—in the act that gives life and celebrates love. Of course, just as most of us are able to breathe well enough to continue some form of conscious existence, the act of coitus is generally not so utterly bungled that its *biological* purpose of procreation cannot be fulfilled. Nevertheless, as I have pointed out,\* desired parenthood may be promoted or in some cases attained, and unwanted increase prevented, or rendered unlikely by appropriate position and action in coitus. But, just as every breath we draw *should be* an “inspiration”—a draught of health and vigour and *bien-être*—so also there is a biologically secondary but individually supreme function of communion, of mutual ecstasy and love in the bodily merging of those who truly love one another, which cannot be achieved, if technical details are neglected or bungled.

\* In “Fertility and Sterility in Marriage.”<sup>(6)</sup> See especially Chapter XIII.

The greater majority of women have no technique in this matter, and many have no idea that such is necessary. *Even those who share the liberation and culmination of the orgasm are apt to remain needlessly passive and receptive beforehand*, instead of participating in the rhythmic motions; or they make such vehement and ill-judged attempts at motion that they spoil both the man's sensations and their own.

The psychological causes of these failures cannot be considered in detail here. They are partly to be sought in the men's attitude of mind to sex, and partly in the women themselves, and are also largely due to the manner in which most married couples approach sex.

In short, women do not, as a rule, know either what *can* be done or what *should* be done in order to make coitus completely successful. They do not know the mechanism—or even in many cases the *existence*—of their own perineal and perivaginal muscles. And among the comparatively few who possess this knowledge, even fewer have any conscious control.

My experience, both as a gynaecologist and—especially—of late years, as a specialist in marital problems, has convinced me that this feminine ignorance and inadequacy are often fatal to married happiness. I have had cases in which either the husband or the wife herself has deplored the latter's defective attitude in coitus. The circumstances in those cases when the women acknowledged their own inadequacy were sometimes poignantly pathetic. Thus, within one year, I came across three instances of the following situation (with certain individual variations, of course, but essentially the same). A devoted wife, a modest and respectable woman in every sense of the word, finds her husband's ardour greatly decreased and his manner cooler and more aloof. She has no exact knowledge of the reason, but she has *intuition*, sharpened by love and grief and unclouded by vanity. *She has consulted leading gynaecologists in three different countries without obtaining any light on the matter*, or any appreciation of her need! So she went, in secrecy, to a house of ill-fame to beg for instruction and advice as to how to recapture

her husband ! (Needless to say, her pitiful quest was in vain.)

Another familiar figure of everyday human tragedy is the wife and mother who has borne two or three children : who has had no relevant instruction or effective treatment after her confinements, and is, therefore, unable to compensate for the unavoidable stretching and slackening of her organs, by conscious contractions and rhythmic movements of the pelvis and the muscles of the pelvic floor. Or, again, her husband, who finds that maternity has robbed his wife of her special physical charm in coitus. I have discussed this matter with experienced gymnastic instructresses of serious and alert mind. They unanimously testified that they had been much impressed by the lively interest shown by mature married women (in the forties) for pelvic exercises, and, above all, for those involving the *muscles of the pelvic floor*. They described the indefatigable persistence and vigour with which these women performed such exercises, and tried to master the processes involved, and those instructresses who were themselves already initiated, were in no sort of doubt as to the reason and motives for this gymnastic zeal.

I would add a final series of examples to the foregoing list. When I first contemplated a brief monograph on pelvic physical culture and its benefits for women, I discussed the idea with a certain number of married women, in order to test their views. I chose for consultation, only such women as I knew to have lived for at least three years in apparently normal marriage, who were free from flippancy and irresponsibility, and were mentally above the average and capable of sound judgment. *Without exception, they immediately recognised and emphasised the importance of pelvic physical culture for women in coitus, and gave me encouraging approval from this point of view.* They passed over the (equal) significance of pelvic physical culture for *pregnancy, birth and the process of local involution, which is termed the puerperium, and concentrated on the coital values.*

Therefore I consider it indubitable that many women are more or less definitely and acutely aware of their deficiencies

in this respect, and anxious to improve. Indeed, it is not too much to say that this consciousness is the source of *a sense of inferiority* in many wives, which needlessly burdens and embitters their lives and their marital relationships. And, finally, it is evident that such women long for improvement and release from their disability and feel—often dumbly—in which direction help should be sought : but do not know *how* to set about their quest.

## CHAPTER II

### NATURE AND PURPOSES OF PELVIC EXERCISES

- (a) *Exercises of the Pelvic and Abdominal Zone.*
- (b) *Exercises of the Pelvic Floor.*

GYMNAStic exercises are systematic and purposive training of muscles; in most gymnastic exercises two or three sets of muscles take part, for the *joints* of the body are involved. There are, however, important muscles which are not attached to joints, or with which joints are not specially connected. As examples, we may cite the *facial muscles* and those of the *diaphragm*. The diaphragm has the form of a cupola, or segment of a sphere, with the convex side uppermost; the cupola becomes lower and flatter when the diaphragmatic muscle is contracted. There are certain resemblances, together with considerable differences, between the diaphragm and the pelvic floor. The pelvic floor is a narrow and shallow cupola with the convex side *undermost*. If the local muscles are contracted the pelvic floor is somewhat flattened, and the terminal portions of the passages which open into the perineal cleft—vagina and rectum—are drawn upwards and inwards, thus narrowing certain portions of these passages. But, if special portions of the perineal muscles are contracted *separately*, the vagina may be even more definitely affected in other sections of its length. There is virtually *no action of the joints* in these contractions of the pelvic floor. For the hip joints, though generally very important, have only a limited degree of flexibility, and that portion of our bony framework, which we term the pelvis, is a comparatively solid girdle of massive bones connected by large, thick and inelastic ligaments. But there are also other and smaller muscles peculiar to the pelvis. So, in the strictest sense of the term, “Pelvic Exercises” ought to mean exercises for the control of the muscles of the pelvic

floor or perineum. And perineal exercises are indeed an important and almost autonomous section of pelvic physical culture, although they may be indirectly assisted and promoted by the contraction of adjacent muscles and the accompanying nervous reflexes.

But we will not restrict the term pelvic exercises to the perineum alone, but take a wider view, including all such muscular exercises as are in any way connected with the pelvis, and which move the bony girdle either in relation to its external surroundings as a whole, or move its main portions, *e.g.*, the sacrum in relation to the two iliac bones. In other words, we shall treat the exercises of the pelvic zone as well as those of the pelvic floor.

*"What is the purpose of pelvic exercises, and how is this purpose effected?"* In our reply it will be necessary to resort to repetition for the sake of completeness.

Pelvic exercises promote the circulation of the blood and the lymph throughout the blood vessels and lymph ducts of the pelvic organs, especially of the whole genital tract. They help a wholesome and well regulated functional activity, prevent disturbances of menstruation and relieve such disturbances in certain circumstances. If pelvic exercises are carried out with due care and intelligence, they guarantee—to some extent—the normal position of the delicately poised uterus and ovaries, and prevent injurious displacements. Pelvic exercises may, further, help to make and keep the genital organs fit for their reproductive work.

Pelvic exercises put women in the position to exert *an active influence in coitus*, both as regards the promotion or regulation of conception, and, by, accentuating the sensations of mutual pleasure with their harvest of happy memories, mutual gratitude, refreshment and relief.

By appropriate pelvic exercise, with *due caution, during pregnancy*, a woman can keep herself healthy and ready for her heavy ordeal, particularly by quickening the circulation of the blood in pelvis and lower limbs, which is apt to be much impeded in pregnancy.

She can keep her abdominal muscles—already strengthened by exercise and wise habits beforehand—in good condition, and her perineal muscles—on which will fall the main stress and strain—as well.

During the *process of birth itself*, the practised and instructed woman should be able to exercise *some amount of conscious control* over her muscles, thus avoiding needless strain and suffering, and, so far as possible, *accelerating birth without injurious interference*. *The acquired and cultivated aptitude of controlling the two main muscular systems of abdomen and perineum, and contracting them or relaxing them at will, is specially helpful in the final stages of expulsion*, and spares the woman both local tears and some degree of pain. Moreover, rapid and convenient *changes of posture* (for instance, in the suspensory attitude known as *Walcher's*, as well as the attitude of extreme flexion\*) may be employed to the best advantage, so that the pelvic entrance or exit may be more easily negotiated.

What of the critical period of recovery and involution after Child-birth?

Pelvic exercises can restore the natural elasticity and contractile power of the muscles so severely tested in the perineum, as well as in the lower abdomen. They can help to restore the normal circulation in the genital organs, and thus also their normal position and condition. And, of course, these *puerperal pelvic exercises* have very much greater efficiency and chance of success if the muscles in question are in good condition through previous training, and the woman's whole body agile and "fit."

A rational and appropriate pelvic physical culture will probably be able to diminish or cure certain morbid symptoms,† such as the persistent "*pains in the back*," so frequent among women, or even to "*nip them in the bud*" if taken in time.

Finally, there can be no doubt whatever that pelvic exercises have a marked curative effect on certain gynæco-

\* See "Ideal Marriage," Chapter XI., and Chapter XIII. in "Fertility and Sterility in Marriage," as well as Chapter VIII. in the present work.

† Through static-dynamic compensation. Cf. the publications by Kermauer (7) and Jungmann (8), cited in the Bibliography.

logical disorders and diseases, as well as on some of the symptoms which trouble women during *the change of life*. And we may unhesitatingly include these benefits as further recommendations. The exact mechanism here, will be treated of later.

*The significance of pelvic exercises for the reproductive functions of women is therefore great and manifold.* And this form of physical culture helps women further *in their whole bodily organism*, and *in their whole individuality*, by increase of health and by justified pride and pleasure in such health and efficiency, both human and specifically sexual.

Two further related aspects of pelvic exercises must be considered before passing on to an exact statement of methods.

First and foremost, it is certain that any and every pelvic exercise is not equally and wholly suitable for any and every age and stage of reproductive growth. What is useful and beneficial in one set of circumstances may do positive harm in another. We shall deal with this difference in greater detail.

A further psychological difficulty arises, though many people will not find it in any way a difficulty or a problem. Should young girls be informed of the importance and significance of certain pelvic exercises for future coitus, when they are instructed in the exercises? *It is quite certain that all gymnastic exercises have the best prospects of success if and when the gymnast understands quite clearly, not only what she is doing, but also why.* Nevertheless, at the risk of seeming hopelessly old-fashioned, the author would not advise such detailed and explicit information to young girls. He is deeply convinced that it is in the interests of women themselves, and for their welfare and protection, if their sexual experience takes place within marriage; and he is certain that anyone, man or woman, who has not normal, responsible and socially recognised opportunity for sexual experience, should refrain from letting the mind dwell on the

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subject, thus bringing an incalculable force into action. Therefore he advises *against* following the example of many coloured races, who give explicit instruction in this respect,\* set in a traditional ritual framework. He would suggest that *direct* perineal gymnastics are best postponed till after marriage. But that *indirect* exercises of the pelvic floor need have no injurious effects in either perplexing, exciting or distressing the most sensitive growing girls. The same is true of most exercises of the abdominal or pelvic zone ; others, again, are best reserved for a later date.

And what of clothing during the exercises ? Should it be cast wholly aside or not ?

This is largely a matter of personal inclination, *i.e.* of taste, and *de gustibus non est disputandum*. And I agree that *Mrs. Mensendieck*<sup>(9)</sup> is quite correct in emphasising the impossibility of judging whether a fully clothed body performs certain postures and movements in the right way. Nevertheless, I think we should do well to limit the nude exercises to the minimum absolutely necessary to judge accuracy and adequacy here ; and this minimum is very small indeed in pelvic exercises. Therefore I should not associate myself with *Mrs. Mensendieck's* recommendation to perform individual gymnastic exercises nude, and between two mirrors, or rather, I should not extend this recommendation to the exercises here in question. I do not consider the risk of Narcissistic suggestion either exaggerated or at all unfounded in certain cases, and the possible developments of any such self-centred and self-directed erotic trend should be avoided.

Therefore also, pelvic exercises are not appropriate for class use. They are very individual and should be performed under the special attention and supervision of the instructress, and then alone. In the first circumstances tricot combination garments are probably best ; and these can be removed, if necessary, in order to permit the instructress to

\* See *Ploss-Bartels' "Woman, in Her Anthropological Aspect"* (William Heinemann (Medical Books) Ltd., London), and *Havelock Ellis in "Psychology of Sex"* (William Heinemann (Medical Books) Ltd., London).

judge and correct certain movements. In exercising alone, I think a light loose pyjama suit would be better, at least after the principles and details of the exercises have been fully mastered. A loose pyjama suit gives fuller ventilation than even the lightest cotton, silk or "rayon" tricot combination, and avoids pressure or friction on groins or perineum. Of course, any woman who is accustomed to do other gymnastic exercises nude can remain so in this case, too; but she should keep the temperature of her room under control, as pelvic exercises should be performed more *slowly* than those of arms, neck or trunk.

Direct perineal exercises are, of course, best performed without clothing. The same is the case in puerperal pelvic exercises, *i.e.*, after child-birth.

## EXERCISES OF THE FIRST GROUP: PELVIC AND ABDOMINAL ZONE

### CHAPTER III

#### INTRODUCTION

WE shall first deal with exercises of the pelvic or abdominal zone, briefly explaining their process and mechanism and describing a selection of such exercises. Only a *selection, bien entendu!* For the possible modifications and combinations of muscular action are so numerous that it would not be possible to enumerate them all in detail. Among these possible pelvic exercises, however, there are many in which the pelvis and lower abdomen are merely accessories—however active—but our exercises have been specially chosen with a view to *letting the pelvis "play lead."* For it is the aim of this study not only to give women complete control of all the pelvic muscles concerned—extraordinarily important though such control may be—but to make this control so absolute that it becomes instinctive, almost automatic, in fact. And we must remember that in most women the pelvis is relatively static and immobile. Pelvic exercises have points of resemblance with dancing. When learning to dance it is necessary to concentrate attention on the “steps” one wishes to master. But the adept in this art performs difficult steps with ease and rapidity, for they have become but means to an end, links in the process of expression—the Dance. Moreover, there are special affinities with pelvic exercises in certain popular modern dances, and women who devote themselves to the tango, for instance, do often attain considerable pelvic mobility and agility, or rather, in most cases, *appear* to attain it, *for they sway from the knees only and not from the hips.* The same is true of most beginners when performing some pelvic exercises—

the smaller pelvic circle, for instance. And it may be an additional incentive that our exercises will certainly favour various and harmonious grace of movement in the dance.

But, first and foremost, we must aim at entire control of pelvic movements. This implies no specially violent effort, nor any special concentration on muscular *power*, as distinct from muscular elasticity and *tone*. All reliable authorities on gymnastics for women are in agreement on this : that women should possess useful and efficient muscular power, both for general human activities and for the special requirements of birth, but that excessive muscular development, and, above all, excessive solidity of muscle, in women should be avoided. All obstetricians would probably concur with *Sellheim*, who based his pronouncement on the experience of generations of medical observation, when he said that we need women whose muscles are not hard but elastic. This is indisputable. But elasticity does not mean flabbiness or lack of tone. We would say that the muscular system in women, especially the muscles of abdomen and perineum (or pelvic zone and floor) should be so trained and controlled that they are strong enough both to support and to expel the prospective child without becoming so hard and thick as to constrict and hinder the act of birth. *For the technique of pelvic physical culture for women consists just as much in relaxation as in contraction : women should be able to draw their pelvic and perineal muscles tense or to relax them at will. And the complete mastery of this technique will enable its adepts to move, contract or relax sets of muscles which usually act together, quite independently, and, if necessary, to relax some while contracting others.*

We have chosen no movements which imply violent efforts or exertions. And we may add that there are certain exercises in general gymnastic use, as well as in games and sports, which imply vigorous pelvic motion. These have, doubtless, a favourable effect in counteracting the prevalent pelvic inactivity and immobility. They may be used with good effect, as introductory or accessory support to our special exercises ; they help to "loosen the joints." *But—there is a very important but here—the womb is a firm and*

comparatively heavy organ, suspended midway in the pelvic cavity in such a way that it has a considerable degree of mobility in relation to the "lighter weights"—organs and tissues—which immediately surround it. And a definite swing or vehement jerk of the pelvis or the whole body, which is abruptly checked, may lead to twists or displacements of the womb or its tubes and ovaries. *Therefore, caution is imperative in these movements.* Sellheim has emphasised this need in various publications, especially in "Gymnastik und Frauenkunde,"<sup>(10)</sup> and various French gynaecologists attribute severe cases of version and displacement to this cause.<sup>(11)</sup> Among the most popular and exhilarating gymnastic exercises are the swinging movements, especially the "mowing," which sway the pelvis vigorously from side to side. Be careful not to end it with a sharp jerk !

The exercises of the pelvis *are not easy*, either to learn in theory or to carry out in practice. This is unavoidable, and here—as in all departments of life—thought, exertion and endurance are necessary to success. They also presuppose some degree of general physical fitness and physical culture—as adumbrated, for instance, in the work of *Eugen Matthias*.<sup>(12)</sup> Further useful exercises preliminary to our special course may be taken from the manuals by *Lisa Mar*<sup>(13)</sup>, and the medical woman, *Erna Vorberg*.<sup>(14)</sup> But, if readers of this book should have no wish to trouble themselves with further explanation and examples, they may quite profitably confine themselves to the *Transitional Exercises* described at the end of our next chapter (IV.). They may also find some help in the chapters dealing with exercises during pregnancy and after child-birth. These chapters contain suggestions which may be modified from *semi-active* (with the aid of the instructress) into fully active and autonomous, and may be then used as *a preparation*. I would, however, suggest that the whole matter deserves serious attention and effort, and may best be supervised by a trained instructress.

By an *instructress*—for it is, in my opinion, unwise, on

principle, to perform special exercises for the female pelvis under the supervision and direction of a male gymnast, however proficient. It introduces an element of embarrassment, disturbance and unrest. Even if the purpose and nature of pelvic and perineal exercises are neither explained nor indicated to the student—and it is not the province of the *gymnastic instructress to give such facts or hints*—many of the students fully realise the why and wherefore. A lady whose profession is that of gymnastic teacher has written to me as follows :—

“ In the course of instruction one has the perfectly definite impression that many of the women and girls instructed are instinctively aware that the increased general agility, and especially the pelvic mobility developed by certain exercises, may be of great value to them in intimate married life. The difficult, but highly characteristic, ‘ Forward pelvic movement in squatting position ’ is performed with indefatigable enthusiasm, in all its variations—however sore and tired knees and thighs may be.” But both instinctive awareness and deliberate deductive conclusions (which are, however, much less often in question here) have a strongly disturbing and inhibiting effect on many women and girls. This almost automatic hesitation, inhibition and retreat, then hinders the proper performance and mastery of the exercises in question. The same lady writes further, as follows :—

“ Perhaps there is an unconscious suggestion, in all pelvic movements, of the sexual function, and, therefore, often a reflex inhibition. . . . I can only say that we can recognise the force of sexual inhibitions in many women, when we find the frequency with which unmarried women totally fail or refuse to carry out the exercises in which the thighs are widely separated. They never begin to take the right attitude, but simply move their *feet* about 7 inches apart, after repeated and emphatic instructions from the teacher in charge. And, in other respects, their behaviour and manner show that they are suffering from very strong inhibitions.” Obviously, such inhibitions would be even more forcible and frequent were the exercises performed under the guidance

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of a male instructor ; and a man—with the possible exception of a trained medical psychologist—would be even less able to overcome these difficulties than a fellow woman. Of course, not any and every woman is psychologically adapted and endowed for this work. The gymnastic instructress must have an attitude which is entirely direct, wholesome and dignified. She must be free from inhibitions, either the inhibitions of erotic repression—or substitute gratification ! She must see clearly and with balance, and be free from superstitions in the erotic sphere, though she need not be a sexual radical.

Herewith there follow :

### SOME HINTS ON HOW TO LEARN PELVIC EXERCISES

Beginners should take care not to attempt too much in the first flush of enthusiasm. It is best to study *not more than three* separate pelvic exercises at one and the same time, but great thoroughness and exactitude in detail is necessary. *Between each of the tonic exercises should be interspersed breathing and relaxation exercises.* I recommend especially the breathing exercises *1 to 4*, in the section dealing with gymnastics during pregnancy, as well as the special relaxation and “loosening” movements *6 and 7* in the same section. Further, I recommend the relaxation exercises *21 and 22* (pelvic exercises). *Respiration is particularly important.* If breathing exercises are regularly and correctly performed between each of the separate pelvic movements, the whole sequence becomes a source of physical and mental refreshment, even—strangely enough—when they must be postponed till the end of a busy day. The breathing exercises are also of great benefit aesthetically ; they widen the chest and arch the torso, improve the carriage, quicken circulation and eliminative processes. It is a mistake to restrict these exercises in respiration to the months of pregnancy alone. Certainly they are very appropriate to those critical times, being extremely gentle and yet affecting thorax and abdomen profoundly. But they should be part

of daily hygiene ; thus, their benefits during pregnancy will be more easily and effectively enjoyed.

These pelvic exercises are not comparable to a brief " daily " dose of general gymnastics. They are a *system, a definite sequence, designed for one purpose, in all its links*. Therefore, they should not be " run through " consecutively and mechanically, but a few should be chosen and performed on each occasion *and varied by slow breathing and relaxing as aforesaid*. In fact, the body should be loosened and refreshed by such exercises and the trunk relaxed before a definite pelvic exercise is begun. This should then be followed by a breathing exercise, repeated several times in succession ; then a pelvic exercise, then again breathing, and so on. Relaxation exercises should close the series on each occasion.

## CHAPTER IV

### DESCRIPTION OF EXERCISES

#### (*Pelvic and Abdominal Zone*)

##### I. DESCRIPTION OF THE BASIC POSITIONS

from which the actual exercises have been evolved.

###### (1) *First Position* (Fig. 1).

Feet together, touching at both heels and toes. Let the weight of the body glide along the outer edges of the feet towards the ball. It must not be supported on the heels, but by both feet equally on their middle portion. The knees are bent very slightly: a stiff rigid knee position should be avoided. The muscles of abdomen and nates are slightly tensed and the head well up. The shoulders must not be drawn up with the neck, they should be well opened.

###### (2) *Feet Sideways Position* (Fig. 2). Henceforth called now and then simply "second position."

The feet are slightly apart, laterally, but neither is in front of the other. They should be between 30 and 40 cm. (12 to 16 inches) apart. The feet may be slightly turned outwards, but the weight of the body must NOT be transferred to the inner edge of the feet, but rest on balls and outer edges.

###### (3) *Kneel-Heel : Squatting Position* (Fig. 3).

Take the first position as described in (1). Then slowly sink to the knees and sit back, supporting the nates on the heels. The trunk remains erect, but the body must NOT be drawn inwards at the loins, hollowing the back. The feet must be flat to the ground with toes and instep. Do not draw in the toes. If the insteps ache at first, they may be made supple enough by steady exercise so that the cramping pain



#### I. FIRST POSITION

*Feet together, touching both heels and toes. Muscles of abdomen and nates slightly tensed.*

(SECTION I, EXERCISE I.)



## 2. SECOND POSITION

*Feet slightly apart, muscles of abdomen and nates tensed, head well up.  
(SECTION I, EXERCISE 2.)*



3. SQUATTING ON KNEES AND HEELS

*Sink to knees, supporting nates on heels.*

(SECTION I, EXERCISE 3.)



4. QUADRUPEDAL POSITION ON HANDS AND KNEES

*Sink to knees, hands under shoulders, arms and thighs parallel.*

(SECTION I, EXERCISE 4.)



5. RECUMBENT OR SUPINE POSITION

*Knees raised and close together, feet on the ground.*

(SECTION I, EXERCISE 6)



stops. A hard mattress may be taken for the exercise instead of the floor. Or cushions and/or several large folded towels may be laid beneath knees and insteps, thus making mastery of this position more rapid and easy.

(4) *Knee-hand* (Fig. 4).

Take the first position. Sink slowly to the knees. Then turn the arms so that the palms of the hands are downwards and the tips of the fingers towards each other. Support the body from the shoulders on the hands ; letting the arms and thighs run parallel to one another. Let the weight be evenly distributed and *keep the thighs vertical from the ground*. Hold the shoulders loosely with relaxed muscles ; do not draw them up. Keep the head up ; to droop the head in the knee-hand position makes round shoulders. The spine should be stretched and the muscles of the abdomen and back well tensed. Hollow back and protuberant stomach should thus be avoided.

(5) *Lying Down* (no illustration).

Supine position.

Lie down backwards, as flat as possible. Some persons suffer from vertigo when the head is on the same level as the chest and feet. In such cases, the head and nape should be supported by a small bolster : the cylindrical shape is better than the flat square cushion. The legs lie stretched out and are placed together. The arms are stretched on either side of the body ; the palms downwards.

(6) *Second Supine Position* (with knees raised and closed) (Fig. 5).

Lie down in the previously described supine position. Keep the knees together, raising the legs slowly, while the feet remain on the ground or couch. The legs from the knees downwards should be brought vertical to the ground or couch.

(7) *Third Supine Position*. Knees raised and apart. (No illustration).

Take the supine position, but with legs apart. Raise the knees slowly, keeping them well apart.

## II. MASTERING THE MOVEMENT OF THE PELVIS

- (1) *Leg Rotation in Knee-hand Position* (Film 1, basic position from Fig. 4).

Take the knee-hand position. Stretch the left leg straight from the hip without bending the knee. Move so far as possible sideways and then back, *with a circular action*, then draw up the knee, returning to the knee-hand position. Repeat, using the right leg. Alternate the legs several times in succession. Be careful to make the sideways movement *so far as possible circular*. If executed thoroughly, with circular action, this exercise helps to give control of pelvic movement, and to increase its range.

- (2) *Leg Rotation in Knee-hand Position* (no illustration).

The exercise strengthens the gluteal muscles if care is taken not to raise the hip while rotating the leg, and to avoid stretching the leg upwards and thus slanting the pelvis. The difference between this exercise and leg rotation No. 1 is that, in the first, the foot and toes are lifted some distance from the floor or couch, whereas, in the second leg rotation, the toes touch the floor in the final stage of the circular movement. This exercise should be performed several times alternating the legs and the directions (left to right, and right to left) of the circular movement.

- (3) *Pelvic Rotation in the Knee-hand Position* (or on hands and knees) (Film 2, basic position from Fig. 4).

(a) Preliminary. Take the knee-hand position. Draw the pelvis backwards from the *lumbar region* and then execute a circular movement to the left, until the left hip rests on the floor. Then slowly complete the circular movement, until the original position is resumed. Then repeat to the right. Alternate both sides several times in succession.

(b) Preliminary. Knee-hand position. Draw the pelvis backwards from the lumbar region, then rotate slowly to the left till the left hip touches the floor as above. Then continue the circular movement backwards till the nates almost touch the heels and (instead of returning to the basic knee-hand position) continue the movement to the

right until the right hip touches the supporting couch or floor. Now rotate again back to the left and repeat several times, left to right and right to left.

(c) After these preliminaries proceed to the complete rotatory exercise, depicted on *Film 2*.

Basic position the *knee-hand*; begin as before and rotate the left hip to the floor, then draw the pelvis *forward*. Then rotate to the right, then backwards to the heels and then again to the left. Repeat several times and then change direction, making the first rotation to the right.

*Note.*—In 3 (a), 3 (b) and 3 (c) care should be taken to keep both hands and both knees perfectly steady on their original knee-hand position places. Beginners are apt either to slide backwards on their hands or shuffle forwards on their knees.

(4) *Vertical Pelvic Rotation*, from knee-hand position (the “Machine Exercise”) (*Film 3*, basic position from Fig. 4).

Knee-hand position. Draw back the pelvis to the heels and then stretch the back and push forwards until the head projects beyond the hands. Then arch the lumbar vertebræ, contract the muscles of the abdomen and thrust the pelvis backwards from the loins till the nates touch the heels. Begin again and repeat several times. Take care, while drawing the pelvis backwards, to keep the loins well arched and the abdomen taut. On no account should the shoulders be lifted, but the pelvis should be moved backwards from the centre of the trunk. When this exercise is rightly executed, the body describes an oval, whose narrowed extremity lies between the hands of the performer.

(5) *Minor Pelvic Rotation*, in supine position, knees raised (not illustrated, see the next exercise).

Lie flat on back. Raise the closed knees; then raise the pelvis till the body is stretched taut from shoulders to knees. Then rotate the pelvis, sideways and then downwards. Let the head rest sideways in order to avoid needless rigidity of the muscles of the neck and to get complete freedom of breathing.

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- (6) *Major Pelvic Rotation*, in supine (or recumbent) position (knees raised) (Film 4).

Lie flat on back. Raise the knees, then *separate* them. Proceed as in foregoing Exercise 5.

*Note*.—The difference between the minor and major pelvic rotations consists in the effects of the *knee posture*, which is closed in the first exercise and opened in the second.

- (7) *Squatting or Crouching Swing* (Film 5).

Sit back in kneel-heel position. Then *move the nates slowly sideways*, above the heels so that the seated position is taken. The arms are best held sideways stretched out loosely—not drawn taut—and slightly below shoulder level; in this posture they help to balance the trunk. The pelvis should be lifted by a vigorous half-circular swing—not *jerk*—across the heels and again sideways, and the movement repeated. Beginners and persons of stout and full build may support themselves partly on their hands while learning this exercise in their first attempts. But the aim of this exercise is to so strengthen both the muscles and their control that the pelvis may be swung completely from left to right (and *vice versa*) without help from the hands. *The nates should be lifted clear of the heels at each swing*. This will imply a slight forward movement of the pelvis, which should be *lifted* and not *rolled* or *dragged*.

*Note*.—I have indicated the expert way of performing the pelvic swing in the squatting position, as it can be and is performed by accomplished gymnasts. But it demands expert advice and should only be attempted by women whose pelvic *viscera*, including bladder, kidneys, urethra and lower intestine, as well as the genital tract, are free from displacement or disease. (The importance of healthy pelvic organs has been emphasised before in this study, but may well be mentioned again.) If there is any suspicion of displacements or inflammatory conditions, the vigorous *swing* should not be attempted, but the trunk should be raised more—and very slowly—and still in the squatting position, to help the movement from side to side.

(8) *Backward and Forward Pelvic Motion*, in the knee-heel position (basic position from Fig. 3).

(a) *Kneel-heel Squatting Position*.—Then lift the pelvis slowly forward until the trunk is quite extended. Be careful, in this slow steady forward movement, to keep the hips well forward. Then slowly move backwards till the *nates are again over the heels*, while the trunk remains upright. If the trunk is thrust forward at all in this latter stage of the exercise, its use and purpose are completely spoilt.

(b) *The same initial position : Kneel-heel Squatting*.—Begin the same forward pelvic movement as in 8 (a), but only about half-way ; then dip back again, into the kneel-heel position. Carry out this dipping and bobbing movement several times in succession, fairly quickly. The backward movement, if sufficiently quick and elastic, will help to give the same quality to the forward lift ; it becomes more a quick rhythmic *spring*.

(c) *Kneel-heel Squatting, with Knees apart* (Film 6).—Lift the pelvis forward, moving from the groin, with the trunk so far as possible erect. Then backwards again, slowly as in (a). But do not come to rest *upon* the heels but *between them*, so that the thighs are enclosed between the shins or lower legs. Practise on a mattress at first.

(d) *Kneel-heel Squatting with Knees apart*.—Proceed as in (c), but move forward only half-way and then drop backwards again with a quick elastic *spring*, and as rapid recovery and forward spring again (see 8 (b) ). Repeat several times.

(9) *Pelvic Flicking or Flipping in the Knee-heel Position* (not illustrated).

Squat back on the heels and separate the knees. At the beginning of this exercise, the pelvis is between the heels, as in 8 (c). Draw the pelvis forwards so far as possible, but do not stretch the trunk to its full extent. Then flick or jerk the pelvis rapidly forward and then backwards, *without sitting*.

The pelvis must jerk rapidly to and fro *without being supported by the heels or on the couch or floor*. This exercise requires a specially rapid alternation of contraction and

relaxation in the pelvic floor. It is, therefore, both abdominal and perineal; for only through such muscular collaboration is it possible to execute balanced and rapid movements.

(9A) *Raising the Trunk Upright, from the Squatting Posture* (Figs. A and B).

Take the squatting or crouching attitude; support the hands on the floor (Fig. A). Then slowly raise the trunk till it is vertical, i.e., at right angles to the floor (avoid hollowing the loins). Keep the knees closed throughout this exercise. As the trunk is raised, the arms are lifted as well, till they are level with the shoulders (Fig. B) and stretched forward. Keep the trunk and arms in this position for a few minutes, then relax and return to the squatting position (Fig. A). Repeat in this manner three or four times in succession. This exercise involves constant alternate tension and relaxation of the pelvic floor.

(10) *Pelvic Lunges* (Figs. 6 and 7).

(a) Take the first position, erect, with feet together. Then lunge forward from the knees to the waist and fall back rapidly to the first position. Fig. 7 shows the final position.

(b) *Second Position with Feet apart*. Then proceed exactly as in 10 (a).

(II) *Forward Pelvic Motion while Walking* (Film 7 and Figs. 8 and 9).

Take the first (standing) position, then slide the right foot forward in a straight line and not too far ahead. Keep both arms slightly bent and behind the back. Arch the lumbar muscles and draw in the abdomen, bending the trunk slightly forwards. The upper bony rim of the pelvis is thus inclined sharply forwards. When this exercise begins, the weight of the body is balanced equally on both feet; as the pelvis is drawn forward, the body weight is gradually shifted completely *from right leg to left*, and the pelvis drawn forward and upward to its fullest extent. Then draw forward the right leg and foot while dipping the pelvis forward and downward with a circular movement and keeping the abdominal muscles tense. The weight is equally balanced for a

few minutes and then shifted to the right leg and foot. Repeat several times.

(12) *Sideways Pelvic Motion while Walking.*

(a) (Film 8 and Fig. 10). Take the first position, as in foregoing exercise. Draw the pelvis upward and so far as possible to the left. Then, keeping the pelvic position, step with the right foot, crossing the right leg sideways and in front of the left. Then follow with the left, so that feet and pelvis resume the normal first position. Then begin the exercise again from the *right* side.

(b) (Not illustrated.) Second position, standing with feet slightly apart. Draw up the pelvis so far as possible to the left. When the maximum stretch has been reached, close the feet, moving the right up to the left. The movement restores the normal pelvic position. Then take the second position again and repeat the exercise from the right side.

(13) *Pushing the Pelvis Slowly from the Right to the Left, and Reverse* (not illustrated).

Take the first position. Then keep the pelvis level and in a straight line, while pushing it alternately to the left and to the right. But keep the line horizontal. *Do not arch or lift the hip.*

(14) *Pelvic Swing : Sideways, or Lateral Pelvic Swing* (not illustrated).

Second position standing, feet a little apart. Move the left hip sideways so far as possible and lift it until the left leg is stretched tensely from thigh to toe. Then thrust forward thigh and knee and make a circular downward movement of the pelvis, bringing the feet to the second position and then at once starting the swing with the other foot and leg, so that the pelvis is in continuous swinging motion from left to right and right to left. Repeat several times.

(15) *Pelvic Rotation from Front to Back.*

First position. Then draw the pelvis forward, thrusting thigh and knee slightly bent in advance (*cf.* the final stage

of the pelvic lunge, Exercise 10, Fig. 7). Then stretch the knee slowly and at the same time lift the pelvis and draw it backward, rotating it and alternately flexing and tautly stretching the knees.

(16) *Horizontal Pelvic Rotation.*

(a) *Minor Pelvic Rotation* (Film 9). Take the first position. Raise the arms and fold the hands behind the nape of the neck. Draw the pelvis to the left, then rotate forwards, slightly advancing the knee and thigh. The knee should be slightly flexed, but, as the pelvis continues its circular movement to the right and then backwards, leg and knee are stretched taut. Continue the rotatory movement several times from left to right and right to left.

Take care to move the *pelvis* steadily. Beginners are apt to confine their efforts to the knees alone.

(b) *Major Pelvic Rotation* (Film 10).—Second position, standing, feet slightly apart. Proceed as in 16 (a), but with more pronounced flexion of the knee joints. (*Cf. Exercises 5 and 6.*)

(17) *Pelvic Spirals: or Spiral Pelvic Motion, or spiral motion of pelvis* (not illustrated).

First position. Thrust forward left knee and thigh so far as possible, flexing knee vigorously. The trunk from shoulders to knees is taut. Begin with the minor pelvic rotation (see foregoing Exercise 16 (a)), but spirally upwards till both knees are stretched straight. Then immediately repeat the spiral movement *downwards* till the first position is resumed. The movement must be continuous and somewhat rapid. It demands considerable suppleness, agility and muscular control, and is, therefore, not suitable for beginners.

(18) *Semi-circular Pelvic Rotation or Pelvic Version while Walking* (Film 11 and Fig. 11).

First position. Advance the left foot and leg in a straight line. The hands should rest lightly on the breast, finger tips touching, elbows well raised. Draw the muscles of nates and abdomen taut, then thrust the left knee forward to the



#### A. SQUATTING POSITION

*Descend to the crouching, hands supported on the floor    Knees together.*

(SECTION I, EXERCISE 9A.)



#### B. SQUATTING POSITION

*Trunk raised till it is vertical with constant alternate tension (in B), and relaxation (in A) of the pelvic floor.*

(SECTION I, EXERCISE 9A.)



6. PELVIC LUNGE (INITIAL POSITION)

*Erect with feet together.*

(SECTION I, EXERCISE 10.)



7. PELVIC LUNGE (FINAL POSITION)

*Lunge forward knees and pelvis.*

(SECTION I. EXERCISE 10.)



### 8. PELVIC MOTION FORWARD WHILE WALKING

*Initial position, slide right leg forward, arch lumbar muscles, draw in abdomen, bending trunk and pelvis forward.*

SECTION I, EXERCISE II



9. PELVIC MOTION FORWARD WHILE WALKING  
*Final position, same as illustration 8, but with left leg forward*  
(SECTION I, EXERCISE II.)



10. PELVIC MOTION SIDEWAYS WHILE WALKING

*Drawing pelvis right or left upward so far as possible.*

(SECTION I, EXERCISE 12.)



### II. PELVIC ROTATION WHILE WALKING

*First position, advance one leg, draw taut muscles of nates and abdomen.  
Thrust knee forward to half kneeling position.*

(SECTION I, EXERCISE 18.)



12. WALCHER'S SUSPENSION—EXTREME FLEXION  
*Initial position. Back with coccyx on edge of table, legs hanging loosely.*  
(SECTION I, EXERCISE 19.)



13. WALCHER'S POSITION—EXTREME FLEXION  
*Final position. Drawing legs slightly apart, upward towards body.*  
(SECTION I, EXERCISE 19.)



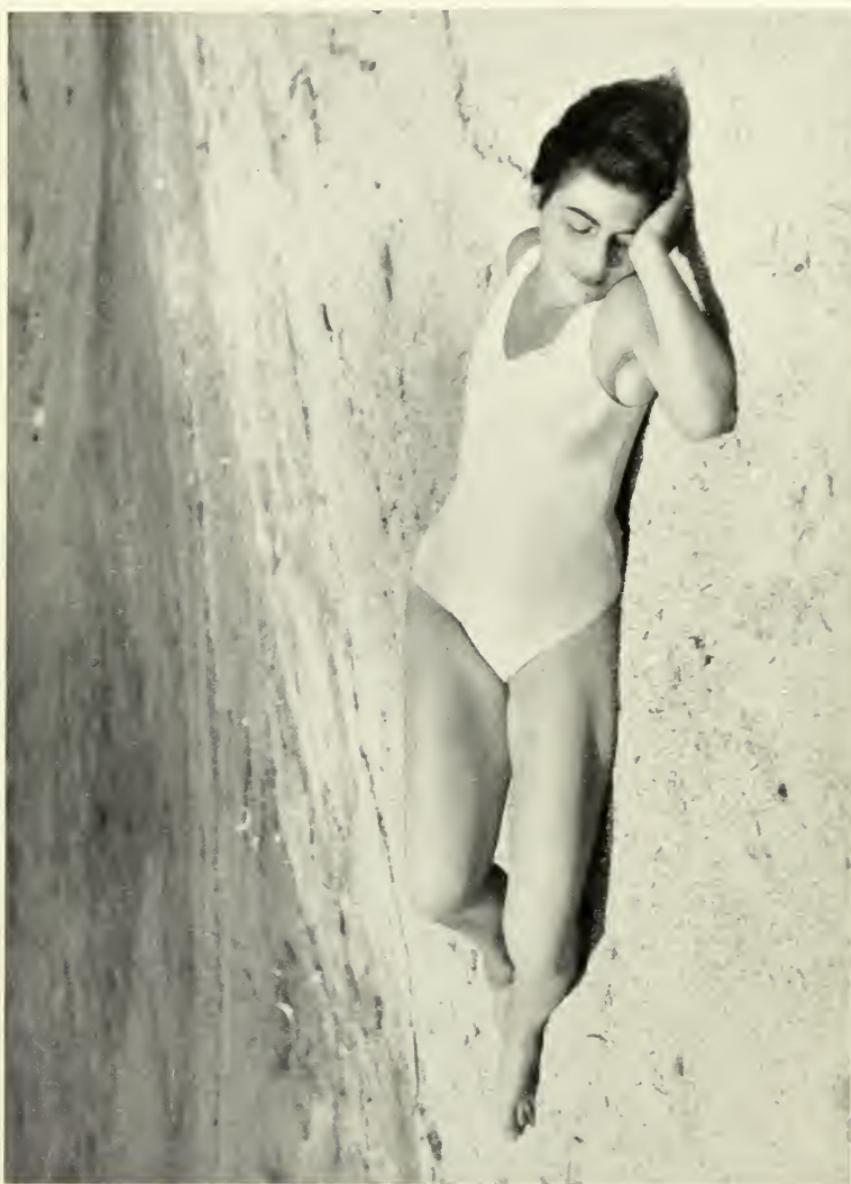
14. LATERAL PELVIC DROP—INITIAL POSITION

*Lying on back, drawing knees close to body.*

(SECTION I, EXERCISE 20.)

15. LATERAL PELVIC DROP—FINAL POSITION  
*Dropping legs, quickly, sideways, causing pelvis to turn sideways.*  
(SECTION I, EXERCISE 20.)



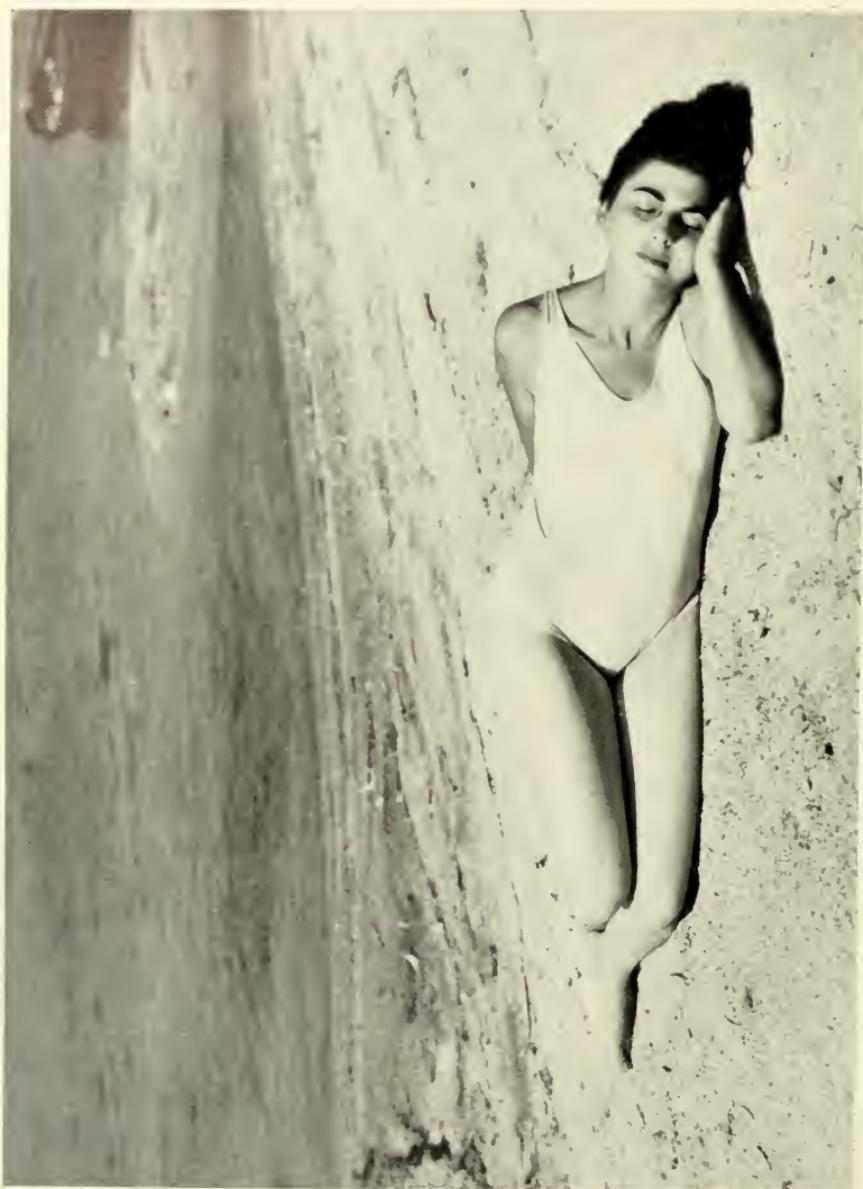


16. LATERAL PELVIC POSITION—TENSION

*Keeping muscles tense, pelvis forwards,*

(SECTION I, EXERCISE 21.)

17. LATERAL PELVIC POSITION—RELAXATION  
*Proltruding pelvis forwards, then relax.*  
(SECTION I, EXERCISE 21.)



half kneeling position. At the same time, turn the pelvis halfway, so that the right hip is towards the left leg, and keep the lumbar muscles well stretched! Having executed this semicircular movement so far as possible, return slowly to the original position; the knees stretch themselves and the right foot and leg advance. Then the left hip is turned slowly towards the right leg, so far as possible, and then brought back to its original position, as before; then repeat, advancing the left foot and leg, and so on, alternately. This exercise, like the foregoing, demands a certain proficiency and muscular tone.

(19) *Walcher's Suspension—followed by extreme Flexion*  
(Film 12, Figs. 12 and 13).

A large solid steady table is necessary in order to perform this exercise. It must be high enough to allow the gymnastic pupil or patient to take the recumbent position shown in Fig. 12, with her feet quite clear of the floor. She lies on her back with her coccyx on the extreme edge, and her legs hanging loosely at full length and slightly apart. In order to prevent herself from slipping off the table, she must grasp the edges of the table sideways with each hand. In obstetrical cases—in which this position is sometimes necessary and beneficial—an assistant supports the patient's arms. But a woman of normal muscular development and agility can hold herself on to the table. Having assured herself that legs and pelvis are so far as possible over the edge of the table, she begins to close her legs and, at the same time, draw them upward and towards the body, but, if possible, without flexing the knees in the process. Having brought the legs up over the body into the attitude designated in phase 4 on Film 12, she may let go of the table, freeing her hands for the further stages of this important exercise.

There are now two alternative possibilities.

(a) The typical procedure, as represented in the film and on Fig. 13. Take hold of the legs, one in each hand and as high up as possible. Press them upwards and forwards, as near the trunk as possible; remember to keep the *knees straight*. The legs will be somewhat apart. Having raised

them as high as possible, let them sink, slowly, *avoiding sudden jerks and drops*, and regain grasp of the table edges.

(b) In the second version of Exercise 19, the legs are flexed at the knees. Thus we have the *true double pelvic flexion*, which may be assisted and accentuated by grasping the knees with the hands and drawing them towards the body, while the legs remain slightly separated. Remain motionless in this attitude for a few moments. Then raise the legs slowly to their full length, straightening the knees and lowering them, so that the hands are once more free to grasp the table and the original position is resumed.

In modification (b), Exercise 19 differs from (a) in the fifth, sixth and seventh phases of Film 12. In phase 8 they coincide.

This exercise requires muscular control and care in detail. *Do not fling or jerk the legs in the downward movement!* They must descend as slowly as can be managed. The exercise is difficult and exhausting for beginners. The legs hang loose and relaxed *at the end of the exercise*, otherwise their muscles are continuously active.

Beginners may find it helpful to let the feet rest on a chair or two chairs, at the conclusion of the downward movement, for a few moments before dropping them gently at full length in the genuine attitude of *suspension or extension*. Either the gymnastic instructress or another adequately strong and handy person should always be present or at call when this exercise is attempted. If necessary, the legs may then be held when they are in a line with the body and gently guided downwards.

*N.B.*—Be very careful to see that the table stands firm and on legs of even length. Otherwise painful and serious accidents may easily occur. In order to gain confidence and avoid slipping down, it is advisable to lie down further on the table, so that the thighs are partly supported, and begin the exercise forthwith. The weight of the legs as they sink slowly downwards automatically pulls the body forwards over the edge of the table. If the exercise is repeated several times, it is necessary to pull oneself backwards and upwards in order not to slip off; this is another reason for recom-

mending the presence and, if necessary, the assistance of gymnastic instructress, nurse or attendant.

### III. EXERCISES FOR RELAXATION

#### (20) *Lateral Pelvic Drop* (Figs. 14 and 15).

Lie flat on back. Draw up the knees as close to the body as possible, lifting the feet from the floor or couch (Fig. 14). Then drop the legs from below the knee in a quick movement sideways (Fig. 15), thus causing the pelvis to turn sideways too. The legs must not be held rigidly. If there is difficulty in mastering this exercise the instructress should give the pupil's lower leg a quick and gentle push. When correctly performed, this exercise relaxes the three groups of muscles, abdominal, gluteal (*i.e.*, of the buttocks and thighs behind) and perineal. The full benefit can only be derived from this exercise when it is repeated quickly several times in succession.

#### (21) *Lateral Position of Pelvis* (Figs. 16 and 17).

Lie on one side, the knees drawn up towards the body, relax the muscles and lie as easily and restfully as though retired for the night and about to fall asleep. Then draw the gluteal and perineal muscles together, protruding the pelvis forwards (Fig. 17). Keep the muscles tense and the pelvis arched forwards for a few minutes, then relax again. These movements render perineal, abdominal and gluteal muscles supple and elastic.

### SUPPLEMENTARY EXERCISES

There are certain supplementary exercises in which the pelvic movements are passive and indirect rather than directly active—as we have pointed out in Chapter III. and in the Introduction. These exercises, although not strictly either pelvic or perineal, help to make these regions more supple and mobile. For this reason—and also because they are, on the whole, more comfortable to perform and easier to learn than the specifically pelvic gymnastics—they form an appropriate transition or halfway house between general physical and special pelvic culture. The following brief

descriptions of such exercises have not been illustrated as they are outside the *exact* limits of our theme.

(22) *Hip-joint Exercise (Relaxation).*

First position. Raise one leg and hold it suspended with the foot about 6 inches off the ground ; the leg should hang loosely. Then revolve the leg from the hip joint as far outward and sideways as possible ; then inwards again, and then outwards. *But do not move or rotate the pelvis.* Alternate left and right several times successively.

(23) *Trunk Relaxation with Knee Lifting.*

First position. Draw the left leg slowly upwards towards the body, bending the trunk slightly forward from the waist with relaxed muscles and loosely hanging arms. Raise the knee as high as possible and droop the head as far as possible at the same time. Breathe out slowly and deeply. Then breathe in, slowly and deeply, and simultaneously raise the trunk and stretch the knee, so that the first position is resumed. Repeat, with the right leg. Note that the lower leg must hang quite loosely when raising the knee and is only stretched again when the knee returns to the perpendicular.

This exercise strengthens and straightens the lumbar muscles.

(24) *Forward Relaxation of Trunk.*

Second position. Feet slightly apart. Breathe out slowly and bend slowly forward with protruding chest ; the whole trunk relaxes gently as it sinks, *but take care not to jerk suddenly forward and downward !* The knees "give" slightly as the trunk moves forward, so they must not be rigid and taut. Then thrust forward successively knees, thighs and hips and raise the trunk to the original position, *breathing in* the while. Repeat several times. The arms hang loosely throughout the exercise.

(25) *Trunk Relaxation during Quarter Rotation.*

Second position. Let the trunk sink forward as in Exercise 24. Then thrust forward the left knee and thigh slowly ; then move knee and thigh sideways and outward,

*i.e.*, to the left, and let the trunk follow them with a circular movement to the left ; then thrust the left hip forward and raise the trunk. Repeat the bending of the trunk and proceed as before with the right knee, thigh and hip to the right. This exercise should be repeated several times, alternating left and right. The arms may either hang loosely or share in the trunk movements, being slowly raised as the trunk resumes the upright attitude. The essential point in this exercise is to feel that the hip is being levered up from the pelvis as the trunk is lifted. This screw-like or leverage movement may be mastered with sufficient effort and attention and greatly strengthens the pelvic muscles.

*Note to Exercises 24 and 25.*—Be careful to keep the pelvis at the angle depicted in Figs. 1 and 2. Beginners are apt to protrude the abdomen and hollow the loins.

#### (26) *Leg Crossing over Opposite Hip.*

Lie flat on back. The arms lie stretched out on either side in line with the shoulders, *i.e.*, at right angles to the body ; palms upwards. Then stretch the left leg to its full length and raise it, describing an arc and moving far enough sideways to be able to grasp the left foot easily with the right hand. The whole left side, especially the hip-joint, is well stretched and suppled. Repeat alternately right and left.

#### (27) *Moving Forward on the Nates.*

Sit down on the floor with legs stretched horizontally. Then propel the body forwards in the seated position by means of alternate slight contractions and levering movements of the right and left gluteal muscles. Of course, the rate of progress is very slow ! Skilled gymnasts are able to move backwards in the same manner, but the exercise should be stopped as soon as exhaustion and backache supervene.

*Note.*—It is best carried out on a parquet floor or on oilcloth. Be careful to protect the genital organs from the possible invasion of dust, dirt or splinters by means of knickers, and preferably a diaper as well.

The exercise marked (29) in the second main section of this book (Fig. 41) may also be studied with advantage.

I should be the last to deny that there are many exercises of utility in making the pelvic zone mobile and supple in the programme of modern gymnastics and physical culture. The same is the case in the particular branch of physical culture which requires the use of apparatus (saddle, parallel bars, ropes and rings, etc.). It would exceed our space limits to describe or even enumerate these; but I would pay special tribute to the Swedish system; their exercises on the bars, as shown in *Schlüter's "School of Rhythrical Gymnastics,"*<sup>(15)</sup> show the remarkable results which can be achieved in promoting or almost creating agility and elasticity of body. But it is easily possible to go too far in this direction, especially having regard to the special structure of the female pelvis. Certain striking exercises and attitudes on the bar apparatus are appropriate and helpful for professional acrobats and dancers, but not for the generality of women. Exercises on these appliances have been designed and developed by male gymnasts, and are entirely suitable in promoting muscular strength and enterprise, but they should be carefully sifted and adapted for girls and women, and only carried out under the supervision of an instructress who possesses a thorough knowledge of anatomy. Until now, this has not been the case in Central Europe, at least, and the women and girls who are the enthusiastic pupils of trained gymnasts and powerful men try to emulate their teachers' proficiency and often injure themselves in the process. Fortunately, the gymnastic societies and clubs are now beginning to realise that swinging and climbing on the bars tend to *harden the abdominal muscles* unduly and dangerously in women.

*Schlüter's* book comprises numerous and varied pelvic movements corresponding to some of those detailed in the present study—together with suitable musical accompaniments. The pelvis is given due importance as the centre of action and attention, but there are certain exercises in *Schlüter's* book which seem to me unsuitable, being far too vehement and abrupt. This objection will be considered later among the "Contraindications."

## EXERCISES OF THE SECOND GROUP: GYMNASISTICS OF THE PELVIC FLOOR

### CHAPTER V

#### ANATOMY AND PHYSIOLOGY

IN dealing with the exercises of the *pelvic zone*, anatomical explanations were unnecessary : but it is otherwise with exercises of the *pelvic floor*. Detailed descriptions of the anatomical structure and functions of this region cannot be given in a practical manual on gymnastics, and I shall, therefore, confine myself to tracing the main points, and illustrate them by a few drawings. The medical reader of this book needs no such explanation, and the lay student will doubtless find the drawings more illuminating than any text.

Plates I. and II. show the two main muscular layers of the pelvic floor as they would appear viewed from outside and from below, and after the outer skin and the layer of fatty tissue between pubes, buttocks (tubera ischii) and coccyx had been removed from the muscles. Plate I. shows the outer and much less powerful muscular layer which is confined to the anterior position of the lower aperture of the pelvic bones. Plate II. depicts the deeper layer, which is also visible in its posterior or hinder portion on Plate I. In both plates, the *sphincter ani*, the powerful muscle which closes and supports the outer aperture of the lower bowel, is shown, but does not come much into our consideration here, although it may be reckoned as part of the pelvic floor, which it helps to support. It is also more or less affected by the voluntary contraction of the perineal muscles. But on the whole, the *sphincter ani* is a separate and independent entity, fully occupied in its special function of closing and guarding the rectum and bowel.

The superficial muscular layer, which is limited to the anterior portion of the pelvic outlet—as depicted on Plate I.—also consists of a kind of *sphincter* or *locking* apparatus in its most important region.

But the structure here is somewhat more complex and less obvious than in the *sphincter ani*. The muscular fibres of the *anterior*, pelvic floor do not, as a rule, enclose the vaginal orifice ; some of them cross over and unite with the fibres of the *sphincter ani*, while others again merge with the tense and massive sinews of the perineum. Nevertheless, though anatomically dispersed, they are a *functional unit*, and serve to close the orifice of the vagina ; that is, they are a constrictor muscle. This *Constrictor Cunni*—as already mentioned in my treatise on “ Ideal Marriage ”—is not nearly so tensely resistant as the Anal Constrictor, but is, nevertheless, quite sufficiently powerful—congenitally in many women and, as a result of appropriate and deliberate physical exercise in others—to play an effective rôle in coitus, both in accentuating the natural pleasure of both partners, and in retaining the seminal fluid and thus helping impregnation.

The underlying and more powerful muscular stratum (the group of the levatores, see Plate II.) has a somewhat *conical* shape. At its lowest point, it is intersected by the rectum. The focus of this muscular cone, far from being circular, is rather an oval slit, whose front rim is formed by the bony *symphysis pubis*, while the rear rim encircles the rectum slightly above the *sphincter ani* and from behind. Let us suppose that this cone or funnel-shaped muscular stratum is contracted by voluntary action : then the two passages—rectal and vaginal—which intersect it will obviously be affected. The most obvious effect of the initial contraction will be to draw the lower extremity of the rectum *upward and forward*. Therefore, the name “ *Levator Ani* ”—“ Lifter of the Anus ”—has been given to this whole muscular stratum. The rectum is not only lifted forward, but narrowed from behind and from either side, in such a manner that the *sphincter ani* is helped in its function. (This may be observed—as it is employed—by any person wishing to control and retain an attack of diarrhoea.)

But the contractile effect is not felt only in anus and rectum. A similar influence extends to the vagina, although, admittedly, to a lesser degree. This has been proved in the course of gynaecological examinations. I have termed the frontal section of the levator stratum the "*Levator Vaginae*," and depicted it in relation to the surrounding organs in "*Ideal Marriage*." We shall consider it further in a later chapter of this study. Here it may be mentioned that all these muscles, together with some further lesser muscular portion, shown also in Plate I., form the "*muscular pelvic floor*," and that the pelvic floor consists further of the tendinous structures shown in Plate IV., and a *covering* or *cushioning* of adipose (or fatty) and connective tissues. The pelvic floor is not only the base of the abdomen ; it is also the special support of the internal genitalia, especially the womb and the vagina, and of the bladder, which is closely adjacent to vagina and uterus. These organs receive a strong pressure from the upper abdominal cavity, through gravitational action in the upright position, and through occasional increase of intra-abdominal weight and tension, e.g., in advanced pregnancy. The pelvic floor meets this strong downward pressure with counter pressure, *which is quite adequate if its muscles are intact, elastic and well developed*. But, if the muscles are slack and the *suspensory apparatus* of the inner genital organs—especially of the uterus—has been overstrained or impaired, there follow *prolapses or displacements*, slight or severe, which are always uncomfortable and sometimes very detrimental both to *general health* and *genital efficiency*.

Plate III. shows most clearly the risks of injury to the pelvic floor during the process of birth ; for there is tremendous forcible *distension* as the head of the child emerges. Even without the slightest obstetrical knowledge, any observer must realise, from the anatomical conditions alone, that all possible means must be taken both to *counteract* and *repair* this—to some degree unavoidable—distension. There is a double need for care and expert cure here : there may be *lacerations*, both of the perineum and the vagina, which will require careful suturing, and which are still far

too often neglected with disastrous consequences to sexual efficiency and happiness\* ; and there will be—even in the most fortunate cases—the need to restore the tense elasticity of all the genital and perineal tissues. The majority of these tissues are formed of *voluntary* muscles, and this gives the clue to success in curing certain damages of pregnancy and birth. *This restorative treatment must be based on the recovery of muscular tone, through deliberate and appropriate exercises* ; we will leave medical massage—though invaluable in special circumstances—out of consideration for the time being.

Another obvious thought arises. The muscular layer of the pelvic floor sustains great pressure and distension during birth. If it is more than usually dense and strong, it will offer extra resistance and not only hinder the emergence of the child's head, but also entail a great risk—in fact a certainty—of bad tears and all they inflict. Therefore, the pelvic floor must not only be *strengthened*, it must be brought so under the power of the will that it may be *appreciably relaxed* when required. This natural trend of reasoning is fully confirmed by obstetric experience. And our experience leads us to the emphatic demand for *elasticity, suppleness and co-ordinated control* in the feminine pelvic organs.

The vagina is not only the passage traversed by the child at birth ; it is also the feminine organ of copulation. A true *communion of sex*, an act which is desired by and delightful to both partners, must imply some degree of active feminine participation ; and this participation is expressed by the voluntary movements of the muscles encircling the vagina. Among women of the European races to-day, there is often no instinctive aptitude for this particular form of muscular action. (This is also the case with muscles in other bodily organs and regions, which have almost atrophied among many of us, but which are quite active and under the full control in some individuals, e.g., the muscles which move the ears.) *The pelvic floor may be moved, to some extent, by volitional effort* : but this effort should not be localised on the whole muscular stratum, but

\* Cf. " Ideal Marriage," pp. 61, 62, 69, 70.

in the anterior (fore) portion of the levator, *i.e.*, the levator vaginæ. For this important muscular mechanism may be set in motion separately and independently. Further, it is possible—and for full sex efficiency, necessary—to be able to set the sphincter muscle at the entrance of the vagina—the so-called Constrictor Cunni—and the lower anterior part of the levator, in motion separately and independently of one another. I would refer to Plate IV., which shows both the superficial Constrictor Cunni and part of the *levator* above it, in section. But it should be borne in mind that the fibres of the L. V.—here shown in section—do NOT run in the direction *b—c—d*, but are intersected diagonally; as is also the C. C. Thus, the fibres of the L. V. are not *parallel to the axis of the vagina*, as might be inferred, but *transverse* to it. Moreover—and I would lay special stress on this—the whole levator stratum, as depicted in section on Plate IV., is somewhat exaggerated. In reality, this stratum has not the even convex curve downward, suggested in the broken line *b—c—d*. In its foremost region, where it encircles the vaginal walls just over midway (from outer orifice to fornix), the muscle shows a shallow inward curve or hour-glass contraction (*c* in Plate IV.), and fits closely to the vagina. Many anatomists have confirmed this structural peculiarity, and during gynæcological examination it may be proved, for, if the woman “draws in” or contracts her levator against the examining physician’s finger, there is often a perceptible contraction, not only in the lower third of the vagina—as shown in *b*—but a separate pressure and contraction, higher up and deeper inside; and this higher, *interior*, contractile zone may be very narrow, and operates *not from back to front, but from either side*. If it is gently tapped by the intromittent finger, like a harp-string, there is a momentary increase of tension and a closer contraction. And, in cases of extreme irritability of the levator, there may be a most distressing *cramp* supervening both during lengthy gynæcological examinations and in actual coitus (*Vaginismus superior*). It is more or less painful, sometimes acutely so, and may catch up and grip the male organ just behind the *Corona Glandis* (rear rim of the tip) so tightly that it cannot

be withdrawn for some time. This condition is known as *Penis Captivus*.

We have now outlined the most important circumstances connected with pelvic gymnastics. Some further points will be dealt with in later chapters.

Pelvic exercises aim at strengthening the pelvic floor as a whole, and also at bringing its muscles under the control of the will, so that this muscular co-ordination may be used to counteract the great stretching that occurs after birth. Moreover, these exercises should also enable women to relax their pelvic and perineal muscles, definitely and deliberately. The muscles of the pelvic floor should be capable of tension or relaxation at will. And the orifice and shaft of the vagina should also be brought under conscious control, so that they may be contracted or relaxed, *together or separately*, at will.

Thus, the exercises of the pelvic floor may be classified as (a) *perineal* and (b) *vaginal*.

## CHAPTER VI

### EXERCISES OF THE PELVIC FLOOR

MOST of the exercises recommended for the strengthening of the pelvic floor proceed *indirectly*: the pelvic floor is an accessory, as it were, in movements engineered by the neighbouring muscles of thighs and buttocks. And novices in these matters at once contract the great gluteal muscles with unnecessary energy when making their first efforts to activate the pelvic floor. But the mind and will should concentrate on the pelvic floor, during these exercises, as the centre from which the main result is hoped. It is wise to combine certain abdominal or general exercises *with* those of the pelvic floor, and, best of all, during the perineal relaxation, as phases of the same sequence. There are natural affinities, and again antipathies, in physical culture. Some movements combine very easily and happily; others, again, do not.

If readers will refer to Chapter IV., they will find that, of the exercises therein described, the *fourth* and the *eighth* are particularly appropriate to the rhythmic tension and relaxation of the pelvic floor.

In Exercise 8, and in its modifications *c* and *d*, this effect on the pelvic floor is almost automatic: at least no special effort of the will is necessary here. I would refer students of these exercises to Film 6, and its printed text. As the pelvis is drawn forward, the pelvic floor is contracted and, as the pelvis returns to its original position, the perineal muscles also relax, *passively*, *i.e.*, *without special volitional effort*, as part of the cessation of the previous contraction. But we must carefully distinguish between such *automatic effects* and *conscious vigorous contractions*. The levator muscles are adequately contracted if and when the tension is felt up to the inner surface of the *symphysis pubis*: and this means definite and vigorous effort.

In Exercise 4—"The Machine Movements"—on the other hand, the rhythmic relaxation of the pelvic floor should be passive only in the second starting position and in the fifth (5) phase. (Note text to film.) In the first and second phases, there should be *conscious contraction*, involving the levator : in the third and fourth phases, there follows *an active release of tension* : a most important link in the sequence of movements, as this *active relaxation of the pelvic floor combined with a contraction of the abdominal muscles*. And the complete and distinct control of these two sets of muscles may be of the utmost value in the final stages of birth. But, as this implies gymnastic skill—though no special muscular force—it is as well not to essay it until the "machine movements" have been fully mastered.

Another exercise which involves alternate contraction and relaxation of the pelvic floor is No. 9, "Pelvic Flicking or Flipping in the Squatting or Kneel-heel Position." Its special utility is based on this rapid alternation. Those who have attained proficiency in Exercise 9 are able to increase its effect by concentrating their attention on the movement of the pelvic floor. And they may further specialise by concentrating this movement *on the vagina*. Thus, this movement of the pelvic floor is accompanied and accentuated by quick *staccato* movements of the vaginal muscles : *a combination which is of particular value for the technique of coitus*.

Exercise 10, *i.e.*, "Pelvic Lunging," can—and in advanced stages should—in its final phase be accompanied by *active relaxation* of the pelvic floor and especially of its vaginal portion ; and as the pupil resumes the initial position, this changes to *passive relaxation*. It should be noted that active relaxation of the pelvic floor, especially of its vaginal portion, are the same as *intentional dilation or expansion of these parts* ; in Exercise 10 there is active dilation of the vaginal orifice.

Exercise 20 achieves a capital muscular relaxation, especially in the pelvic floor, but the full benefit is only gained if this perineal action is obtained consciously.

Exercise 21 offers an alternate tension and relaxation,

contraction and dilation, in the pelvic floor. But here, too, in order that the *levator* may fully participate, it is necessary to concentrate especially on this region of the pelvic floor.

Certain exercises will be mentioned explicitly in the second section of this book, which treats of physical culture in pregnancy and the puerperium. They may, with advantage, be combined with deliberate contraction and relaxation of the pelvic floor. It should be mentioned that the exercises there designated semi-active, *i.e.*, those which involve support by an attendant or some assistant, may also be carried out actively, that is, without such support. In this manner, as well as by the modification and/or intensification of muscular effort, there may be produced a whole register of semitones between such tempered and careful exertion as is suitable to pregnancy and after child-birth, and vigorous action, at full pitch as it were.

The most appropriate exercises in this respect are No. 15 and No. 16 of that group, and especially No. 15, if the feet are parted and the knees more or less separated. In 15 the contraction of the pelvic floor naturally accompanies the *lifting* of the pelvis, and in 18 the upright movement of the trunk.

In the case of two more of these exercises, we revert to the classic exercises described in manuals of obstetrics as indirectly promoting the strength of the pelvic floor; they date from the days of *Thure-Brandt*, and are generally the only systematic efforts of a gymnastic kind for their purpose which the older books describe. They are No. 17, "*Opening and Closing of the Knees against Pressure*," and No. 27, "*Opening and Closing of the Knees against Pressure while the Pelvis is raised*." And both of these exercises are unquestionably very important and useful, especially if they are performed with special conscious attention to the participation of the muscles of the pelvic floor.

As I have already stated, many exercises in the general gymnastic *repertoire* for women are recommended for the development of the pelvic floor, of course *indirectly*. But,

as may be proved by individual experiment, they do not in the least necessarily imply a contraction of the levator. Take, for instance, the opening and closing of the legs when in the seated position. The pelvic floor only shares in these movements if and when there is conscious effort at its contraction. But, I gladly admit that there are several gymnastic exercises in which the pelvic floor may share and benefit *under the same conditions, i.e., deliberate special attention and effort.* Appropriate examples may be found in "*Be Healthy And Handsome!*" by a medical woman, Dr. Hildegard Yunkers-Kutnevsky.<sup>(16)</sup>

Direct gymnastics of the pelvic floor include two groups of exercise : the general, and the *special, or vaginal.*

The typical exercise of the first group, which is primary and often the only one mentioned or perhaps imagined, is the "*Retraction (or Drawing-in) of the Anus.*" This exercise should be performed lying recumbent and with the trunk completely relaxed. *Von Liebenstein*<sup>(17)</sup> gives two photographs showing what happens to and in the region of the pelvic floor during this exercise. As these photographs are not reproduced in the present book, I may quote the description in their accompanying text. In the first photograph, depicting the quiescent state : "The tissues of the pelvic floor are relaxed. The anus is almost circular and may easily be recognised with its concentric radiating folds. The perineum \* is broad and relaxed ; the *labia minora* (inner lips) slightly apart and the buttocks slack and slightly rounded." The second photograph shows these regions at their maximum degree of tension : "Anus, perineum and exterior genitalia are drawn inwards and together by the contraction of the muscular strata and appear decreased in size. The anus is a narrow oval slit hardly visible. The perineum appears higher set, as it is narrower (than in the first photograph) and the genital cleft is closed. The tense, rounded buttocks are pressed tightly together with a sharply indented dividing line."

\* Term specially used for the region between the introitus, or outer opening of the vagina, and the anus. Laymen often use this term, in a general sense, to include the whole pelvic floor, but it is better to avoid that so as not to make confusion.

Having contracted the anus and perineum to the maximum degree, pupils should retain the muscles taut for a short time, then relax and rest.

This will suffice in exercise *after* child-birth, for the pelvic floor, stretched and relaxed by the effort of birth, needs "toning up" before anything else in these circumstances. But, when "anal retraction" is prescribed before child-birth, as a preparation for confinement or for general physical efficiency, there must be a further and complementary phase; *active relaxation*, that is, *conscious dilation* at the conclusion of the exercise.

It is not easy to give directions to novices in these matters as to *how* they should set about this dilation. They must consciously cease and, *in fact, reverse the previous muscular contraction*; they must not only return to the normal muscular condition, but go beyond it; they must consciously expand the parts previously drawn tight. And it may confidently be said that this conscious and deliberate muscular relaxation and dilation neither involves any vehement exertion nor any insuperable difficulty; especially when there is already a certain degree of general training in muscular co-ordination. Unfortunately, active dilation of the pelvic floor is, as a rule, wholly neglected in physical culture; but it is absolutely necessary and an integral part of any exercises of this region at other times and in other phases than after child-birth, and particularly before the first experience of maternity. Otherwise there is a risk of an increased muscular tonicity (*without concomitant suppleness*) which constitutes additional danger for both mother and baby.

Kirchberg<sup>(18)</sup> has recommended a *combined exercise*, abdominal and perineal, including the direct movements of the pelvic floor detailed above, alternating with repeated "forward lunges and contractions of the abdomen," while the levator is still drawn taut. In my opinion, this combination has great value in preparing for the effort of giving birth, but I should like it to be supplemented by alternating the abdominal movements suggested by Kirchberg, *with conscious dilation of the pelvic apertures*. I consider this modification

much the more valuable and significant, as may be realised from the facts outlined above.

Both the simple primary "anal retractions" and *Kirchberg's* exercise, as well as the modification of the latter suggested by me, may be performed in the upright position, as well as lying recumbent. I recommend the second position—feet slightly apart—to begin with.

It is hardly possible to describe the *special vaginal exercises of the pelvic floor* in more detail than the general (or "perineal"). Anyone who has once mastered the secret of muscular action and co-ordination has only to apply what she knows. There is, of course, a special *muscular sense*, which is much more highly developed in some individuals than in others, but it can be cultivated. A certain accurate anatomical knowledge—it need not be *extensive*—is highly desirable. And knowledge and control will enable the perineal and vaginal muscles to be set in motion separately or together, as the occasion requires.

The mind can help the muscles by means of *definite imagery*; this is well known in the theory and practice of physical culture. But it is necessary to form an accurate picture of the result to be attained, or the obstacle to be overcome. It may perhaps be simplest and easiest for the woman who is a novice in pelvic physical culture if her physician explains this in the course of a gynaecological consultation. The patient may thus learn how to contract either the "constrictor cunni," the upper "levator vaginæ," and/or the whole pelvic floor. The constrictor cunni muscle is not so difficult to localise and control (see Plates I. and IV.), but she should learn to differentiate between the movements of the constrictor cunni and of the more internal portions of the muscular stratum (Plates II. and IV.), which we have termed levator vaginæ, and to activate them separately or together. There is, as a rule, no great difficulty here.

But what of cases in which no trained gynaecological or anatomical assistance is available? In such circumstances I recommend the procedure followed by a married lady and enthusiastic physical culturist about thirty years of age, who

experimented on herself in order to ascertain how far she could control the action of her perivaginal muscles, and reported the results to me. The experience of several other women confirms hers. I quote verbatim from my work on "Fertility and Sterility in Marriage," p. 161, Chapter V.\*

"(a) In order to test the working of the muscles which had appeared to clasp the male organ in coitus, she introduced a speculum which she had previously rinsed and soaked in warm water. Through contractions of the muscles of the orifice (*Constrictor Cunni*), as distinct from the deeper muscles of the upper vagina, it was possible to *move the speculum*: it was drawn or sucked into the vagina during the contractions and slipped out as the muscles relaxed. The movements of "snapping" were quite ineffective, as the speculum was not deep enough inside.'

"(b) (Experiment to test the power of voluntary contraction in the deeper vaginal muscles.) A narrow tube or uterine sound was introduced. The "snapping" contractions moved it vigorously to and fro from left to right; it almost rotated. The sound must be inserted very far and in this case a rubber one was used. The difference between "snapping" and "sucking" is clear.' "

If women have once realised the nature of the movements involved, they can exercise the various muscles independently of instrumental or mechanical aid.

\* See also pp. 157-162, and "Ideal Marriage," pp. 65-72.

## CHAPTER VII

### CERTAIN CONTRAINDICATIONS

THE exercises already described are not by any means suitable, safe or beneficial *to all or any women, at any stage of life, or in any and every state of health.*

In my opinion, the exercises of the perivaginal muscles for psychological reasons cannot be recommended to unmarried women ; or, to put it in more modern terms, to women who are not in a position to express and satisfy their sexual emotions in a socially protected and recognised manner. To draw her attention needlessly to the genital organs may lead to suffering and danger. If a girl has understood and practised general physical culture and attained a certain degree of muscular fitness and control—including general pelvic co-ordination—she will be fully prepared for the perivaginal sections at marriage ; or, preferably, shortly before marriage. And married life will normally increase both her knowledge and her powers in this respect.

The physical culture of the pelvic floor in general, including, of course, *relaxation as well as tension*, is quite suitable for girls, especially in combination with other movements. They cannot harm the general organism, even if immature, nor perturb the imagination.

This is equally true of the exercises of the pelvic zone described and depicted in our Films, *with the exception of No. 19 (Film 12, Figs. 21 and 13)*. This is, in some respects, unique, and we will deal with it presently. The other abdominal exercises have been carefully selected and, indeed, *constructed*, so that they can do no harm, even during puberty. For they have been adapted with a view to *increasing pelvic suppleness and elasticity as a whole* and avoiding any excessive wrench or dislocation of the component pelvic

parts. Similarly, I have been at pains to avoid prescribing any sort of bodily exertion which might harm undeveloped genital organs, or those with slight anomalies of structure. Thus, all sudden leaping and jumping, all wrenching and violent slinging of the body have been ruled out ; and, indeed, such are wholly unnecessary for our special purpose.

Thus there is no *absolute* need for preliminary gynaecological examination before beginning these pelvic exercises; but I would add that an occasional expert review and testing of the condition of the interior genitalia is very advisable for every woman ; and I agree with *Westmann*<sup>(19)</sup> that no woman should take up sports, games and athletics without such preliminary inspection and passing as "fit."

And gynaecological inspection becomes urgently advisable in all cases where there is any reason to suppose the existence of morbid conditions, either genitally or anywhere in the abdominal cavity.

*The presence of inflammations, even in their chronic stage, is an absolute contraindication to pelvic gymnastics.*

As regards Exercise No. 19 (Film 12), which aims at enabling women to pass at will and with the least possible difficulty from the attitude known as "*Walcher's Suspension*"—with pendent legs—to the extreme pelvic flexion and *vice versa*, it may also be said that this advanced gymnastic exercise is calculated slightly to loosen the joints of the separate pelvic bones, and thus to give the whole region a certain dilation. There are great advantages in this effect, as we shall show ; but there is also the risk of injury if the dilation exceeds a definite limit or is attempted at an unpropitious stage of growth. Therefore Exercise 19 should not be attempted wholesale or by half-grown girls.

The bony girdle between abdomen and lower limbs, which we term the pelvis, has three places in its circumference which—although only permitting a very limited range of separate movement to its several sections—have, in some degree, the nature of joints. Their mobility is strictly limited, both through the structure of the bony surfaces themselves and the extremely tough and strong *ligaments* which connect these bones. These *articulations*, as they are

termed, connect the *sacrum* on either side with the *ilia*, while the third unites the *rami* of the *ischia* in the *symphysis pubis* at the front.

Both women themselves and the obstetric specialists in charge of births are concerned that these articulations should be as mobile as possible, for this greatly helps in the process of birth. But it is equally important to preserve the actual *bony ring* of the pelvis solid and intact, for, otherwise, further painful and dangerous complications arise both during pregnancy and at birth. Moreover, the pelvis has other functions besides those of reproduction ; it is the basis that bears the whole weight of the trunk.<sup>(20)</sup> Therefore, we have great need to keep the "golden mean" here. In childhood and at puberty, the pelvic articulations are comparatively loose and the bones cartilaginous. Moreover, there is an automatic loosening of the articulations during pregnancy. We may even agree with *Max Hirsch*<sup>(21)</sup> that there is a certain similar relaxation during each menstrual period.

Therefore we must stress the need for care. No exertions which might strain the pelvic articulations during pregnancy, during menstruation, and/or before the body is fully grown : roughly before twenty years of age. As a rule, we may say that Exercise 19 should only be carried out between maturity and the beginning of the first pregnancy. And even then moderation is advisable. I would recommend it, not as a *daily exercise*, but rather every third day, and then twice or thrice in succession, preferably under skilled supervision and *never during menstruation*. I would also suggest that, when beginning to learn No. 19, it is well to support the feet somewhat in the *suspensory* attitude. Where there is constitutional asthenia or marked muscular weakness it is contraindicated.

A few words of warning must be uttered here, although not strictly relevant to regulated physical culture for girls and women. But the pelvis is a most important region, and the feminine pelvis is often injured by the lack of judgment shown in games, gymnastics and athletics. The immature

pelvis has several specially vulnerable points. It is normally inclined to develop the distinctive *width* which differentiates woman's physique from man's. But excessive development of the pelvic—and adjacent—muscles and ligaments may check this normal tendency and artificially promote the narrow pelvis which approaches the proportions of the boy ; asexual, even if not definitely masculine. There is probably a double explanation of the extremely narrow average pelvic measurements of professional women acrobats and/or sports-women. They may be and doubtless often are naturally of sexually intermediate types ; the *pronounced* feminine build is not suited to such violent physical exertion. And, on the other hand, the woman athlete often owes her proficiency and her particular physique to her prolonged and strenuous practice. Only prolonged observation and investigation will enable us to prove how much is inborn idiosyncrasy, and how much the result of habit and training, *i.e.*, acquired modification. But the small amount of reliable data already available corresponds to the results which the *theory* of genetic physiology would lead us to expect. Therefore there is every reason to counsel moderation in pelvic exertion during the formative years.

*Violent and prolonged gymnastic exercises impose a great strain on girls and women !* A strain often unperceived and forgotten until serious symptoms appear at crucial physiological times—during pregnancy for instance. There is frequent trouble with the circulation and cardiac symptoms abound. And there is injury to the upper genital tract, revealing itself in menstrual pains and irregularities, in troublesome and persistent discharges, and—worst of all—in the aggravation of possibly slight gynaecological lesions and anomalies, of which the woman herself may have been quite unaware.

No. Athletic women are not particularly adapted for motherhood, rather the reverse. And there is every reason not to "force" this type by artificial conditions and stimulation.

But there is, of course, another side to the problem of

special physical culture for women. There is great risk of excessive artificial slackness of muscle in some of the systems of rhythmic gymnastics now in vogue which favour "limpness" of tissue and movement, and asthenia generally.

These are the two extremes : ultra-athletic and ultra-asthenic. With the exception of No. 19 and its very definite and restrictive contraindications, I do not think there are any special reasons for "warning off" the exercises of the pelvic zone described in Chapter IV.

Of course, they are not all equally easy or even equally possible for *every* woman. This is a relative indication in each individual case. It is always best to begin with what comes easiest to each pupil and pass on to the more difficult tasks and lessons. For this reason, and also for the greatest accuracy in execution, I strongly recommend the services of a gymnastic instructress, *at least* at the beginning of the course.

The following brief hints to beginners—for which I am indebted to *Mrs. Lisa Mar*—may be of use to my readers :—

In the majority of women the pelvis appears to be more mobile in the recumbent position—*i.e.*, lying—than when standing. And, undoubtedly, women who have no previous gymnastic training find the exercises more difficult to master in the upright position than in the supine.

Curiously enough, even comparatively stout and heavy women learn to rotate the pelvis more easily not only lying on their backs with raised knees, but even in the knee-hand (quadrupedal) position. Of course, the instructress can help and guide here, and there is less fatigue after these exercises.

Therefore, we have begun this sequence with these particular exercises (Films 1 to 4). Stout women and women in middle life—especially if they have no previous gymnastic training—may restrict themselves to these exercises—and, of course, to the perineal and perivaginal—for they will find them sufficient for their purpose.

Finally, a humble but very essential matter deserves mention. *All pelvic exercises should only be undertaken after emptying the bladder by urination, and, if possible, after evacuation of the lower bowel as well.*

# THE UTILITY OF THE CAPACITIES, ACQUIRED BY PELVIC EXERCISES

## CHAPTER VIII

### UTILITY IN COITION

THE control and range of pelvic movement attained by definite exercise may be of the greatest use to women both in mating—or coition—and in motherhood. They may also be beneficial in avoiding or alleviating certain anomalies in the genital organs.

We will first consider the advantages of pelvic elasticity and control in the coital act.

Both the external muscle of the vaginal orifice (designated by the abbreviation C. C.) and the deeper internal Levator Vaginæ (L. V.) will more or less appreciably *constrict* or *embrace* the male organ \* in the process of insertion. And this intimate contact and definite pressure increases stimulus and sensation in both partners to a very high degree ; but it can hardly be exercised at all by women who have not specially cultivated the muscles of their pelvic floor. In those cases the peculiar intensification of pleasure which the perivaginal muscles afford is lost. Of course, there may be compensating circumstances : particular proficiency in technique, preliminary love-play and sexual and emotional excitement ; and these may suffice for complete climax and relief. But the vaginal muscles afford the summit of joy if they are correctly used. And this for complex reasons. In most women—though not in *all*—there are several involuntary (reflex) contractions of the vagina during the orgasm ; but, if these muscles have never been cultivated or controlled (*i.e.*, co-ordinated) they remain slack and feeble and cannot act appreciably on the phallus. And the lack of vaginal

\* The term phallus is hereafter used for the male organ in erection, as in “ Ideal Marriage ” and “ Fertility and Sterility in Marriage.”

"tone" or control is all the more regrettable when there has been inevitable distension of that passage in giving birth, or when the whole pelvic floor has not been properly attended to and restored. (There is, of course, a certain reflex action of the muscles, independent of the conscious will.) But, in the circumstances just outlined, the vagina, instead of a soft, and yet close, elastic *sheath*, forms a limp *sack*; and there is inadequate contact between the vaginal walls and the phallus: thus, both partners are deprived of natural and obvious stimuli. After *several* confinements this condition is, unfortunately, very prevalent; but it may supervene even after the first birth in women who have never cultivated or trained their perivaginal muscles. And women are still generally unaware of the disastrous effects of this excessive stretching and slackening, and so they take no measure to prevent or counteract it. Men, on the other hand, are very well aware of the possibility and often deliberately defer parenthood in order to avoid it. And if parenthood is *subconsciously desired yet indefinitely postponed* there may be very unwelcome results. Of course, there may be extreme levity and one-sided carnality and irresponsibility here; but there is no doubt that the damage which a confinement may inflict on the female organs is taken into consideration by *people of entirely serious character and worthy of respect*. Ascetics who shut themselves away from life and the forces of life may deny this; other-worldly moralists may condemn it; but it is so, and, for those versed in physiological and psychological fact, it is wholly understandable. *But birth is not necessarily devastating to this most intimate physical charm.* With the exception of certain structural anomalies, and granting adequate obstetric skill in command of all modern resources, deformation of the coital apparatus may be avoided. This may best be achieved by previous physical training,\* as well as proper care and remedial exercise after child-birth, carried on with accuracy and perseverance. We shall have occasion to refer to the almost incredible benefits following the cultivation of the

\* See Chapter VI., and also "Ideal Marriage" and "Fertility and Sterility in Marriage," *passim*.

levator vaginalis muscle. But, at least, it is possible to make one definite statement in this context and to give it almost the weight of an axiom. *A woman with well trained and co-ordinated muscles of the pelvic floor has, as a rule, even after several confinements, a more efficient vaginal organ than an untrained PRIMIPARA, or even than a complete novice in these matters, who has not borne a child.* For, though there is an inevitable expansion of the vaginal passage after any confinement, which diminishes the passive pressure of the close soft walls, this may be compensated by the active friction and contact of the encircling muscles on the male organ.

And, in order to exercise this friction aright, the muscles in question must be so fully under control, so instantly responsive to the mind, that there is no need to concentrate attention on them, and their action becomes semi-reflex. The same process is experienced by us all with other important sets of muscles and nerves; for instance, in learning to speak, to walk and to eat. The *sensation* accompanying the situation automatically "touches off" the muscular mechanism. The perivaginal muscles should pass through the necessary stages of training for efficiency in coitus and child-bearing, so that they may act automatically when the hour arrives. And, as a rule, they adapt themselves with fair speed. But a certain degree of practised co-ordination is very desirable, for conscious muscular effort in coitus spoils the spontaneity, the deep impulsiveness of the whole act, and may dislocate its reactions to a degree which will repel and disable both partners and, finally, undermine the entire relationship.<sup>(22)</sup>

Again, these muscles should not simply grasp or grip the phallus, they should, as it were, *caress and stroke* as well. It cannot be considered ideal sexual communion if the stimuli are so violently concentrated that the climax ensues at the earliest possible moment in both partners. Not only intensity, but delicacy of sensation and a certain *range of difference*—of tactile *nuances*—are the ideal here. And they may be attained through the faint yet shifting pressures and vibrations of the perivaginal muscles of the pelvic floor.

And, of course, the pelvic zone has also its part to play, although the results here are of a different pitch and order of sensation.

I would refer my readers to Plates I., II. and IV., which show first the possibilities of the Constrictor Cunni and of the outer parts (*b*) of the Levator. These are supplemented by the parts of the Levator Vaginæ, which are situated further inside the body (Plate II *c.* and Plate IV *c.*) and gives a further range of action—friction—and sensation. But full sex efficiency in coitus demands advanced proficiency in exercise and also favourable structural conditions ; for the genital and pelvic organs in both sexes, and especially women, have a very wide range of individual variation, even apart from actual deformity or abnormality.

We have mentioned the contractile possibilities of the pelvic and perivaginal muscles. But it is necessary to contract the C. C. with special force in cases where the woman wishes to help her husband to retain the member in her vagina though his erection is incomplete. In these circumstances *the inner parts of Levator Vaginæ must not be set in motion* ; their action would only expel the male organ (if it had indeed any effect). But the *outer parts of the Levator Vaginæ* may be of great help by their *clipping*, almost “snapping,” action. The main rôle, however, must be played by the C. C., whose continuous *suction*, as described in the experiment recounted in Chapter VI. (*a*), not only retains the male organ—provided that the erection has not wholly subsided—but also obtains a certain hold on the root of the penis. This has the effect of hindering the backward flow of blood from the congested corpora cavernosa and gives the clasping C. C. muscle still more purchase. And these combined and interacting processes have often great value in coital technique, and, as a result, in its emotional, mental and hygienic irradiations. In normal coitus the too rapid ebb of the man’s excitement after ejaculation may be averted and the male organ retained for a while, which is an agreeable and tender *finale* for the man and often a main factor in sexual satisfaction for the woman, for it tends to equalise the sharp contrast between

the sudden cessation of masculine excitement and tumescence and the much more gradual ebb of feminine feeling after the supreme moments. And this "compensatory" process leads spontaneously to the most difficult of all the four phases of ideal communion : to the epilogue, or afterglow, which so often fails or even repels and wounds the sensibilities of a loving woman, but which may be the most idyllic and deeply satisfying of all. The woman herself may contribute to this consummation by the expert use of her C. C. muscle.

A further and most valuable benefit for the mating woman is *the power of prolonging coitus* if her husband has already reached his climax before she has attained hers. If the disparity in the two-fold *coital curve* \* is not too great, it may be made good by the action of the Constrictor. And the perivaginal muscles are the best agents in bringing about an immediate repetition of the act, should both parties desire it. This ability to clasp and retain the male organ in cases where potency is relatively slight or impaired and erection imperfect has often proved the salvation of a marriage tie, and such ability may be acquired by appropriate pelvic exercises.

We have spoken of the more external C. C. muscle in coitus. The levator vaginalæ (L. V.) may play a distinct part in retention of the male fluid. Many women who long in vain for motherhood, lament, in the privacy of gynæcological consultation, that they cannot do this, and attribute their sterility to this cause. Their view is often doubtless exaggerated or wholly mistaken, but, nevertheless, it is generally true that the penetration of the sperm cells into the womb, and therefore the likelihood of fertilisation, may be greatly helped if the seminal ejaculation remains as long as possible in the immediate neighbourhood of the *cervix*, or neck of the womb, *i.e.*, as deeply as possible inside the vaginal vault. The obvious method of attaining this is for the woman to take the attitudes in coitus which favour the flow of semen into her vagina by the action of gravitation,

\* See "Ideal Marriage," Chapter IX. (also XI.) for further important considerations, as well as Chapters V. and XIII. in "Fertility and Sterility in Marriage."

instead of attitudes which cause the fluid to ebb towards and out of the orifice. Among the former attitudes there are especially two sets of possibilities: the knee-elbow, or quadrupedal, and the recumbent attitude with the coccyx raised so far as possible. These two attitudes may, either of them, be supplemented by deliberate contraction of the perivaginal muscles, and in two ways: either by the C. C. continuing to clasp the phallus so that it acts as a natural seal or plug, or by a general contraction of the whole pelvic floor, which draws the vagina tight as though to prevent the escape of excessive menstrual discharge or liquids used in douching. (This needs a vigorous contractile power.) And, finally, the L. V. may act during the summit of coitus by contracting and pressing the *glans penis* firmly against the uterine *portio vaginalis* in the moments of emission. I have treated these points more fully in Chapters V. and XIII. of "Fertility and Sterility in Marriage."

The L. V. may not only favour fertilisation, it may also help to avert it when undesired. This requires energetic muscular action, together with conscious dilation of the outer C. C. The L. V. propels or expels the fluid ejaculate downward and out of the vagina. As will be evident, this is only possible for women with highly trained and co-ordinated pelvic and perivaginal muscles, such as are aimed at by the exercise we have described as No. 10 (Pelvic Lunges with Feet slightly apart in the Second Position).

We have now to consider the finer shades of muscular action in the *superficial* area of the pelvic floor. There is certainly great individual difference in structure among women in this region; on this, all anatomists are in agreement, although their definitions and descriptions are somewhat contradictory.<sup>(23)</sup> Nevertheless, some women are able to exercise and control these mechanisms so that they have an appreciable effect, as is confirmed by gynaecologists. And, *nota bene*, the women who can use their C. C. and L. V. muscles at will are *more likely* to excel here than those who are not adepts, for instance, in the deliberate conscious dilation, opening or expansion of the vaginal introitus. This may be

operated either by diminishing the " tone " of the constrictor (see Plate I.), or perhaps also by the contraction of certain transverse muscular fibres (also visible in Plate I.). But, whatever be the precise agents, women who can entirely distend or open their introitus at will, have certain uncontested advantages both in married life and as subjects of necessary gynaecological and clinical treatment.

The C. C. muscle may close convulsively under psychic influences, or as a result of disturbing local conditions. When there is fear or reluctance to admit gynaecological instruments, for instance, a woman who realises that the inspection is right and necessary may overcome her unconscious resistance, and, by deliberately opening her vaginal orifice, she may facilitate examination and, therefore, diagnosis and remedial measures. Or, perhaps the C. C. closes and the nerves shrink before the male organ in early married life, even though there is full psychic consent and intention for union. If the woman realises this and deliberately *expands* her orifice, the anatomical and nervous obstacles may be overcome.

Further intimate facts are revealed in the course of medical and gynaecological practice which, far from being trivial, may influence the whole subsequent happiness of marriage, enhancing or undermining it. I refer to the peculiar difficulties of first intercourse. Virgins who have learnt to control the muscles of their pelvic floor may greatly reduce this difficulty by gently pouting forward the vaginal orifice instead of closing it convulsively. And after perforation has taken place, for the first few days or weeks, there is sometimes a slight soreness and difficulty, which may and should be met in the same way,\* as should also any slight soreness due to a scratch, a chill, a bruise or the monthly period. Obviously, I refer here only to slight cases of involuntary rigidity of the C. C. The severe cases are spasms involving the neighbouring muscles, and termed *vaginismus* in the vocabulary of medicine. These are of psychic origin and quite refractory to local treatment whether the conscious will is involved or not. Nevertheless, *vaginismus* might be *prevented* in some cases if

\* See " Ideal Marriage," Chapter XIII., for further relevant facts.

all women were fully aware of and in control of the muscular actions of their pelvic floor.

Women have a special organ of sensation situated in the pelvic floor, and termed the *Clitoris*. Its tip is extraordinarily sensitive to the slightest contact. Certain muscular fibres of the pelvic floor should theoretically be able to draw the whole of this little organ, and especially its tip, the *glans clitoridis*, downwards towards the mouth of the vagina. In this manner the clitoris shares in the rhythmic friction by the phallus during coitus. It is not necessary to describe the clitoris in detail, nor is it shown accurately on the Plates, in order not to overload and confuse the diagram. Nevertheless, they show the muscular fibres to which I allude. *Vignes*<sup>(24)</sup> remarked that they—like all the other separate strands of the perivaginal system or group—act in combination, as a rule, but can also be set in motion separately. I do not doubt that this may actually be the case with the particular group that draws the clitoris downwards. I have also received accounts of deliberate and voluntary control in this direction, and of the enhanced pleasurable result, especially in the first phase of coitus. This clitoridal action appears to me very important *as compensating and counteracting the greater slowness with which the woman tends to reach the climax*, and enabling her to increase the stimuli she receives quite independently of action by her partner. This may even enable her, if necessary, to dispense with any prelude of what I have termed *genital stimulation*. *The complex mutual interplay is, in itself, sufficient justification for the culture and mastery of these superficial muscles of the pelvic floor*. There are, however, great structural variations in the genital organs of women, and voluntarily directed downward motion of the clitoris will not, in my opinion, be found possible *for any and every woman*, however great her pelvic efficiency in other respects. For the clitoris is fixed to the pubic arch in a manner which greatly limits any change of position : it is very small in all cases, and in some it is even below average dimensions. A certain degree of *infantilism*, or arrested growth, here is even quite usual before full sexual intercourse is experienced.

And the distance between the clitoris and the vaginal orifice or introitus *vaginæ* is very different in different individuals, either because the clitoris is higher set and further forward than usual, or because the introitus is further back, *i.e.*, nearer the anus.

The *glans clitoridis* may be inclined towards the phallus as the latter enters the introitus *by increasing the woman's pelvic angle*. This means that the lumbar region is hollowed and the anterior or frontal portion of the pelvis—if the woman stands on her feet—slightly lowered. (The same movement is also possible in the recumbent and kneeling and sedentary attitudes, as we shall see.) And this further possibility introduces us to the use of the culture and control of the *pelvic zone*. We shall now, therefore, cease to deal with the *pelvic floor*, assuming as self-evident that its action can combine with and enhance the wider-ranging motions and positions of the pelvis—and, in fact, the body—as a whole.

In order to realise the significance of this shifting *pelvic angle* or *pelvic inclination* which dips forward the lower abdomen and pubis, and brings the *glans clitoridis* sometimes into actual close contact with the *dorsum penis* (or upper surface of the phallus, *e.g.*, in coitus performed in the first and usual attitude of the converse, or face to face position)—it should be known that women have two distinct and independent kinds of sexual pleasure or *voluptas*, localised respectively in clitoris and vagina (including orifice, inner walls and *portio vaginalis* of the womb). Either the clitoridal or the vaginal sensation may be aroused *without the other*, and may culminate in supreme ecstasy or orgasm, with subsequent relaxation and full satisfaction.\*

The perfect sexual communion should *combine* both

\* See "Ideal Marriage," p. 180: "But the sensations differ as much between themselves as the flavour and aroma of two fine kinds of wine—or the chromatic glories and subtleties of two quite separate colour schemes. And even the orgasms induced by clitoridal or vaginal stimulation respectively are, curiously, though not widely, *different*, although the internal mechanism, the reflexes, the local and cerebral discharges and the ensuing relief may be equal and identical."

clitoridal and vaginal sensations. In women who are novices, *clitoridal sensation* is apt to predominate, and sensitiveness to be much greater outside than inside the vaginal sheath. Therefore at the beginning of sexual relations the considerate husband should be careful to give much attention and ingenuity to delicate contact with this little organ. He should even remember contact with the clitoris, after the *immisio penis* has begun, *i.e.*, after the beginning of actual intercourse, which may be managed by appropriate attitudes and is helped by the vehement rhythmic contractions of the introitus *vaginæ* in orgasm. I speak of cases of fairly normal build and proportion, in whom the clitoris is not positively dwarfed and defective, or anchored too high on the pubic rim. But it is possible for a variety of reasons that orgasm is delayed, and, therefore, clitoridal stimulation should be applied either *before* or *immediately after* insertion. And—to return to the substance of this slight discursion—as the clitoris itself has so little independent movement, the best way of making clitoridal stimulation by the penis possible, is by *sufficient increase of the pelvic angle, or forward dipping of the pelvic rim.*

To understand the full range of possibilities here, it is necessary to realise that there are two primary positions in coitus between man and woman: the one which we share with all other mammals: the averse position, in which the man faces forwards to his partner, but she turns her back; and the converse position, distinctive to our species, in which they face one another. And in these two main categories there are numerous postures or attitudes.\* And anyone who is even partially aware of these attitudes will understand at once that pelvic inclination cannot be changed or increased equally well in them all. Each attitude has its peculiar charms, advantages and difficulties; but, speaking generally, it may be affirmed that the least suitable and favourable to change of pelvic angle is flexion (Attitude III. in the Synousiology of "Ideal Marriage") which corresponds

\* Cf. "Ideal Marriage," Chapter XI., and "Fertility and Sterility in Marriage," Chapter XIII., in which all these are considered in detail; as regards types of sensation afforded and aptitude for impregnation or its reverse, *i.e.*, contraception.

fairly closely to the fourth phase of Film 12. On the other hand, the attitudes of extension, both (*a*) quite horizontal and (*b*) suspensory (*i.e.*, corresponding to the transition from the second to the third phase of Film 12), are very favourable to this modification. What of the medial attitude (most in use in Europe at the present time), *i.e.*, the attitude in which the woman lies on her back with slightly parted limbs and with one knee slightly raised? In this respect it is easier than flexing and less so than stretching. Special facilities for increasing the clitoridal share in coitus by means of increased pelvic inclination are given in the attitudes of equitation (man lying on his back, woman astride his loins) and the sedentary attitude face to face. This fifth attitude, in which the man is seated and the woman is supported across the man's thighs, facing him, is very propitious to the clitoris. The woman has considerable freedom of movement, and thus is able to dip her pelvis forward at will and maintain the greatest possible amount of close contact between *glans clitoridis* and phallus. Moreover, she is also able to direct the ejaculation—if she inclines well forward at the critical moment—towards the posterior vaginal wall, instead of into the *portio vaginalis* and *os uteri*: and this certainly diminishes the likelihood of impregnation. (The conditions and effects of this modification during sedentary coitus are shown clearly in the scale drawing reproduced on Plate V.) If impregnation is *desired*, the inclination of the pelvis should be decreased, so far as possible, at the moment of ejaculation. Then the phallus is no longer pressed downwards by the symphysis pubis, its axis corresponds with that of the vagina, a deep penetration results and the seminal fluid flows forth close to the *os uteri*, or even directly into this aperture.

Pelvic inclination may be changed in the course of horizontal or recumbent coitus, and in the following manner: Let the woman lie quite flat on her back in the attitude of extension (II.), that is, with legs separated but *not bent at all*. This posture, in itself, increases pelvic inclination, and it can be further accentuated by drawing in the loins and hollowing the back just above the hips, so that *symphysis pubis* and clitoris are stretched as far as possible downwards. The

final phase in this particular technique is the lifting of the woman's legs, simultaneously with the greatest possible backward curve of her lumbar region, which brings pelvic inclination to its *minimum*. It is possible to express the difference in pelvic inclination between the first and the final attitudes by means of numbers. The median line of the pelvic floor—which is drawn from the point of junction between the sacrum and the lumbar vertebræ at the rear, to the upper rim of the symphysis pubis in front—is termed the *conjugata vera*. In the extended horizontal attitude the conjugata vera forms an angle of 145 degrees with a second imaginary line along the anterior surface of the lumbar vertebræ. If the woman draws in her loins (and protrudes her coccyx and gluteal region) this angle is increased. But in pronounced flexion it only amounts to 115 degrees. In my monograph on "Fertility and Sterility" these two attitudes and angles are shown in Figs. 3 and 4 respectively of Plate VIII., for which I am indebted to *Bumm's* great work on "Gynaecological Surgery."<sup>(25)</sup> They are reproduced here as Plates VI. and VII. The differences in the vaginal axis deserve careful attention. The Exercise No. 19 in our series (Film 12, Figs. 12 and 13) gives some idea of the attitudes and anatomical conditions involved.

If we consider the second main coital position—the Averse or *a Tergo*—in which the face and abdomen of the man are turned towards the woman's back, we shall find that it is also possible to modify pelvic inclination with happy results. But, in coitus *a tergo*, there is *generally* no phallic friction of the clitoris—which is situated on the anterior rim of the pubic floor, whereas the man approaches from behind. The exception to this rule among the averse attitudes is the extreme form of the ninth group \*—especially if the loins

\* Described as follows in "Ideal Marriage," p. 233: "The woman kneels while her body from trunk to thighs is inclined at a more or less acute angle. Her body can be stretched horizontally, supporting itself on hands and arms or on a couch or chair of appropriate height. A third variation is also possible, the woman's body can slope downwards from pelvis to head with shoulders and elbows resting on a low couch or chair (the famous knee-elbow posture used in gynaecology), and form an angle to the upright thighs or legs. There is no substantial difference between the variations mentioned above and an attitude in which the woman stands on her feet and bends her body as far forward as possible from the hips."

are drawn inwards, for this permits the lower surface of the *symphysis pubis* with the clitoris to touch the lower surface of the male organ. But there is need for caution both here and in the previously mentioned sedentary attitude face to face (or anterior sedentary) with strong pelvic inclination, for then the axis of the two organs, invading phallus and receiving vagina, *differs*, and it is particularly necessary to avoid vehement thrusting movements when this is the case, or severe injury may be inflicted on the woman.

The risk of such injury is, however, diminished if she has learnt to move her pelvis swiftly and easily, and thus, by slightly shifting the position of her vulva or the direction of her vaginal passage, at the danger signal of any sudden pain, to avoid laceration or, even possibly, rupture.

This consideration leads to a further caution. The woman can only incline her pelvis or shift her position freely and rapidly *in such attitudes as place her body beside or above the man's*. If the man is uppermost, whether lying or kneeling, or standing on his feet, the woman is very largely immobilised. But there is a great feminine freedom of movement in the astride attitude or equitation (in which the man is supine, and the woman astride across him), in the anterior sedentary (in which both are seated, she across his thighs facing him), in those kneeling postures, in which the man stands upright, while the woman bends forward, and, finally, in the posterior sedentary (in which she sits across his thighs but turns her back to him). There is a partial—but limited—mobility for the woman in the posterior lateral or sideways attitude (both lie on their sides, the woman in front with her back to the man) and even less freedom of movement for her in the anterior lateral (lying sideways, face to face) for the leg on which she is lying is pinned down.

There is, however, a further modification of this anterior lateral attitude, as well as that described in "Ideal Marriage," where the woman draws up the leg on which she lies so far as possible and clasps the uppermost thigh of the man with the other leg. The third possible lateral posture was described to the author in a letter by *Henry Hamill*,<sup>(26)</sup> who

recommended its advantages. In the last two years I have recommended it to many married couples who sought advice on coital technique, and have been able to overcome previous difficulties by its adoption and practice. The procedure is as follows :

The man lies half sideways and half supine (*i.e.*, on his back). One leg rests on the couch, slightly bent at knee and hip. The woman lies down over this leg, half sideways, half in the ventral attitude (face downwards). And she intertwines her legs and thighs with the man's. Of course, a certain amount of adaptation and adjustment is necessary before complete contact is possible, and not all couples are able to manage this. But when it is once satisfactorily mastered, and if the woman has trained pelvic muscles, she has great freedom of movement and full choice and scope both for pelvic inclination, and for clitoridal friction if desired, as well as for adjustment at the moment of ejaculation, which certainly *helps* either to promote or avert impregnation.

Which attitude gives the woman least freedom of movement ? Undoubtedly flexion. In many respects this posture is second to none, but it gives least scope for the knowledge and powers obtained through pelvic physical culture. Only the most adept erotic artists understand how to give special stimulus in the flexed attitude by very slight and gentle sideways motions or, rather, *undulations* of the whole abdomen and pelvis. Change of pelvic inclinations is quite out of the question in flexion.

The medial attitude—which most Europeans regard as *normal*—is midway between the immobility imposed by flexion and the possible freedom of action in the attitudes first enumerated. Here much depends on the man's build and weight, both absolutely and relatively to hers, and also, even more, on his consideration and tenderness. If he is so lacking in regard as to let his partner bear his whole weight, both change of pelvic inclination and rhythmic contraction of the perivaginal muscles become almost impossible. But if he exercises due care and thought and supports himself mainly on his elbows and knees, drawing the latter higher

up towards his body than is usual, he benefits from her ability to execute a greater variety of pelvic movement, *i.e.*, to impart a greater range of sensation than he has at his own command, because of the distinctive genital structure of the male. For, in man, the organ of sex is an external limb, attached to the pelvis and without much range of independent spatial movement. This fact limits him to *rhythmic backward and forward movements*, which may be gentle or vehement, but have few possible variations. But the woman's receptive *sheath* is within her pelvis, and this enables her not only to sway to and fro as he does, but also—if her pelvic muscles are well trained, firm yet elastic—to exercise pressure on shaft or tip of the male organ at will and thus impart fresh and keener stimulus. Also, in the same manner, to apply varied friction and pressure to her own organs both internal (vagina and *portio*) and external (*clitoris*). She is also able to perform *other than longitudinal* movements; she may vibrate or undulate her body sideways and thus add a new series of sensations. This faculty is most vividly realised in the really adept performance of *coitus astride*. If the woman is physiologically and technically able to do justice to this attitude—in which she plays the active part—the steady but vibrant pressure and friction of *portio vaginalis* and *glans penis* gives far keener and subtler pleasure to both herself and her partner than anything possible in “medial” coitus. The summit of sensation is attained by a very gentle but steady rotation of the pelvic periphery from the *portio vaginalis* as a centre; the *portio* presses against both *corona glandis* and *frenulum preputii* alternately, with a circular movement which does not provoke a premature climax, but prolongs the most exquisite intensity of pleasure. Of course, this type of sensation means *full length penetration*, as well as great skill on the woman's part. And such full length penetration always implies a certain risk of undue strain or even rupture. But, as in equitation, the woman's body is above the man's, she is able to alter her position or call a halt at the danger signal of any pain. The sedentary attitudes, both posterior and especially anterior, are also well adapted for pelvic mobility

and changes of inclination, though less so than equitation, as has already been pointed out.

For woman has a far wider register of coital, or sexual, sensation and of variation therein at her disposal than man. His specifically sexual pleasure is *very highly localised*, and his power of modification here is very limited and practically in only one manner. But woman has a *threefold* choice : she can perform the same *type* of movement as the man ; or she can exercise the rotating movement described in equitation ; or she can undulate and vibrate her perivaginal muscles.

But, without knowledge or previous practice, she generally fails to attempt either the second or the third and her efforts at the backward and forward pelvic swing are, only too often, so clumsy that they merely serve to impair and hinder the distinctive male action in coitus ! Or else she is merely passive !

*Sex efficiency by means of pelvic exercise gives her command and choice of delights in union, thus serving not only her own happiness and health, but, and equally, her mate's as well.*

## CHAPTER IX

### USES IN PARTURITION OR BIRTH

SEX efficiency through pelvic exercises may be just as valuable in the act of birth as in the act of mating. The pelvic floor muscles are somewhat limited in their accessory possible functions, and can help principally by *active dilation* or *relaxation*. But this active dilation can very appreciably help birth as well as preserve the perivaginal muscles from injury. I am in agreement with *Westmann* that "an active cramp or convulsive contraction of the pelvic floor, in reaction to the pains of labour, can materially hinder and delay the emergence of the head." And every midwife, every obstetrician, knows what that means! If the parturient mother has been weakened and exhausted by prolonged labour to such a degree that she can no longer control this automatic resistance of the tissues of her pelvic floor, her child risks death before it sees the light of day. And many "forceps deliveries," with all the disadvantages they entail for mother and baby, might be avoided if women had learnt to "loosen the pelvic floor." And what needless accumulation and prolongation of pain! Not only through the protracted ordeal of birth, but also because of the simultaneous convulsions of the expulsive uterine muscle, and resistance of the pelvic floor, with the dangers of extensive ruptures and lacerations!

Of course, the muscles are not the *only* resistant factors in the pelvic floor. This *rigidity* is often shared by the tendinous fibres (*fasciæ*), the connective tissue, the vaginal wall and the skin, especially in the far from infrequent cases of a certain degree of *arrest of growth* or infantilism. Or there may be diminished elasticity because the first birth takes place much later than Nature intended. The vaginal and pelvic tissues are most supple and elastic in the early twenties

or even earlier, and, at the present day, the first birth generally takes place later than that—sometimes ten or fifteen years later! This *dysgenic* tendency will need thorough and complicated measures if it is to be overcome or reversed ; for the present we can only urge women *not to postpone their first experience of maternity unnecessarily long*. And we may also do all that can help in keeping the local tissues as supple as possible for as long as possible. The exercises of the pelvic floor, in their alternate *tension and relaxation*, may contribute considerably to this end by quickening the *circulation of blood and lymph and the general metabolism of these parts*.

Arrested genital growth or infantilism may also be counteracted by means of exercises, and this will facilitate birth, though indirectly. But the *active dilation or relaxation* of the pelvic floor is not only more direct, but more important.

The exercises of the pelvic and abdominal zone also help child-birth, directly and indirectly. Directly—for *range and change of position* are thus made easy in the various stages of labour, and, indirectly, for the abdominal muscles have become more efficient and under more control.

Of course, there are occasionally deliveries so easy and rapid that there is no conscious exertion of the abdominal pressure, for the abdominal muscles and all their accessories work automatically, *i.e.*, by *reflex action* at the appropriate moment. But most deliveries are far from easy, and not only owing to inadequate muscular action, but also because such muscular action may be incorrect or actually *hindering and resistant* or exercised at the wrong moment and stage of expulsion, and without the necessary deliberate relaxation in the intervals of respite. For birth, like coitus in our species, is not a simple natural process which “ takes care of itself.” It is an art and accomplishment to give birth without *unnecessary exertion and unnecessary anguish and injury*. And this accomplishment (or faculty) is, in most women, neither instinctive nor acquired. Therefore, they require the skilled aid of midwives and obstetric specialists. And if the directions of such specialists are not overlooked or

omitted in the anxiety, pain and disablement of the occasion—as still happens far too often—it should be much easier to follow them if the woman has learnt to *breathe adequately and control and co-ordinate her muscles*. For these are the main points: not to exercise *deliberate* downward pressure *before* it is necessary; to apply this voluntary pressure at the right moment and to avoid strain on the lungs by carefully alternating deep breaths; to relax muscles fully during the respites between pains; not to hasten the unavoidable final distension of the pelvic floor by *voluntary* contractile effort in excess of the local elasticity; and finally, to manage the emergence of the child's head slowly and without the shock of a rending laceration: all these *are possible*, but only to women whose minds, wills and muscles are trained to efficiency and control.

For this we need a general and thorough physical culture, adapted to the structure and the functions of women, and including, of course, breathing exercises. And this primary physical culture should be reinforced by the special pelvic exercises described in my previous chapters.

The direct pelvic action on parturition centres in one exercise in particular, *i.e.*, that exercise which we have described under No. 19 in our list (Film 12, Figs 12 and 13). The movements beginning with *Walcher's suspension* have great advantages in other respects, but are, first and foremost, *a preparation for giving birth*. During pregnancy the pelvic articulations are loosened and become more supple, though only to a slight degree. This fact is utilised in Exercise 19 thus: in the first phase (*Walcher's suspension*) the backward movement of the somewhat salient upper rim of the *sacrum* (the so-called *promontory*) enlarges the upper pelvic outlet in its measurement *from front to back* (*i.e.*, from the promontory to the upper edge of the *symphysis pubis*), which is most important for the emergence of the child's head. This same posture, however, diminishes the *lateral* diameter of the lower pelvic outlet—between the inner surfaces of the tubera ischii, which is the most important in obstetrical practice. In the flexed phase the conditions are exactly

reversed, and the expansion of the lower pelvic outlet attains its highest degree if the woman draws her legs as near as possible to her body. Therefore the emergence of the head in birth is greatly helped by a change of attitude from the horizontal (extension) and especially suspension to the flexed, which not only presses forward the head, but twists or *slips* back the bony pelvic girdle over it. Of course, this manœuvre is most valuable if there are obstacles to the child's head, such as too flat and shallow pelvic structure. In that case there is the following automatic adaptation : The child's head enters the upper pelvic entrance inlet with the anterior parietal bone foremost, this is strongly curved and bent over the other, which is pressed against the promontory (see Plate VIII.). Thus the head is adapted, or, one might say, *modelled or moulded* to the maternal proportions, and pelvic movement therefore, as outlined above, may be helpful here. *Sellheim* <sup>(27)</sup> described this process as follows : "When there is disproportion in measurement between the maternal pelvis and the infant's skull, the pelvic aperture, dilated by means of the suspensory attitude, will take a larger skull than the usual posture for deliveries. If there is prolonged pressure or combined pressure and pull on the head in the direction of the pelvic axis, and if the mother's attitude is changed from suspensory or supine to the position of flexion, this automatically compresses the parietal portion of the skull (if the respective sizes are not too disproportionate) and favours the following stages of delivery. Continuous alternate distension of the pelvis and compression of the child's head, by means of appropriate pelvic movements, makes the very best of the natural adaptability of both structures, and can help to surmount difficulties of proportion in cases which are not extreme."

Of course, those who stand beside the woman in travail must know how to help her here. And all who have any actual acquaintance with the difficulties generally experienced by women in travail when they attempt pelvic movements will agree that it is of the utmost advantage, both for women themselves and their *accoucheurs* and attendants, to have some previous knowledge of and practice

in what is required. It is obvious that doctor or nurse will aid her so far as possible in these movements, e.g., by relieving the weight of her legs in the phase of transition from suspension to flexion. But at least she will know *what help she requires*; she can say "lift" or "let go" and that makes all the difference! I may state, however, that I have not personally observed cases of the deliberate and protracted *modelling* of the child's head through repeated alternate suspension and flexion, as described by *Sellheim*, for I did not see his remarks at the time of publication. But I have frequently made use of this alternation of attitude in the course of obstetrical work, in order to help the release of the child's head, and this in combination with three different procedures, namely:—

In the first place, together with the *impression* of the infantile head by the method of *Hofmeier*, whether between labour pains or as each pain begins. In the second place, in order to facilitate the passage of the head *in certain cases of foot presentation or breach presentation*, and I then combined the aforesaid directions with pressure from outside and above and, if necessary, with extraction from below as well. In the third place, together with version and extraction, because of a moderate degree of contracted pelvis.\*

It is hardly necessary to emphasise further what knowledge and power of pelvic movement and adjustment may mean for a woman, and what agony and exhaustion it may save her. Of course, necessary measures of this kind are

\* I refer readers to illustrations such as Fig. 579 in *Stoeckel's "Treatise on Obstetrics,"* (28) which will clearly show that, in cases in which the head is born last, and where there is also a certain pelvic disproportion, it is of great importance for the obstetrician in charge to draw or press the head through the pelvic aperture and lift or slip the symphysis upwards and away from it. If the head has not become firmly fixed through excessively small pelvic proportions, this procedure can be best carried out through the woman's movements from suspension to flexion. I need hardly add that this little technical suggestion is addressed only to the medical and nursing professions among my readers. Of course, the suggested "Indications" in my text can only be fully understood by persons who have professional knowledge and experience. Nevertheless, I have preferred to insert these suggestions, even into a book which will have lay readers, both in order to interest professional circles and to remind women of the great importance and use of the whole subject for them.

sometimes carried out *during anaesthesia*, and thus the woman's co-operation is excluded. But there are also many cases in which anaesthesia is contraindicated for a variety of reasons, or even unavailable. And if there is a simultaneous lack of trained assistance, then indeed, the life of the baby and the future welfare of the mother—her health, her power to work and her sexual efficiency, even her life itself—may all depend on her power to co-operate, to help the process she is undergoing, rather than attempt to hinder it. On these grounds alone, both medical practitioners, who take obstetric cases, and, in especial, midwives and maternity nurses (who often have to work under the greatest difficulties and without any expert co-operation) should advocate the general practice of pelvic exercises among women in order that those whom they work for may, at need, help themselves.

*Walcher's suspension attitude* may even help the progress of parturition, by itself alone, without change to flexion and without further manipulations, where it is necessary to counterbalance a slight inadequacy of the upper pelvic circumference or an unfavourable position of the head. In such cases, the patient may be placed on the edge of a bed or couch (*which should not be either very low or very soft!*) so that her legs hang down and only touch the ground with the toes. *But it is necessary to take care that this (suspension) attitude should only be taken during the contraction of the womb* (actual pains). In the intervals between these paroxysms the feet should be supported on footstools or low chairs. Even with this modification "suspension" is quite uncomfortable for a woman who has no previous experience of (or association with) it. Accordingly, far too little use is made of it in our obstetric practice! Another main reason for preparation and practice on the lines of Film No. 12.

Modern obstetric practice is not the originator of modifications in pelvic posture during birth. This has been proved both in social history and ethnology and on Plate IX. (Figs. *a* to *d*) some illustrative material relevant to these customs has been reproduced. They offer striking confirma-

tion of the efficacy both of suspension and flexion. There is a certain primitive suspension in *a*: the weight of the pendent legs increases the pelvic angle and thus enlarges the pelvic circumference. And this is carried to its maximum degree in a manner much more awkward and painful than *Walcher's* in *d.\** In *b* we have the opposite extreme, corresponding to flexion. This peculiar crouching or squatting has certain disadvantages, but also the great merit of expanding the lower pelvic outlet. But flexion, as we have described it, answers this purpose just as well, and the leverage of the outstretched lower legs, as shown in Film 12, is even more efficacious. And if the woman is in the attitude of flexion instead of squatting, the flexion may be adjusted and altered without difficulty to the horizontal-recumbent or "normal" attitude. "Normal" for parturition at least in Germany and in many other countries; whereas, in England and in Holland, we generally prefer to let delivery take place in the lateral position.

It is even possible to change over from flexion to the opposite pole of a more or less pronounced suspension, if the woman lies across the edge of the bed with her feet supported on chairs or hassocks. The anatomical conditions are not entirely simple, and the power of changing posture (and hence exact degree and point of strain on the pelvis) may be of crucial value, especially during the expulsion of the child's head through the bony girdle of the lower pelvic outlet and the muscular fibres and tissues of the vulva. For in the flexed posture the distance between the *tubera ischii* (*i.e.*, the diameter of the lower pelvic outlet from side to side) is at its maximum possible; in the suspensory attitude, at its minimum. And the increased distance between the *tubera ischii* automatically draws the muscles and tissues of the pelvic

\* One of the oldest illustrations of this attitude was given by the great Venetian obstetrician, *Scipione Mercurio*. It may instructively be compared to the so-called "bridge exercise" prescribed in certain works on gymnastics and physical culture.<sup>(29)</sup> <sup>(30)</sup>. I cannot recommend these bridge exercises for our present purposes: they are far inferior in all ways to No. 19. And it is not necessary to have much visual imagination in order to understand that it would not be possible to remain in *Scipione's* attitude for long without great previous practice. There are, however, other similar but not identical illustrations of obstetric attitudes which approach *Walcher's*<sup>(31)</sup>.

*floor taut and tense.* Therefore the pelvic floor is tautest in flexion and loosest in suspension. Individual structure must guide the obstetrician as to which posture best suits each stage of each case. In some cases, it will be absolutely necessary to open the lower bony pelvic aperture as widely as possible by means of flexion, even at the risk of increased tension of the muscles and tissues—which may be obviated betimes by an incision. In other cases it will be necessary to mitigate the intense strain on the pelvic floor, so far as possible, by means of *Walcher's suspension*, without taking the distance between the tubera ischii into account. *The obstetric art is an art which must reckon with great diversities of structure, constitution and circumstances; both physicians and midwives need to do this far more than has hitherto been customary.*

But just as doctors and midwives should make full use of change of attitude in obstetrics, so also women should help both those in charge of their health and lives, and themselves in their critical hours, by *pelvic elasticity and efficiency attained through exercises.* By mastery of their abdominal and perineal muscles, both in contraction and relaxation, women will be able to bring forth their children with the least degree of danger and of injury.

## CHAPTER X

### UTILITY IN PREVENTION AND ALLEVIATION OF GYNÆCOLOGICAL DISEASES

IT would be outside the scope of the present study to deal fully with the effect of physical exercise on structural defects and functional derangements of the reproductive organs of women. I shall merely outline the main points and deal somewhat more in detail with one important morbid condition, for in explaining the contraindications for pelvic exercises (Chapter VII. *supra*) I have already anticipated much of the subject-matter of this chapter. Therefore, I confine myself here to emphasising the inadvisability of *all* and *any* pelvic exercises in *any active* stage of inflammation of the feminine organs, *especially the upper genital tract*, i.e., womb, oviducts, ovaries and *ligamenta lata* (broad bands). There is then imminent risk of "lighting up" the inflammation. But if the active inflammation has subsided and become *fully* inactive, the chronic condition, and even certain sequelæ of former inflammations, may be much alleviated by the results of wisely chosen and executed physical exercise of the pelvic regions; such results include the better circulation of blood and lymph stream through the local tissues, and the activation of metabolic processes as well. But it should always be borne in mind that the risk of "lighting up" *foci* of a former inflammation is a very complicated matter, which can only be judged by a skilled specialist after thorough examination and testing; indeed, there are certain cases in which prolonged observation and tests are necessary before an opinion can be formed. Moreover, even if the diagnosis is favourable, the patient needs frequent overhauling and should be careful to avoid needless vehemence and strain, particularly at first.

What of menstrual disturbances: are they contraindications for our exercises? If there are too great losses *pelvic exercises should not be undertaken. And any irregular hæmorrhages should be promptly dealt with by special examination, observation and treatment—gynæcologists should never weary of impressing this on their patients.*

Another intimately important matter is the possible connection between pelvic exercises and miscarriages. The gymnastic instructress of any experience will often encounter this problem in various forms. Some women have an excessive dread—almost a psycho-neurotic complex—that *any form of active exercise may make them miscarry.* The instructress may, with full confidence and authority, assure such women that the gentle rhythmic movements of the pelvic exercises described in these pages are quite free from dangers (with one exception, presently to be noted) in all normal cases. But if the uterus has already shown a constitutional tendency to premature expulsion of its contents, the greatest *quiet and care* are necessary as soon as pregnancy has definitely been diagnosed, and all exercises should be omitted. And even in normal cases, where there have been no previous miscarriages or premature expulsions, any *extra exertion should be avoided: for instance, Exercise No. 19 (Film 12, Figs. 12 and 13), the rhythmic movement from suspension to flexion and vice versa, should not be attempted if even one menstrual period has been missed.* Moreover, after two menstrual periods have been missed—that is, so far as we can judge, from the beginning of the third month—the pelvic exercises hitherto recommended should be superseded by those appropriate to pregnancy, as described in the following chapter.

The gymnastic instructress may be exposed to worry and inconvenience by the actions of women who attend her classes with the sole intention of terminating an early pregnancy by the greatest possible physical efforts and strains. They will not, therefore, concentrate on pelvic exercises for this purpose, but prefer “physical jerks,” jumping and leaping, which are also highly popular for

many other reasons at the present day. A word of warning may be of some service here.

Either of the exercises of the pelvic and abdominal zone and those of the pelvic floor, and especially both in combination, are of great help in speeding up the circulation of the blood stream through the internal genital organs and thus promoting metabolism, *i.e.*, growth. Thus, the arrested development or infantilism of these organs which is so frequent, may be counteracted and in time cured.

I must also mention the possibility, or even likelihood that some cases of painful menstruation (dysmenorrhea) may be favourably influenced through improved local circulation. The same may be said of certain cases of leucorrhœa; but vaginal discharges may be of much more serious origin than simple leucorrhœa and, owing to their diversity of causes, it would be unwise to rely too much—or only!—on exercises, to deal with these distressing symptoms. *In all cases of vaginal discharge a doctor must be consulted.*

The effect of pelvic exercises on obstinate constipation would demand a whole chapter for itself, were it to be treated in any detail. But it must suffice to say, first of all, that such obstinate constipation is in constant interaction with the genital functions and "fitness" (or "unfitness"!) of women who suffer from it, and is a focus of toxins. The bad effect is both chemical and mechanical, local and general. Mechanical, because the rectum is in close proximity to the vagina and uterus, and a rectum overloaded with solid faeces presses painfully on the tender adjacent genitalia. And the auto-intoxication of the whole body and irritation of temper and torpor of brain, rapidly caused by these excremental toxins, act most harmfully on the whole sexual system. Chronic constipation deflects local circulation, it promotes haemorrhoids, or piles, with all their pain and inconvenience; it presses on the nerve centres, causing neuralgic pains in the lower back and bowels, and the overloaded and distended *ampulla recti* may push the vagina forwards and make insertion and coition difficult and painful. Even though I am not prepared fully to endorse the opinion

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of Sir W. Arbuthnot Lane,<sup>(32)</sup> that one of the chief characteristics of the chronically constipated woman is the complete loss of sexual desire, and that the resultant complications and degenerative symptoms are responsible for a large number of marital catastrophes, it must be admitted that constipation (or intestinal stasis), whether frequent or chronic, may be fatal to married happiness as to individual health.

In any case, it is particularly dangerous to both the general and genital fitness of women ; therefore the *natural remedial measures* of pelvic exercise should be most warmly welcomed and widely employed. *For pelvic exercise can and does cure constipation.* It does so in various ways : first, by reflex action of the rectal walls, set in motion by the vibrations of the adjacent pelvic floor.\* And also through the abdominal gymnastics of the pelvic zone, for these exercise the abdominal walls, giving them tone, as well as the muscles which form the rear boundary of the peritoneal cavity and the muscles of the major pelvis. The particular rhythmic character of the alternate contractions and relaxations recommended in our system *acts as a gentle massage* on the whole contents of the intestines, and especially on the intestinal muscles, and this is *extremely stimulating* to intestinal and rectal action.

Exercise No. 19 (combined alternate suspension and flexion) has a similar effect, not only by the rhythmic action of many important muscles and muscular groups, but also through *suction and pump action*, especially if the legs below the knee are not held at full length, but drawn up as close to the abdomen as possible, in the phase of flexion.

There remains only the duty of emphasising the value of exercising the pelvic zone in order to promote circulation in

\* Although the subject is too important to be dismissed in a footnote, I may take this opportunity of pointing out that this reflex action—following the stimulus to vagina and uterus in coitus and the movements of the perineal muscles—may cause spasmodic contractions of both bladder and lower bowel during or immediately after the sexual act. Not only because of this risk, but also for the merely mechanical conditions of the local organs (distension, pressure), it is urgently advisable to attend to the relief of both bladder and bowels before erotic stimulation becomes acute ! This may sound “sordid” and “basely material,” but the results, if neglected, may be much more so !

the lower abdomen and limbs, and thus prevent the formation of piles and varicose veins \* through extreme local congestion. Also in cases of constitutional weakness (asthenia) and relaxed tissues of the abdominal walls (pendulous abdomen), including the special relaxation of the muscles following the distension of pregnancy and the spasms of birth.

I will recount one concrete case which proves better and more arrestingly than any argument the value of exercises for the pelvic floor in *vaginal and uterine prolapse*.

An unmarried lady, about thirty-three years of age, who had never had sexual relations and suffered severely from displacements, came to me for professional advice. Gynæcological inspection showed a gaping vulva, an intact hymen which was, nevertheless, widely stretched by pressure from above, and a displacement in the anterior (front) vaginal wall, like the segment of a sphere (7 cm. by 4 cm.). This displacement represented the posterior wall of the bladder (cystocele), and became even more pronounced if the woman made "bearing down" movements of the pelvic muscles. The pelvic floor was relaxed, and the uterus, of slightly above normal size, was in a position approaching normality (*i.e.*, anteflexion), but had sunk so far down the vagina that (although the cervix was not stretched) the exterior *os uteri* was only between 3 and 4 cm. above the vaginal orifice. The posterior vaginal wall was not displaced.

During some years of treatment I advised the use of a circular (ring-shaped) vulcanite pessary, which relieved the displacement to some degree, though it became necessary to increase the size of this appliance and use a larger "number." The patient came for examination and consultation every

\* In the work cited under reference No. 19, and already mentioned in this study, *Westmann* mentions that the muscular action of the abdominal walls stimulates the venous circulation upwards and thus counteracts the distension of the walls of the veins and damage to the cardiac valves (p. 42). His remarks apply even more forcibly to the pelvic exercise we advocate. The only exception to this rule is Exercise 19. If there is any tendency to varicose veins, women should only perform Exercise No. 19 (Film 12, Figs. 12 and 13), under the special supervision of the instructress and with great care. Any sudden downward fling or collapse of the raised lower limbs is in itself, forbidden, but may happen to beginners and may overstrain the walls of the blood vessels by the sudden double shock.

three months, and, on these occasions, the appliance was removed and cleansed. Then she went abroad, came for a few consultations at irregular intervals, and then ceased to visit me.

After a couple of years she again appeared in my consulting room : not—as she made clear at once—as a patient, but in order to show me what Christian Science had done for her ; and she was now, in every sense of the word, devoted to that way of thought and practice. She had brought her ring in a box, and reported that she had removed it some two years before, having come to the conclusion that all illness was merely imaginary and could be cured by faith. Her distressing symptoms had vanished, and she wished me to satisfy myself of this by gynaecological inspection. This inspection took place and the results were as follow :—

The vulva was close and the introitus almost circular and about 2 cm. in diameter ; a corresponding portion of the smooth anterior vaginal wall was visible from the outside. Digital palpation showed a perceptible ring of tighter tissue which was doubtless due to muscular action. The patient voluntarily and of her own accord relaxed this narrow band of tissue in order to permit full examination. The anterior vaginal wall was still relaxed as before, and there was still a marked tendency to prolapse with cystocele. I received the definite impression that there would shortly be a recurrence of the former displacement as soon as the posterior vaginal wall proved inadequate to support the anterior surface and the muscular *constrictor cunni* gave way under the strain. It was, however, interesting to note that the *portio vaginalis uteri* was between 7 cm. and 8 cm. from the *introitus*, i.e., it was much *higher* than before.

I saw the patient again, after a year had elapsed ; the conditions locally were unchanged since her return. She felt no distressing symptoms and was glad to need neither appliance nor medical inspection. Her later letters confirmed her improvement in health. Then I received the news of her sudden death.

There is only one explanation of this remarkable improvement—almost recovery : *it must have been due to the extreme*

and prolonged exertion of the whole genital and perineal muscular apparatus, under the influence of the mind. The inspection I made confirms this view, besides suggesting other interesting considerations. There were no convulsive symptoms of any sort. There were no vehemently contracted muscles which hurt when "twanged" or tapped in the course of digital examination, as is often the case in this region. Nor can the result be attributed wholly to the muscular fibres of the levator vaginalis (in the narrower sense of the term); it was a contributory agent, but not the sole. No. The whole posterior vaginal wall, which had been too slack to offer any counter-pressure and support to the displaced anterior wall, was now able to afford such support, together with the *introitus* which had resumed an almost normal diameter. The upper layer of the vagina was completely lacking in "tonicity" even after "recovery," but the underlying tissues had become firmly elastic. The patient did not voluntarily relax the vagina inside, nevertheless it was possible to press back the posterior wall with complete ease by means of a *speculum* (or *écarteur*). But she could and did operate a definite relaxation of the *introitus* or orifice in a perfectly natural way, in order to admit of digital and/or instrumental examination. This was a striking case of active relaxation (or dilation) at will.

The circumstances of this case made a strong impression on me at the time. I am of opinion that the improvement cannot be wholly ascribed to the intentional exertion of the voluntary (rigid or striated) muscles of the pelvic floor, but that the smooth or involuntary adjacent muscles were also involved (for instance, those of the *Ligamenta Cardinalia*, the posterior vaginal wall and perhaps the *Ligamenta Douglasii* as well). I will not discuss the probability that a nervous impulse could extend to these particular muscles which are generally independent of the will, nor will I now consider further possible explanations of the undoubted facts.\*

The exertion of the muscles of the pelvic floor, under the

\* I may, however, mention that other authors, as V. Liebermann (53), treat of similar cases (Treatment of Prolapse by the Thure-Brandt method), and are obliged to assume that the ligaments have recovered their lost elasticity and power through remedial exercises.

initial stimulus of strong psychic impulses, had an astonishing effect in this case. And this result is specially of interest—and has been so fully recounted here—because it points a moral in pelvic exercises. Even though the initial psychic impulse will generally be less pronounced than the emotional enthusiasm of a convert, we must accept the fact that, in the early stages of prolapse, voluntary *contractions of the perivaginal muscles may exert a very favourable influence.* Many other trained observers confirm this view.

And I entirely concur with the view of *Max Hirsch*<sup>(34)</sup> that the preservative and remedial treatment of *atonic pelvic muscles* through exercises is a very fruitful therapeutic field. He writes : “ Unfortunately, these possibilities of treatment are much neglected and hardly employed because the early stages of vaginal and rectal prolapse escape observation, and the later stages, which are patent and visible, are generally treated by means of appliances (pessaries) or operations. And yet the timely treatment of early stages is likely to save patients from the—frequently serious—consequences of operations which are not by any means always successful.” And he draws the inference that all asthenic or *muscularly atonic* women—*i.e.*, those whose muscular tissues are congenitally slack and weak—should perform pelvic exercises *as a preventive and prophylactic measure to avoid prolapse*: an opinion which I entirely endorse.

And so we may pass to the consideration of the remedial treatment of the pelvic floor *after childbirth*, and to the whole subject of physical culture during pregnancy and in the puerperium.

## SECOND SECTION EXERCISES DURING PREGNANCY AND AFTER CHILD-BIRTH

### CHAPTER XI

#### INTRODUCTION

THE visible and partly voluntary reproductive function in *man* is confined to the act of coition. In *woman* this function is fourfold : it includes two *acts* : coition and birth ; and two processes or conditions of continuous change : pregnancy and involution after child-birth, or the puerperium. We have dealt with the effect of voluntary pelvic exercise on coitus and birth : we shall now consider pregnancy and the puerperium from the same aspect.

In pregnancy there is a steady organic *crescendo* ; expansion, proliferation, culminating in birth. This crescendo is both genital and general. There follows *involution*, or return to the non-pregnant norm : an ebb or diminuendo after the vital flood.

But both allied yet opposite processes need the same methods of physical culture, combining exercise with great care. Thus, many of the following exercises may be used with benefit for both the pregnant and the puerperal state, always provided that *due care is observed*.

The most appropriate basis for these exercises is, in my opinion, the *Swedish system*. Here the movements combine activity and passivity, and may be adapted and accentuated in either direction and slightly or extremely at will.

Some time ago I was in the habit of recommending exercises of this kind to my patients, but my instructions were not sufficiently co-ordinated into a system. I am

indebted to the information given me by *Mr. Georg Yske*—formerly gymnastic instructor in Amsterdam—for many practical details and suggestions which have been of help here, and I record and express my sincere thanks to him. Together we planned and, so far as possible, personally experimented with the whole series of exercises, and I took the part of the mother—expectant or convalescent—whom we wished to help. My readers may smile at such an idea, but *I consider it the duty of anyone who wishes to prescribe or help with the gymnastic treatment of pregnancy or the puerperium—or any remedial gymnastics—to try the possible exercises in person on themselves.* Doctors, midwives, nurses, can only form an idea of the necessary amount of exertion by trying it on themselves. And even the gymnastic instructress, who is fully aware of this difficulty in theory, should really also have the opportunity of experiencing the other side: of being a patient as well as an instructress, and realising how different the “easy movements” may appear to an exhausted or burdened body. This statement is in no wise intended as a reflection on a most helpful profession, but applies equally to all strong and healthy people of any profession in their dealings with the sick and weak. I would go further and say that the fact that doctors are generally wholly immune from the risks and burdens of maternity is the real reason why they so seldom use the Swedish system in the treatment of pregnant and convalescent women, and also of women recovering from illness other than child-birth.

In prescribing this system, I admit the difficulty of having *an assistant or attendant present when the patient carries out these exercises.* Nevertheless, the supervision and support of a doctor, midwife or nurse—all of whom should, therefore, have sound gymnastic knowledge—or of a gymnastic instructress, is necessary in most cases; and the gymnastic instructress should, of course, make herself acquainted with the relevant facts respecting gestation and involution after gestation.

Individual conditions are most important here. The amount of exertion needs careful watching and regulating.

Medical men and women will fully realise this; and the supervision and execution of the movements I recommend are not technically difficult. The non-medical assistants in these cases must have much "muscular sense," as well as the faculty of assimilating and carrying out medical instructions with *promptitude and accuracy*.

Of course, this means yet more time, energy and training, and these have no doubt hitherto been the main obstacles to the obstetric use of Swedish gymnastics, for time, energy and special training involve additional expense.

But the expense would bring its own reward, *and not only in the department of obstetrics*. There is much leeway to be made good here. The same is true of *massage* during pregnancy, the puerperium and convalescence generally, but this should be *reserved for trained masseuses alone*. *Massage* is a skilled profession, and the *incorrect* application of *massage* may do great harm.

The women who are in the fortunate position to afford this special care *will help both themselves and their fellow women by insistently requiring it*. So long as there are no midwives and nurses who have received special training in *obstetric physical culture*, the gymnastic instructress will be their only help. And the gymnastic instructresses themselves will have their work cut out for them in this branch and also in training nurses and midwives.

Then, as the demand makes itself felt and the supply of trained *personnel* is increased, public attention will be focussed on this new branch of the healing art, and it will be incorporated in many public health programmes and institutional resources. The adequate care of child-bearing women has an enormous influence on the general health of the whole community. *Sellheim*<sup>(35)</sup> is of opinion that the loss of muscular tone and physical fitness as a result of (neglected) motherhood is the most common and prevalent of female complaints and disabilities, but also the most neglected, as it is so prevalent as to be accepted as inevitable! And I entirely agree both with this diagnosis, and with his further suggestion that it is a most urgent duty and public necessity to impress

the need for preventing these gratuitous injuries—*on all officialdom, everywhere*: for such prevention would be the *most important possible measure of social hygiene*.

Hospitals and private nursing homes would not necessarily meet with difficulties in applying and developing obstetric physical culture. It is largely a matter of organisation and of the appointment of gymnastic instructresses in charge, who would have the duty of arranging and supervising physical exercises for pregnant and convalescent women. Of course, establishments of any size will require more than one such gymnastic instructress.

Not only hospitals, but *general public health work must include obstetric physical culture*. Health insurance and both public and private philanthropy have great possibilities of action here, and the field is still almost untilled. The necessary financial outlay would be more than recouped by the saving on invalidism which would ensue. And, from the wider social aspect, it would be a most lucrative investment.

The women's societies and leagues for the protection and promotion of women's special interests, especially among working women, will find this a fruitful subject for consideration, study and practice. The same is true of the various women's clubs for gymnastics and games: these, however, will naturally be better able to practise *active* exercises of contraction and relaxation than those of an even partly passive description.

The purposes of pelvic exercise during both pregnancy and puerperal involution are twofold: they should *exercise the body without strain or over-exertion*. The distended abdominal muscles and the muscles of the pelvic floor must be kept in good condition, and the circulation of the blood stream, both throughout the whole body and particularly in its lower half, must be facilitated. Yet neither abdomen, pelvis nor organism in general must be at all overstrained, for pregnancy and the puerperium, although so natural, are almost half morbid and dangerous conditions for humanity to-day.

I have already quoted from *Sellheim's* essay in the *Medizinische Welt*, and may further cite his remarks on this necessary *concurrent practice and protection* of the abdominal muscles. He writes : "The abdominal muscles *change their size*. In the evolutionary phase before birth, they grow larger and, in the subsequent involutionary phase, they decrease. The natural processes must be supported and assisted in any remedial measures. We must aim at restoring the abdominal muscles *ad integrum*—that is, to their state before gestation began—after involution. And the crucial points here are the tissues of the abdominal walls. How can we promote, first the growth and then the *waning*, the involution of such structures as the abdominal walls ?

"They must be spared needless strain. If the tissues are to revert to their initial state—as do the muscles which form a constituent part of the tissues—the natural process must be supported by *contractile exercises*. This is the sum of the matter : contractile exercises—and suitable counterpressure on the muscular areas.\* In actual practice this means, (*a*) bandaging, and (*b*) contractile exercises of the muscles, compressed by the bandages, thus giving a *functional stimulus* to the muscles which pregnancy has distended and relaxed, and developing that stimulus to its maximum.

"Thus the *possible* recovery can become *actual*. And that means a great deal. Most of the women who are correctly bandaged and practice contractions of their abdominal muscles with the support of the bandages during the six to eight weeks of puerperal involution, recover an almost virginal firmness of the abdominal walls, if their other individual conditions permit."

\* *Sellheim* is, of course, speaking of the *period after child-birth*—the puerperium.

## CHAPTER XII

### GENERAL PRINCIPLES FOR GYMNASTICS DURING PREGNANCY

WE must *define the lines on which these exercises have been planned. Of what should the expectant mother take special heed when performing the exercises?*

The individual physical powers of women vary widely, and, therefore, an exercise which is mere play to one woman will cause another sensations of dizziness, rush of blood to the head or nausea. So each individual must choose and practise what does not strain or hurt herself. And it should particularly be borne in mind that all attempts at gymnastic *tours de force* should be avoided during pregnancy.

*Correct breathing* is important in every exercise. Where there are no contrary instructions, the woman should breathe quietly and regularly, for, to hold the breath influences heart action unfavourably. But the exercises recommended below aim at curing superficial and inadequate respiration and at improving—or preserving—the capacity and elasticity of the thorax. Singing is a splendid respiratory exercise, and deserves to be specially practised by the pregnant woman for many reasons, and not least because of its tonic and beneficent effect on the emotions.

It is urgently advisable to rest one hand against the wall or on a steady, solid table at a sufficient height from the floor when performing exercises in the upright position. A chair or small table may slip and easily be knocked over. Even in normal circumstances many women have difficulty in keeping their balance when exercising, and, in the pregnant state, this becomes very much more difficult.

If there are unusually vigorous movements of the infant *in utero* following any of the exercises, this shows that the exercise has been too prolonged or too vehement. But, on

the whole, the exercises herein prescribed do not result in any undue foetal movements—that is, if they are carried out with proper care and caution. In the English language there is a beautifully appropriate term for the right pace and way in which the exercises should be performed : the term is *measured*. *Measure* is essential : and, just as the expression “with measured tread” conveys a suggestion of dignity and deep reverence, as of a priest carrying sacred emblems, so it may also be applied to the strengthening bodily exercises of the woman with child.

If the expectant mother works regularly and appropriately day by day, together with the wonderful organic processes which are building a new life in her body—she will make that body full of vigour and elasticity, and she will enshrine in its inmost sanctuary the most precious gift that life can give her—enshrine it gladly and proudly.

For the expectant mother should carry her child, not as one overburdened with a heavy load, but as a cupbearer guards and lifts a precious chalice of the wine of life : a Holy Grail. Vigilance that has naught of fear but that incessantly cherishes and protects is the keynote of the bodily care due to the woman with child.

As *Leonore Geibel* has said :—

“ Heavy I pace and my slow swinging calm  
Shall lull thee gently without fear or fret,  
My little son, no burden but sweet balm,  
The melody whereto my days are set.  
  
Deep in myself withdrawn, I brood apart,  
But fearing naught—for thou hast banished fear ;  
Bearing new worlds, new dawns beneath my heart,  
Nor looking backward, as the hour draws near.”

\*       \*       \*

What of *essential details* in exercise during pregnancy ?

First and foremost : *adequate amount of and control of breath*. During the complicated development of the child's body, the metabolic processes of the mother undergo changes and stresses which make the maximum amount of oxygenation (through the lungs) necessary for the welfare of both. And most people breathe insufficiently. Either they do not know how to breathe aright, or they “do not think it

matters." Moreover, there are special difficulties in the later months of pregnancy. The size of the child and its position in the abdominal cavity force up and somewhat hinder the full action of the lungs. Thus it is urgent that the expectant mother should learn how to breathe, and learn it *betimes*. For she is not only strengthening and refreshing herself thereby, but she is gaining control of respiration in later stages and during actual birth. And increase of oxygen benefits the heart action and the circulation of the blood ; for the heart has an extra share of effort during gestation—as well as the lungs.

The importance of full and correct breathing for the act of birth is twofold. It refreshes the body and counteracts exhaustion, and it also promotes the action of the diaphragm and the rhythmic pressure and relaxation which may be so helpful in expelling the child and avoiding severe injuries to the maternal organs, especially the pelvic floor.

Gymnastic exercises also quicken *elimination and the combustion of waste products* through muscular activity, speeding up circulation, clearing bowels and kidneys and sweat glands, and helping to keep down the *excessive fat* which often accompanies gestation. Both general exercises and respiratory exercises work perfectly together in these directions, and may, therefore, be most usefully *combined*. The ideal here is alternate breathing exercises and bodily movements in the open air : and the most simple form is walking with deep and full breathing. And, of course, neither method excludes the other, but may complete and enhance it.

And the final point to bear in mind among the *general* benefits of exercise during pregnancy is the advantage of relaxing and "suppling" exercises. On this subject Sieber—whose pamphlet "Are Exercises advisable during Pregnancy ?" <sup>(36)</sup> I can, on the whole, recommend, equally with Mrs. Lisa Mar's treatise "Beauty in spite of Maternity." <sup>(37)</sup> —is of opinion that these "suppling" exercises serve to steady the muscular system, and to soothe the nerves which are in a state of unstable but permanent excitement throughout pregnancy. And I agree that their effect is appreciable.

There are certain groups of muscles on which pregnancy casts extra strain, both owing to the increase of weight and the disturbance of equilibrium : I refer to the tendons of the *feet* and of the *back*. The many small bones of the feet are laced together by muscles which are often painfully stretched by their increased load ; therefore every woman will do well to exercise and develop the muscles and tendons of her feet, either before she enters the pregnant state, or at least as soon as she perceives that she has done so. And this applies not only to the feet, but to the whole length of the lower limbs which are affected by the increasing bodily weight and must also be prepared and strengthened.

The main reason for foot and leg exercise during pregnancy, however, is indirect. It should prevent stagnant congestion—for the enlarged womb hinders circulation—and the results of such congestion, namely, varicose veins.

The muscular development and tonicity of abdominal walls, pelvic zone and pelvic floor have been dealt with in the first section of this book as they affect pregnancy and parturition. I will, therefore, merely refer to the detailed treatment in those earlier chapters.

But, *it should be noted that pelvic exercises during pregnancy should be executed with great vigilance, and only in certain forms which will be described ; other types of pelvic exercise must be quite ruled out.*

We must now turn to the *negative requisites*, having dealt with the *positive benefits* of exercise during pregnancy, for there are certain precautions to be observed and certain definite contraindications.

Instead of recounting these, point by point, let us refer to basic principles : *what* should be avoided and *why* ?

Even in the breathing exercises a certain care is advisable : women who have not previously accustomed and developed their lungs on these lines should not breathe deeply too often in succession, for a slight dizziness might supervene. Expectant mothers are more liable than other persons to attacks of vertigo, and should, therefore, avoid overstrain, especially if they perform breathing exercises either in the seated position or standing upright.

And all actual fatigue should be avoided, for such a result would have a directly contrary effect to that which we intend. The heart would be too much strained, the circulation impeded instead of quickened, and metabolism unfavourably affected. The important local circulatory conditions in the whole lower half of the body would share in the metabolic disturbance, and the good influence of wisely selected and performed physical exercise on bodily and mental well-being would be simply reversed. We must again emphasise the danger of vehement gymnastic effort and all attempts at *tours de force* for the expectant mother, whether in endeavours to surpass her own record or in unconscious competition with others. The latter risk is always present during classes for physical exercise, and makes these communal and corporate exercises, on the whole, inappropriate for pregnant women. And there is another strong contraindication in the *individual differences of bodily symptoms and degrees of efficiency* which are even more diverse during the pregnant state than under normal conditions. It must be an individual matter to choose the exercises and regulate their performance. If a woman is healthy and of active constitution and habits, undertakes the exercises with interest and pleasure, and feels refreshed and not tired by them, she has certainly not over-exerted herself. For, when the preliminary difficulties have been overcome, gymnastics during pregnancy, like gymnastics in general, should be a refreshment and pleasure, giving a sense of power and well-being, and then they achieve their object and without overstrain.

As soon as the pregnant state has definitely begun, the expectant mother should be medically examined and a similar gynæcological inspection should take place at regular intervals, in order to check any possible harm to mother or child. This should always be done, but it is particularly necessary if physical exercises are contemplated, for there may be contraindications, general or local. *For instance, if the organs of respiration and circulation (lungs, heart and veins) are not perfectly healthy, no gymnastics should be attempted.*

And, of course, the special and cumulative symptoms of pregnancy must be taken into consideration. This would seem to be obvious, but, unfortunately, is not always sufficiently recognised. The symptoms in question affect the whole lower half of the body.

Perhaps the least well known gestatory symptoms are those affecting the *pelvic joints*. As we have pointed out in a previous chapter, all these articulations, both of the symphysis and the ilio-sacral region, *loosen* automatically as pregnancy proceeds, and the pelvic regions acquire a certain, *though limited*, degree of *mobility* with respect to each other. But if this mobility becomes excessive, there is damage to the pelvic bones, which damage results in pain and difficulty when the woman stands or walks. And so she must avoid all such exercises as tend to increase this peculiar mobility of the pelvic zone, and, above all, the exercise *par excellence* that supplies and activates the pelvic zone and which is described in detail as "Suspension-Flexion" (Exercise No. 19) and depicted in Film 12 and Figs. 12 and 13. *There is a paradox here: the alternate movements of "Suspension-Flexion" are the most important of all for the act of birth itself, but they should be mastered before pregnancy begins and strictly avoided for its duration.*

In the later months there are difficulties of circulation, and the blood tends to be congested in the lower limbs; there are often haemorrhoids and varicose veins. Wherever it is no longer possible to prevent these injuries—when they had been sustained *before pregnancy began*—all exercises which make special demands on the leg muscles should be ruled out. In fact, after careful consideration, I have deleted the "heel raising and lowering" movements which have been recommended in other quarters as *typically beneficial* from my present list and remarks. For it has been proved that pain and swollen veins followed these exercises in certain cases which had hitherto been free from any congestive symptoms. And for similar reasons I specially recommend the semi-active and/or "passive" exercises, particularly those which may be performed in the sitting posture or lying at full length, and modified throughout a

whole register of "degrees" from activity to passivity, *as suits the individual.*

I recommend a certain degree of care and moderation in all leg exercises carried out in the upright posture: avoid abrupt and vehement *jerks* from hip or knee. Rapid and vigorous centrifugal movements of this kind have a bad effect on the circulation, especially if they are complicated by the need to preserve balance, as is the case when standing. So they should only be employed in exceptional cases during pregnancy, where there are specially favourable individual conditions, and then only with due caution. As a rule, a slight and gentle pendulum movement of the leg suffices, and even this should not be continued if symptoms of circulatory disturbance are perceptible (such as a heavy sensation and swollen veins).

More vigour may be put into the leg exercises—at least the *centrifugal*, i.e., those in which the direction of movement is from the centre of the body outwards, if performed lying at full length, as in the *rotation* and the "scissors" exercises. In such cases the force of gravitation does not combine with the centrifugal impetus to hinder the flow of blood back from the extremities to the heart, but it counteracts the latter, so that recumbent exercises entail much less risk of vascular congestion.

On the other hand, the recumbent posture has the disadvantage of taxing the abdominal muscles more or less heavily. The degree of strain depends on the kind of exercise chosen and the mastery of delicate and slight *gradations of exertion*. Some previous training and proficiency are very helpful here. And doubtless some exercise, even vigorous exercise of the muscles of the abdominal wall during pregnancy is no disadvantage; on the contrary, their increased tonicity and control is very desirable. But—as has been already stressed in these pages—the exercise must *alternate effort with relaxation at will and not be entirely effort*; the muscles must be tensed or loosened rhythmically, and the effort should not be too prolonged and should be restricted to the most *suitable times and seasons*.

We must deal more in detail with these times and seasons,

or *phases of pregnancy*. Any and every physical exercise is not suited for the whole duration of the pregnant state, nor for every woman in that state, indiscriminately. And what exactly is harmless or helpful in any particular case, or what, on the contrary, should be stringently avoided, can only be judged by a medical practitioner who knows the general constitution and history of the woman herself and/or who has carefully examined her and has also accurate knowledge of the possibilities and effects of physical exercises. Moreover, any untoward symptoms or ill effects, even if not directly traceable to the exercises, should be a danger signal followed by complete rest and prompt professional consultation.

The two phases in which there are the greatest dangers of mishaps are (*a*) during the first months, and (*b*) during the final weeks of gestation. By the "first months" we may understand the period from the last occurrence of menstruation to the third recurrence of the date at which menstruation would normally be due. During these months, general and gynaecological experience concur as to the ease and frequency of incomplete or complete expulsion of the product of conception; *i.e.*, of haemorrhages or miscarriages. And general and gynaecological experience also concur that this risk is greatest on the dates during which menstruation would normally be due for the second and third time. So anything and everything that might cause rupture and expulsion of the embryo should be carefully avoided at such times. Both violent bodily exertion and mental and emotional shock may cause haemorrhage and miscarriage, and any strain or shock to the abdomen is particularly liable to do so. Therefore, it is obvious that such injuries, efforts, shocks and stresses should be guarded against with great care in the first three months of pregnancy, and the days corresponding to normal menstrual dates. It is equally obvious that these precautions are not equally urgent or valid in every individual woman, although it is well to observe complete abstention during early months and dates of the normal menstrual cycle in first pregnancies. When the expectant mother has already been pregnant before this occasion, and shown a tendency to

haemorrhage or expulsion, there should be added care, and I would forbid these physical exercises to her during pregnancy. But there may be full use of physical exercises if and when previous gestations have been normal and successful, and shown no constitutional tendency to uterine convulsions or spells of bleeding.

The reason for special caution in the final weeks of pregnancy are different. I have specified the final *six* weeks, but this allows a fair margin and is perhaps somewhat indefinite. Among women who have not already borne several children the lower portion of the womb does not always retain the firmness and tension necessary to lift and enclose its contents : thus any marked and especially any sudden increase of pressure sometimes causes rupture of the protective membranes (amnion, chorion). Therefore, every physical exercise entailing such increase of pressure within the abdominal cavity—whether actively or passively, by vigorous muscular exertion or simple pressure on the abdomen—should be avoided by *multiparae* \* in the final stages of gestation. The particular peril in their case is the exact reverse of the risk run in the early months, which is greatest in women who are pregnant for the first time. The danger of ruptured membranes, loss of some of the liquid in which the unborn infant lies, and, in consequence, premature labour, is greater in multiparae because their cervix (the lower portion or “neck” of the womb) is generally somewhat dilated in the later months, so there should be no vigorous abdominal exercise at that stage.

The multipara whose abdominal muscles have not been strengthened by correct exercise and care in her successive previous pregnancies, and who has, therefore, become flaccid and even somewhat pendulous as a result, should certainly wear a deep and firm support—special belt or corset—when performing physical exercises.

I shall now conclude these hints, recommendations and warnings to the expectant mother with a quotation from Heinz Küstner's treatise, “Ought a Woman to take part in Sports during Pregnancy?”<sup>(38)</sup> For, although I have

\* Women who have borne several children.

confined the subject-matter of the present book to gymnastics, and mainly to a highly specialised and limited form of gymnastics, and omitted mention of games and athletic sports both as irrelevant and as far too wide a subject for treatment in the space and time at my disposal, *Küstner's* remarks might be perfectly applicable to gymnastics as well as sports, and deserve to be known and heeded by my readers.

*Küstner* answers the question embodied in his title as follows :—

“ We must differentiate between two categories of women. The first group have taken active and frequent part in sports and games before they became pregnant ; the second group have taken little or none. A woman who is thoroughly habituated to athletic sport will find it very difficult to refrain wholly during pregnancy, and it would be a great and harsh deprivation and possibly even detrimental to her mental and bodily health were all such activities strictly forbidden her as soon as we knew she was pregnant. For such women, in the first three months, I permit games and sports except on the days when the menstrual period would be normally due. For, at these critical days, strong bodily vibrations may cause haemorrhage and even miscarriages, as has been indisputably observed and recorded. At other times, a moderate athletic activity, without strain—such as swimming for example \*—is thoroughly beneficial and preserves elasticity and muscular tone. And, I am of opinion that there is no greater risk for mother or child between the third month and the sixth. After the sixth month, all exercises entailing tension of the abdominal muscles should be ruled out. I have certainly met women patients whose muscular tone and gymnastic training permitted them to do trunk exercises in late stages of gestation, such as many unpractised women could not have performed in their normal state of health, but there is always the risk of premature rupture of the foetal membranes, of *placenta prævia*, or other serious complications.

\* With exception of such cases in which there is imperfect action of the sphincter muscles of the vagina, for then the water containing possibly dangerous micro-organisms can flow into the vagina.

"What of women who have been decidedly unathletic before and up to the time they became pregnant, *i.e.*, who have either not taken part in games and sports at all or only occasionally and whose proficiency is slight? I should forbid all physical exercises till the third month is past; then, from the third to the sixth month, gentle exercises involving the whole body, to be followed, after the sixth month, by arm and leg exercises only. In this manner, we shall succeed in keeping the maternal body supple, and in strengthening the particular muscles which are called on to bear the weight of pregnancy, while avoiding undue constriction of those regions which should be flexible and yielding."

Should exercises of the *pelvic floor* be continued during pregnancy? I think the answer must be to make a definite distinction between *indirect* exercises—in which the pelvic floor is affected *secondarily*, as it were, by the exertion of other groups of muscles—and *direct* exercises, which affect the perineal and vaginal groups *alone*. As an example of the *indirect* group we may take 9a (Figs. A and B). Anyone who gives the first illustration even a moment's attention will understand that the contraction of the abdomen involved in this exercise rules it out for the greater part of gestation. And this becomes particularly evident when we read the letterpress and realise that the trunk should be *dropped loosely*, that is, that the pressure and contraction of the abdomen is *sudden* and *not gradual*. Such a type of exercise could only be recommended in the early months, and then only to women who have considerable gymnastic proficiency, and no constitutional tendency to uterine haemorrhage, etc. And these precautions amount to a *veto*, for there must be so many restrictions and so much care that it is best to *rule out Exercise 9a for the pregnant woman, not because the pelvic floor is drawn taut, but because of the manner in which tension and relaxation are affected therein.*

This gives the key to the advisability or the reverse of other indirect perineal exercises for the expectant mother. What are the precise movements of the rest of the body by

which the perineal muscles are contracted and relaxed ? We shall enumerate appropriate exercises of this region in dealing with physical exercises after child-birth, and there are some which can be performed during pregnancy as well. And there are a few gentle indirect exercises for the muscles of the pelvic floor, such as that recommended by Sieber,<sup>(36)</sup> which is as follows :

*"Exercise for the muscles of the pelvic floor while seated on the floor.—Stretch the legs out from the body, separate the legs as the breath is drawn into the lungs, close the legs as you breathe out."* Again, another exercise is for the same regions, but standing upright : "The left thigh is raised until it is horizontal, then the knee is grasped by the hand and drawn sideways so far as possible and then returned to its former position and the thigh lowered. Repeat with the right leg. Breathe in as the knees are moved sideways, and breathe out as they are brought forward again. Do not attempt this exercise without a firm support." But we must not forget that however useful these movements may be, they only deserve the name of exercises for the pelvic floor if the *perineal muscles, especially the levator group, are consciously contracted and relaxed.* If this effort is not made, the levator group is quite inactive, and unaffected by the combined movements recommended by various authorities on physical culture, as may be easily proved by sensation or inspection.

So most of the indirect and secondary perineal exercises *only become effective by becoming direct*, and this means that the *direct exercises are preferable*, because attention is concentrated on the tension and relaxation of the local muscles and these movements are more effectively mastered. I have described these exercises of the pelvic floor in detail, and there is no objection to their performance by the expectant mother so long as they are not carried out with extreme frequency or force, and there is no tendency to uterine haemorrhage and/or miscarriage. And, of course, to benefit fully by these exercises *they should have been mastered before pregnancy begins.*

## CHAPTER XIII

### DIRECTIONS FOR THE EXERCISES DURING PREGNANCY

GYMNASISTICS during pregnancy fall naturally into three categories : (A) General Exercises, (B) Exercises for the Abdominal and Pelvic Zone, and (C) Exercises for the Pelvic Floor.

#### (A) GENERAL EXERCISES

##### *Group I. : Respiratory*

###### *(1) Abdominal Breathing* (Figs. 18 and 19).

The woman lies on her back with raised knees and lays her hands palm downwards on her body. Breathe out, and test while doing so whether the abdomen contracts sufficiently. It is advisable to execute a whistling sound between the teeth—on “ss” or “pf”—while breathing. Inhalation should be through the nose, and the air should flow slowly into the lungs until the abdomen is arched upwards and tense, and this can be felt by the hands. Repeat several times, but not *too* often, alternating with other exercises.

*Note.*—As the unborn child grows in size, the mother’s capacity for abdominal breathing steadily diminishes. The muscular contraction of the abdomen while *exhaling* is less and less possible as pregnancy draws to its climax. But it is advisable to attempt this form of abdominal exercise for as long as possible. *Of course, there should be no excessive pressure on the body by the hands.*

###### *(2) Flank Breathing* (no illustration).

Lateral posture, *i.e.*, the woman lies on her side and draws up her knees comfortably. Breathe out—on a whistling note—then draw the breath into the side lying uppermost and raise the arm slowly at the same time. There should be a sensation of fullness and tension, comparable to a pneumatic

cushion. Breathe out, letting the arm sink slowly. Practise alternately on right and left sides.

*Note.*—As soon as this posture becomes painful, as it will in advanced pregnancy, the exercise should be discontinued. It is possible to carry out the flank breathing while sitting in a chair with sloping back.

(3) *Costal Breathing* (Figs. 20 and 21).

This exercise is performed seated on a chair or on the floor, Turkish fashion. Inhale so that the ribs move, and, at the same time, move the arms sideways and raise the head without leaning back. When exhaling, let the arms cross over the breast and the head bend forwards, relaxing the neck.

(4) *Full Breathing* (Figs. 5 and 22).

Lie on the back with raised knees and arms stretched loosely on either side of the body as in Fig. 5. Exhale or breathe out on the hissing or whistling note ("ss" or "pf" sounds), then fill the abdomen again, letting the air dilate the ribs and flanks and meanwhile raising the arms slowly and bringing them backwards and outwards as in the posture shown in Fig. 22. While exhaling make the same arm movements, reversed, and return finally to the initial posture.

(5) *Passive Breathing Exercise* (Figs. 22 and 23).

The preceding exercise is very suitable for help from the gymnastic mistress or the physician. But note carefully that as the patient's arms are moved sideways they should lie quite loosely and heavily in the hands of the teacher or doctor, and that the patient's shoulders should not, on any account, be drawn upwards, but spread as widely as possible apart as may easily be managed (see Fig. 22). It helps complete exhalation if the gymnastic teacher presses the patient's hands against her ribs—not violently, of course, but firmly enough to be felt.

*Note.*—The instructress should herself be able to breathe deeply and have a good lung capacity. She should breathe in and out with the patient, for, in respiratory exercises, a living example is surprisingly instructive and helpful.

Exhalation should only be performed as represented in Fig. 23, that is, with pressure on *abdomen* as well as ribs, *in the early stages of pregnancy and the later stages of convalescence after child-birth*. After the first pregnant months and very soon after child-birth, the patient's arms should be sharply flexed, so that the pressure falls only on the ribs and especially at the sides. Even so, there should be no sort of discomfort or excessive pressure.

### *Group II. : Relaxation and Suppleness*

#### (6) *Loosening the Leg* (no illustration).

First position (standing). Lift the leg slightly above the floor and forwards and shake it gently from thigh to toes so that the foot moves loosely to and fro. Repeat with the other leg alternating left and right. It is essential for the woman to have *a firm table* beside her on which she can rest one hand. Chairs are inadvisable, they slip or overbalance too easily.

#### (7) *Loose Pendulum Leg Exercise* (no illustration).

First position as in Fig. 1, but without raised arms. Move one leg backwards and then swing it very gently to and fro from the hip. *Sharp jerks should be avoided*; move very gently and evenly. Practise alternately, left and right. A firm support is necessary in this exercise as well as in the last.

#### (8) *Leg Relaxation* (Figs. 24 and 25).

(a) Lie down on back with raised knee. Raise the leg from the knee downwards and let it fall back on the thigh. Practise alternately, left and right.

(b) As in (a), but exercising both legs simultaneously.

*Note*.—A sudden drop of the lower leg is to be avoided, as this would jar the pelvic organs. *Nor is the exercise suitable for advanced pregnancy*.

#### (9) *Leg Rolling, Inwards and Outwards* (Figs. 26 and 27).

Lie down on back. The gymnastic instructress takes hold of one ankle and places her other hand beneath the thigh. She then lifts the patient's leg and rolls it inwards so far as

possible, moving slowly. Then again, slowly outwards so far as possible.

*Note.*—As described above, this movement is wholly passive. It may, however, be tried in an active modification though a loose and easy support at the ankle is advisable in that case too. If this support is dispensed with, the leg is not lifted from the floor or couch. This exercise may be so adapted and modified by a greater or lesser degree of exertion on the patient's part and help from the instructress that it may be continued throughout pregnancy.

(10) *Foot Exercise (passive)* (Fig. 28).

The woman sits on a chair with a back to it. The instructress sits beside her also on a chair. The patient lays one knee across the instructor's lap ; the instructress clasps the patient's leg at the ankle, lifts it slightly and moves the foot up and down. Fig. 28 shows the foot at its fullest stretch.

The foot is then moved from side to side. Finally, a circular movement is made outwards and then inwards and then in the opposite direction.

*Note.*—Here, too, all modifications and gradations between passivity and active exertion in resistance to pressure are possible ; therefore, this exercise is suited for the whole duration of pregnancy.

(11) *Leg Relaxation (passive)* (Fig. 29).

Patient and gymnastic instructress seated as before. The patient lays one leg across the knee of the instructress. The latter lifts the leg high at the ankle and then lowers it.

*Note.*—This may be preceded by repeated passive flexion and extension of the leg. Here, too, there is the possibility of modification and adaptation as in Exercises 9 and 10.

*Note on the Exercises of the Second Group.*—In the aforesaid modifications, between passivity and degree of exertion, the loosening or relaxation of the joints *must not be overdone*. The active movements are best interspersed between a larger number of completely passive exercises. The patient always appreciates this method. There is great scope here for sympathy and intuition on the part of the instructress.

*Group III. : Exercises of the Thighs and the  
Abdominal and Pelvic Muscles*

(12) *Knee Raising in Recumbent Posture* (no illustration).

The woman lies on her back. She draws up one knee, as close to her body as possible. Then she slowly stretches out her leg and rests it on the couch again. Practise alternately, left and right. The woman may draw her knee closer to her body with both hands if she prefers to do so, but only in the early stages of pregnancy, not in the later months.

This exercise becomes more vigorous and exhausting if the second knee is raised before the first has returned to the initial posture.

If these movements are modified and accelerated so that each leg is flexed and then stretched alternately and continuously without returning to the recumbent posture, the combination of movements is that of *bicycling*.

*Note.*—The bicycling exercise is very popular, and partly so, perhaps, because no detailed explanations are necessary for the patient to understand it. There are nursing homes and clinics in which “And do the bicycling exercise steadily!” sums up all the instructions previous to the special gymnastic treatment of the puerperal stage (after child-birth.) And, of course, this procedure is better than the complete absence of any definite purposive movements. But it should be borne in mind that this exercise entails considerable exertion, especially when performed rather rapidly, and is, therefore, only safe and suitable for healthy women with comparatively good muscular tonicity.

(13) *Knee Raising in Recumbent Posture against Pressure* (Fig. 30).

(a) The woman lies on her back while the gymnastic instructress lays the palm of one hand in the hollow of the patient's foot and clasps the thigh from above with her other hand. She lifts the lower leg (*i.e.*, below the knee), pressing the thigh, thus bending the patient's knee. Then the knee is again stretched and the leg laid flat. Repeat several times in succession and *not too quickly*. The suitable *tempo*

depends on the condition of the patient. When slowly executed, this series of movements is so easy and gentle that they may be performed by women in pregnancy and the puerperium, and by invalids in general.

*Note 1.*—Properly instructed and careful lay persons are also able to give the necessary assistance and support in this exercise. Or two expectant mothers in a hospital or nursing home may help one another. This help is most comfortable if the couch or table is *comparatively high*, as in Fig. 40.

*Note 2.*—The gymnastic instructress or assistant must not press the large blood vessels of the thigh with her finger tips, and should even avoid pressure on the smaller veins.

(b) The completely passive nature of this exercise (as described under (a)) is changed into resistance to pressure if the instructress presses the patient's thigh with her hand so that some exertion is necessary in order to raise the knee. Similarly, a certain degree of pressure is possible with the other hand against the patient's foot. Of course, the amount of exertion may be modified to any degree. The instructress must be on guard against undue strain of the diaphragm, and regular breathing is, therefore, essential during this exercise.

#### (14) *Knee Rotation* (Fig. 31).

Recumbent posture as in preceding exercise ; and as in 13, the instructress holds the patient's foot and, with the other hand, her knee. The instructress rotates the patient's knee outwards, at first slightly, then in wider circles. Practise alternately left and right.

#### (15) *Lifting and Lowering the Pelvis* (Fig. 32).

Recumbent posture, with raised knees. The instructress supports the patient's body by placing her hands beneath loins and buttocks. The patient then endeavours slowly to raise her pelvis, aided by the instructress ; thus there is a *combined movement*, the patient taking part without over-exerting herself. Having lifted her pelvis so far as possible from the couch or table, she should slowly lower it and return to the initial posture. *On no account should the pelvis be jerked down.*

*Note.*—This exercise should be avoided in the later months, and should not be attempted in early pregnancy if and when there has been any tendency to miscarriage (see Chapter XII. *passim*). This is even more imperative if and when the exercise is wholly active, *i.e.*, without support and help from the instructress. In such cases the pelvis should not be raised to the highest degree possible, as the exertion involved is certainly too great.

(16) *Trunk Lifting and Lowering* (Fig. 33).

Recumbent posture. The instructress places one arm beneath the patient's shoulder blades and presses the patient's knees down firmly on the couch. The patient then slowly raises the upper part of her body, supported meanwhile by the instructress and letting her head droop back limply. Inhale while raising the body, then exhale and slowly lower the body again. Pay special heed to loose relaxed drooping of the head, for this relaxation is the only way of obviating needless and deleterious lung pressure during this exercise, and such lung pressure is very harmful even to non-pregnant women. So long as the patient's head and neck muscles are relaxed she can breathe quietly and without effort, and thus the instructress is able to check any undue strain.

*Note 1.*—In this exercise the couch or table on which the patient lies must not be too low, and the instructress must have perfect freedom of movement, and not risk slipping or losing her foothold.

*Note 2.*—If no assistance is available, the patient can perform this exercise by herself, if she observes the following precautions. She should lie on her back on the floor, with a thin flat pillow under her head and her feet securely tucked under some firm solid piece of furniture, such as a chest of drawers or cupboard against which she can brace her ankles. A cushion or pillow should be placed between the edge of the piece of furniture and the woman's legs to avoid bruising. The arms lie sloping slightly outwards, so that from elbow to palm, the lower arm almost rests flat on the floor. While raising the trunk, support weight first on the elbows and



18. ABDOMINAL BREATHING—EXHALATION  
*Lying on back, raised knees, hands on body, exhaling.*  
(SECTION II, EXERCISE I.)



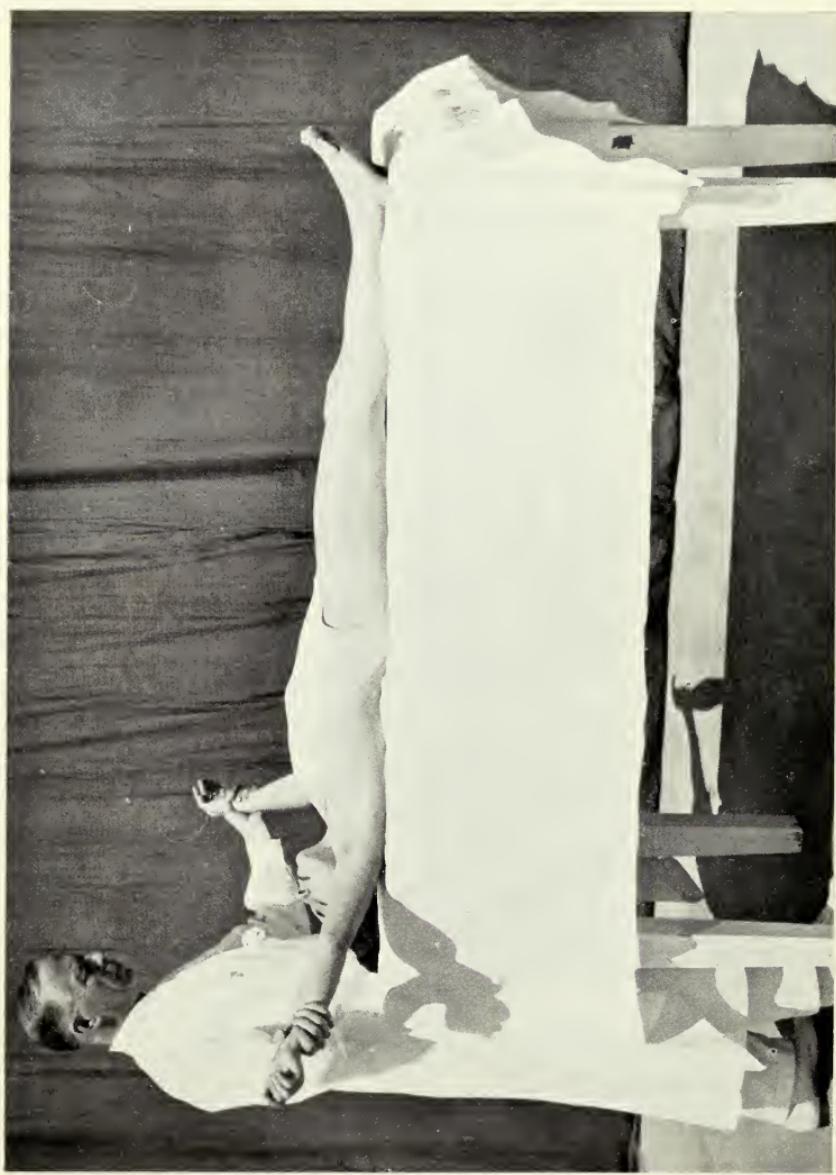
19. ABDOMINAL BREATHING—INHALING  
*Inhaling through nose until abdomen arched upwards and tensed.*  
(SECTION II, EXERCISE I.)



20. COSTAL BREATHING—INHALATION  
*Inhaling deeply, moving arms sideways and raising head.*  
(SECTION II, EXERCISE 3.)

21. COSTAL BREATHING—EXHALATION  
*Exhaling, crossing arms, bending head and relaxing neck.*  
(SECTION II, EXERCISE 3.)





22. PASSIVE BREATHING—INHALATION

*Arms lying loosely, moved widely sideways while inhaling.*

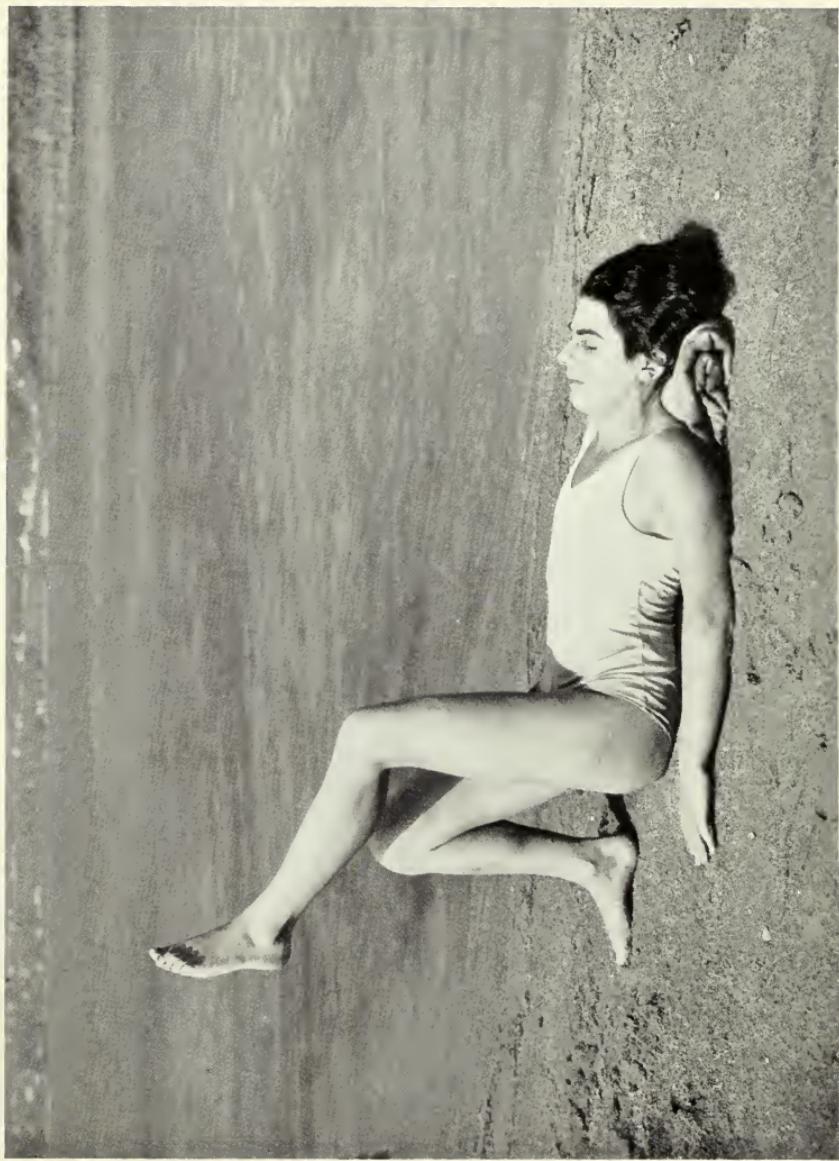
(SECTION II, EXERCISE 5.)



23. PASSIVE BREATHING—EXHALATION

*Arms moved forwards firmly against ribs while exhaling.*

(SECTION II, EXERCISE 5.)



24. LEG RELAXATION—INITIAL POSITION  
*Raising leg from knee downwards.*  
(SECTION II, EXERCISE 8.)



25. LEG RELAXATION—FINAL POSITION  
*Letting leg fall back slowly on thigh. Left and right alternately.*  
(SECTION II, EXERCISE 8.)



26. LEG ROLLING—INWARDS

*Rolling leg slowly inwards so far as possible.*  
(SECTION II, EXERCISE 9.)



27. LEG ROLLING—OUTWARDS

*Rolling leg slowly outwards so far as possible.*

(SECTION II, EXERCISE 9.)

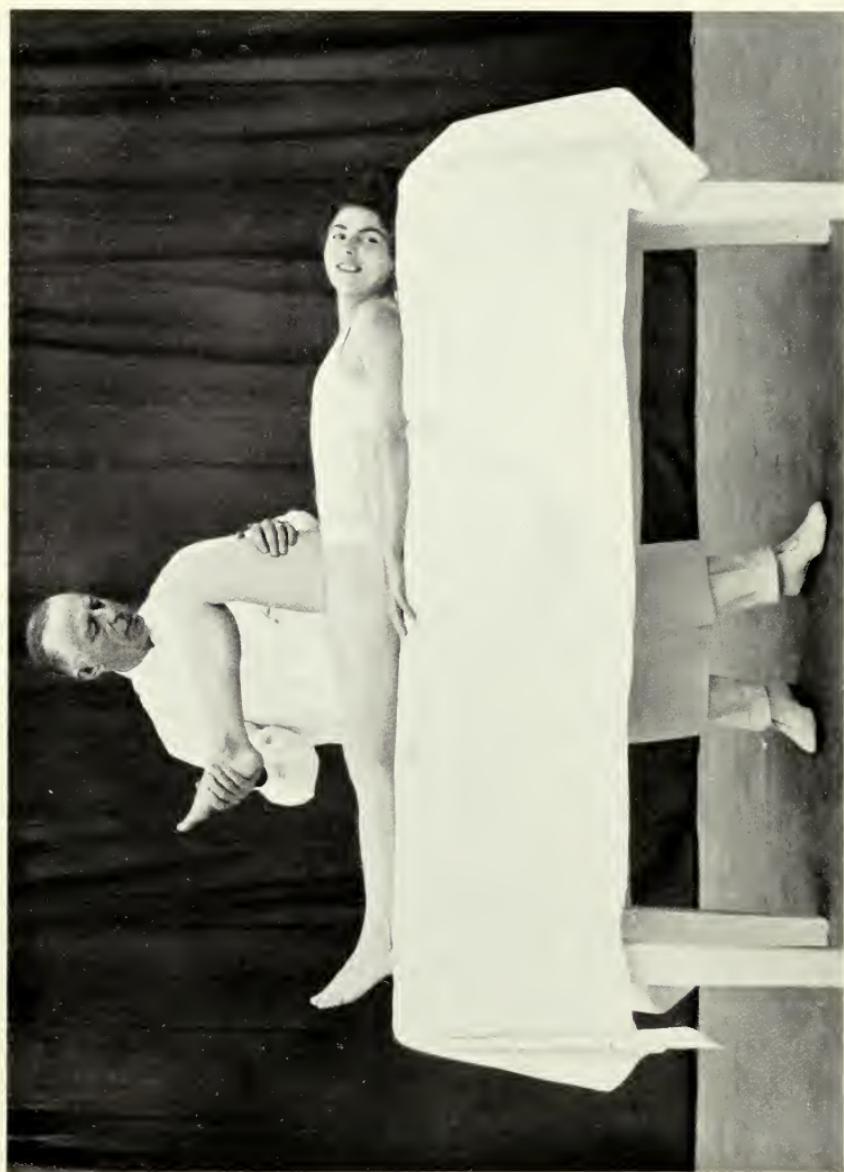


28. FOOT EXERCISE—PASSIVE

*Moving foot at fullest stretch, up and down, side to side, then circular movement in alternate direction,*  
(SECTION II, EXERCISE 10.)



29. LEG RELAXATION—PASSIVE  
*Lifting leg high at ankle and then lowering it.*  
(SECTION II, EXERCISE II.)



30. KNEE RAISING IN RECUMBENT POSITION AGAINST PRESSURE  
*Lifting the right leg, pressing thigh and bending the knee.*

(SECTION II, EXERCISE 13.)

31. KNEE ROTATION  
*Rotating knee slightly, then in wider circles.*  
(SECTION II, EXERCISE 14.)



32. LIFTING AND LOWERING THE PELVIS  
*Raising and lowering her pelvis with assistance.*  
(SECTION II, EXERCISE 15)





33. LIFTING AND LOWERING THE TRUNK  
*Raising trunk while shoulder supported and knees kept firmly down.*  
(SECTION II, EXERCISE 16.)

then on the hands. Raise half-way to the sitting posture, then sink slowly back again. Without the precautions and arm support as described, this exercise is far too strenuous for the expectant mother. Even with due precautions, care is necessary, and medical sanction should be obtained before trunk lifting and lowering are attempted.

(17) *Opening and Closing the Knees in Resistance to Pressure*  
(no illustration).

Recumbent posture with raised knees. The instructress clasps the knees of the patient and the latter attempts to push them apart against the pressure of the instructress's grip. Then the instructress lays the palms of her hands against the inner surface of each knee and exercises pressure against the patient who endeavours to close her knees. The patient must not hold her breath while making these movements. The resistance to pressure must be very gradually increased. The instructress must not allow herself to be drawn into any competition or trial of strength with the patient (*cf.* Exercise 27, Fig. 40). If the patient exercises alone she can use her own hands to press her knees together and/or apart. But she should first, in my opinion, try the exercise with skilled supervision in order to understand the possible and advisable degree of resistance.

*Note.*—In all exercises which have no special directions about breathing appended, it may be taken as a rule that the breath should never be "held." In order to avoid fatigue and overstrain of the neck muscles, it is advisable for the patient to let her head droop easily towards either the left or right shoulder when exercising in the recumbent posture.

Further exercises which may be employed with advantage are those described in our next chapter—dealing with gymnastics after child-birth, with the exception, however, of Nos. 24 and 25. These are performed lying face downwards, so may only be used in the early months of gestation, before the womb has become so enlarged that the abdominal pressure would do harm. But these two exercises ("Leg raising backwards" and "Leg raising backwards

against pressure") are *specially suitable for the early months*, as they can be performed very slowly and gently, and do not affect the contents of the pelvis. And as the choice of suitable exercises at the beginning of pregnancy is so limited, full use should be made of Nos. 24 and 25.

There are further possibilities as well as the exercises aforesaid: various exercises in the repertory of general physical culture for women may be included in the programme, for either the whole duration of pregnancy or a part. Any expert will be able to alter or combine well-known sequences of movement in "new" exercises, but in selecting and composing all such exercises, the principles stated in Chapter XII. should be borne in mind. During *pregnancy all sudden jerks and all strong vibrations or impacts should be avoided as far as possible*; thus, all gymnastics which include either jerks or shocks are forbidden.

But the material contained in these pages is sufficiently full for a varied and beneficial programme of physical culture, and it is obvious that women who had had no—or very slight—previous physical training should give most time to such elementary matters as foot exercises, trunk movements and breathing.

#### B. EXERCISES OF THE PELVIC AND ABDOMINAL ZONE

In Chapter IV. certain exercises of this category are described. Those listed under Nos. 1 to 4 are only suitable and/or possible for women who have had physical training, and whose abdominal walls are firm and in sound condition, and even for them only suitable in the early months. These exercises are performed on the hands and knees, and the breasts, which pregnancy renders larger and heavier, *should in all cases be protected by a firm brassière when in the quadrupedal posture*.

Exercises 5 to 10, as listed and described in Chapter IV., should not be attempted in pregnancy, as they are too vehement and/or involve swinging movement. Only 8 (a) and 8 (c) (Film 6.) might be taken into consideration.

On the other hand, No. 11 (Film 7), No. 12 (Film 8), and Nos. 13 and 15 are, if executed slowly, suitable also for the expectant mother, for, apart from their excellent effect on the general muscular system, they increase the mobility of the pelvic zone and bring it under voluntary control, without in any way displacing or over-burdening the womb. These four exercises may, therefore, be safely performed by healthy women throughout pregnancy, especially if they have been mastered beforehand. Even when this is not the case they may be attempted, but without needless exertion and attempts at technical perfection; in fact, there should never be attempts at *tours de force* in this manner while gestation lasts. Even if their technical execution is far from faultless they bring great benefits, and not the least of their merits is the length of time during which they are practicable. *But again, do not overdo it!*

*Note.*—Instead of performing some of these and the following exercises, No. 11 (Film 7) and No. 18 (Film 11), as prescribed on the toes, it is advisable to execute them during pregnancy on the whole feet.

The “Sideways motion of the pelvis” described under No. 14 (Chapter IV.) can be practised throughout pregnancy if and when there has been some previous proficiency, and if *the TEMPO is much slower than under normal conditions*.

The “Horizontal Pelvic Rotations” (Films 9 and 10) described under headings 16 (a) and 16 (b) in Chapter IV., and the “Pelvic Version while Walking” (No. 18, Film 11),—which certainly needs some previous practice—may also be performed throughout gestation, if the movements are not vehement and extreme. But the “Pelvic Spirals” of No. 17 are best omitted by the expectant mother, even if an expert.

No. 19 (Film 12, the Suspension-flexion) must be entirely prohibited during pregnancy for the reasons already given in detail.

On the other hand, No. 26 (the numbers mentioned here under B all refer to Chapter IV.) is not fatiguing, and may be executed so long as not causing any complaints.

## C. EXERCISES OF THE MUSCLES OF THE PELVIC FLOOR

An *indirect* exercise is afforded her by a sufficiently vigorous voluntary contraction of the buttock or gluteal muscles and of the inner surface of the thighs (adductor group) to affect the adjacent area. If the adductor and gluteal contractions are not very vigorous, there is generally no effect on the pelvic floor, and this special benefit is as a rule illusory. And this is especially the case during pregnancy, because vehement exertion is then contraindicated. Moreover, such indirect exercise of the perineal muscles, even if effective, can only *increase power and not control*. Control, *i.e.*, the capacity to contract and relax by voluntary effort, is the essential here, and this essential is not promoted by indirect perineal exercises.

Nevertheless, there is some value in these exercises during pregnancy if attention is not limited to the action of legs and trunk, but is also consciously directed to alternate tension and relaxation of the pelvic floor : gluteal and thigh muscles must move together with the perineal.

Among the general exercises already cited (under A) for use during pregnancy, the "Lifting and Lowering of the Pelvis" (No. 15 of this chapter) is appropriate, in combination with movements of the pelvic floor. The feet should be somewhat apart and the knees more or less open. The pelvic floor should be drawn taut as the pelvis lifts and relaxed as it is lowered.

Further, and especially suited for combined movement of the pelvic floor are No. 17 of this chapter, "Opening and Closing the Knees in Resistance to Pressure" and "Opening and Closing of the Knees against Pressure with raised Pelvis," which we shall describe more fully as No. 27 in the next chapter. But it is much better for the woman not to exercise the counter-pressure in No. 17 *with her own hands*. There is too much risk of overdoing effort. If, as is here suggested, the gymnastic instructress exercises the counter-pressure, she can judge the necessary amount of exertion by her own "muscular sense." And there is a good test of excessive exertion, which is immediately followed by

tremulous jerks. *This must not be*: movement should be even and continuous. The instructress can also suggest active perineal exertion when necessary.

The same is true and even more urgent as regards No. 27. This rather exacting exercise should be very sparingly and cautiously employed by the expectant mother.

We will add a recommendation of No. 16 of the last group ("Trunk Lifting and Lowering"). It combines well with perineal tension in the first phase, and relaxation in the second.

Finally, there is an exercise which must be carried out by the woman without further assistance: the "*Opening and Closing of the Legs stretched at full length while seated on the Floor*," and "*Thigh Movements while standing upright*." Sieber describes the latter as follows: The left thigh is raised till it is horizontal, then the knee is grasped in the hand and pulled so far as possible sideways and then back again and the knee lowered. Repeat with the right thigh. Inhale during the sideways movement, exhale while returning to the original posture. *This exercise necessitates a reliable support for the free hand.*

Neither of these two exercises is strictly perineal, but can be happily and effectively combined with deliberate tension and relaxation of the pelvic floor.

The exercises inherently most suitable in combination with movements of the pelvic floor are those of the pelvic zone, listed in Chapter IV. under Nos. 9, 9 (a), 10, 20 and 21. *But they should be avoided during pregnancy as they are much too jerky and spasmodic.*

For directions as to how to perform direct exercises of the pelvic floor I would refer readers to the final portion of Chapter VI., to which there is nothing further to add on this topic.

As to the frequency and intensity of movement, a certain moderation is advisable during pregnancy; for instance, twice or thrice a day, and three or four times in succession on each occasion. And the voluntary and conscious muscular relaxation is more important than the contractile force.

## 118 SEX EFFICIENCY THROUGH EXERCISES

Those who have not already mastered the art of contracting the muscles of the vaginal orifice (*Constrictor Cunni*) and those of the interior vaginal passage (Levator group) *independently* of one another, should not attempt this during pregnancy. It will suffice in these cases to give indirect exercise to the Levator group, by contracting the gluteal and anal muscles as though controlling an unwelcome motion of the bowels.

The direct general exercise of the pelvic floor can take place throughout the whole of gestation, but is of most benefit, if there is already control and mastery of these particular muscles, before pregnancy begins; as, in that case, it is only necessary to keep in training.

## CHAPTER XIV

### EXERCISES AFTER CHILD-BIRTH

Two benefits should accrue from these exercises. They should have a *general healing and restorative effect* on circulation, respiration and metabolism, thus helping to compensate for the very high organic demands of pregnancy and birth, and to counteract the peculiar perils following delivery. And, in the second place, they should help the *involution, the return to normality* of the stretched and slackened body, especially of the abdominal and perineal muscles, so that no lasting harm ensues. Both purposes are of equal value. But first and foremost : exercises after child-birth should not defeat their own purpose : *they must not harm, instead of helping.*

Therefore, there should be no *strain*, nothing convulsive and perhaps even more urgently, there should be no rigid, cast-iron standardisation. Body and mind of the patient should give the keynote. All depends, e.g., on whether she is in good condition or weakened by considerable loss of blood ; whether her delivery was easy or had to be completed by artificial means after prolonged labour ; whether there have been lacerations of the genital tissues or not ; whether there is risk of post-partum haemorrhage ; whether there is any rise of temperature—all these considerations are highly important. To mention only one example, whose significance must be obvious : if there is no laceration of the perineum, direct exercises of the muscles of the pelvic floor should begin on the third day ; but, if there are perineal tears, these exercises should not begin before the first week is at an end.

Of course, only the physician is able to judge all these factors adequately. Sometimes, the midwife is able to take over responsibility, but she should ask expert advice in case

of any doubt. And careful supervision of the patient and observation of the effects of the exercises are necessary in every case.

A factor of importance is the degree of practice, or the reverse, attained by the woman before her confinement. Probably all obstetricians who have concerned themselves with this subject are in agreement that a muscular system kept elastic by previous physical culture returns to normality after child-birth far more easily than the slack and often overstrained abdominal walls of an unpractised patient.\* All obstetricians concur equally in warning against excessive athletic training, and especially against competitive sports.

The best practical differentiation of exercises after child-birth is based on (*a*) actual *childbed*, and (*b*) the later phases of involution. Of course, the borderline between these stages of recovery shifts and depends on individual factors. For normal cases, we may make the division at the end of the second and beginning of the third week, after delivery. As a rule, exercises implying much effort should be kept for this later phase, and, of course, women who have to attend to their domestic duties as soon as they leave their beds, must be careful to avoid fatigue. *Note, however, that these later puerperal exercises cannot take the place of those which should be performed during the fortnight following birth; if exercise during this first fortnight has been neglected owing to ignorance or adverse circumstances, the omission can only be made good with difficulty—or not at all.* This may be observed in the cases of women who have had to rest completely for several weeks owing to injuries at birth, haemorrhages or other illness; and the obstetricians of an older generation who had experience of the school of doctrine which kept puerperal women as long as possible in absolute repose, have also many cases to cite and much to warn us against. *For the involution, recovery, or return to normality of the abdominal and perineal muscles takes place in the fortnight after delivery and chiefly in the first week.* The later exercises

\* Especially of a multipara.

are *strengthening* to the muscles—which should have already returned to their original state—but cannot restore the elasticity of a muscle which pregnancy and birth have *stretched* and neglect after birth has *stiffened* so that it is rigid. And a muscle which has remained stretched lengthways may be vigorously contracted but lacks the proper support from the adjacent connective tissues in repose (*H. Küstner*, see Bibliography, No. 38).

Of course, even the early phase of actual childbed has its changes, as the patient herself can clearly perceive. From day to day, she can trace the marvellous process of gradual but relatively rapid recovery after her ordeal, and of re-adjustment in the abdominal organs. She will appreciate a care which does not overtax her physical powers in that fortnight, and the exercises should increase and develop in sequence, just as do the changes in her body. *The chief maxim to observe is that the woman must never feel overstrained after her ration of exercises.* If she feels any overstrain, she has done too much. But it is quite possible to regulate and avoid this, as I have pointed out, by adopting the Swedish methods and grading movements by intercalating semi-active and semi-passive exercises, between complete passivity and vigorous movements against resistance. Thus, such a register of possible combinations is provided that no young mother, however muscularly feeble and inexpert, need be overtired, or, on the other hand, deprived of the full benefit of puerperal physical culture.

I am of opinion that these special exercises in the fortnight after child-birth cannot be adequately replaced by simply letting the patient get up and return to ordinary routine. During the reaction against earlier errors and the mistaken view that a woman who had given birth to a child should be kept in bed and entirely inactive for a week at least and sometimes longer, there was a repudiation of this *ultra-quiescent* method, which took the form of urging the women to “get up as soon as possible.” In certain clinics, there were even cases of physicians who “got them out of bed on the first day”! But most specialists contented themselves with the second day or the third. Only a

relatively small number, among whom I was one, advocated the longer period of rest in bed. But we have learnt to accept the new principle, and even to prescribe definite movement instead of the former immobility. For there is no doubt that early "getting about again" involves early return to muscular exertion, and favours the resumption of metabolism and the health of the whole organism. The secretory functions, the elimination through bladder and bowel and the formation of milk are earlier restored or less clogged. Sleep comes without artificial aid. The appetite thrives. As for the organs of sex and maternity, far from becoming displaced and dropping forward, as some critics have ventured to affirm, they resume their normal position sooner and have the increased support of taut sound muscles in the pelvic floor. The abdominal muscles, instead of sagging, become firmer and more elastic, and finally, the circulation is speeded up and actively counteracts varicosities and embolism, though affording no absolute guarantee against these lesions. But I must wholly endorse the comments of *Stoeckel* (*Bibliography*, No. 28), when he adds to these encomia the question whether such benefits can only be gained by "getting up soon"? For this *régime* cuts down the time of rest and recuperation to a minimum, and robs women of that blessed solace of bodily peace and quiet which the majority so profoundly appreciate and enjoy. Puerperal physical culture offers all the benefits enumerated above without the drawbacks of "getting about soon." It is much more truly *considerate* to the woman, and can be much better regulated, rationed or adapted individually. Moreover, it combines rest with a certain activity and variety, and has a refreshing as well as a soothing effect on the mind beyond all comparison with the other alternatives of enforced quietude or premature exertion.

If the young mother is healthy and sufficiently strong, and expresses her wish to leave her bed for a short time on the sixth or seventh day after delivery, I am of opinion that there need be no hesitation in allowing her to do so. But it should not be urged upon her at that stage of involution. After two more days have elapsed, however, she should be

directed to get up, and, meanwhile, the special exercises should become more vigorous and longer, in order to give adequate practice to the muscles. Of course, it must be admitted that iron realities of existence only too often make the perfect blend of rest and exercise quite impossible. In many hospitals and institutions it is not feasible to keep the women under care as long as is admittedly necessary, and adequate periods of such care are also often not possible for the women themselves (owing to their private circumstances)—however beneficial. Is it necessary to mention that, in the overwhelming majority of cases, the home of the young mother also makes proper rest and care out of the question? Nevertheless, we will here describe ideal conditions and requisites. Where these can be realised, we should aim at nothing else. Where they are impracticable, we should attempt as close an approximation as circumstances permit.

Before describing the appropriate exercises, I would stress the need of *proper bandaging and abdominal support*. The interactions of such support with the appropriate exercises after childbirth are direct and important, especially in the early phases of involution. The abdominal bandage is indispensable to the exercise of the muscles it supports. The pressure of the supporting bandage permits the relaxed and distended abdominal walls to contract again without injury to the slacker areas from the internal counter-pressure: *e.g.*, to the sides and flanks, during special exertion of the frontal muscles.

There are various kinds of bandage for use after child-birth. There is the large folded towel or "napkin" of traditional custom, drawn as taut as possible and secured with safety-pins. There is the "Gurita," introduced into Europe by *Stratz*, who first made use of it in the Dutch East Indies; it has been widely adopted in Central Europe. But neither of these is so well suited to the needs of exercise after child-birth as some deep bandage of woven elastic. The simplest form of such a bandage is perhaps a strip of material 6 yards long and 6 inches wide. This material is

of some elastic weave, and is wrapped crosswise round the body so that it supports both the pelvis and the thorax (see Figs. (a) and (b) on Plate X. for the positions in which safety fasteners should be attached). If the bandage is correctly applied, it will not slip when the patient gets up.

Another support which can do good service is a deep belt of elastic material shaped to the contours of the feminine body ; such belts are on the market nowadays in fair variety, *but they must be firm and strong enough* if they are to afford proper support to the abdomen in front. If the material sags, it can be "taken in." In Sellheim's Clinic, a strong closely-woven bandage is used with a thin layer of cork, which is said to give an elastic pressure on the frontal muscles.

In my private practice, I used to order similar occasional maternity supports for my patients, to be made to measure. The abdominal half was of strong elastic and the back—which could be changed—of closely-woven washable material. Of course these special supports have great merits, but mean too much delay and expense to be suitable for most cases in practice.

Exercises after child-birth, while the patient still keeps her bed, should be performed once or twice a day, according to the woman's condition and circumstances. I think it is better to have two spells, and let the evening ration be the lighter of the two, with special use of semi-active movements. If the patient feels too languid and disinclined for exertion, these semi-active movements should be replaced by wholly passive exercises, for these are better for her circulation, especially in the lower extremities and also for her general condition, than lying motionless. For even if she is fatigued, she will generally feel refreshed and benefited after skilled and light passive exercise. And such exercises combine admirably with light *massage* : or sometimes, massage may replace actual exercise. The whole subject of massage is outside the limits of the present study, so I will only say that it might be used far more fully and beneficially

for invalids, convalescents, expectant and parturient mothers than is at present the case.

Women after child-birth are specially liable to chills, both because of their heightened susceptibility to all infections, and also owing to their profuse perspiration. There should be no needless exposure to draughts, and the rooms should be well warmed and at an even temperature, even if the woman has been used to perform her exercises nude. Any chill may not only damage and retard her own recovery, but, if she is nursing her baby, may have serious effects on the child.

Begin the exercises twenty-four hours after delivery. If the woman wishes an even earlier commencement, and if conditions are favourable, *gentle passive movements and light massage can be applied.*

The initial group of exercises after child-birth consist of *Leg rolling : active and Passive*, as described under No. 9 of the exercises in pregnancy (Chapter XIII.), and depicted in Figs. 26 and 27.

#### *Foot Exercise : Passive. (Fig. 28.)*

These are described in No. 10 of exercises during pregnancy (Chapter XIII.). They should be performed lying down, while the gymnastic instructress supports the leg just above the ankle with her left hand. It is advisable to avoid all pressure on the calves after child-birth, in order to spare further strain on the large blood-vessels.

#### *Leg Relaxation : Passive. (Fig. 29.)*

Compare No. 11 of the exercises during pregnancy (Chapter XIII.). But, after child-birth, the attitude should be recumbent. Instead of resting the thigh across the knee of the instructress, it should be raised vertically (or at right angles to the trunk) and supported by the instructress with one hand. While the patient is exercising the left thigh the instructress stands on that side and supports her with her left hand ; while her other hand clasps the lower leg just over the ankle and then drops it. The patient must relax

her muscles completely during these movements so that her leg hangs limp from the knee.

Omit this exercise, however, if there are any varicose veins between knee and ankle.

In the later phases of the puerperium the patient herself may clasp her own thigh with both hands and hold it vertically, while the assistant raises the lower leg. Of course, the latter movement may also be active. But the leg must drop back quite passively with relaxed muscles.

#### *Knee Raising, in the Recumbent Posture, and PASSIVE.*

As described under heading No. 13 (*a*) of exercises during pregnancy (Chapter XIII.), Fig. 30.

#### *Knee Rotation : Passive.*

As described under No. 14 of exercises during pregnancy (Chapter XIII.), Fig. 31.

Of course, these aforesaid exercises should all be performed alternately left and right. The number of times they should be repeated is an entirely individual matter depending on the patient's state, *but it is better to repeat them only twice in twenty-four hours than too often in succession.* These passive movements of the lower limbs can be usefully intercalated with breathing exercises and active movements of the arms, of which more presently.

The only respiratory exercises we need consider at these times are :—

#### *Passive Breathing.*

As described under No. 5 of exercises during pregnancy (Chapter XIII.), Figs. 22 and 23. The remarks appended to those directions should be followed, especially in the first stages after child-birth. There should not be the slightest pressure on the breasts, and the first portion of the exercise—lung distension—is the more important.

#### *Abdominal Breathing.*

As described under No. 1 of exercises during pregnancy (Chapter XIII.), Figs. 18 and 19. A certain care is necessary, as deep breathing repeated too often in succession can cause

giddiness, especially when there has been much loss of blood.

In association with breathing exercises, there should be *active movements of the arms. Flex and stretch the wrists and do the same with the elbows.* Let the arms lie loosely, parallel to the body, then *lift them sideways and backwards* (either horizontally or in a semicircular curve).

All this sounds very simple, but requires full attention and exact judgment, on the part of the instructress or nurse in charge, in order that every individual woman shall benefit by what best suits her case.

*On the next day, i.e., from thirty-six to sixty hours after delivery, the same exercises should be performed; but if the patient's condition and other factors permit, complete passivity should be gently and slightly modified into active motion.* It is best to alternate them, passive and active, and, as has been emphasised in dealing with exercises during pregnancy, the active exercises should be fewer than the passive. This has a very soothing and refreshing effect on the patient.

Avoid rigid rules and machine-made systems! In *rationing* these exercises, take into consideration not only the special symptoms—such as temperature and type of *lochia*—but the functions of excretion (evacuation) and lactation. For instance, it is very important to bear in mind any impeded flow of milk, any special strain owing to tendencies to either constipation or its reverse. It must never be forgotten that this special phase of *involution* after child-birth is very apt to bring disturbances or at least hindrances to recovery.

If it becomes necessary to limit exercises after child-birth for any good and sufficient reason, *the passive movements of the lower limbs should be performed if at all possible:* for they quicken and restore circulation and prevent varicosity in cases of extreme exhaustion.

*During the further days of the puerperium,* if all has gone well and in a normal manner, the patient should gradually exert herself more often and more intensely.

The exercises just described should still be retained, but performed with a daily increase of exertion, becoming more and more active. It is always advisable that the instructress should be present to help and supervise them, or, if necessary, to transform them into exercises in resistance to pressure. (As an example I may cite that modification of No. 13 (a) described under heading No. 13 (b) in the exercises during pregnancy.)

The programme after child-birth should also include the following items already described and recommended :—

*Full Breathing (or Full Respiration (?)).*

As described under No. 4 of exercises during pregnancy (Chapter XIII.). This exercise may now replace the passive breathing (No. 5).

*Flank Breathing.*

As described under No. 2 of exercises during pregnancy (Chapter XIII.). This is appropriate as soon as the patient is able to lie on her side with comfort.

*Leg Relaxation.*

As described under No. 8 (a) and (b) of exercises during pregnancy (Chapter XIII.). This should gradually replace the passive modification.

*Knee Flexion (?), Active and in Recumbent Posture.*

As described under No. 12 of exercises during pregnancy (Chapter XIII.).

*“Bicycling” Exercise.*

An elaboration of the previous exercise, also described under the same heading (12).

*Lifting and Lowering of the Pelvis.*

As described under No. 15 of exercises during pregnancy (Chapter XIII.), Fig. 32.

This exercise should be carried out from the first days after delivery as a rule, and a support should be placed beneath the woman's body on the bed. But often enough

assistance is not given to the patient, who has to strain herself in consequence.

### *Trunk Lifting and Lowering.*

As described under No. 16 of exercises during pregnancy (Chapter XIII.), Fig. 33. In the second note to that description I have mentioned that the exercise may be performed alone. In such brief mention of puerperal gymnastics as is known to me in literature, the exercise is only recommended in the completely active form, and with modifications such as folding the hands over the abdomen, supporting them on the hips, folding them behind the head or stretching the arms at a level with the head. And there is no mention of the need for firm support to the feet.

I am of opinion that the exercise in this form *is best reserved for the later phases of the puerperal state*. But, in the form and with the modifications described (in Note 2 to No. 16), it may take an early place in our repertory, even if quite active. *But do not leave either the feet or the lower leg without some support that presses them firmly downwards!* In general I think it is preferable to substitute this way of exercising by the exercise of "Trunk Lifting and Lowering, Holding Towel" as described in No. 18 on page 130, which enables the exertion to be modified and rationed.

### *Knee Opening and Closing against Pressure.*

As described under No. 17 of exercises during pregnancy (Chapter XIII.). This exercise, and its cognate which will be described in No. 27, is mentioned in most of the available literature and recommended as specially strengthening to the pelvic floor. But, as I have already stated at length, these indirect perineal exercises have very limited effects and should be replaced or supplemented by conscious action of the perineal muscles. I prefer to recommend such *direct* exercise of the pelvic floor, after child-birth especially, because it is much less exhausting in itself and can, therefore, be performed more often. And it does not only tend to recovery from the distension of birth, but to mastery of the perineal muscles as well; an equally important gain!

Nevertheless, the simple knee exercise has its uses, but the counter-pressure must be carefully measured and not too vigorous, especially soon after delivery.

There follow below a number of

### *Further Puerperal Gymnastic Exercises*

which I consider specially appropriate.

These may form a complete system or sequence, together with the passive exercises recommended for the first days after delivery, and particularly if they are *gradually modified* from almost passive, in an ascending scale of activity. But it must again be emphasised that the strict division between the pregnancy and puerperal groups is somewhat artificial, and that they may be interchangeable, which has the advantage of meeting individual needs and providing an element of variety which stimulates interest in the exercises.

#### *(18) Trunk Lifting and Lowering, Holding Towel (Fig. 34).*

The patient lies on her back. The instructress holds a towel of strong material by both ends in both hands. The patient grasps the towel in the middle with both hands, and tries to pull herself up slowly, and with neck muscles relaxed and head hanging loosely. The instructress helps her by pulling the towel, more or less vigorously. The patient should breathe in as she pulls herself up; when she has reached the seated posture, she should breathe out, slowly, and with a sibilant sound, sinking back again as she does so. She must be so placed that she can also press her feet slightly against the body of the instructress or the end of the bed to brace herself.

Note that this movement should depend mainly on the *abdominal muscles of the patient herself*. She should be given necessary support by the muscular power of the instructress, but her own arm muscles should not be exerted more than can be helped.

#### *(19) Lifting and Lowering One Leg at a Time (not illustrated).*

Recumbent posture as before. The instructress lays one

hand on the body of the patient and clasps one leg at the ankle with the other hand. She then *lifts* the leg or *supports* it, while lifted by the patient, until it is at an obtuse angle to the body. Then lower the leg, still with support. Practise alternately left and right.

This support enables one to modify the exertion required, from *nil* to full activity.

(20) *Lifting and Lowering of both Closed Legs* (Fig. 35).

Recumbent posture as before. Instructress places one hand on patient's body and clasps both ankles with the other. The legs are then raised—gradually and being supported the while—till they form an obtuse angle with the patient's body. Then they are lowered and still supported by the hand of the instructress : they should be lowered *slowly*, with a *deliberate tension* of the muscles and not rest with their full weight on the supporting hand. After each performance of Exercise 20 the patient should *breathe quietly and deeply three or four times*. Repeat the exercise, then breathe deeply again, and so forth alternately. This exercise may be repeated four or five times alternating with deep breathing, but the instructress must stand firm against undue exertion or too frequent repetition, however much the patient may wish them.

*Note.*—The above directions refer to the exercise in its more active forms, entailing a certain degree of support by the instructress. If Exercise 20 is kept passive it is, of course, less exhausting to the patient, but also less effective.

(21) *Leg Rotation with Thighs Apart* (Fig. 36).

Recumbent posture. The instructress clasps both ankles (or the soles of the feet as is most convenient ; much depends on the height of the table or couch from the floor), and raises them both together, slowly, till they form an obtuse angle with the patient's body, or supports them as the patient herself performs the exercise. Then each leg separately makes a circular movement outwards and back again. The patient, meanwhile, breathes quietly and regularly and, *if the exercise is active rather than passive, it should not be*

*repeated more often than thrice in succession.* Then breathe deeply several times.

(22) *Leg Rotation and Crossing* (not illustrated).

Recumbent posture. The exercise differs from the preceding (No. 21) in the circular movement of the legs outward: they should not only meet, but cross one another.

*Note.*—As the movement here is somewhat complicated, Exercise 22 is more suited for *completely active exertion* on the patient's part, without the help of the instructress. It should, therefore, be reserved for the later stages of recovery after child-birth. But, if patient and instructress are so well accustomed to one another and so much in sympathy that they can respond to each other's movements, Exercise 22 can be performed *semi-passively*.

(23) *The "Scissors"* (not illustrated).

Recumbent posture. The instructress holds the patient's ankles as in 21, lifts the legs about 6 inches from the couch, separates them, and holding them level with one another, crosses them so far as possible and then separates them again.

In this exercise, the legs should cross over one another alternately, first the left being uppermost, then the right. After this exercise, the patient should at once lie with raised knees as in Fig. 5, and breathe abdominally several times in succession.

This exercise gives excellent scope for every grade, from complete passivity to active exertion and even to *a certain degree of resistance to pressure*.

(24) *Leg Lifting, Backwards* (Fig. 37).

The patient lies on her abdomen. The instructress clasps one leg, above the ankle and at the knee, and slowly lifts it backwards, or she supports the patient's effort to raise the limb, *which should be kept at full length, not flexed*. Then, as the woman slowly lowers her leg to the couch, the instructress should exercise a gentle counter-pressure.

Of course, this exercise can only be attempted when the organs have recovered sufficiently for there to be no objection to the woman's prone (abdominal) posture.

Like all exercises involving one limb at a time, this too should be performed alternately left and right.

For the sake of clearness, Fig. 37 represents the limb as held from the inside, but, in fact, it is better to hold it from the outside.

(25) *Leg Lifting Backwards against Pressure* (Fig. 38).

Posture as in Exercise 24 (face forwards). The instructress places one hand above the hollow of the knee, and the other just above the gluteal muscle, and exercises a certain degree of pressure which the patient must overcome by a rapid upward and backward movement of the leg. Then she must at once let her leg slip back again. Repeat with each leg three or four times in succession.

(26) *Knee Parting and Closing with Raised Pelvis and against Pressure* (Fig. 39).

The patient lies on her back, separates her legs and raises her knees. She then places her hands below her nates at the back and rests on her elbows in order to give herself better "purchase" for lifting her pelvis. The instructress clasps each knee and the patient alternately opens and closes them against pressure from the instructress. In the later stages of the puerperium (under normal conditions after about a fortnight), or in muscularly strong and expert women, apart from pregnancy and puerperium, the woman's hands need not support her pelvic region.

When the mother has left her bed and as soon as she is sufficiently recovered, the following exercises may be performed :—

(27) *Turning the Trunk Sideways* (Fig. 40).

(a) *Passive*.—The patient sits on a chair and grips the chair-legs firmly with her lower limbs as is clearly shown in the illustration. The instructress stands behind the patient holding her round the shoulders and turns her trunk so far

as possible to one side and back. The patient supports her hands firmly on her hips. Turn left and right alternately, *but very slowly*.

*Note.*—Even in this wholly passive form, the turning exercise has merits, but it is even more important if it can be carried out as a form of *resistance to pressure*. It may contribute greatly to the recovery and tonicity of certain groups of muscles, which have hitherto been, perchance, neglected.

(b) *Active*.—The pelvis is kept motionless, in the same way as described under (a); then the upper portion of the trunk is turned alternately, so far as possible to the right and to the left. This must be done *slowly*, for all *swings* and *jerks* are to be avoided.

#### (28) *Leg Raising Sideways* (Fig. 41).

The patient stands in front of a table supporting herself by the edge. First initial position: then one leg is raised sideways very slowly and stretched at full length. The patient should be careful not to bend her body sideways above the waist in order to balance the leg. Practice alternately left and right.

*Note.*—After all leg exercises (whether lifting and lowering, rotation or the “Scissors,” etc.), there should be special *suppling or relaxation movements*. It is perhaps best for the patient to lie on her back and shake her legs, lifting them and kicking gently “like a beetle on its back,” and her arms may take part in the same movements. Otherwise, she can easily get muscular pains and cramp, and has not the organic refreshment which should be the result of gymnastics, and which can only be afforded by a *due rhythmic balance of tension and relaxation*.

I would cite the following further exercises for this puerperal phase, *i.e.*, after the first fortnight: Nos. 3, 6, 7, 10 and 11 (as originally described on p. 109 and shown in Fig. 29) and 12 of the Pregnancy Group (Chapter XIII.).

Arm exercises, extension, flexion, lifting, lowering, forwards, sideways and upwards—with deep breathing—may

be performed from the day on which the patient is permitted to sit up in bed for any length of time. When she leaves her bed and is about once more, she may do arm exercises both while seated and standing upright.

So she slowly passes on to the *final puerperal stages*; the exercises, hitherto limited and adapted to special needs, gradually merge again into general physical culture. But I would suggest special care during this transition to the following points :—

There must not be any immediate and excessive physical exertion. The involution and complex processes of reversion and recovery within the maternal body are still continuing, and in themselves demand a considerable amount of vital expenditure, so that no unnecessary extra demands should be made. This is particularly the case if the mother suckles her child—as is not only her imperative duty to the baby, but also in her own interest, as lactation sympathetically promotes uterine contraction and the return of the strained and distended genital organs to their normal state. Breast feeding must, therefore, be prescribed in the interests of both parties. But, if it is necessary to emphasise consideration and moderation in exercise, thus avoiding *needless fatigue*; it is equally necessary to emphasise the dangers of lethargy and *laissez-faire*, which lead to permanent injuries if this most important branch of physical culture be neglected. And in cases and conditions which allow neither time nor energy for general exercises, there must at least be *due attention and cultivation of the abdominal muscles and of the muscles of the pelvic floor*.

A further matter of importance is *the abdominal belt or bandage*. The abdomen should be supported, during both the earlier and the later phases of involution after child-birth. The support should only be discarded when the muscles have returned to their normal state, and reacquired their former force and suppleness. Till then an adequate support should be worn, not only for the exercises, but during the whole day's work. The best kind of support is a flexible belt made to measure, of firm elastic material,

deep enough to cover and contain the whole abdominal region.

Finally, as long as the young mother is nursing, and her flow of milk is undiminished, she should avoid all exercises which involve bending the upper part of her body forward rapidly or for any appreciable length of time. These movements cause pain and often loss of milk from the heavy and distended breasts. And the bust should be supported and protected by a *brassière* or *soutien gorge* (bust bodice) which fits closely *without pressure*, and is, if possible, made to measure.

We have dealt here almost exclusively with exercises belonging to the category of "general physical culture," and merely mentioned the significance of exercises of the pelvic floor without directions as to how these should be performed after child-birth. Nor indeed, have we anything to add to what has already been explained on this topic in the first section of the present work. *But it may be as well again to stress the supreme importance of exercise of the muscles of the pelvic floor in the puerperium: they need more urgent care than any others, even the abdominal group.* For inadequacy in the latter group may be, to some extent, counteracted by artificial support, but incomplete recovery and consequent functional defect of the pelvic floor is only repairable by great efforts. So the pelvic floor should be exercised vigorously and systematically throughout the puerperium from the third day after delivery unless, indeed, severe injuries and lacerations contraindicate such an early start. And this is the more easily done as the direct contraction, tension and relaxation of the perineal and perivaginal muscles is much more important than this indirect and accessory movement—as I have repeatedly indicated—and can be operated without special fatigue or loss of time.

What of the *exercises of the pelvic zone after child-birth?* Here, too, I have nothing to add to the description already given. In the early puerperium, special abdominal exercises of the pelvic zone are out of the question. In the later stages,



34. LIFTING AND LOWERING THE TRUNK, HOLDING A TOWEL  
*Pulling herself up slowly, neck muscles relaxed, head hanging loosely.*

(SECTION II, EXERCISE 18.)



35. LIFTING AND LOWERING OF BOTH CLOSED LEGS  
*Legs raised and lowered (supported) till they form an obtuse angle.*  
(SECTION II, EXERCISE 20.)



36. LEG ROTATION WITH THIGHS APART  
*Making circular movements outwards and back again.*  
(SECTION II, EXERCISE 21.)

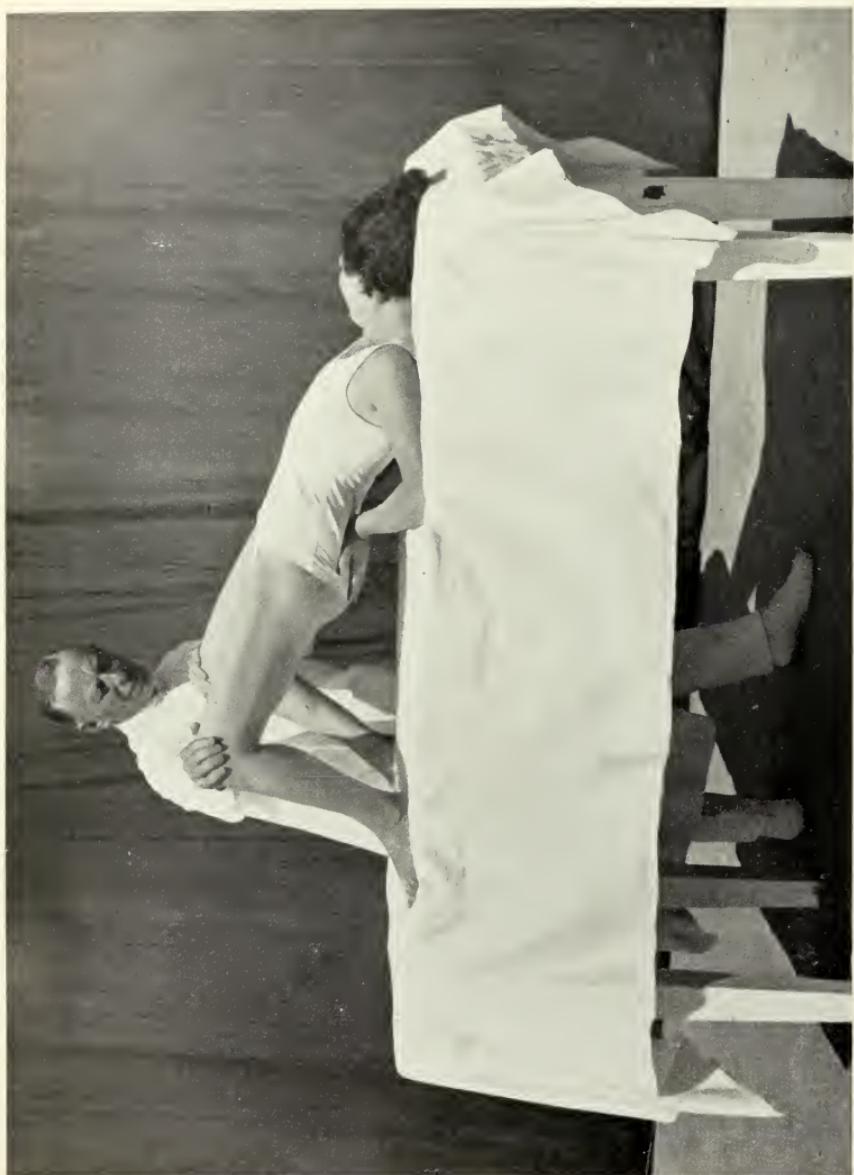
37. LEG LIFTING, BACKWARDS  
*Raising leg slowly backwards in full length not flexed.*  
(SECTION II, EXERCISE 24.)





38. LEG LIFTING, BACKWARDS, AGAINST PRESSURE  
*Raising leg by rapid upward and backward movements.*

(SECTION II, EXERCISE 25.)



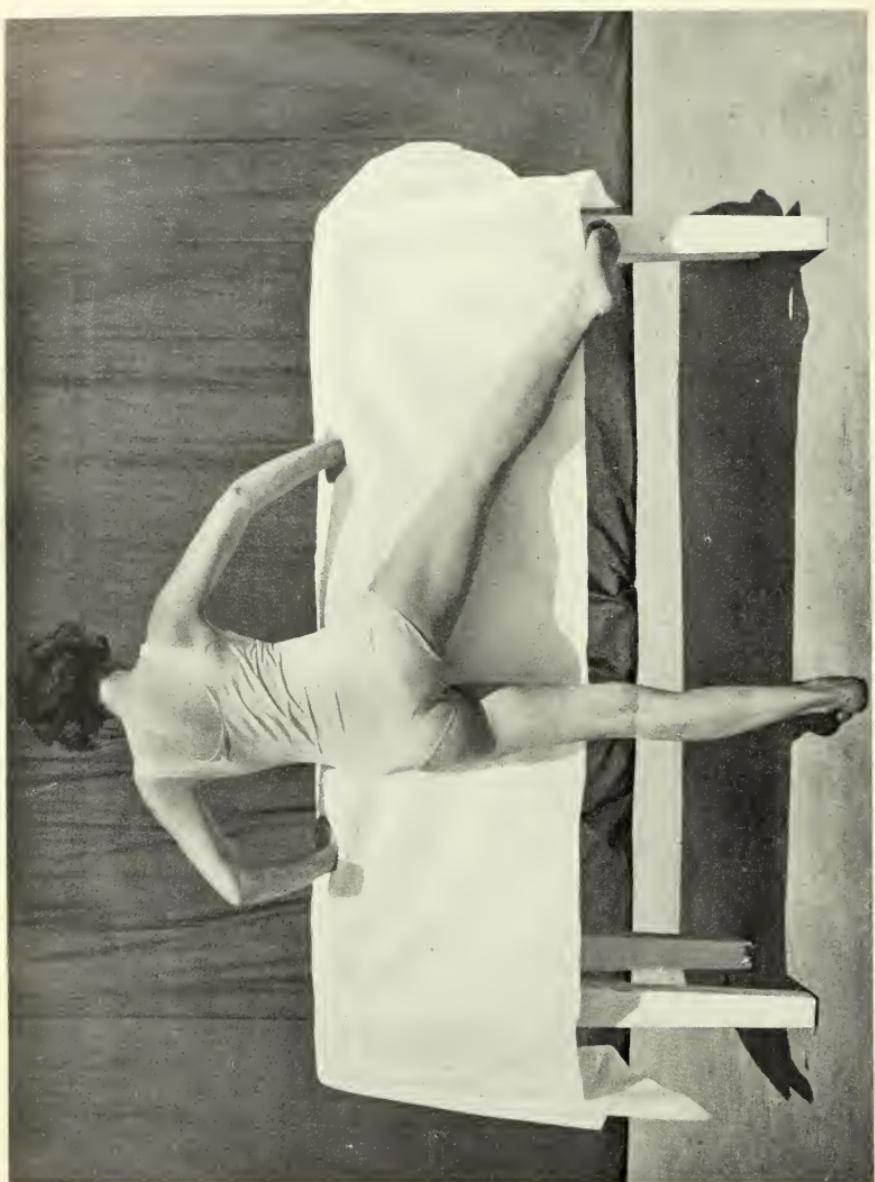
39. KNEE PARTING AND CLOSING AGAINST PRESSURE

*Raising pelvis, separating and closing knees against pressure.*

(SECTION II, EXERCISE 26)



40. TURNING THE TRUNK SIDEWAYS—PASSIVE  
*Holding shoulders, turning trunk alternately slowly to right and left.*  
(SECTION II, EXERCISE 27.)



41. LEGS RAISING, SIDEWAYS

*Lifting leg slowly, full length, sideways.*  
(SECTION II, EXERCISE 28.)

however, many such exercises are most valuable as affording a training to the *whole* abdominal wall. The first of this series to be attempted are those executed in the upright attitude, *i.e.*, standing or walking. The sedentary and recumbent exercises should be attempted somewhat later—say from the beginning of the fourth week, after delivery. Of course, they all gain greatly in efficacy *if the patient already knows how they should be performed*. And, in that happy case, fatigue is less and they can be attempted sooner.

As a rule, the abdominal exercises involving the “Hands and Knees” or quadrupedal posture, should be ruled out for nursing mothers. And the “Extension-Flexion” exercise should not be attempted in the six weeks following childbirth.

## SUPPLEMENT

### CHAPTER XV

#### SPECIAL TREATMENT FOR PRESERVING AND RESTORING THE BREASTS AFTER LACTATION

THE development and texture of the bust can only be affected *indirectly* by pelvic exercises or by the special physical culture during pregnancy and the puerperium which we have described in detail. And this indirect influence operates through the improved general and genital health and efficiency of the individual woman. Nevertheless, it is undoubtedly consonant with our efforts to preserve and increase this health and efficiency, if we also consider special methods of preserving the contour and consistency of the breasts when they have fulfilled their nutritive office. No doubt, the function of the mammary glands is first and foremost to secrete milk and feed the child, for the mother's milk contains all necessary elements for the child's health and growth in the early stages of post-natal life, and breast-fed children have the best chances of becoming fully healthy and efficient as individuals and as members of the human race.

But the breasts are not organs of nutrition *alone*. They are also *erogenous* regions, attracting desire and affording pleasure. A well-proportioned and rounded bust greatly adds to the attraction of any woman's appearance, and has often decisive influence on the impulse of approach in lover or husband. And when the bust is "spoilt"—misshapen, flaccid or shrivelled—there is a correspondingly unfortunate effect, which easily leads to definite "inferiority complexes"—particularly when this pitiful disfigurement follows on previous comeliness and charm. On the other hand, women whose breasts are conspicuously lovely, or even merely pretty, are always proudly and happily aware of them.

So it stands to reason that the emotional effect of such loss or impairment on the woman herself and on the feelings

and too often the conduct of her husband, may be of crucial importance for their joint happiness. This is one of those psycho-physiological facts which can only be denied by persons with no sense of reality or no wish to perceive it. So it becomes easy to comprehend why so many women who have become or are becoming mothers, demand that their physicians should help them to preserve the form and charm of their bust by evading the duty of lactation. And it is even possible, to some extent, to sympathise with the emotional turmoil of the woman whose feeling for her mate outweighs her sense of obligation to the child. Of course, every responsible and conscientious medical man will use all his powers of persuasion to induce the mother to do her first duty to her child. But, as he is not only fully conscious of his responsibility to that helpless little life, but also aware of the *adult* difficulties and complexities of the situation, he will not content himself with seeing the baby fed at the mother's breasts, he will also do his best to *advise* and *devise* methods of preserving their firmness and freshness.

How far can *definite physical exercises* do this? As a rule, only indirectly, through the *general* improvement and expansion of the whole body. Apart from this *general* development, only one muscle comes into play; that is the *pectoralis major*, rising from the breastbone and collarbone and curving in firm convergent clusters of muscular fibres towards the upper arm, where it is attached.

Systematic exercise of the upper arms strengthens the pectoral muscles on both sides and promotes the curve and carriage of the thorax. Of course, this beneficial effect is best felt while the body is still growing, and it is advisable to give special care to this region between the ages of fourteen and twenty-four. But do not over-exercise the pectoral muscles! This error produces an ultra-athletic structure of arms and thorax, which defeats the object we have in view, emphasising the distinctively masculine contour and obliterating the feminine.\* Exercises of this type during puberty and

\* Actually many girl devotees of games and athletics have typically boyish outlines of arms and thorax. I know one such case caused, in my opinion, by excessive rowing. The girl herself was extremely depressed and ashamed at this unfortunate result.

adolescence must be *very carefully individualised*, and modified or accentuated according to personal needs in each case.

The action of the *pectoralis major* on the thorax in general, interests us less, however, than its effect on the mammary gland which it supports. The breasts are linked to the muscles by connective tissue, and as long as the attachment is not excessively loosened, their position or "set," whether high or low, depends on the *pectoralis major*. I am even inclined to suppose that physical culture attaches the glands and muscles more closely and over a greater area, even though this cannot be proved by anatomical demonstration. The accuracy of the observation of women experts in physical culture that they "can feel the action of the muscle quite distinctly right inside the gland" cannot simply be dismissed as groundless. Moreover, I have heard from the same quarters that, when these exercises are performed nude, the interaction of the muscles on the mammary glands is perfectly perceptible. It is, at least, certain that breasts firmly and closely attached to the pectorals beneath them, rise and move with the supporting muscles. *Erna Glässmer* and *Rud. Amersbach*<sup>(39)</sup> show various admirably successful photographs in which muscles and breast appear as though chiselled from one piece of marble.

We must, therefore, aim at increasing the *taut and close connection between glandular and muscular tissues* in this region both by developing the *pectoralis major* and by preventing undue strain on the attachment through swollen and pendulous breasts.

We append descriptions of various exercises to develop the *pectoralis major*. In selecting them at the suggestion of *Mrs. Lisa Mar*, we have started with the assumption that the main need here is not *control of tension and relaxation*, but increased muscular *development and tone*. The most suitable exercises are, therefore, those which involve *resistance*, whether exerted by the instructress, or by the patient, actually or *subjectively*. The most effective are those with an element of *rebound*; *uniting rapidity with the overcoming of resistance*; these have much greater results than any breathing movements.

As a rule, it suffices to perform the more vigorous exercises of resistance twice or thrice in the course of the week. The intervening days may be used for the gentler exercises of the shoulder blades and adjacent region, for an absolutely exclusive cultivation of the pectorals would destroy symmetry and harmony of line. The whole region must be developed in unison. In the following exercises, this requisite has been kept in view, and a couple of appropriate trunk exercises have been added, in order to avoid lopsided monotony.

*Direction for the Exercises.*

They must not be attempted unless the bust is supported by a firm and comfortable *bust-bodice* or *soutien gorge*, either during lactation or after the child has been weaned. The bust-bodice must fit closely yet allow freedom to the muscles while supporting the glands, so that they *sag* as little as possible. There should be elastic bands over the shoulders, and it may sometimes be well to tuck folded handkerchiefs or soft thin wadding inside the *brassière* or bust-bodice which the nursing mother should always wear, in order to have extra support during the exercises and prevent undue shaking of the delicate mammary structures.

The "rebound" exercises should not be practised while the woman is breast-feeding her child, only after weaning, when the breasts are no longer tightly distended with milk. And it is obvious that a certain moderation and care should be observed as long as there is any swelling above the normal size, when swinging the arms quickly and vigorously; for the breasts are very sensitive to sudden pressure, however rapid.

It may be well again to remind readers that the following suggestions aim at *restoring the maternal breast after lactation* :—

(29) *Exercise of Resistance against Pressure.*

(a) The patient sits on a chair, *without leaning against it for support*, with her arms hanging loosely. The instructress lays her hands on the upper portion of the patient's arms and exercises a gentle pressure, while the woman slowly

lifts her arms—which must be fully stretched not bent at all at the elbow joint—to slightly over the level of her shoulders. As she lifts her arms, she should breath inwards, and as she exhales, she should let her arms sink down again parallel to her thorax. Repeat this exercise three or four times. The patient ought gradually to be able to lift her arms against constantly increasing pressure. After this exercise, the arms should be swung to and fro, or shaken loosely, like the legs after Exercise 28 and the “Scissors,” etc.

(b) As in (a) till the patient has lifted her arms level with her shoulders, breathing inwards and with her palms downwards. The instructress clasps the inner surface of the patient’s arms above the elbow with each hand and presses backwards, while the patient breathes out on a hissing note between her teeth, and brings her arms forward and together till her palms touch, keeping them level with the shoulder line. Then breathe in again and move the arms backward *without counter-pressure* and repeat the exercise.

(c) As in (b) with this one difference : the thumbs should be uppermost and the palms towards each other, *i.e.*, forwards.

### (30) *Arm Flexion against Imaginary Pressure.*

(a) This exercise can also be performed in the seated posture. Hold the left arm stretched out sideways level with the shoulder and palm upwards. Then draw down the arm *from the elbow joint downwards* slowly and resisting a very strong imaginary pressure till the hand meets the shoulder ; as this is done the wrist will form a right angle to the outer surface of the lower arm. This wrist flexion is gradually decreased until the hand rests on the shoulder. Then the lower arm is completely relaxed. Stretch the arm sideways again and repeat the exercise, keeping the arm level with the shoulder—it must not hang down limply and obliquely. Practise alternately left and right.

(b) Instead of stretching the arms sideways, they can be stretched forwards.

(c) Instead of moving each arm alternately, practise them together simultaneously.

(d) Practise simultaneously with one arm forwards and one sideways.

(e) Having fully mastered both ground theme and variations of this exercise, the following extended version may be tried. As the hand rests on the shoulder, the shoulder should be rolled backward and upward with a *rotatory* movement and the exercise repeated from the beginning. This modification of the exercise is especially helpful and tonic.\*

(31) *Arm Stretching with Towel.*

Stand upright in the first position. Then let the arms hang at full length, grasping both ends of a firmly rolled towel—or strip of strong cloth—from above, and so that the knuckles are nearer the body than the towel. Now raise the arms, still stretched at full length and grasping the ends of the taut towel, slowly above the head and then lower them behind the back, as far as possible. During these movements, the arms must be at full stretch, and this is not always easy at first with a towel 80 cm. long. Inhale while lifting, exhale while lowering the arms. Then raise them again, drawing in the breath, till they are above the head, and breathe out as they are lowered, in front, to their first attitude.

The correct performance of this exercise demands repeated and regular practice. The towel should be grasped at shorter lengths every time, so that the hands draw closer and ever closer together. This promotes shoulder action and strengthens the local muscles.

(32) *Rebound Exercise.*

(a) First position, as in preceding exercise. Both arms

\* I have been told by critics, more expert perhaps in theory than in practice, that in variations (a) to (d) of Exercise 30, neither the shoulder muscles nor the pectoralis major is sufficiently exerted, and that, therefore, variations (a) to (d) are merely supplementary and accessory.

This objection is not valid. Both pectoralis major and shoulder blades take a vigorous share in the movements of this exercise. Thus it may be seen that a slightly pendulous breast—so long as it is not irreparably deformed—is lifted and tautened as the arms move, so that, for the moment, its defect ceases to be perceptible. Moreover, these special variations, 30 (a) to (d), generally tire the shoulder blades so that they feel the effects after the lapse of twenty-four hours.

held sideways, level with the shoulder, palms forwards, thumbs uppermost. The elbow joint should be not fully stretched, but very slightly bent, the arm muscles not slack but taut. Both arms should then quickly be brought together, *moving from the shoulder blades* as though about to clap the hands together, avoiding this, however, by jerking the arms backwards as rapidly and suddenly as possible, to their initial attitude, just before the palms have touched.

(b) First position. Hold both arms level with the shoulders and sideways, palms downwards, thumbs touching the edge of the palms. The elbow joint should be very slightly flexed as in preceding modification (a). Then strike downwards from the shoulders with both arms as though to slap the thighs, but jerk suddenly upwards and backwards again before this can happen.

(c) Bodily attitude and arm posture as in (a) and (b), but palms upward and thumbs in a line with palms. Strike upwards over the head with both arms but, just before the palms touch, jerk them suddenly back to the initial position.

(d) Body and arms as in (b), but let the arms cross over in front and stop the movement, when the hands are close together. Then move the arms sideways again at shoulder level, and repeat.

The fatigue which follows correct performance of these exercises is a signal when to stop. Do relaxing and loosening movements immediately following 32 and its modifications.

### (33) *Swimming without Water (or on Dry Land).*

A firm table is necessary for this exercise. The patient lies on her abdomen, but her trunk from the ribs upwards is over the edge and has no support. In order to prevent accidents, the instructress presses down both legs of the patient very firmly and steadily. Head and arms drop down limply over the table edge, as the exercise begins. Then the patient brings both palms together, thrusts her arms forward as though swimming, and as she executes the sideways semicircle with both arms, she lifts her trunk up as far as possible and *inhales*. Keep in this posture for a few moments, then breathe out and lower the arms, as the trunk relaxes

and sinks below the table edge. Repeat twice or thrice in succession.

(34) *Raising the Trunk, Upwards and Backwards.*

The patient lies face downwards on a long table, or on the floor. Fold the hands together behind the back, so that the fingers intertwist and grip each other. Then breathe in, slowly raise the trunk and, at the same time, raise the arms as far as possible, keeping them at full stretch with the hands linked. Then exhale and let the head droop sideways again. Keep in the raised posture as long as inhalation is possible, but as soon as this becomes a strain breathe out again and sink back, in order that there should be no injury to the lungs.

(35) *Trunk Inclination with Grip at Nape of Neck.*

First position, standing upright. Breathe in, raising the arms slowly sideways, and fold the hands at the nape of the neck behind the head. Pull back the elbows as far and as tautly as possible. Breathe out slowly, thrusting the chin out and bend forward till the trunk is at an obtuse angle to the legs. Keep the abdominal muscles at firm tension, and let the sacral muscles be contracted, so that the whole back forms a slight slope. Keep the elbows pointing backwards. Breathe in, lifting the trunk, and breathe out, lowering the arms. Repeat the exercise several times in succession.

(36) *Creeping Posture.*

Quadrupedal attitude, on hands and knees. Then thrust the arms as far forward as possible and slightly to one side. The thighs should be kept vertical and the buttocks raised and protruded, while the upper part of the body droops forward as easily and loosely as possible. The instructress may then press lightly on the shoulder blades and cause a slight rhythmic jerking or flicking movement, which the patient may learn to produce alone with practice.

\* \* \*

Although not strictly part of the subject-matter of this chapter, I may add a few remarks relative to many inquiries

which I have received as to the effect of physical exercises on the bust.

There are NO exercises which directly promote the growth of the mammary glands or their recovery after lactation. But a wisely selected course of general physical culture has an admirable effect on the whole glandular structure, and so also on the breasts. But, in my opinion, the best of all indirect methods of promoting the adequacy and beauty of the bust, is *normal sexual activity*, and this is also the best prescription for recovery after lactation.

There are numerous cases of defective bust development which are the result of innate or acquired *constitutional anomalies*. A breast set wrongly on the thorax can be as little influenced or improved by gymnastic methods as a crooked nose or deformed ears. The same is true of positively misshapen breasts. If these have been either acquired or developed from the earliest years, neither exercises nor massage can cure them, and *highly skilled surgery alone can avail here.*<sup>(40)</sup>

But breasts which remain childishly undeveloped, though free from positive deformities, may be brought to maturity far more through massage, especially vibro-massage, and diathermy than through any form of gymnastics. And the treatment should not be limited to diathermy and local massage, but aim at eradicating the *constitutional cause—the endocrine inadequacy or imbalance*—by promoting full functional activity of the ovaries and of the group of synergistic glands which interact with the ovaries.\*

A profound constitutional change takes place throughout woman's organism during pregnancy, and in the most "natural" and normal manner. But this natural fulfilment occurs less easily in women with small, flat and flabby breasts, for in such cases there is generally a corresponding inadequacy or infantilism of the inner genital organs. Nor is pregnancy *in itself* always able to make inadequate breasts fully functional and fit for suckling. Moreover, any vigorous "local" gymnastics during pregnancy would

\* Cf. "Fertility and Sterility in Marriage," Chapters VI. and VII., pp. 167-206.



42. TAPOTEMENT OF THE BACK

*Alleviating pains frequently felt in upper part of back caused by too large and weighty mammae.*



probably be quite useless in helping bust development, and do more harm than good. So, in order to avoid possible misunderstandings, I wish to emphasise that the exercises just described, and numbered from 29 to 36 inclusive, *should not be attempted during pregnancy*: they are decided "training exercises," and thus involve a good deal of effort and fatigue.

The best prescription for undeveloped breasts during pregnancy with a view to functional activity in nursing is massage and diathermy. But care should be taken in applying these, as the stimuli received by the nerves of the breasts may easily lead to reflex uterine contractions and the risk of miscarriage or premature labour.

Finally, what of the pains and troubles resulting from excessively large and heavy breasts, especially such as are most distended by the rapid process of growth and secretion during pregnancy and the puerperium: can these be remedied by gymnastic exercises? In the strict sense of the term: No; but appropriate and *gentle exercise of the shoulders and upper portion of the back* alleviates and diminishes the pain and fatigue of those parts (shoulders and back) which sometimes ensue from the heavy weight of the over-filled and tensed breasts.

A further excellent remedy for these troubles is gentle massage, especially a slight *tapotement* of the muscles of shoulders and back (see Fig. 42). This form of massage may replace any exercise of the shoulder muscles if the patient is easily fatigued. The *tapotement* may be repeated several times during the day. Many women who have experienced its soothing yet stimulating beneficial effect find it indispensable. Of course, the breasts themselves should be supported during this massage of the back by a properly made and adjusted bust-bodice, *soutien gorge*, and not only during *tapotement*, but throughout the stage of lactation.

In fact, apart from physical exercises, the demand first formulated above, that the breasts should be prevented from dragging their muscular and connective attachments

loose by their own weight, is of equal importance and needs equal attention.

Three factors need consideration for this purpose. There must be appropriate care for the epidermis, keeping the skin elastic and flexible; there must be constant and adequate support for the tender and swollen glands; and there must not be excessive demands on them, functionally: they should not be required to supply milk for any longer time or in greater amount than is *actually necessary* for the child's welfare.

To deal with these three requisites in detail would take too long. But a few hints may be given.

First of all, avoid *overfeeding* during pregnancy. The expectant mother normally puts on a certain amount of adipose tissue, especially in the breasts, and if this layer of fat is excessive, it over-stretches the elastic skin, and then, when the fatty layer is dispersed after lactation, the skin is slack and pendulous and the breasts hang down shapelessly. The skin itself loses its firm satiny smoothness and forms thousands of tiny wrinkles and pits—quite apart from the peculiar white scars or *striæ*, which are never totally obliterated after pregnancy—and one of the chief feminine charms is a thing of the past.\*

Secondly, the breasts should be *supported* by a *soutien-gorge* or bust-bodice, but not *compressed*. Any pressure on the sensitive organs from below stretches the skin of their upper portion and favours pendulous and sagging breasts. The bust-bodice or *soutien-gorge* should, so far as possible, follow the natural contours, and the best material is strong but porous and to some degree elastic. The usual manufactured articles are much too flimsy to give proper support. There should be wide shoulder straps and fastenings at the back. Expectant and nursing mothers should have special linings, protecting the very sensitive and vulnerable membrane of the nipples from rubbing or pressure. There should

\* The avoidance of overfeeding during pregnancy is, of course, not the only measure to be taken for preserving the skin of the breasts, that of the stomach and the thighs. A special massage—of the skin *only*—and the use of a good non-greasy cream is also of great value in certain instances.

be an inlet strip of elastic beneath the breasts so that the belt portion of the garment gives easily to the movements of lungs and arms. And the shoulder straps should be wide enough not to "cut" or pull, and adjustable so that they may be "reefed" or loosened as the breast is emptied or filled again with milk.

In these respects, I am of one mind with *Erna Gläsmer and R. Amersbach*,<sup>(40)</sup> but must express some reserve about their view of shortening the *duration of breast feeding*.

I must admit my need to overcome certain inhibitions and preconceived views on this topic, having been for so long accustomed to consider the welfare and needs of the baby alone. But I now realise that this was, in principle, for many of the mothers inadequate. *If the child's needs can be fully met, i.e., if the child is healthy and has received in the first months mother's milk, and if supplementary food-stuffs of good quality are available, there are grave reasons for refraining from any avoidable burden and strain on the organs concerned.* *Gläsmer and Amersbach* conclude that lactation should not last longer than three months if the child is healthy. This is not an arbitrary pronouncement, but the result of observation and inquiry; and Nature supports the suggestion, as a rule, for, after three months the flow of milk begins to dwindle in many cases. The *tempo* at which the weaning of the baby and the resultant involution of the mammary glands takes place is *decisive for their subsequent condition and appearance*. Here, too, it is wise to follow Nature's hint and let the change be *gradual*. If the child is "taken off the breast" suddenly, the organ becomes full and tense with milk, and this has great disadvantages.\*

\* In order to avoid this repeated distension and overstrain, which can have a most unfortunate effect on the shape of the breasts, *Gläsmer and Amersbach* recommend five "meals" in the course of the twenty-four hours, and that both breasts should be used at every meal. They are of opinion that this avoids distension and enables each breast to function fully and without strain. They point out, however, that no rigid system is possible in this matter, for the details must vary in each case with the functional activity of the breast and the child's appetite and stage of development.

I would emphasise this reservation, but, on the whole, I should agree that their suggestion is better for the mother than the method formerly practised, and cannot harm the child; in fact, it is often beneficial to the latter as well.

These disadvantages are avoided if weaning is gradual. The breast recovers and adapts itself to normal conditions without loss of shape or texture. The baby is also best served by gradual transition to artificial food : its intestines are far less strained if adaptation is slow and gentle. Therefore, I recommend that weaning should take from a fortnight to six weeks to complete, according to the mother's supply of milk. The bottle should take the place of an increasing number of meals at the breast.

Even after the secretion of milk has dried up, the processes of involution and recovery have not ceased, for the majority of the special structures developed during pregnancy disappear and the supporting connective tissue slowly regains firmness of texture. We have already explained and urged the need of paying particular heed to the appearance of the breasts *during this transition*, both by appropriate exercises and the support of suitable garments which fit snugly without undue pressure.

## CHAPTER XVI

### SUMMARY AND EPILOGUE

#### *The Significance of Physical Culture for Sex Efficiency*

PHILOSOPHY—the intensive culture of the speculative intellect—and gymnastics—the most important section of physical culture—have this in common: they both lead the thinker, who consistently follows any trend of thought, from an individual standpoint to a more or less definite “system” of thought or action.

My trend of thought in these pages has passed theoretically from explanation of the rôle of pelvic zone and pelvic floor in sexual communion, and of the influence of the pelvic articulations and the control of abdominal and pelvic muscles and of respiration on the process of birth, to the consideration of the value of general and local muscular exercise for puerperal involution, and for health and recovery after child-birth. On the practical side, I had to enumerate and describe the particular muscles which need exercise and the best way of learning to control them. I had to explain the appropriate exercises in detail, and to deal with the respective indications and contraindications \* for these exercises. Finally, I constructed a definite and detailed *system of pelvic exercises* with supplementary special exercises for pregnancy and the puerperium.

The Tone was set for this system:—

First, through the aim of the whole sequence and *the valuation of sexual functions*, the culture of 100 per cent. sexual efficiency, and an active share in the experience of communion and the benefit and pleasure this experience

\* Technical medical terms for “Reasons for adopting any particular method of treatment” and “Reasons forbidding such treatment,” respectively.

confers, for *both* participants. Further and equally, our aim included the facilitation of the act of birth, the minimising or prevention of any ill effects therefrom, and the restoration of undiminished sexual efficiency and feminine potency. The preservation of sexual attraction and eligibility as a partner in this experience into an advanced age, and the prevention of certain morbid changes in the genital organs.

(2) A further distinctive feature is my advocacy of the need to consider *both the reproductive and erotic factors* more seriously than has hitherto been attempted in recommending physical culture to women.

(3) The exercises of the abdominal and pelvic zone form a definite and complete sequence, arranged for maximum efficacy.

(4) The various regions of the muscular portion of the pelvic floor are distinguished in detail, and special exercises are suggested for each region.

(5) Full use is made of the principles of Swedish gymnastics for pregnancy and the puerperium.

How can we best bring the benefits enumerated in the first place to the greatest possible number of women? I suggest that they should study the chapters of theory in this book in order to gain both a general view of the subject and hints as to methods of attaining our purposes. Of course, these may also be brought to them by lecture courses, and more or less informal talks, which have the advantages of immediate contact between teacher and pupil, but the particular disadvantages that certain subjects, enveloped hitherto in an atmosphere of difficulty and delicacy, can only be treated vaguely before audiences of several persons just when there is most need for explicit clarity.

The practical side, the mastery of the different exercises, can be attained simply by reading and following the directions in this book. But the more complicated and advanced items of our sequence, such as the whole of the exercises for the abdominal and pelvic zone, need the supervision of a specially trained gymnastic instructress. If

such expert help cannot be obtained, it might be possible to attempt some of them with satisfactory results after careful study of our directions and the illustrations and films appended.\* The performance will be less "finished" and technically perfect, but there may, nevertheless, be substantially good results.

I have dealt in detail with the technical side of this work, for the means to a valuable end need the utmost care and accuracy. But the end itself transcends and includes all the means and I would dwell for a brief while, in conclusion, on the psychological and human aspect of the work and the purpose it strives to serve.

For some of my readers the *ethical significance* of my aims will be what decides or forbids their interest and help. They will ask, first and foremost, "*Are these things right or wrong in themselves?*" Now, I do not think the strictest pietists and supporters of traditional codes can still, to-day, disapprove of the alleviation of birth pains through physical culture! There will always be enough and to spare of anguish and danger to please the devotees of the Old Testament doom: "*I will greatly multiply thy pain and thy conception: in sorrow shalt thou bring forth children!*" Similarly, the prevention of subsequent injuries and morbid conditions of the genital organs can also hardly be condemned by believing Christians to-day!

But, of course, *traditional Christian ethics* do not accept the other aims of this work as worthy or lawful. Those whose dogma declares "*the lusts of the flesh*" to be "*sinful*" must logically disapprove of all our efforts to enhance mutual

\* In order to teach this gymnastic technique to other persons, there must be absolute mastery and proficiency, and I would earnestly request gymnastic instructresses who wish to take up this branch of the work professionally, to apply for special instructions to *Mrs. Lisa Mar*, 9, Steinstrasse, Baden-Baden. As has been explicitly mentioned in the preceding pages, the pelvic exercises have all been constructed, selected and tested by *Mrs. Lisa Mar* and myself, in collaboration. Our years of joint effort in our professions have led to entire agreement in the general aims and details of this study; and, as *Mrs. Mar* is as talented a lecturer as she is an able gymnast, she is entirely qualified to teach the teachers. Moreover, at the present date, she is the *only* person so qualified.

joy in coitus, even by the most *biologically normal*, i.e., "natural" means; and equally of attempts to keep women apt for desire and pleasure after their confinements and even after certain age limits.

So much for religious considerations. Then there are individuals whose congenital tendencies—mental and physical—make them value self-denial and self-control more than self-fulfilment *in all circumstances*. And there is the much more numerous group of *sham ascetics*, as well as the genuine kind. Some of these sham ascetics are consciously acting a part; others, again, are diverting profound primitive urges in themselves, which they dare not follow out, logically and directly. But both varieties of this difficult type behave as though the joys of sex were contemptible, and—logically and consistently—are sharply opposed to any effort to vindicate and cultivate such pleasures.

There must of necessity be other opponents of a book that aims at making women active partners in sexual communion. For there are men whose instinctive masculine urge is to "take," and to conquer the women they desire, and there are women whose instinctive complementary urge is to be passive and possessed; and both are alike so one-sided and extreme that they find *any* activity on the woman's part in coitus repugnant and even "unnatural." They feel that woman should be the *object* of desire, and women sometimes feel this as acutely as men. It is well for both partners, if this aggressively masculine type can meet and gratify its passively feminine ideal!

Finally, there is a category of men who think their wives "too good and pure" for an active share in the pleasures they afford; who consider it "more decent" and reverent to their wives if they reserve any complete mutual stimulation and gratification for hired embraces with women they despise. They *seek* satisfaction in this market—but do not find it! For supreme sexual satisfaction implies the interaction of emotional love and physical sensation. And the effect of this blind masculine misunderstanding and "respect" and restraint on the mental and bodily health and happiness of the wives they neglect is something

that very few men, till now, have troubled to try to understand.\*

Yes, there will be and must be many opponents of my aims and views. But, once these views and aims are understood, many more who will greet them with sympathy or even enthusiasm.

I am not including men among these supporters whom I confidently anticipate. This book is not addressed to them. My message for them was embodied in "Ideal Marriage"; this book is addressed to and intended for *women and their special helpers*. But the tenderest husband cannot help his wife in *this* particular field: only experts can avail here.

"Ideal Marriage" was written as a guide in erotic physiology and technique for husbands. The present manual aims at making women able to receive and share all the joy their partners should be able to bestow. But neither book is meant to reveal the deprivations or deficiencies of a possibly inadequate partner, for it is useless and cruel to emphasise losses and defects that *cannot* be cured. Nevertheless, some such defects are curable, and the present work may conceivably prove of great help to any husband who learns how to suggest to his wife the possibility of retaining her attractions, through those ordeals of pregnancy and birth, which she had previously thought spelt the death of beauty and married intimacy.

Of course, the husband himself may learn too late "what might have been," and the marriage may be impaired or ruined thereby. But, for such a drastic result of knowledge there must surely have been previous "rifts within the lute." A marriage that has mentally and emotionally triumphed over specifically sexual inadequacy and disillusionment may certainly survive the knowledge of such sexual and technical inferiority. And the risk of some harm through knowledge should not prevent the benefit and help it may bring to many more struggling human beings, both in the prevention of needless suffering and the positive achievement of happiness.

\* See "Ideal Marriage," *passim*, and especially Chapter I., pp. 6-9, and Chapter IX., pp. 172-193.

But, enough of the man's share in that happiness—however important for him, and however just and right. The real destiny of a woman's life is often—far more often than she herself is aware—dependent on her full sexual realisation—or the lack of it.

In fact, I would maintain that :

Just as it is the man's *rôle to awaken* his mate's desire and pleasure, so it is *her duty and privilege to tend and preserve* that vital flame in their relationship. And for these purposes they each need special, *i.e.*, expert, technical knowledge and technical skill.

When the woman's lover has become her helpmate for life “*sex appeal*”\* is no longer enough. What she needs much more, in any permanent association, is “*sex efficiency*.” For habit is apt to diminish and blunt “*sex appeal*,” especially the frequent habit of married life ; whereas, in the same circumstances, “*sex efficiency*” increases as “*practice makes perfect*.”

Erotic aptitude *need not be and must not be* destroyed, or even, on the whole, impaired by maternity. And advancing years should wither it as little as possible, especially the power of consummating the sex act with full mutual joy and benefit.

These, then, are our aims, our *desiderata*, our demands. And all actual experience below this level of beauty and power is felt by women—whether they acknowledge it or are aware of it, or not!—as a grievous lack and personal defect. Any anatomical or functional inadequacy in the genital sphere affects the personality, and is manifest as some form of inferiority complex in both men and women, but it is apt to be specially pronounced in women. Unfortunately, gynaecologists have in the past quite failed to recognise these facts (with few exceptions) and partly still

\* “*Sex appeal*” has been analysed in my book “*Fit or Unfit for Marriage*”<sup>(41)</sup>. For our present purposes, it may be defined as “sexual attraction,” though the two are not precisely the same. The term “*sex efficiency*,” so far as I know, has never yet been employed in Britain or America. It forms part of the title of the Anglo-American edition of the present study. *Modern industrial efficiency* is a familiar term throughout the world, thanks to the popular Press. *Sex efficiency* is analysed and advocated throughout these pages.

so fail ; for the *taboo* set up by religion and social custom against the investigation or discussion of sexual matters "blinkered" them and rendered them blind to any but the *reproductive and the pathological aspects* of the feminine genitalia. But neurologists have found ample occasion to recognise the extent of the influence exercised by inferiority or inadequacy in the essential feminine organs or functions on the whole human personality. This may sometimes be observed in an unmistakable manner in cases of sterility, especially of sterility which has at first been voluntarily sought and then irrevocably regretted.<sup>(42)</sup> And we have already attended to the grievous results of the disappearance or disfigurement of the breasts through neglect after maternity. But *genital inferiority feelings* manifest themselves most strongly when their centre of disappointment or humiliation is the sexual act itself. This is even the case when the woman does not love her partner or does not desire sexual pleasure *per se*, or rather, imagines that she despises it ! How much more so, then, where there is both the ardent wish to give pleasure to the beloved man, and to experience that pleasure herself, but where ignorance, psychic repressions or physical defects make it impossible to realise that wish !

Indeed, such a *reduced feminine potentiality or ineffective womanhood*, especially in specific sexual inadequacy, rouses inferiority complexes which may injure the whole feminine organism, bodily and psychically, and have unfavourable and often very serious repercussions on individuals, institutions and communities.

But *enhanced or accentuated potential womanhood*, bringing full capacity to achieve and enjoy normal married life, technically as well as in other respects, and the consciousness of being able to pass through pregnancies and births, without loss of sexual sensation or charm for the marriage partner, must give women a wholesome and justifiable sense of security and pride in themselves. This ease of mind and pride will make them happy helpmates in every sense ; will enable them to *understand* the children they bear and love, and to bring the distinctive qualities and experiences of their

womanhood into play, in the problems of the community as a whole.

For indeed the woman of to-day has *acquired consciousness of herself as an individual*. Yet she is perturbed and tormented by the need to reconcile the strange contradiction in her being ; for she is, biologically and organically, first and foremost, not an isolated independent unit, but linked with other lives as the vehicle of the race. The message we bring here should help to solve her problem by harmonising the individual need for experience and culture with the instinctive life of the race ; by making the child-bearer more efficient and "fit" in motherhood, and the lover more apt and happy in love ; for that love is, at its best, at once the supreme triumph and the supreme surrender, the quintessence of abandonment and of achievement. These are emotions as profound and as permanent as any of which human nature is capable, but which can only be experienced through the instrument of a sexually efficient body in the fullest sense.

So I trust these physical exercises may be of help in soothing the unrest, solving the perplexities, and widening the horizon of women to-day, torn as they often are between instinct and conscious intention, and uncertain of their goal. May the book bring them greater sex efficiency and enhanced potential womanhood, and, through these, greater and more perfect humanity and happiness !

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**PLATES I—X**

## PLATE I.

*The Muscular Apparatus of the Pelvic Floor*, viewed from below. The skin, adipose tissue and also the labia majora, together with the superficial fascia have been removed in order to show the *superficial muscles*.\*

M. constr. c. = *sphincter vaginae* (musculus constrictor cunni, which, as its name implies, constricts the vagina). While the other muscles in the picture are shown in the ground colour, this muscle, with which we are chiefly concerned, is shown in a darker colour to differentiate it from other structures. In Plate IV. this muscle is shown in cross-section and indicated—a.

m. c. rad. = musculus constrictor radicis clitoridis; m. i. cav. = musculus ischiocavernosus. The bundles of these two little muscles (which occur on either side of the middle line but are indicated on one side only of the picture) are inserted by tendinous fibres into the upper lateral surface of the crus of the clitoris (*corpora cavernosa clitoridis*, cf. Plate II.). Their contraction strengthens the swelling of the clitoris, and—so far as it is actually movable—presses it with its glans (*glans clitoridis*) downwards in the direction of the vaginal orifice.

m. trig. u. = musculus trigoni urogenitalis; m. tr. per. = musculus transversus perinei. These muscles are also paired, but only indicated on one side of the picture. As is shown in the picture, the first named of these lies on a deeper plane; the fibres run transversely and proceed in the direction of the median line under the m. constrictor cunni; their contraction, accompanied by simultaneous and active relaxation of the sphincter, produces a widening of the vaginal entrance.

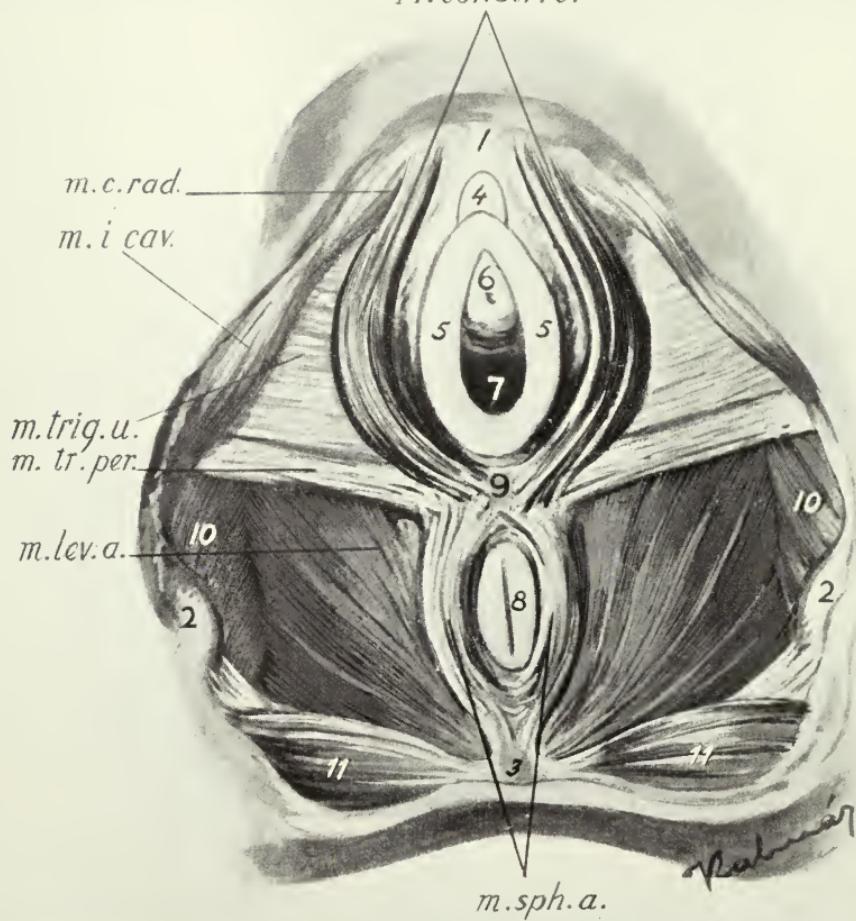
m. lev. a. = musculus levator ani—the posterior constituent of the levator group—raises the anus, that is, draws it inwards; the fasciculi of this muscle are also bilateral although only indicated on one side of the picture.

m. sph. a = musculus sphincter ani.

1. Pubic symphysis covered by tense connective tissue.
2. Tuber ischii.
3. Tip of the coccyx.
4. Corpus clitoridis.
5. Labia minora.
6. Urethral orifice on the urethral prominence.
7. Entrance to the vagina.
8. Rectal orifice.
9. Perineum.
10. Obturator internus.
11. Gluteus maximus.

\* The picture is drawn by Professor Kalmar, under the direction of the author, making part use of Plates XII. and XIII. in *Edvard Martin's* work, "The Gripping Mechanism of the Female Genitals."

*M. constr. c.*



## PLATE II.

*The Muscular Apparatus of the Pelvic Floor*, viewed from below. The skin, adipose tissue, superficial layer of muscles, together with the deep fascia, have been removed so as to expose the deeper layer of muscles—the levator group.\*

m. i. cav. = ischiocavernosus (see description of Plate I. concerning these muscles and their action on the crus clitoridis)—4' in this picture.

f. = edge of the superficial fascia which has been cut through and removed.

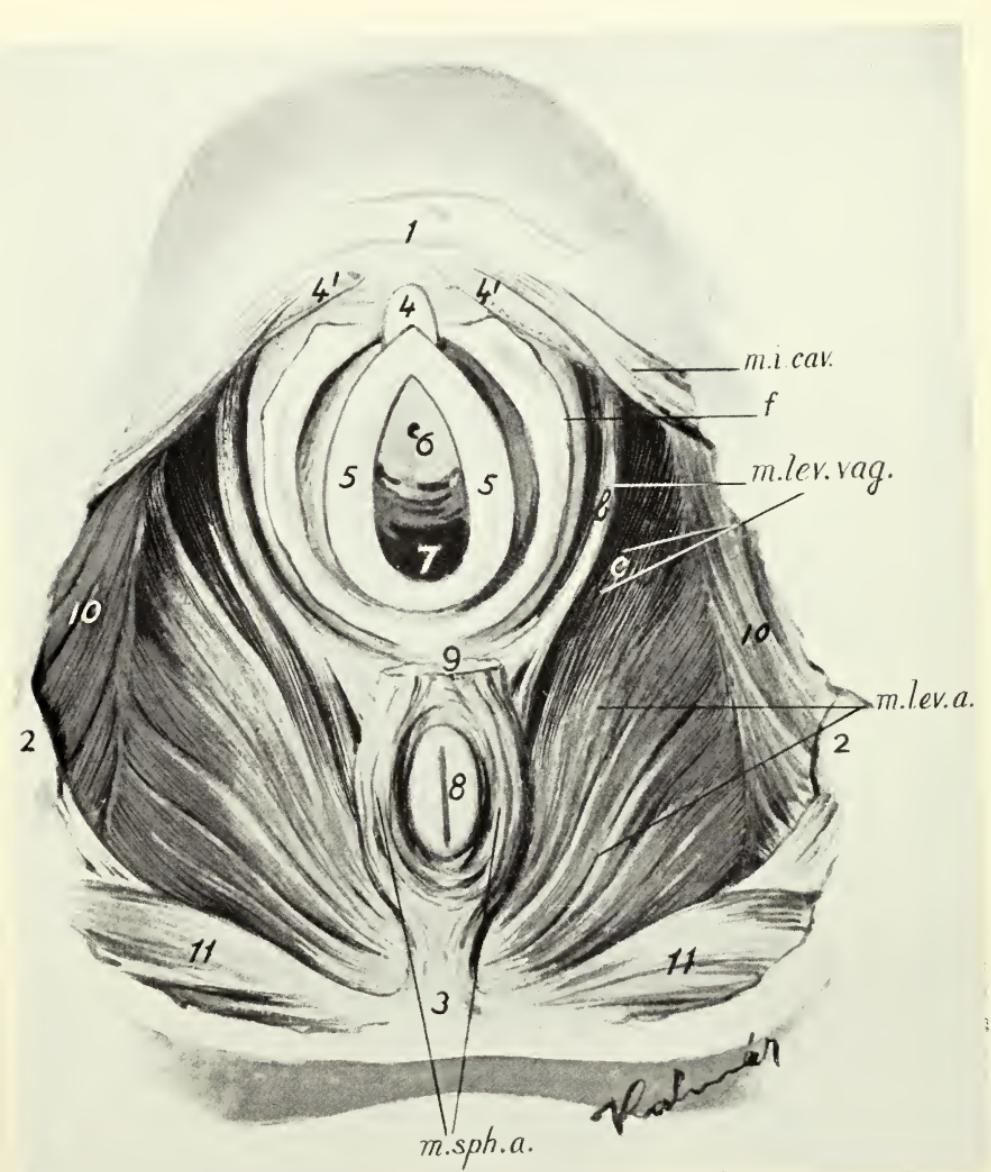
m. lev. vag. = levator vaginæ (compare b and c in Plate IV., which indicate these muscles in section, whereas in this picture they are shown in their entirety).

m. lev. a. = levator ani (*cf.* Plate I.) ; together with the last named and with the corresponding muscles on the other side, they form the levator group. That portion of the group represented by the levator vaginæ is shown in a darker colour to differentiate it from the others ; it is thus made clear in the picture that this muscle, though it cannot be considered as an independent one from an anatomical point of view, stands apart as regards function.

m. sph. a. = sphincter ani.

1. Symphysis pubis, covered by stiff connective tissue.
2. Tuber ischii.
3. Tip of the coccyx.
4. Corpus clitoridis.
- 4'. Crura clitoridis, corpora cavernosa clitoridis (two cylindrical portions of erectile tissue).
5. Labia minora.
6. Urethral orifice on the urethral prominence.
7. Vaginal orifice.
8. Anus.
9. Cut surface of the excised perineal muscles.
10. Obturator internus muscle.
11. Gluteus maximus.

\* The picture is drawn by Professor Kalmar, under the direction of the author, making part use of Plate XIV. in Eduard Martin's work, "The Gripping Mechanism of the Female Genitals."



### PLATE III.

*Stretching of the entire muscle structure of the pelvic floor during child-birth.\**

This plate demonstrates the condition present at the moment of maximum dilatation during the passage of the foetal head. The outlines of the bones of the pelvis are indicated by dotted lines; the skin and all the fasciae which lie between it and the muscle layers, also thinned out by stretching, are, in this picture, omitted. The head of the foetus, on which the hair is clearly visible, is shown in the ground colour, whereas the stretched-out muscular pelvic floor is shown in a darker colour. The occiput is projecting under the symphysis pubis, while the shining forehead is stretching to the uttermost the soft parts of the mother's perineum.

c. c. = sphincter vaginæ (muscular constrictor cunni) and other constituents of the superficial muscular layer.

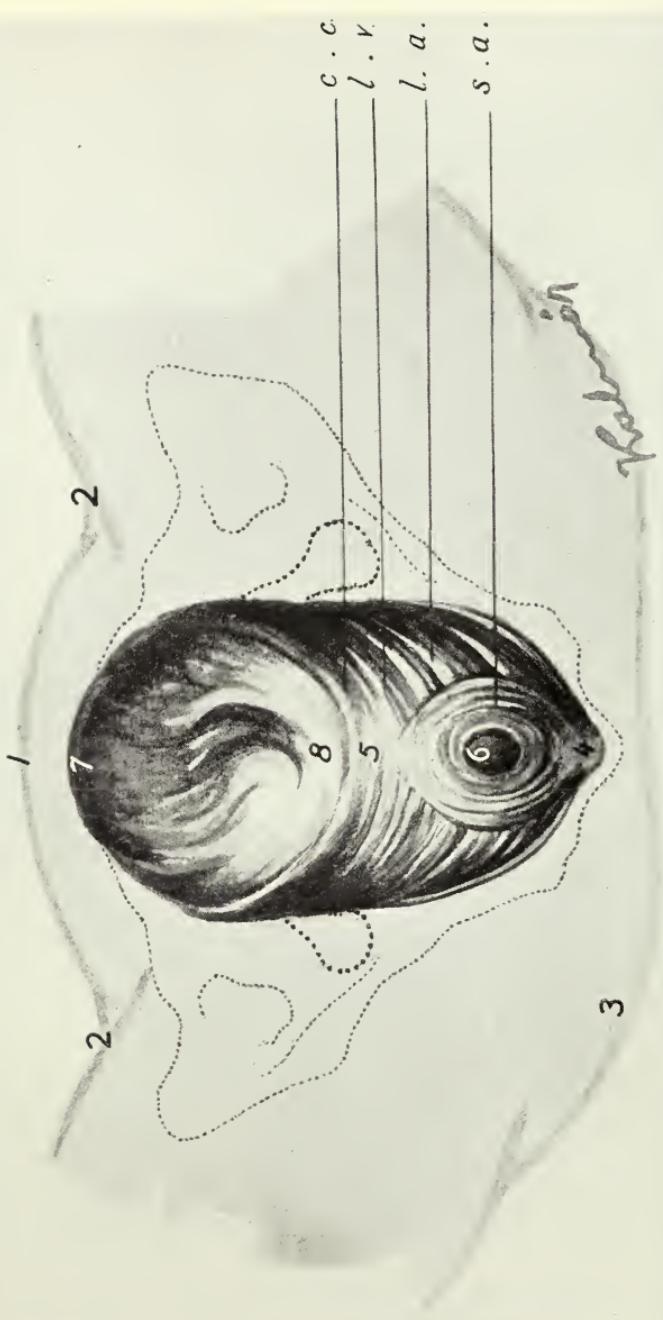
1. v. = levator vaginæ      )  
1. a. = levator ani            ) levator group.

(The differentiation of the various constituents of the muscular pelvic floor must, at this stage of the birth, be a matter of conjecture, because, by reason of the stretching and bearing down, the whole muscular floor is momentarily converted into a single thin sheet of muscle, and it is not till some time later that they gradually resume their normal features.)

s. a. = sphincter ani.

1. Skin of abdomen.
2. Groin.
3. Buttocks.
4. Tip of coccyx.
5. Perineum.
6. Rectal mucous membrane, made visible by reason of the stretching of the anus.
7. Occiput.
8. Frontal region of the child's head.

\* Drawn by Professor Kalmar, under the direction of the author, making part use of several pictures in various hand- and text-books.



## PLATE IV.

*Vertical Section through the Female Pelvis*, showing the relation of the muscular apparatus of the pelvic floor to the vagina.\*

a = sphincter vaginæ (musc. constrictor cunni).

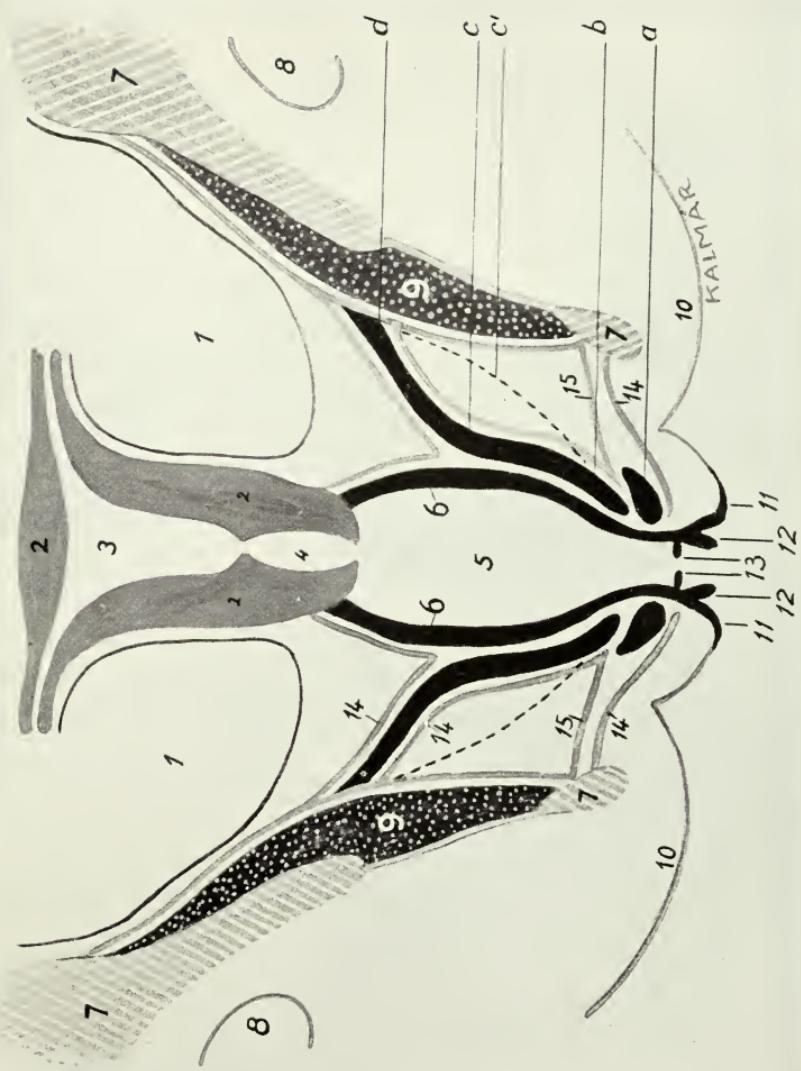
b, c, d = levator.

Further description in text also regarding the dotted line b, c', d.

The transverse-running muscle fasciculi of the musculus trigoni urogenitalis (see Plate I.) are for simplicity not drawn in, but their position and direction are roughly indicated by the line 15.

1. Abdominal cavity.
2. Uterus.
3. Cavity of the uterus.
4. Cervical canal.
5. Vaginal cavity.
6. Walls of the vagina.
7. Os innominatum (bony pelvic girdle).
8. Acetabulum (socket for top of the thigh bone).
9. Obturator internus muscle.
10. Buttocks.
11. Labia majora.
12. Labia minora.
13. Hymen.
- 14 and 15. Layers of fascia.

\* Drawing by Professor Kalmar from suggestions and sketches by the author.



## PLATE V.

*Relation of Phallus to Vagina and Clitoris during coitus in the obverse position, with increased pelvic inclination.*

*Section through the female pelvis* (drawing by the Author).

The shadowed line *a* shows the outline of the male organ, and *b* indicates the orifice of the male urethra. The lines *c* and *d* convey an idea of the altered position of vagina and perinæum when the phallus enters from in front whilst the pelvic inclination of the woman is increased. For the sake of clearness, there is no indication of the pressure and temporary change of position of other organs. The broken lines show the normal outlines of the female organs in repose.

Note here especially the contact and friction of the glans clitoridis and phallus.

*Cf.* for further particulars, the text of Chapter VIII., p. 67.

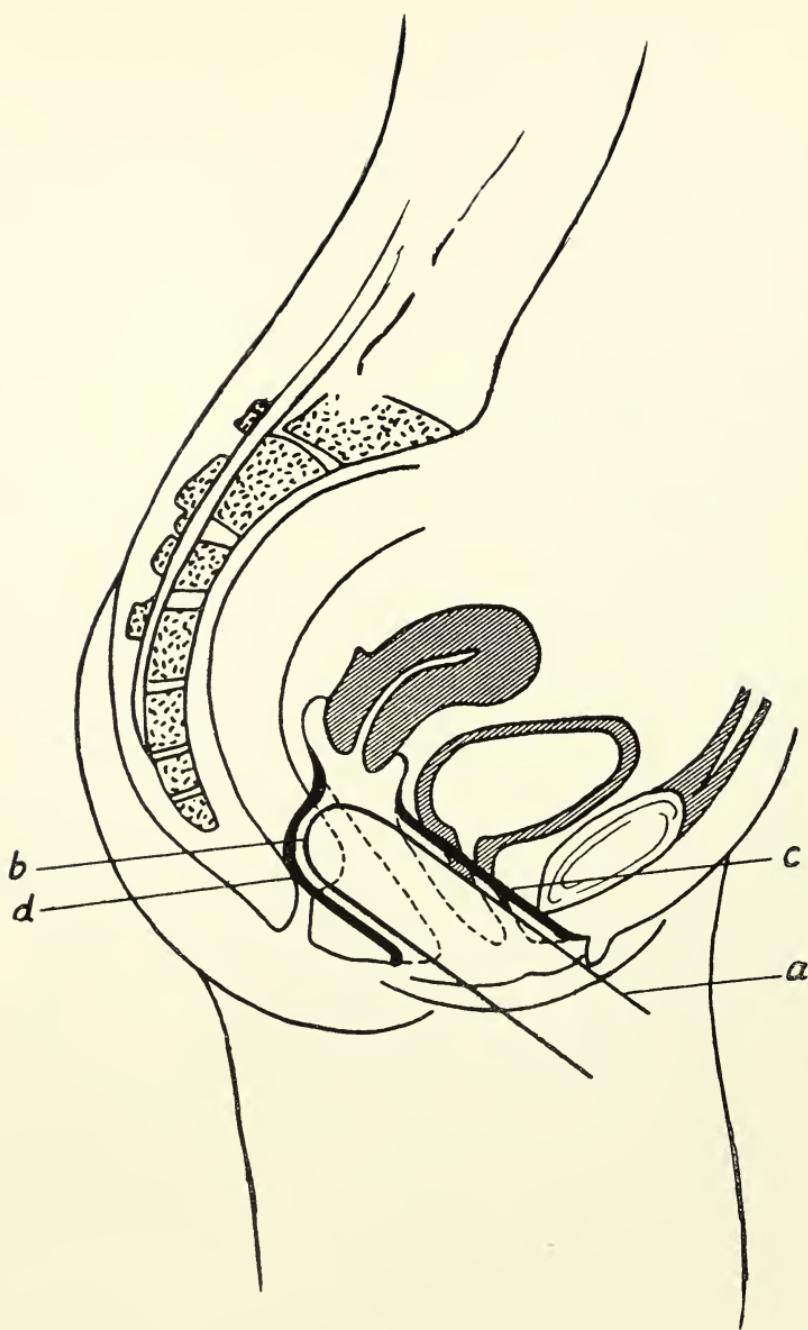
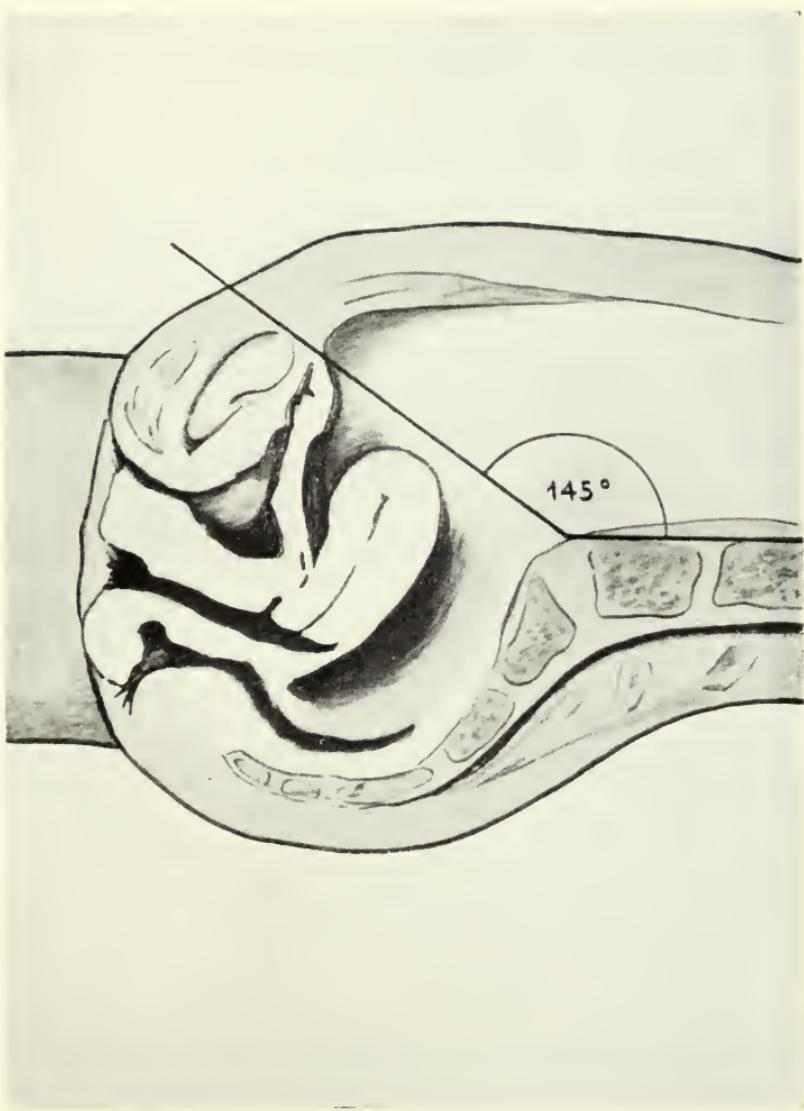


PLATE VI.

*Pelvic Inclination in supine horizontal attitude, with extended thighs.*

Section of the female pelvis, adapted from Bumm's "Operative Gynäkologie" (taken from "Fertility and Sterility in Marriage"). Compare with Plate VII.



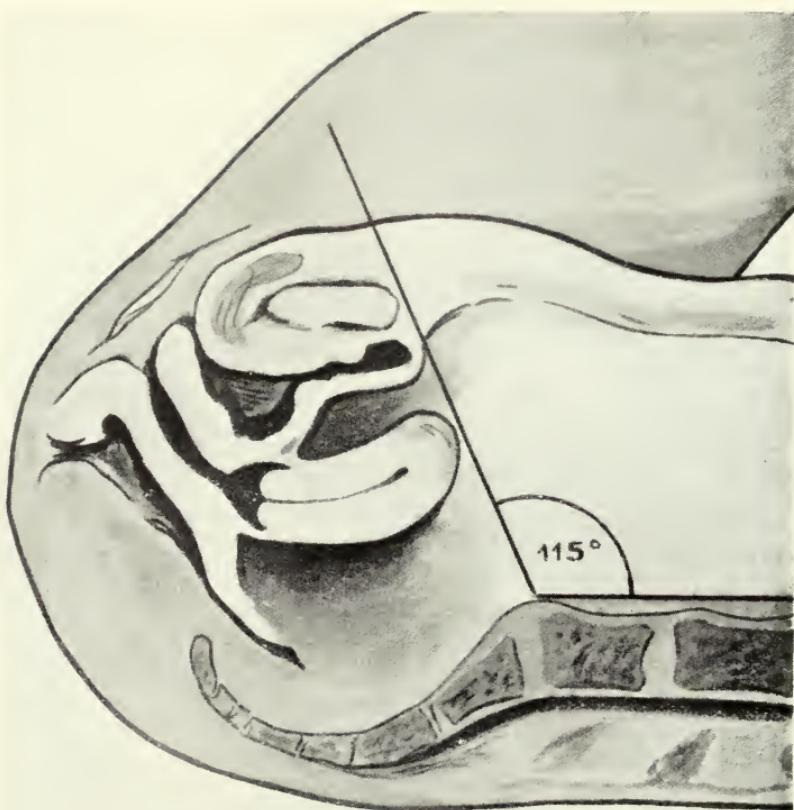
## PLATE VII.

*Pelvic Inclination in supine horizontal attitude, with thighs in extreme flexion.*

Section of the female pelvis, adapted from Bumm's "Operative Gynäkologie" (taken from "Fertility and Sterility in Marriage").

Compare with Plate VI. and observe the difference of the pelvic inclination in these two positions.

Note also the difference in the direction of the vagina and the respective angles of vagina and portio; as well as the position of the portio as regards other pelvic organs. The importance of these differences is explained in the text of Chapter VIII., p. 68.



## PLATE VIII.

*Frontal Overlapping of Parietal Bones at Birth* in case of contracted pelvis.

The posterior parietal bone is pushed under the anterior bone.  
(After Sellheim's illustration in *Halban und Seitz*: "Biologie und Pathologie des Weibes," Vol. II., p. 1.)

*Cf.* text of Chapter IX., p. 76.



#### PLATE IX.

*Various Attitudes during Parturition\** in order to facilitate “ pelvic torsion over the infant in process of birth,” especially in the intermediate stages whilst changing between these attitudes.

*Cf.* text of Chapter IX., p. 78.

- (a) *Upright body, suspended from above.*
- (b) *Squatting or Crouching*, more or less corresponding to our recumbent attitude with extreme flexion.
- (c) *Recumbent attitude with raised legs and slightly raised trunk* (usual attitude for parturition in many countries).
- (d) *Maximal bending backwards*, corresponding to our professional “ *Walcher's Suspension.*”

\* From *Sellheim's “ Die normale Geburt ”* in *Halban und Seitz : “ Biologie und Pathologie des Weibes,” VII., I.* (Berlin and Vienna, 1927, Urban and Schwarzenberg).



a

b



c



d

PLATE X.

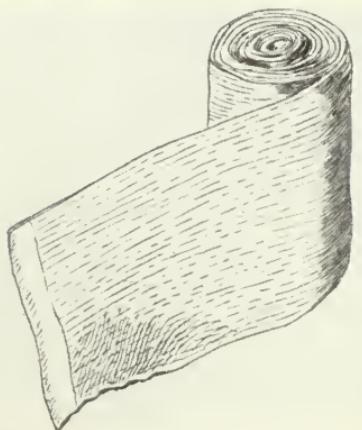
(a) *Bandage after Childbirth.*

(b) *Bandage in situ.\**

(a) The bandage is a strip of elastic material 6 yards long and 6 inches wide. In (b) it is shown wrapped round the body from pelvis to thorax.

*Cf.* text of Chapter XIV., p. 124.

\* From *Stoeckel's "Lehrbuch der Geburtshilfe,"* 3rd Edition, 1930 (Gustav Fischer, Jena).



(a)



(b)



# CINEMATOGRAPHIC SUPPLEMENT

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## Films 1 to 12

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To flicker Films 1, 2, 3, 7, 8 and 9,  
hold section in left hand and flick  
outer edge with right thumb.

To flicker Films 4, 5, 6, 10, 11 and  
12, hold section in right hand and  
flick outer edge with left thumb.





FILM 2.

PELVIC ROTATION IN THE HANDS-AND-KNEES ATTITUDE.  
Original position.



FILM 3.

VERTICAL PELVIC ROTATION ON HANDS AND KNEES. "The Machine" Exercise.

Initial position.



**FILM 4.**

M A J O R  
P E L V I C  
R O T A T I O N :  
R E C U M B E N T ,  
W I T H R A I S E D  
K N E E S (S i x t h  
*P h a s e*).

The pelvis has reached the highest point of its orbit, as in the first phase. The exercise continues in the following manner: in the next sequence of pictures: rotating to the right, as shown in phases 2 to 6.



18  
40

**FILM 5.**

S Q U A T T I N G  
O R C R O U C H I N G  
(E i g h t h P h a s e ).

The pelvis again touches the floor and the exercise begins anew.



V  
40



### FILM 1.

LEG ROTATION IN HANDS-AND-KNEES ATTITUDE.

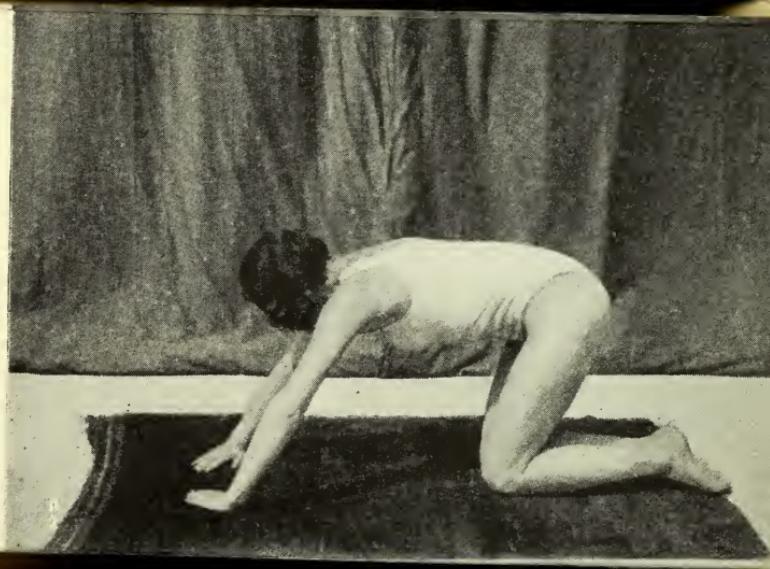
On hands and knees. Stretch the left leg from the hip joint slowly backwards. Keep the knee as straight and tense as possible.



### FILM 2.

PELVIC ROTATION IN THE HANDS-AND-KNEES ATTITUDE  
(Beginning of First Phase).

The pelvis is slowly drawn backwards from the lumbar vertebrae. The hands are not moved.



### FILM 3.

VERTICAL PELVIC ROTATION ON HANDS AND KNEES. "The Machine" Exercise.

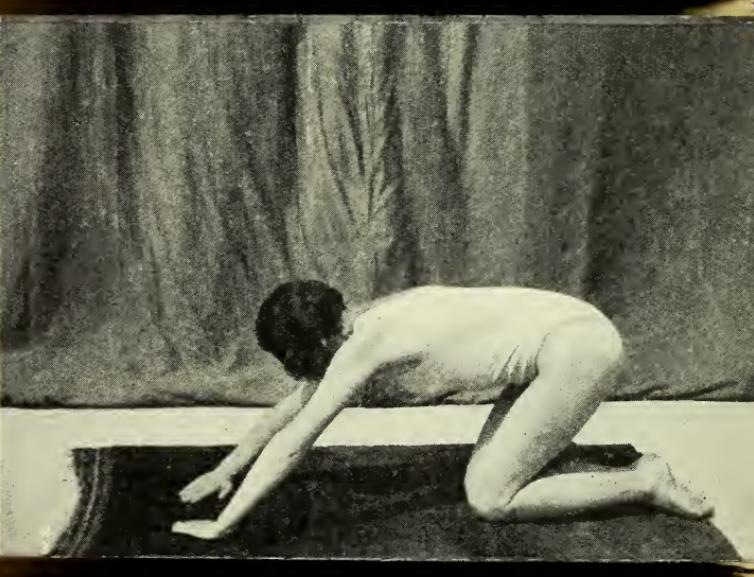
The preliminary movement here consists in drawing back the pelvis to the heels while the hands remain stationary on the ground.







3



3

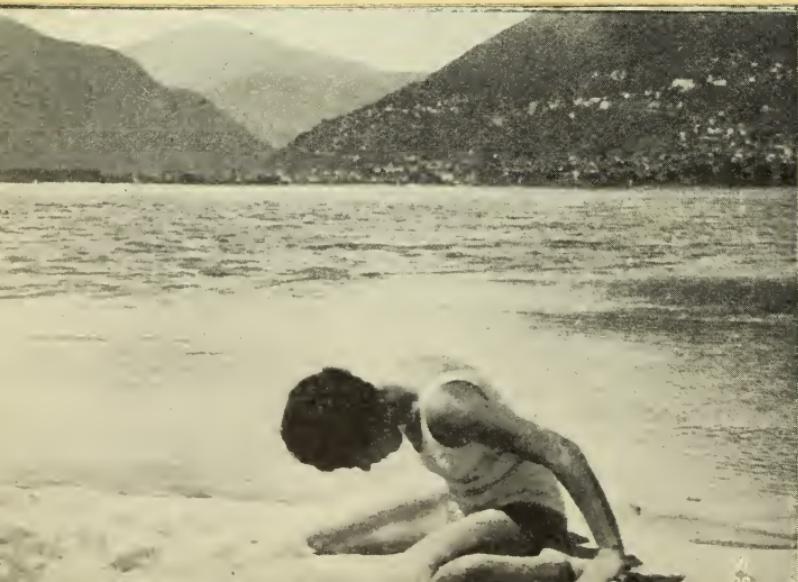


3

FILM 4.

M A J O R  
P E L V I C  
R O T A T I O N :  
R E C U M B E N T ,  
W I T H R A I S E D  
K N E E S (F i f t h  
P h a s e).

The pelvis moves  
upwards and to  
the left.



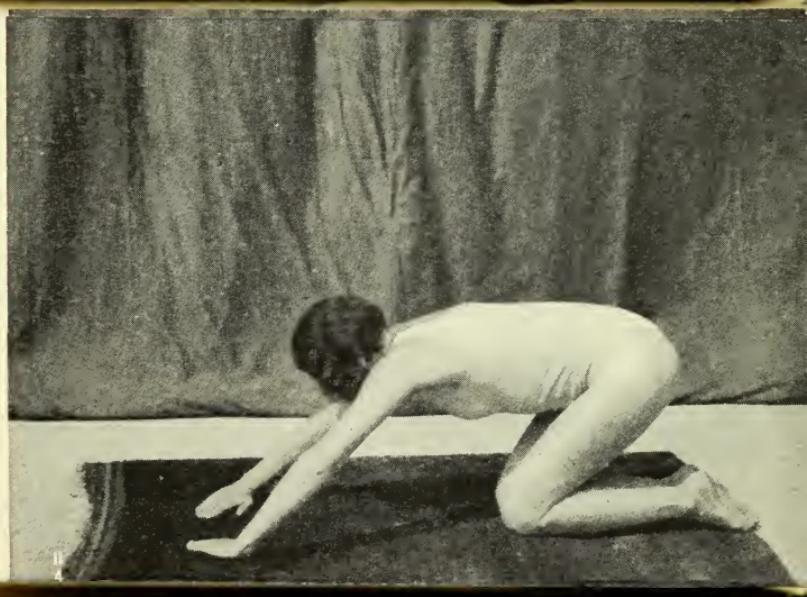
**FILM 1.**

LEG ROTATION IN  
HANDS-AND-  
KNEES ATTITUDE (End of  
*First Phase*).

The left leg is at maximum extension backwards and simultaneously raised so far as possible off the ground. In the illustration, the leg is shown in perspective.



14



14



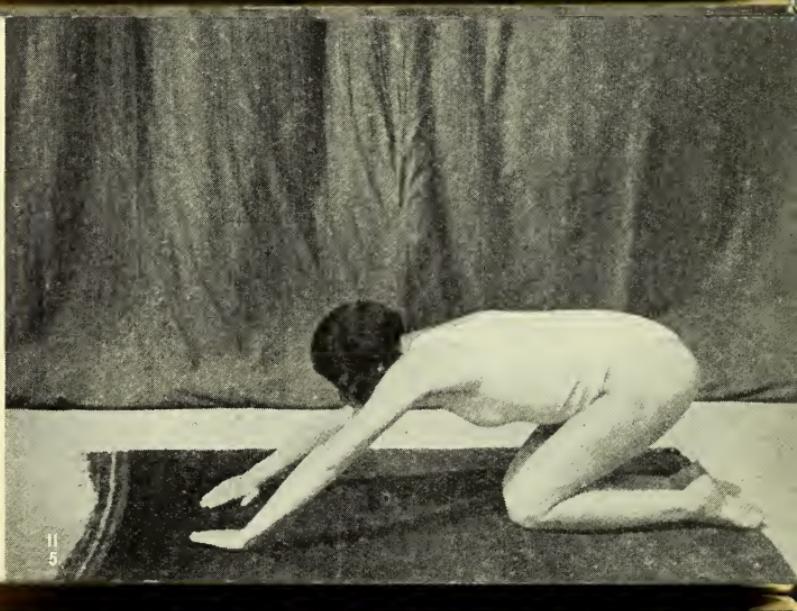
III  
4



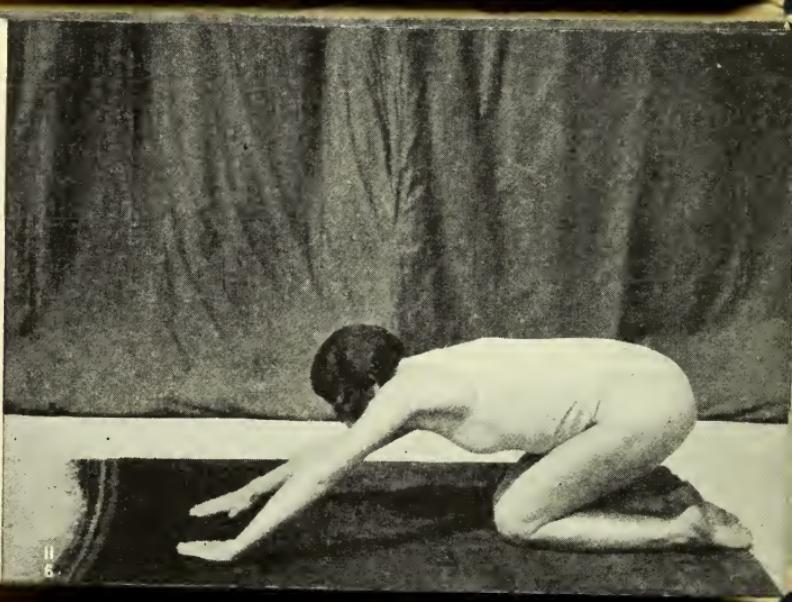
**FILM 1.**

LEG ROTATION IN  
HANDS-AND-  
KNEES ATTITUDE (Begin-  
ning of Second  
Phase).

The left leg is  
rotated slowly  
outwards as the  
hip joint is  
raised. The cir-  
cular movement  
causes the leg to  
appear shortened  
in perspective.









**FILM 6.**

PELVIC MOTION, BACKWARDS AND FORWARDS, IN THE KNEE-HEEL POSITION, WITH KNEES APART (*Eighth Phase*).

The pelvis is back at the initial position. The exercise begins anew.



### FILM 2.

PELVIC ROTATION IN THE HANDS-AND-KNEES ATTITUDE (End of First Phase).

The pelvis is drawn back as far as possible.

### FILM 3.

VERTICAL PELVIC ROTATION ON HANDS AND KNEES. "The Machine" Exercise (First Phase of Exercise).

Stretch the back fully and thrust the body forwards, keeping the face near the ground.

**FILM 4.**

M A J O R  
P E L V I C  
R O T A T I O N :  
R E C U M B E N T ,  
W I T H R A I S E D  
K N E E S (F o u r t h  
P h a s e).

The pelvis describes a semi-circle above the floor, from right to left.

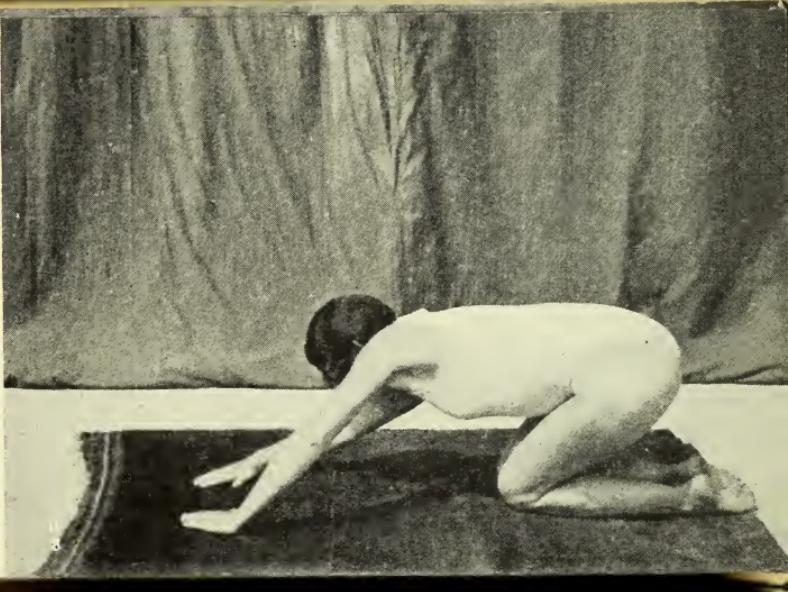




FILM 2.

PELVIS ROTATION IN THE HANDS-AND-KNEES ATTITUDE  
*(Beginning of Second Phase).*

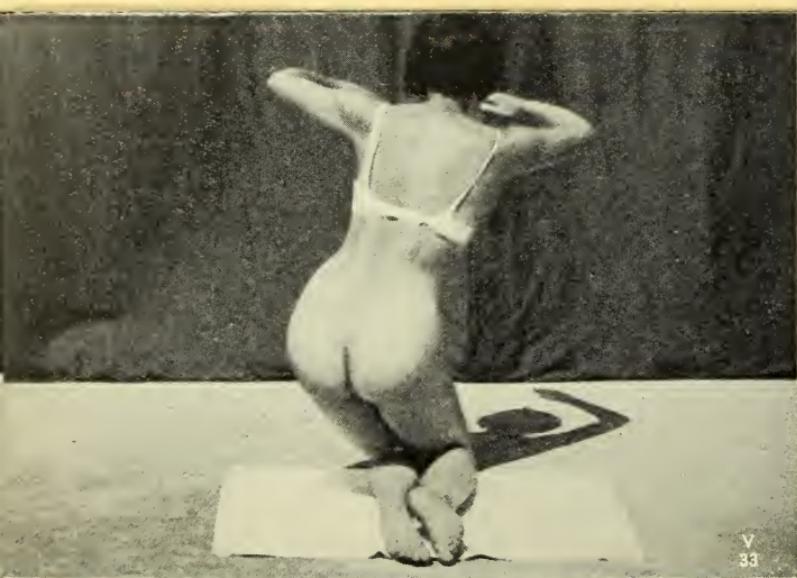
The pelvis is drawn downwards and towards the left. The knees remain stationary and as in the original position.

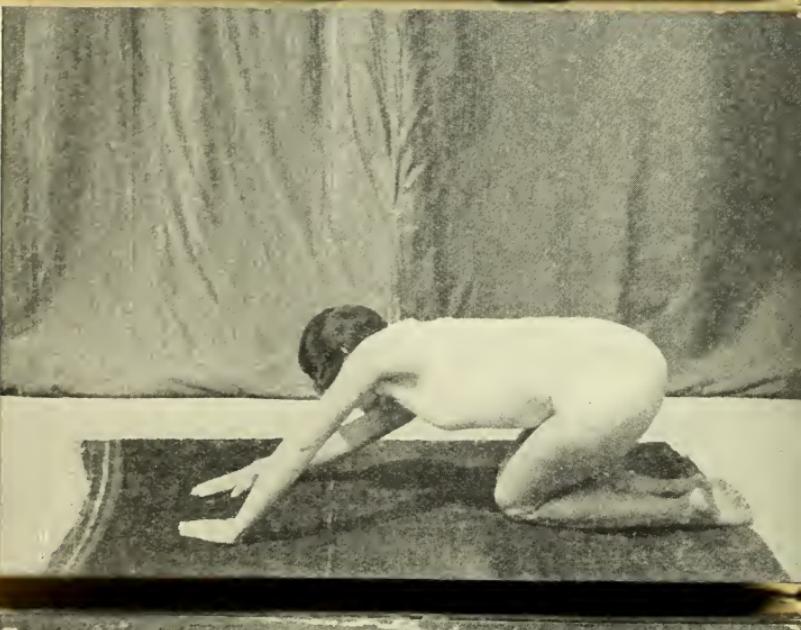


**FILM 4.**

M A J O R  
P E L V I C  
R O T A T I O N :  
R E C U M B E N T ,  
W I T H R A I S E D  
K N E E S ( *T h i r d*  
*P h a s e* ).

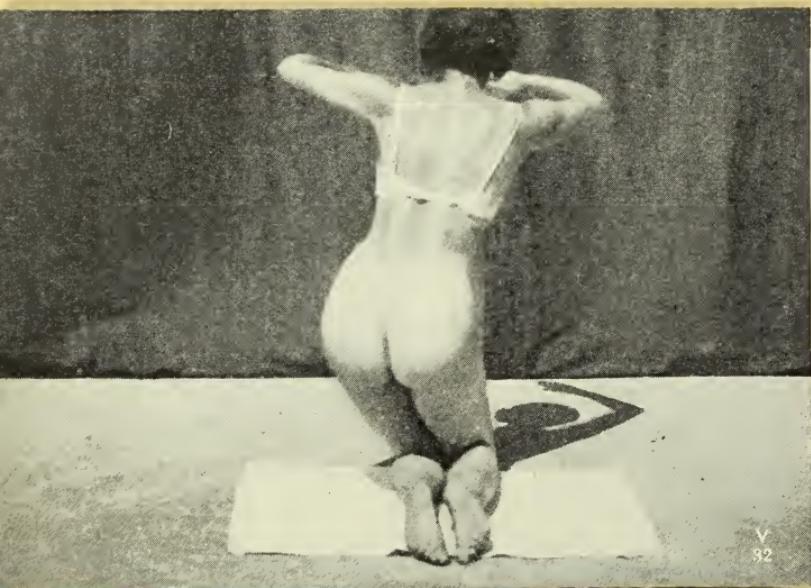
The buttocks  
touch the floor  
on the right side.







W  
32

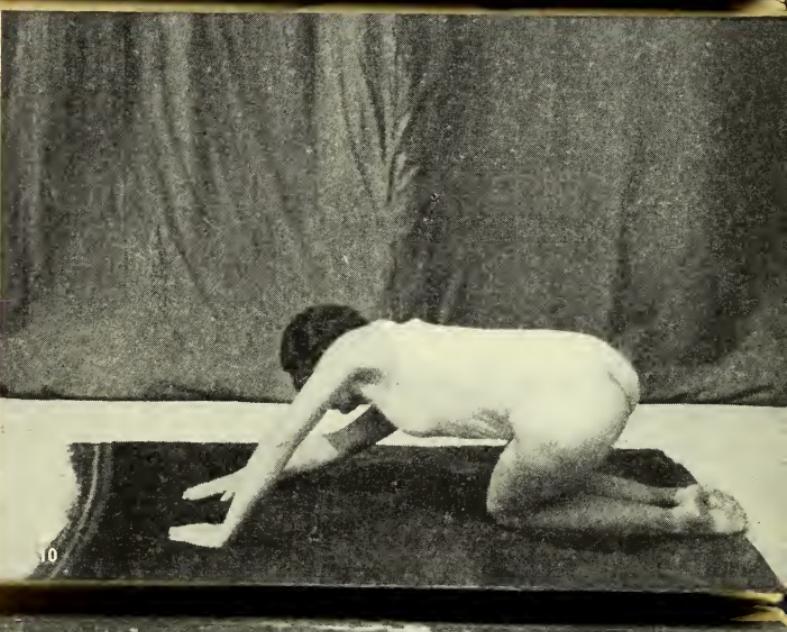


V  
32





10



10



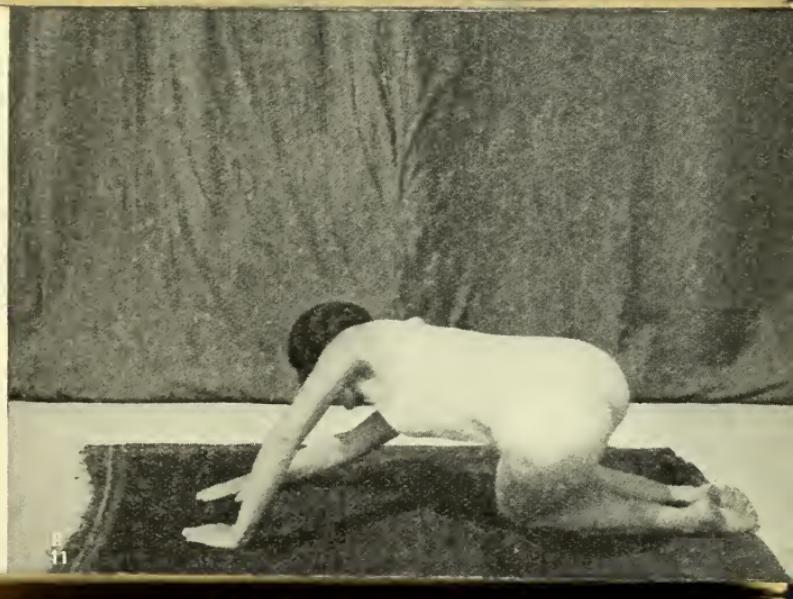
10



FILM 1.

LEG ROTATION IN HANDS-AND-KNEES ATTITUDE (End of Second Phase).

The left leg has reached the maximum point of its circular outward movement and the tip of the toes is at its furthest from the floor. The leg is pointed straight at the spectator and is, therefore, much foreshortened in perspective.





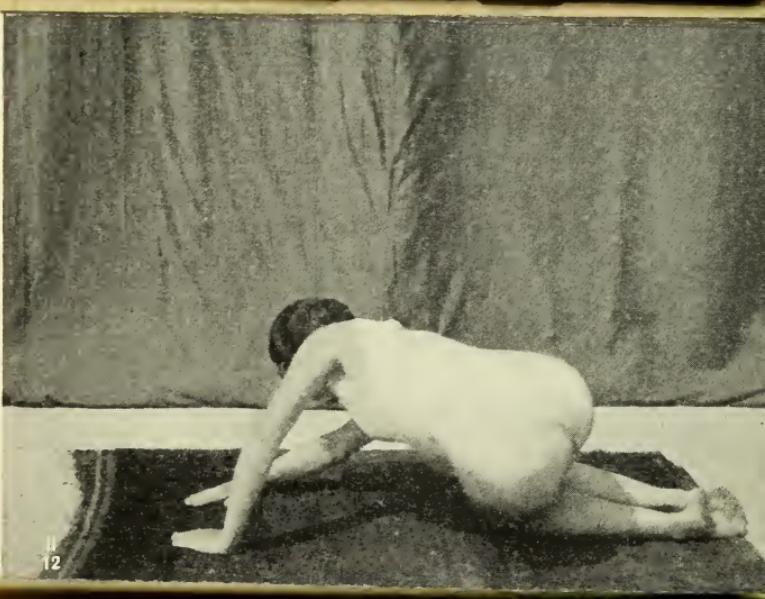
**FILM 1.**

LEG ROTATION ON HANDS AND KNEES (*Beginning of Third Phase*).

The left leg begins its return movement to first attitude. It appears less foreshortened, that is, longer.



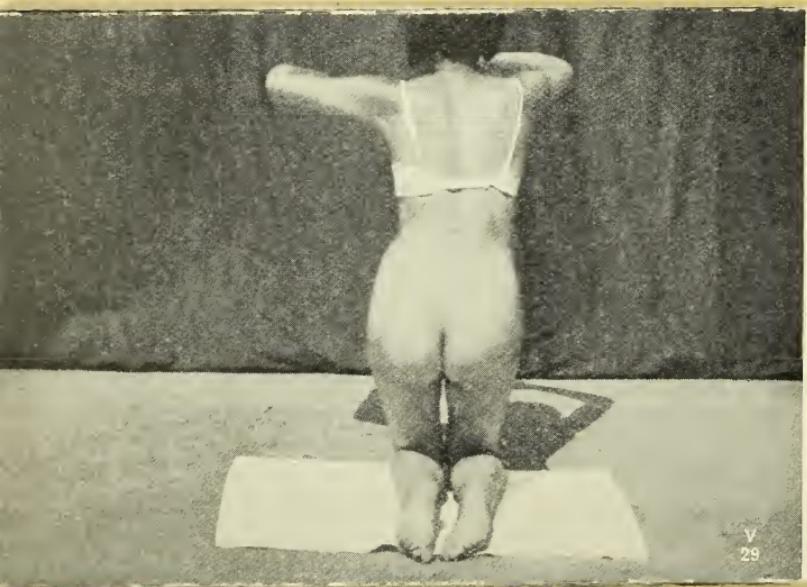
12



12



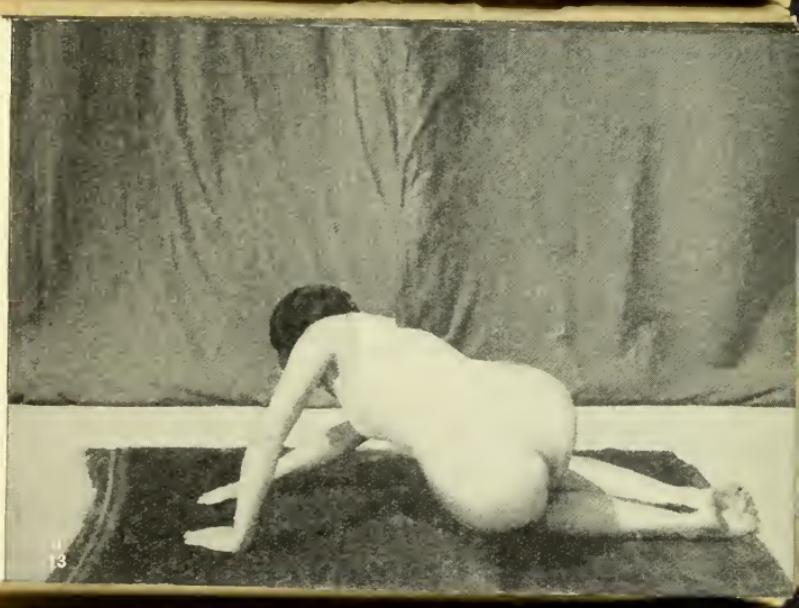
12



FILM 5.

SQUATTING  
OR CROUCH-  
ING SWING  
(Seventh Phase).

The pelvis is  
lifted towards  
the left down-  
wards.



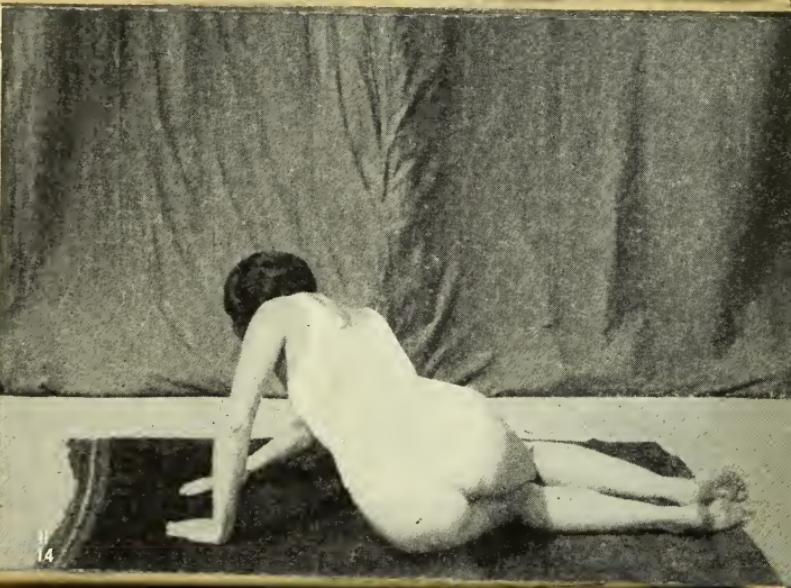


FILM 5.  
SQUATTING  
OR CROUCH-  
ING SWING  
(Sixth Phase).

The pelvis has  
again reached its  
maximum point  
above the heels.



14



14

**FILM 2.**

PELVIC ROTATION IN  
THE HANDS-  
AND-KNEES  
ATTITUDE  
(End of Second  
Phase).

The left hip  
rests on the  
ground. The  
knees remain  
stationary.



14

FILM 4.

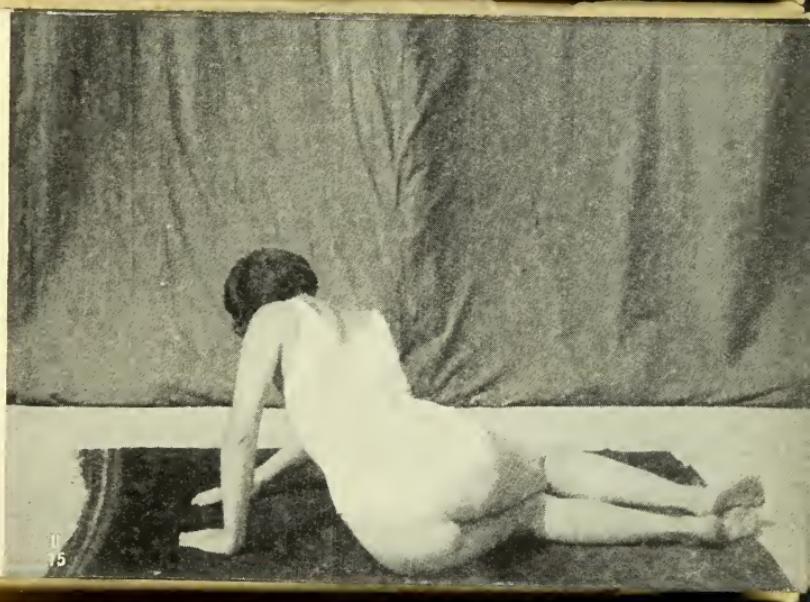
M A J O R  
P E L V I C  
R O T A T I O N :  
R E C U M B E N T  
W I T H R A I S E D  
K N E E S (S e c o n d  
P h a s e).

Let the pelvis  
move slowly  
downwards and  
to the right.





15



15



III  
15





### FILM 3.

VERTICAL  
PELVIC ROTATION ON  
HANDS AND  
KNEES. "The  
Machine"  
Exercise (Second  
Phase).

The head and face are directly above the supporting hands. The back must not be pushed further forwards.



**FILM 6.**

PELVIC MOTION, BACKWARDS AND FORWARDS, IN THE KNEE-HEEL POSITION, WITH KNEES APART (Seventh Phase).

The pelvis is gradually dropped between the thighs on the floor.

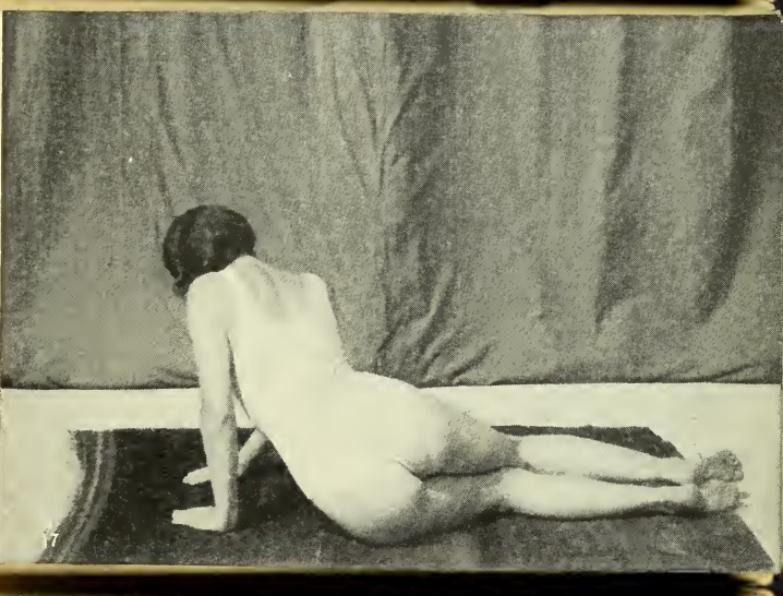
**FILM 1.**

LEG ROTATION ON HANDS AND KNEES (*End of Third Phase*).

The left leg has reached its maximum extension backwards.



17



17

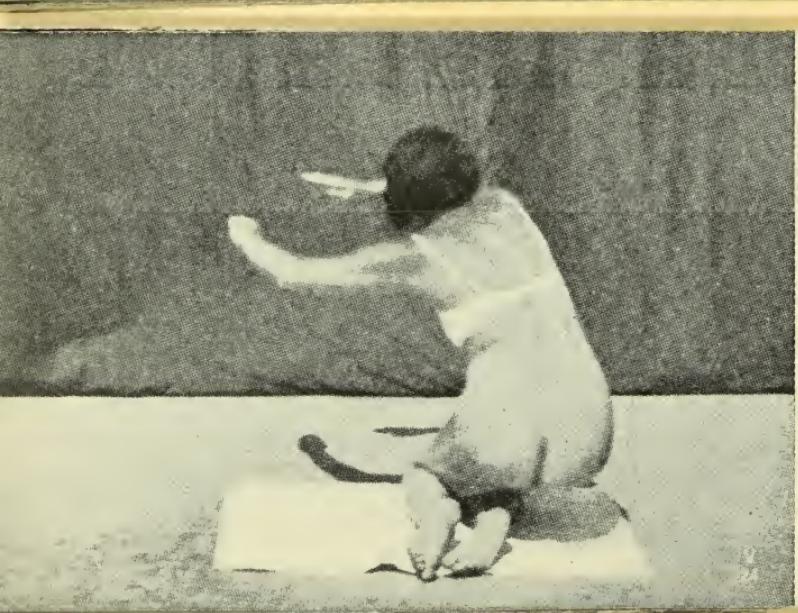
**FILM 3.**

VERTICAL PELVIC ROTATION ON HANDS AND KNEES. "The M a c h i n e" Exercise (*Third Phase*).

Arch the lumbar vertebrae, draw the abdominal muscles tense and the pelvis backwards.



17



**FILM 1.**

LEG ROTATION ON HANDS AND KNEES (*Beginning of Fourth Phase*).

The left leg is drawn slowly up to the body from the hip joint.

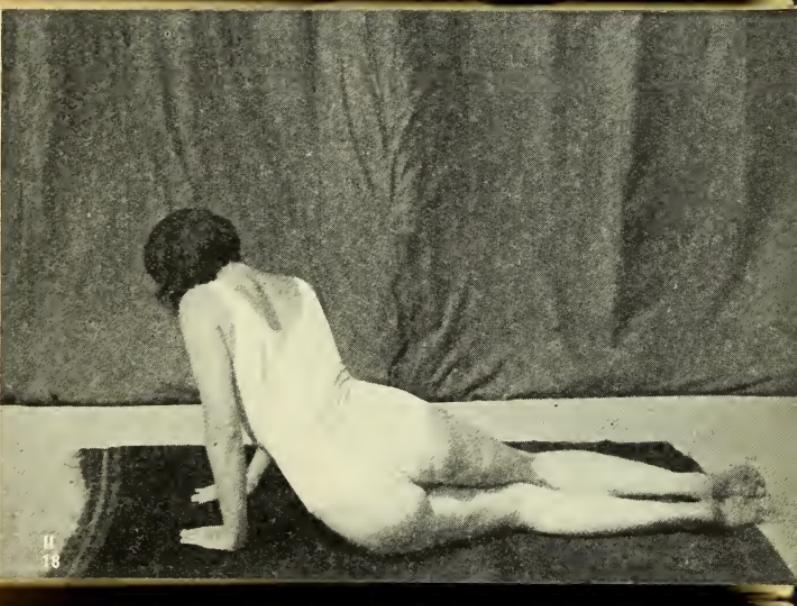


I  
18

**FILM 2.**

PELVIC ROTATION IN THE HANDS-AND-KNEES ATTITUDE (*Beginning of Third Phase*).

The pelvis is drawn forwards.



II  
18



III  
18



V  
23



V  
23



V  
23



FILM 4.

M A J O R  
P E L V I C  
R O T A T I O N :  
R E C U M B E N T ,  
W I T H R A I S E D  
K N E E S (S i x t h  
*P h a s e*).

The pelvis has reached the highest point of its orbit as in the first phase. The exercise continues, as in the phases from 2 to 6.



**FILM 1.**

LEG ROTATION ON HANDS AND KNEES (*End of Fourth Phase*).

The left leg is back in the original posture — hands and knees.



20



20

**FILM 3.**

VERTICAL PELVIC ROTATION ON HANDS AND KNEES. "The Machine" Exercise (*Fourth Phase*).

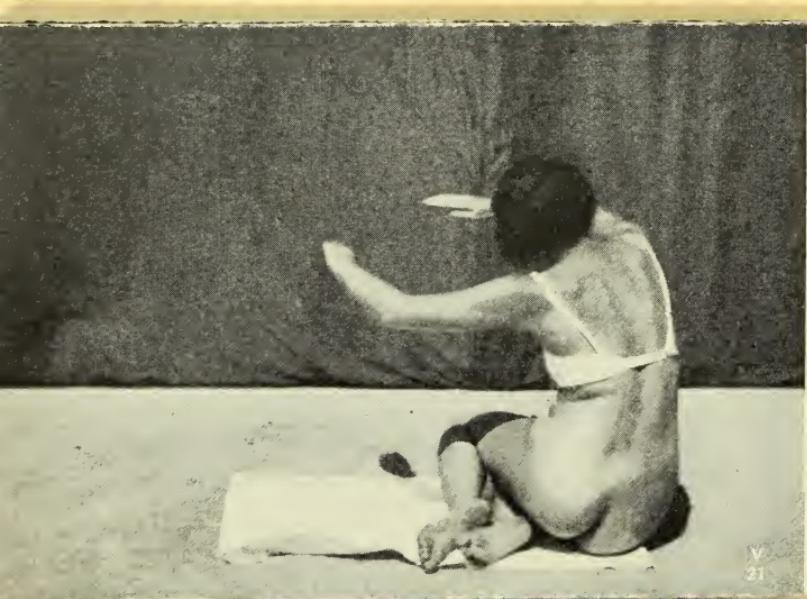
The lumbar vertebrae have reached their maximum arch upwards and the abdomen its extreme tension.



20



V  
21



V  
21



VI  
21

**FILM 5.**

SQUATTING  
OR CROUCH-  
ING SWING  
(Fifth Phase).

The pelvis is  
being lifted to-  
wards the left,  
clear over the  
heels.





IV  
20



V  
20



VI  
20

**FILM 5.**  
**SQUATTING OR CROUCHING SWING (Fourth Phase).**  
The pelvis touches the floor.

**FILM 6.**  
**PELVIC MOTION, BACKWARDS AND FORWARDS, IN THE KNEE-HEEL POSITION, WITH KNEES APART (Sixth Phase).**

The lumbar vertebrae are arched outwards and the abdominal muscles drawn tense.

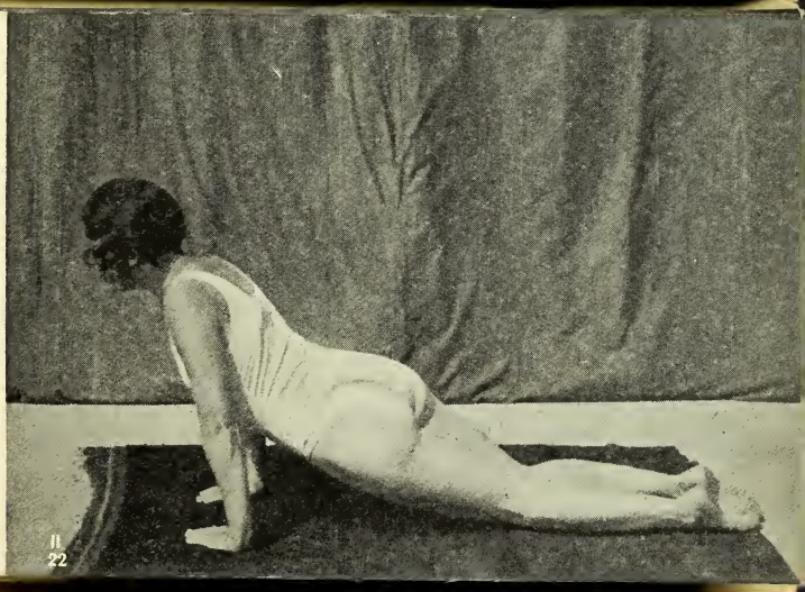
**FILM 1.**

LEG ROTATION IN HANDS-AND-KNEES ATTITUDE (*Beginning of Fifth Phase*).

Stretch the right leg from the hip joint slowly backwards. Keep the knee as tense and straight as possible.



I  
22



II  
22



III  
22

**FILM 4.**

M A J O R  
P E L V I C  
R O T A T I O N:  
R E C U M B E N T,  
W I T H R A I S E D  
K N E E S (F i f t h  
P h a s e).

The pelvis moves upwards and to the left.







### FILM 1.

LEG ROTATION IN HANDS-AND-KNEES ATTITUDE (End of Fifth Phase).

The right leg is at maximum extension backwards and simultaneously raised as far as possible off the ground. In the illustration, the leg is shown in perspective.

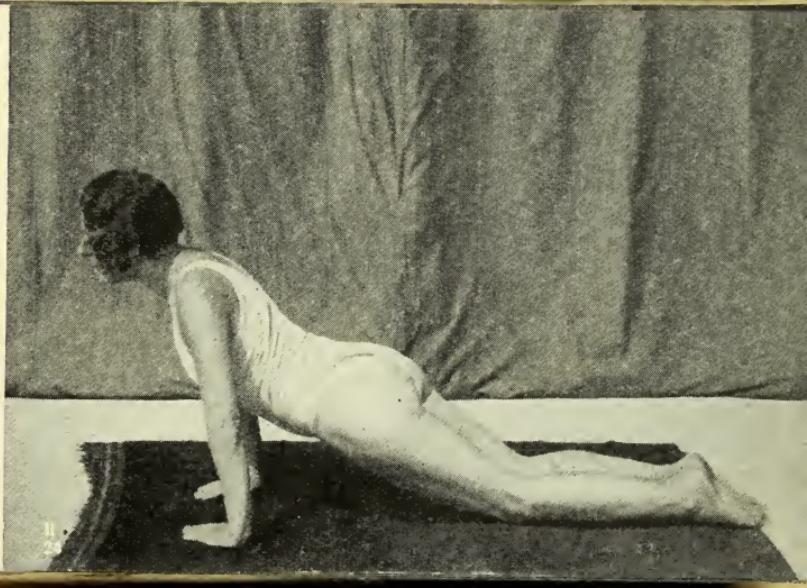


J  
24

### FILM 2.

PELVIC ROTATION IN THE HANDS-AND-KNEES ATTITUDE (End of Third Phase).

The pelvis has been drawn forwards to the fullest extent.



III  
24

### FILM 3.

VERTICAL PELVIC ROTATION ON HANDS AND KNEES. "The Machine" Exercise (Fifth Phase).

The pelvis is drawn back again to the level of the heels and the exercise begins anew from the first phase.

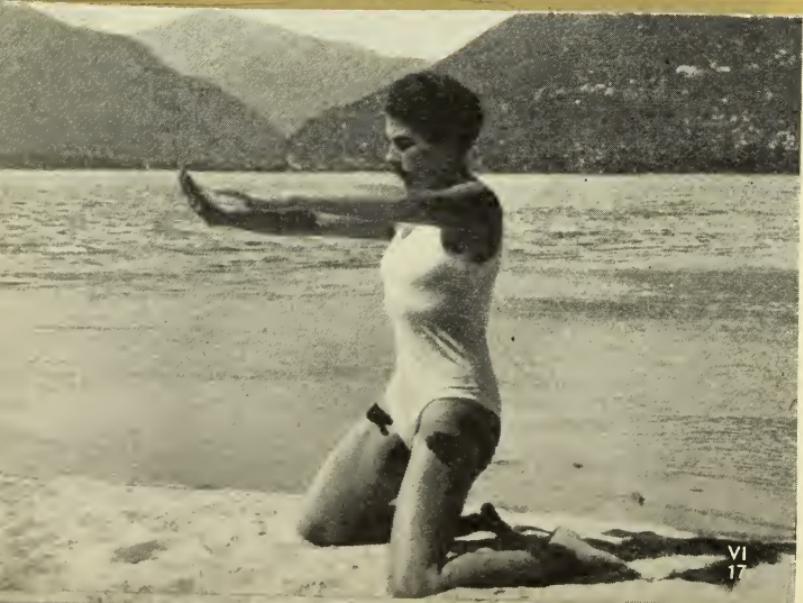


III  
24

**FILM 4.**

M A J O R  
P E L V I C  
R O T A T I O N :  
R E C U M B E N T ,  
W I T H R A I S E D  
K N E E S (F o u r t h  
P h a s e).

The pelvis de-  
scribes a semi-  
circle above  
the floor from right  
to left.



**FILM 6.**

P E L V I C  
M O T I O N ,  
B A C K W A R D S  
A N D F O R -  
W A R D S , I N  
T H E ' K N E E -  
H E E L P O S I -  
T I O N , W I T H  
K N E E S A P A R T  
(F i f t h P h a s e).

The pelvis is  
drawn back-  
wards moving  
from the but-  
tocks.

**FILM 1.**

LEG ROTATION IN HANDS-AND-KNEES ATTITUDE (*Beginning of Sixth Phase*).

The right leg is rotated slowly outwards as the hip joint is raised.



25

**FILM 2.**

PELVIC ROTATION IN THE HANDS-AND-KNEES ATTITUDE (*Beginning of Fourth Phase*).

The pelvis is drawn downwards and to the right.



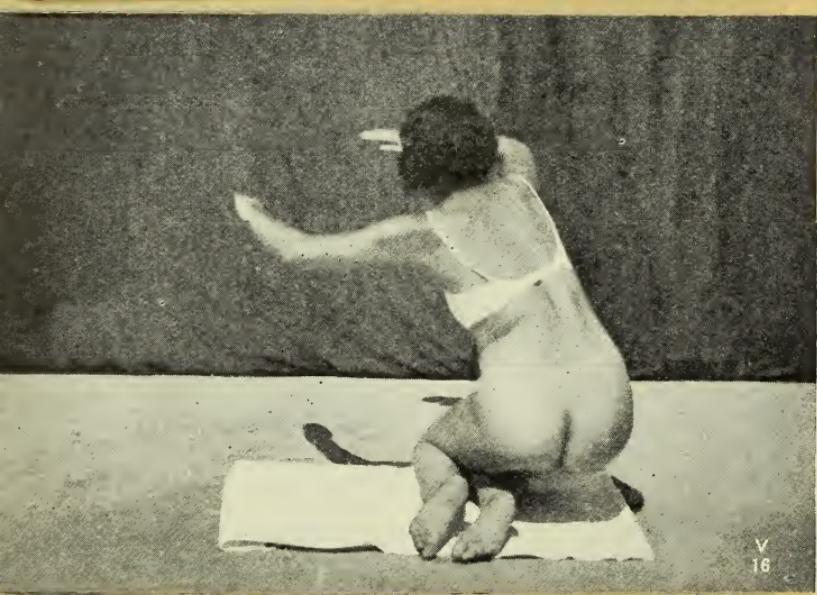
25

III  
25





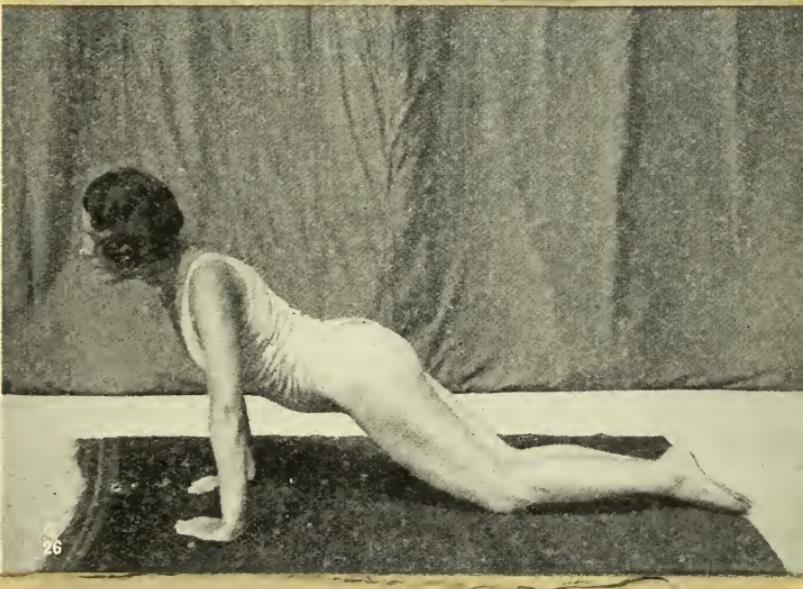
V  
A  
16



V  
16



VI  
16





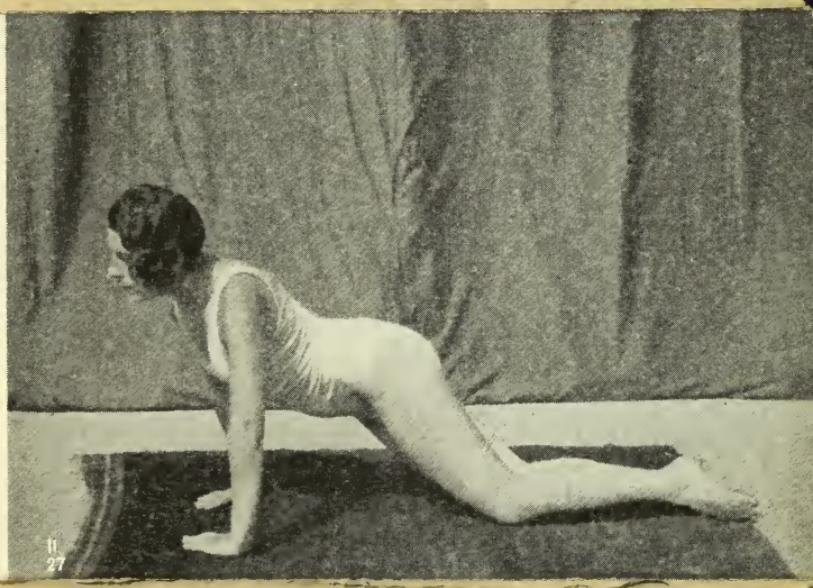
**FILM 6.**

PELVIC MOTION, BACKWARDS AND FORWARDS, IN THE KNEE-HEEL POSITION, WITH KNEES APART (Fourth Phase).

The trunk is now from knee to shoulder completely stretched.



1  
27



II  
27



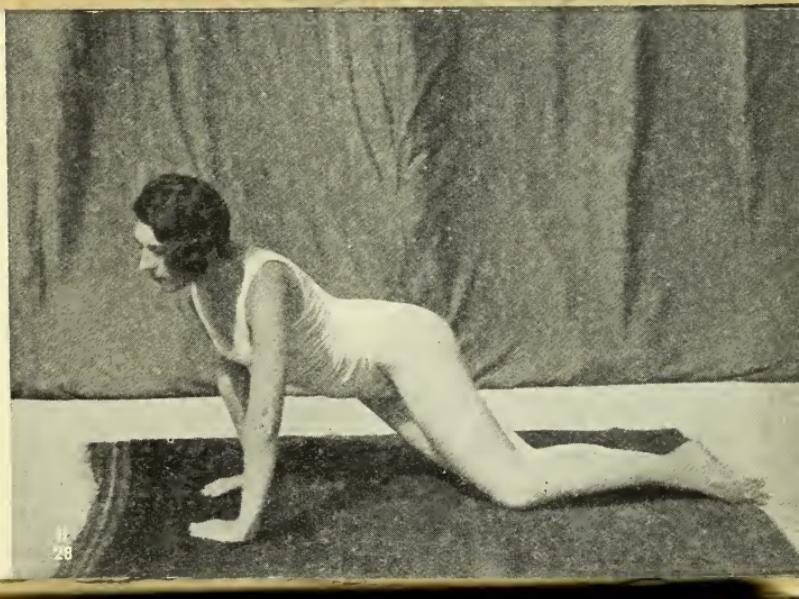
III  
27

### FILM 3.

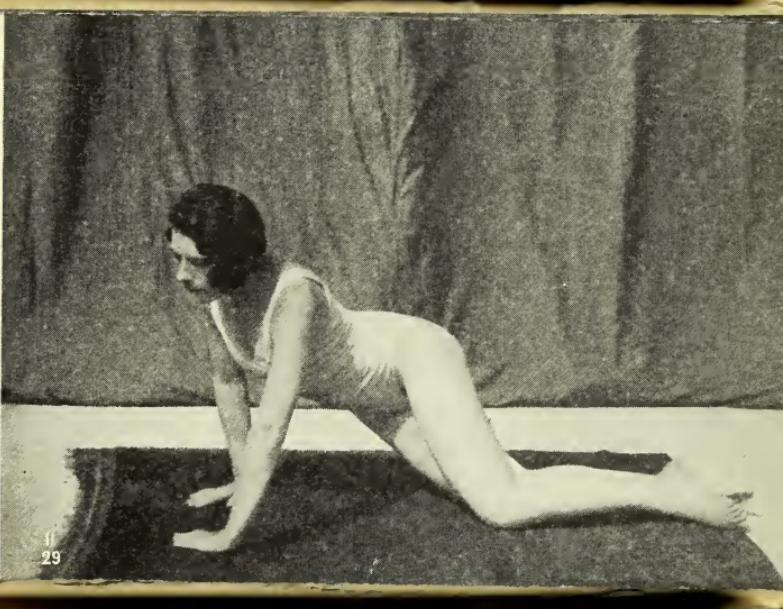
VERTICAL  
PELVIC ROTATION ON  
HANDS AND KNEES. "The  
Machine" Exercise (First  
Phase).

Stretch the  
back fully and  
thrust the body  
forwards, keep-  
ing the face near  
the ground.





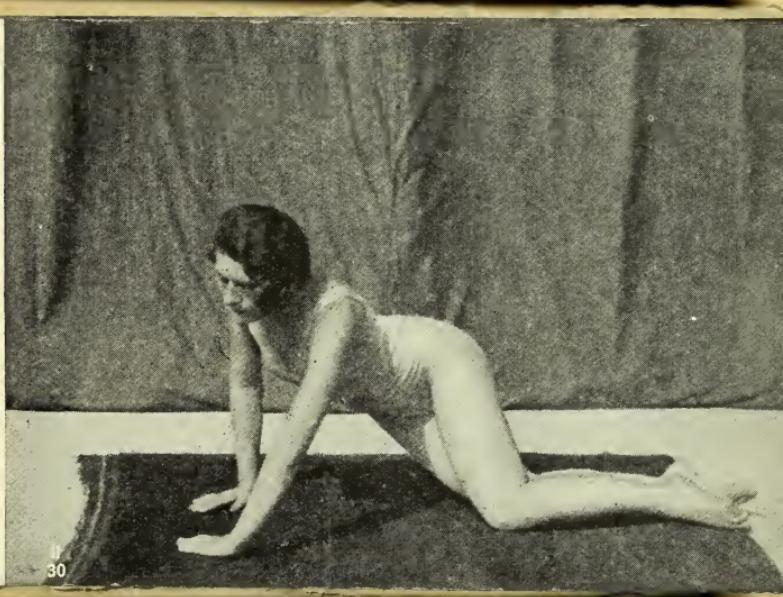








I  
30



II  
30

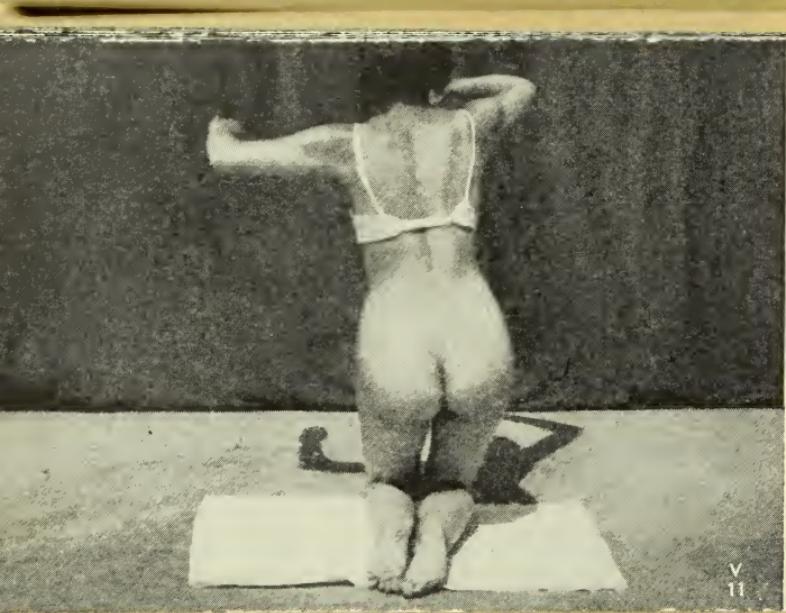


III  
30

### FILM 3.

VERTICAL  
PELVIC ROTATION ON  
HANDS AND  
KNEES. "The  
*Mache*"  
Exercise (Second  
Phase).

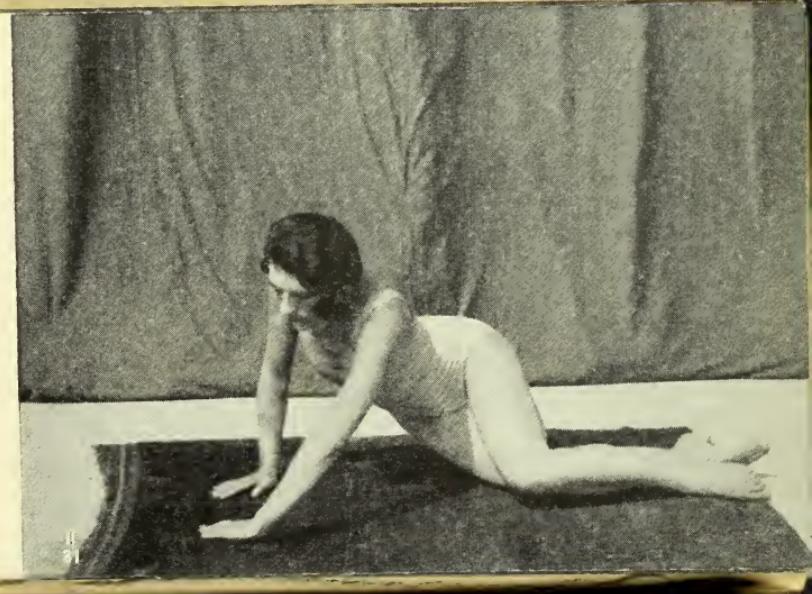
The head and face are directly above the supporting hands. The back must not be pushed further forwards.



**FILM 5.**

SQUATTING  
OR CROUCH-  
ING SWING  
(Third Phase).

The pelvis moves  
to the right side  
downwards.



### FILM 3.

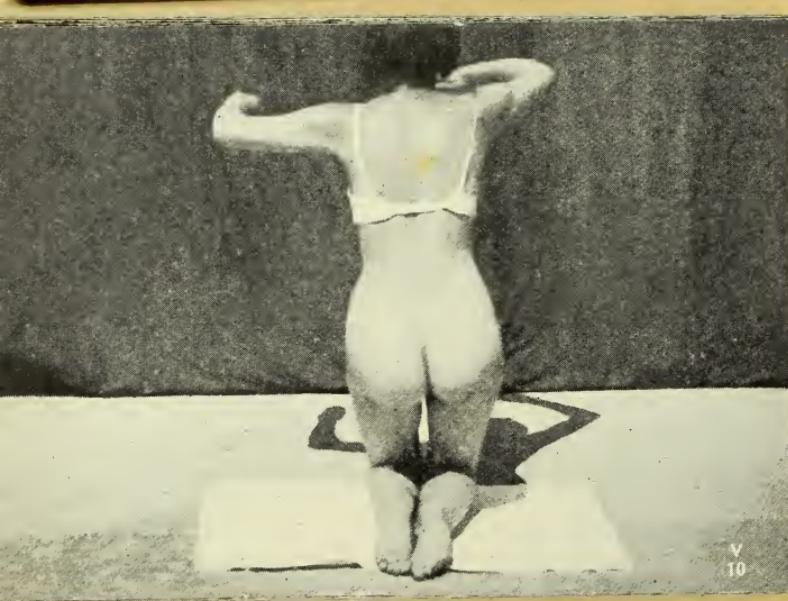
VERTICAL  
PELVIC ROTATION ON  
HANDS AND KNEES. "The  
*M a c h i n e*"  
Exercise (Third  
Phase).

Arch the lumbar vertebrae, draw the abdominal muscles tense and the pelvis backwards.

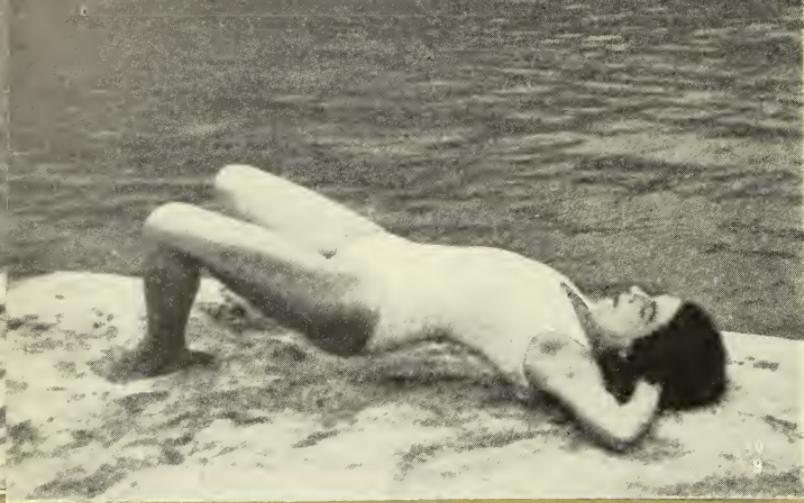
**FILM 4.**

M A J O R  
P E L V I C  
R O T A T I O N ;  
R E C U M B E N T ,  
W I T H R A I S E D  
K N E E S ( *T h i r d*  
*P h a s e* ).

The buttocks  
touch the floor  
on the right side.







**FILM 5.**

**SQUATTING  
OR CROUCH-  
ING SWING  
(Second Phase).**

The pelvis has reached its maximum point direct above the heels. Note the distance between the buttocks and the heels.

**FILM 1.**  
LEG ROTATION IN  
HANDS-AND-KNEES ATTITUDE (End of Sixth Phase).

The right leg has reached the maximum point of its circular outward movement and the tip of the toes is at furthest from the floor. The leg is pointed straight away from the spectator and is, therefore, much fore-shortened in perspective.



33

**FILM 2.**  
PELVIC ROTATION IN  
THE HANDS-  
AND-KNEES ATTITUDE  
(End of Fourth Phase).

The right hip rests on the ground. The knees remain stationary in the original position.



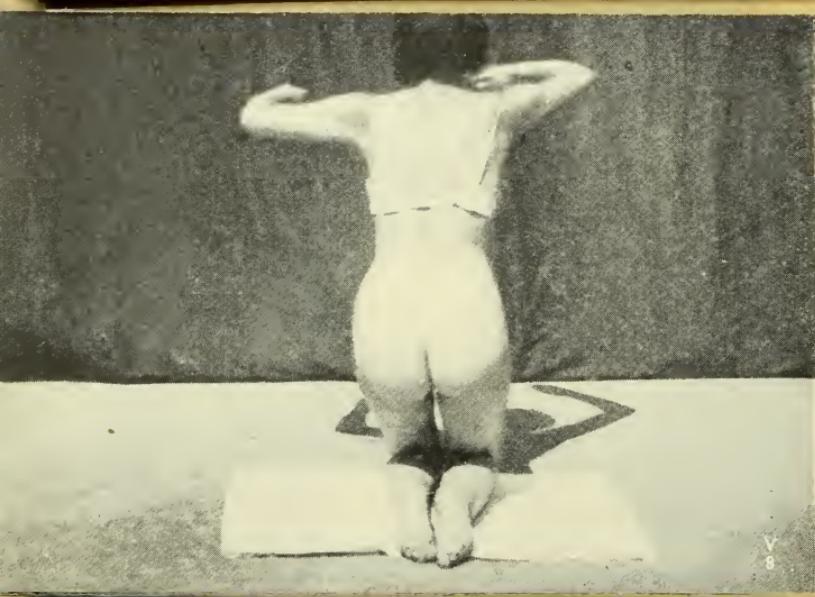
33

**FILM 3.**  
VERTICAL  
PELVIC ROTATION  
ON HANDS AND  
KNEES. "The  
Machine"  
Exercise (Fourth  
Phase).

The lumbar vertebrae have reached their maximum arch upwards and the abdomen its extreme tension.



33



**FILM 1.**

LEG ROTATION ON HANDS AND KNEES (*Beginning of Seventh Phase*).

The right leg begins its return movement to the first attitude. The lifted hip is particularly well shown in this picture.



34

**FILM 2.**

PELVIC ROTATION IN THE HANDS-AND-KNEES ATTITUDE (*Beginning of Fifth Phase*).

The pelvis is drawn backwards again.



34



III  
34

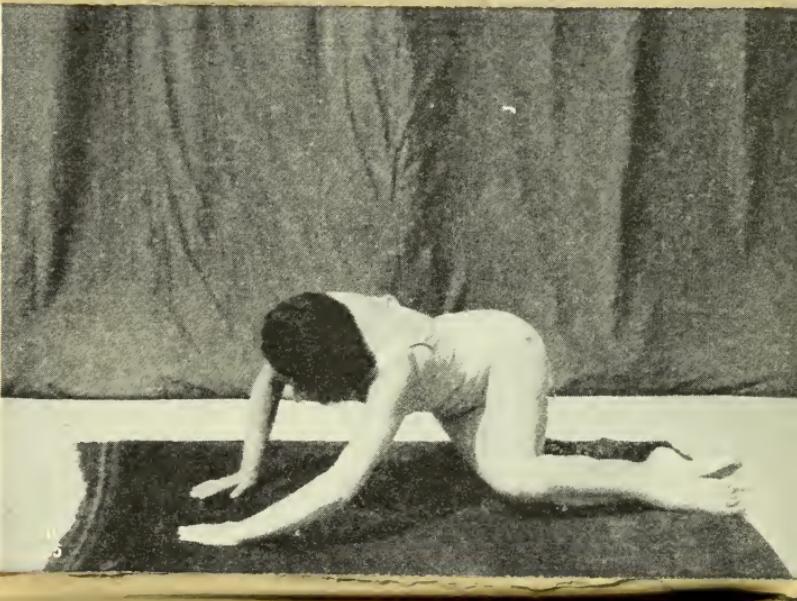


M  
7



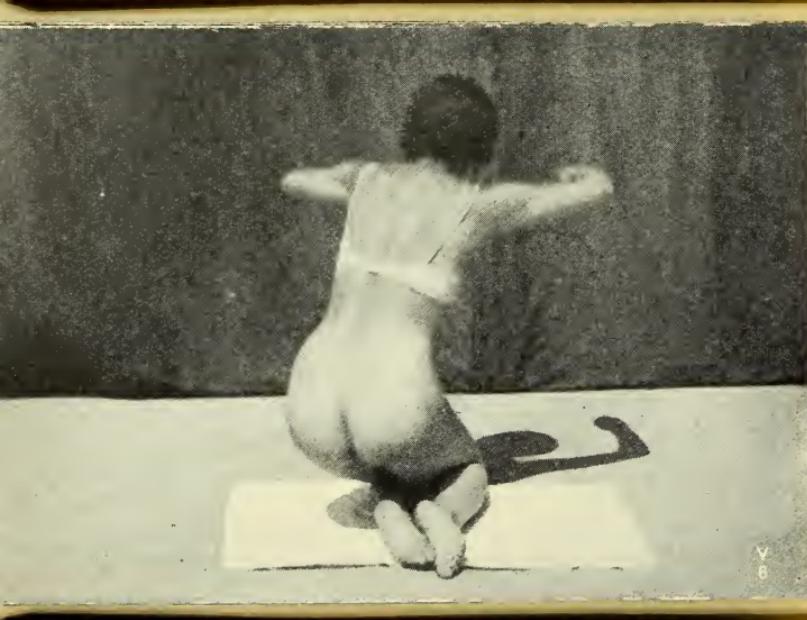
V  
7







IV  
6



V  
8



#### FILM 6.

PELVIC MOTION, BACKWARDS AND FORWARDS, IN THE KNEE-HEEL POSITION WITH KNEES APART  
*(Third Phase).*

The groin is lifted more and more, but the upper part of the body remains as erect as possible.

FILM 1.

LEG ROTATION ON HANDS AND KNEES (End of Seventh Phase).

The right leg has reached its maximum extension backwards.



I  
36



II  
36

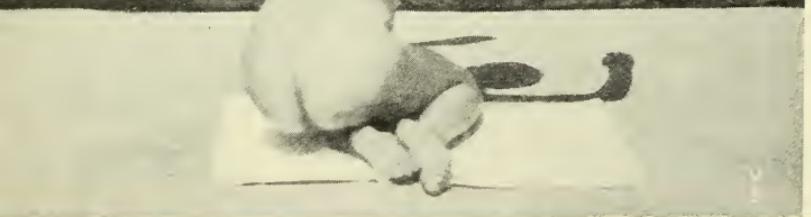


III  
36

FILM 4.

M A J O R  
P E L V I C  
R O T A T I O N :  
R E C U M B E N T ,  
W I T H R A I S E D  
K N E E S (S e c o n d  
P h a s e).

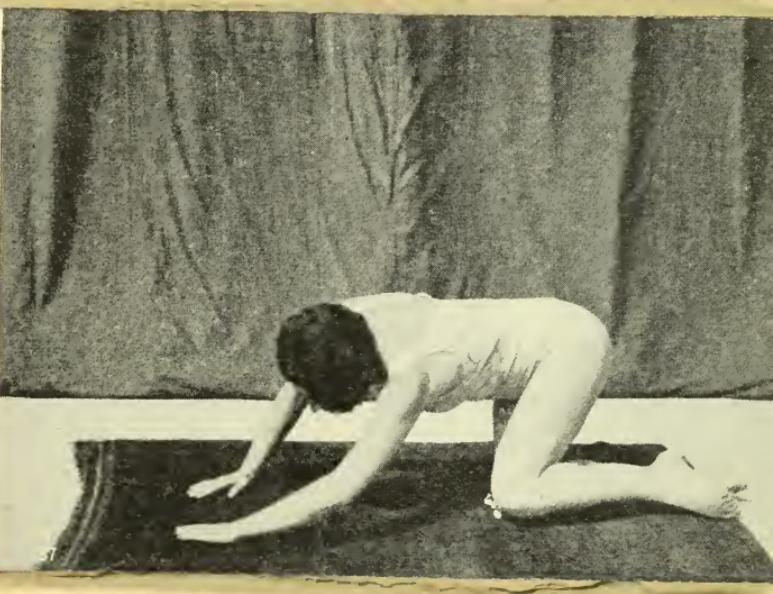
Let the pelvis  
move down-  
wards to the  
right.



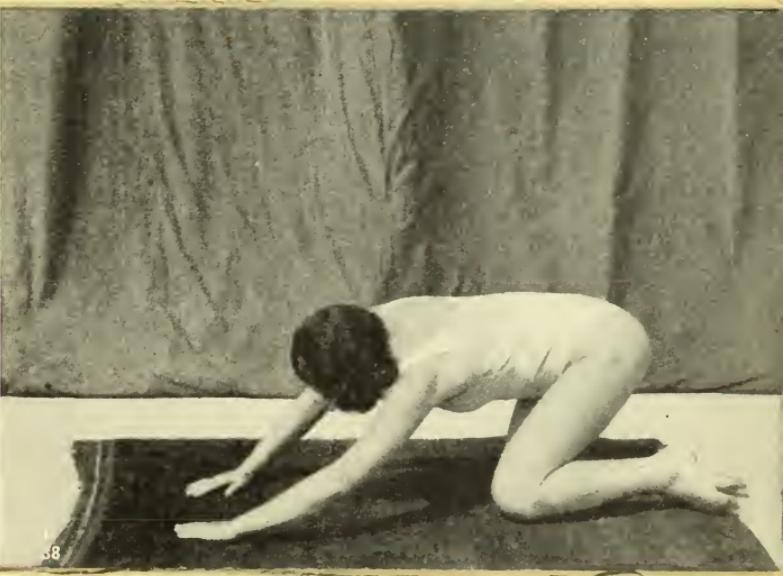
**FILM 1.**

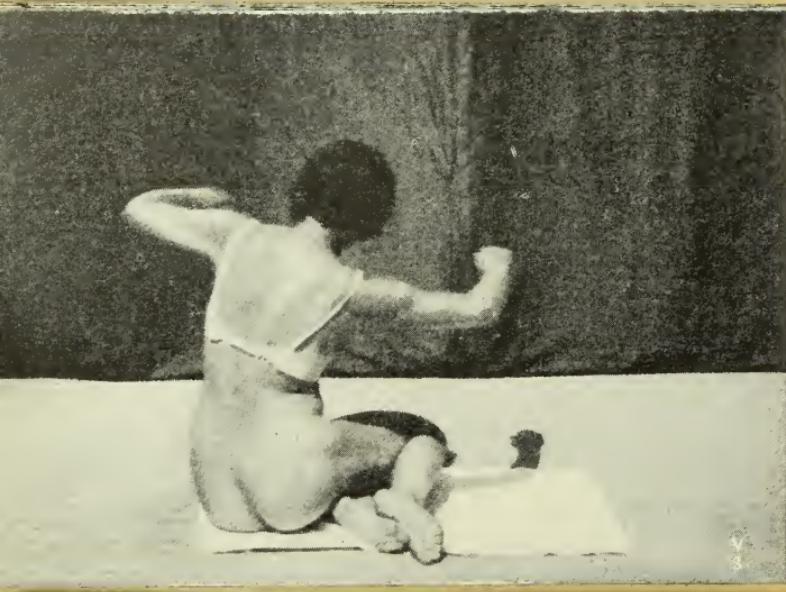
LEG ROTATION ON HANDS AND KNEES (*Beginning of Eighth Phase*).

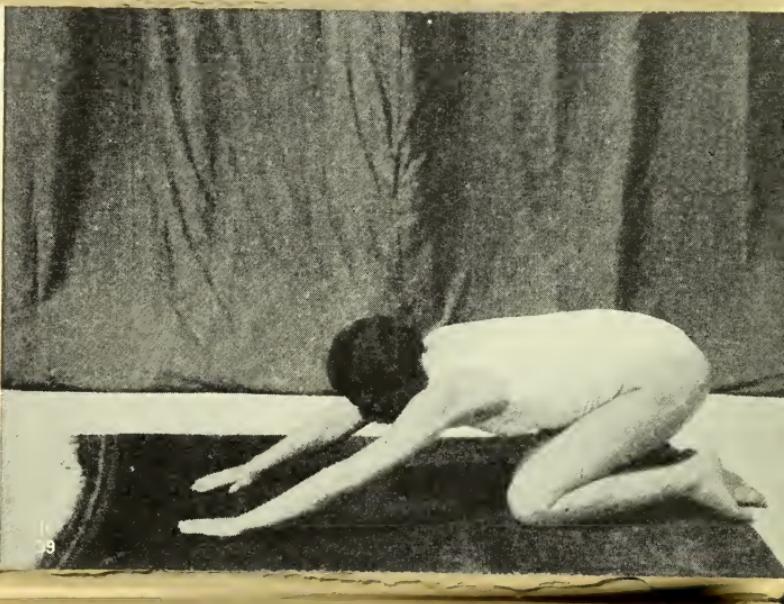
The right leg is drawn slowly up to the body from the hip joint. The correct position of the pelvis is particularly well shown here.











**FILM 4.**

M A J O R  
P E L V I C  
R O T A T I O N :  
R E C U M B E N T  
W I T H R A I S E D  
K N E E S (F i r s t  
Phase).

Raise the pelvis  
as far as possible  
from the floor or  
couch.



**FILM 6.**

P E L V I C  
M O T I O N  
B A C K W A R D S  
A N D F O R-  
W A R D S, I N  
T H E K N E E-  
H E E L P O S I-  
T I O N, W I T H  
(Second Phase).

E x e r t t h e  
m u s c l e s o f a b d o-  
m e n and b u t-  
t o c k s, a n d l i f t u p-  
w a r d s t h e p e l v i s,  
m o v i n g f r o m t h e  
g r o i n .

### FILM 1.

LEG ROTATION ON HANDS AND KNEES (End of Eighth Phase).

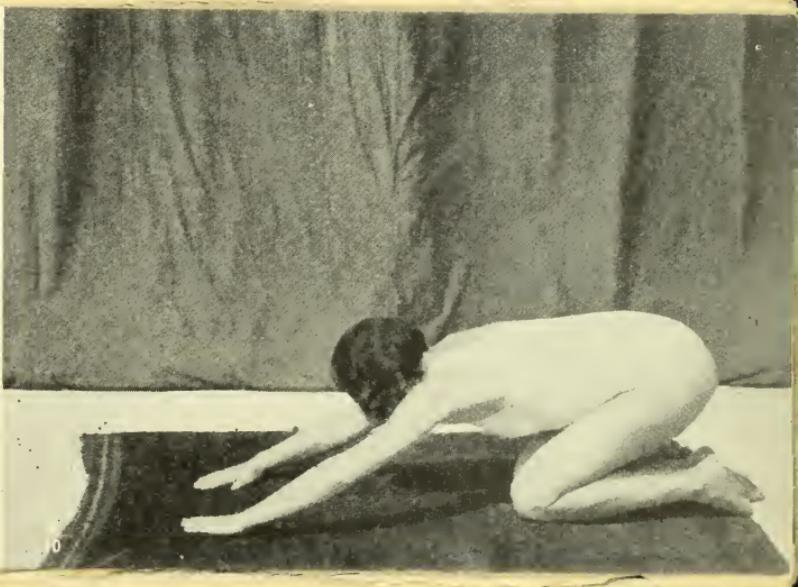
The right leg is back in the original position. The exercise may now be repeated from the beginning.



### FILM 2.

PELVIC ROTATION IN THE HANDS-AND-KNEES ATTITUDE (End of Fifth Phase).

The pelvis has returned to its original position. The rotary movements begin anew.



### FILM 3.

VERTICAL PELVIC ROTATION ON HANDS AND KNEES. "The Machiné" Exercise (Fifth Phase).

The pelvis is drawn back again to the level of the heels and the exercise begins anew from the first phase.



**FILM 4.**

M A J O R  
P E L V I C  
R O T A T I O N  
I N  
R E C U M B E N T  
A T T I T U D E .

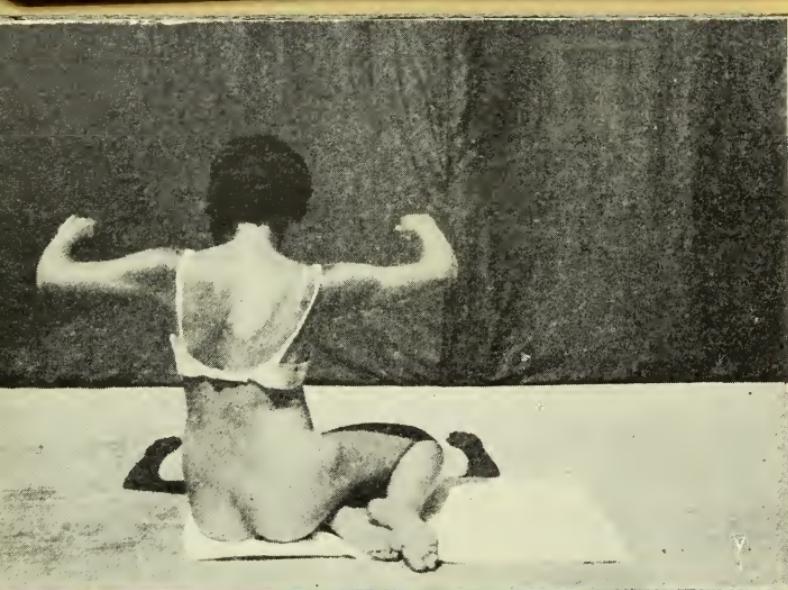
Initial position:  
on back with  
raised knees.



**FILM 5.**

S Q U A T T I N G  
O R C R O U C H I N G  
S W I N G  
(First Phase).

The pelvis resting on the left by the side of the thighs is being lifted clear of the heels.



**FILM 6.**

P E L V I C  
M O T I O N,  
B A C K W A R D S,  
A N D F O R  
W A R D S,  
I N T H E K N E E  
- H E E L P O S I  
T I O N , W I T H  
K N E E S A P A R T  
(First Phase).

The pelvis still rests between the thighs on the floor, the vertebral column shows no exaggerated hollow of the loins.



## CINEMATOGRAPHIC SUPPLEMENT

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Films 1 to 12

---

To flicker Films 1, 2, 3, 7, 8 and 9,  
hold section in left hand and flick  
outer edge with right thumb.

To flicker Films 4, 5, 6, 10, 11 and  
12, hold section in right hand and  
flick outer edge with left thumb.



### FILM 7.

PELVIC MOTION FORWARDS, IN THE ACT OF WALKING (*First Phase*).

The right leg steps forward and the upper part of the body is slightly inclined forward with arched loins. The weight of the body rests equally on both feet.



### FILM 8.

PELVIC MOTION SIDEWAYS, WHILE WALKING (*First Phase*).

Initial position : Feet together. The pelvis is drawn to the left while the knees are slightly bent.



### FILM 9.

MINOR PELVIC ROTATION (HORIZONTAL) (*First Phase*).

Initial position. The pelvis begins a circular movement to the left.

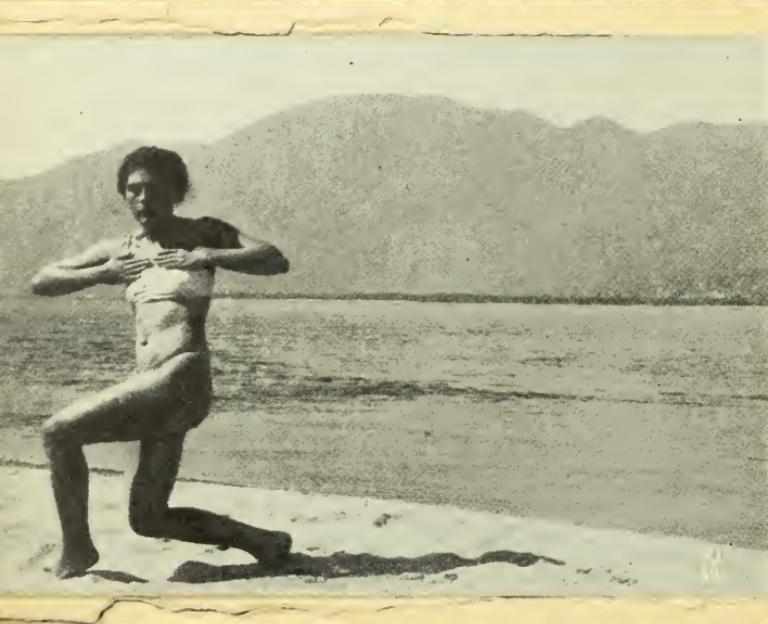




FILM 10.  
MAJOR  
PELVIC  
ROTATION  
(HORIZON-  
TAL).

The pelvis has  
returned to the  
initial position.  
The exercise  
begins anew.

X  
40



FILM 12.  
SUSPENSION-  
FLEXION  
(Tenth Phase).

The thighs come  
to rest over  
the edge of the table  
and part slowly  
as they relax.

XII  
40





**FILM 7.**

P E L V I C  
MOTION FOR-  
WARDS, IN  
THE ACT OF  
W A L K I N G  
(Second Phase).

The right hip is  
v i g o r o u s l y  
thrust forwards,  
while the whole  
p e l v i s i s  
slightly raised.





X  
38



XII  
38



VII  
4



VIII  
4



IX  
4



X  
37



**FILM 11.**  
PELVIC VER-  
SION WHILE  
WALKING  
(Twelfth Phase).

The left leg steps forward. The exercise has now reached its first phase and begins again anew.



XII  
37





X  
36



XII  
36

VB  
8VB  
6VB  
6**FILM 9.**

MINOR  
PELVIC  
ROTATION  
(HORIZONTAL)  
(Second  
Phase).

The knees are bent. The pelvis is as far as possible to the left.



X

35



XII

35



VII  
7



VIII  
7



**FILM 9.**

MINOR  
PELVIC  
ROTATION  
(HORIZON-  
TAL) (*Third  
Phase*).

The pelvis begins  
to move back-  
wards from the  
left.



FILM 10.

M A J O R  
P E L V I C  
R O T A T I O N  
(H O R I Z O N -  
T A L) (Seventh  
Phase).

The pelvis moves  
backwards.

X

34

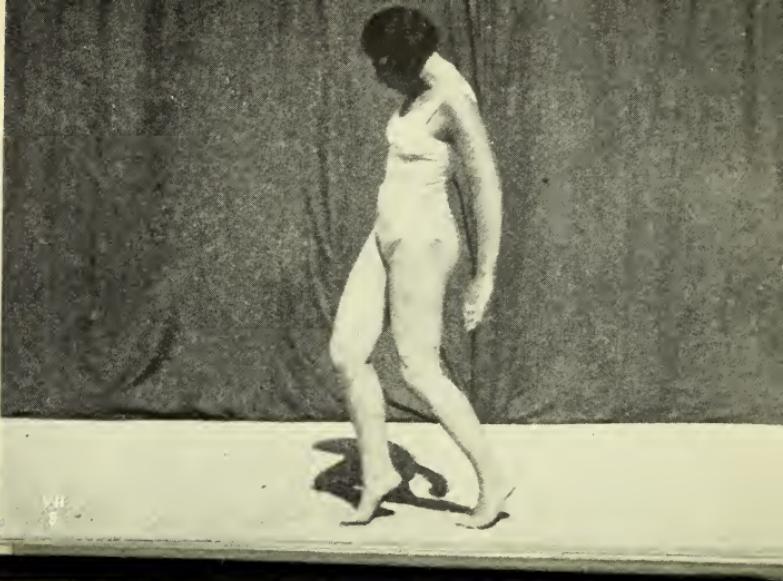


XI



XII

34





FILM 10.

M A J O R  
P E L V I C  
R O T A T I O N  
(H O R I Z O N -  
T A L)  
*(Sixth  
Phase).*

The pelvis is as  
far as possible  
to the left.

X  
33



XII  
33

**FILM 7.**

P E L V I C  
MOTION FOR-  
W A R D S,  
W H I L E  
W A L K I N G  
*(Third Phase).*

The pelvis has now been drawn forward as far as possible and the right hip raised. The upper part of the body is quite erect.



**FILM 8.**

P E L V I C  
MOTION  
S I D E W A Y S,  
W H I L E  
W A L K I N G  
*(Second Phase).*

The pelvis is as far to the left as possible.



**FILM 9.**

P E L V I C  
MOTION FOR-  
W A R D S,  
W H I L E  
W A L K I N G  
*(First Phase).*





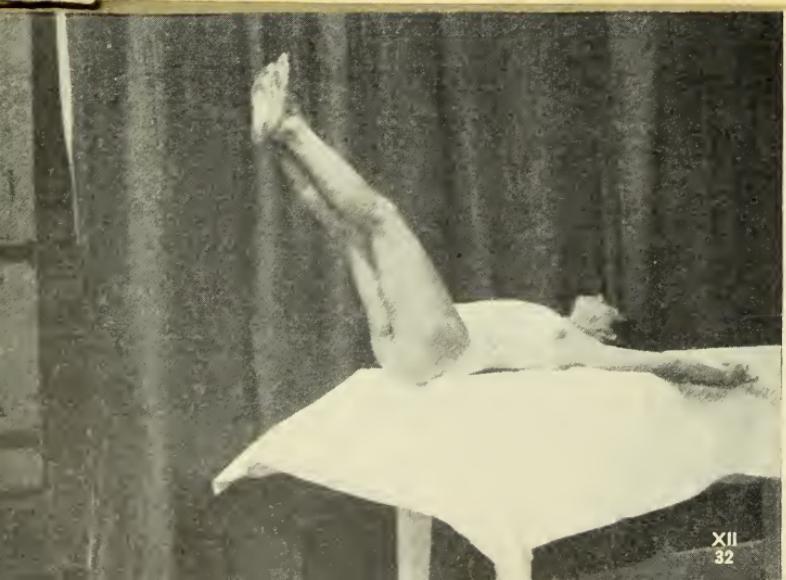
X  
32



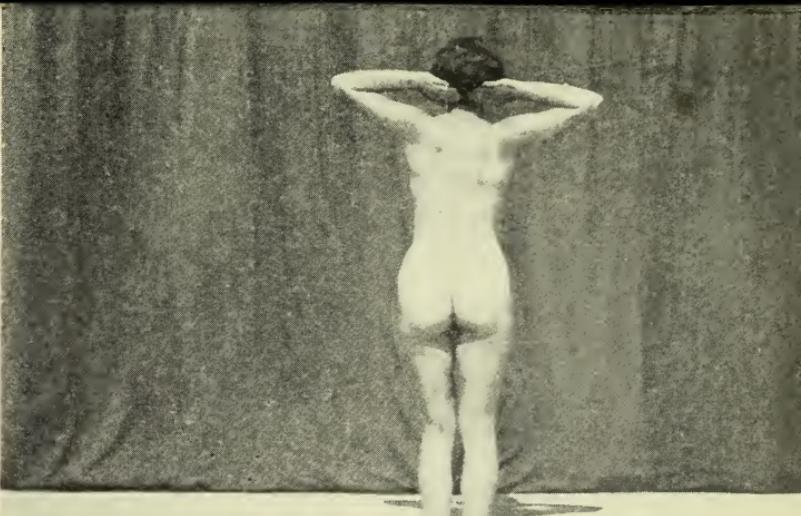
**FILM 11.**

PELVIC VER-  
SION WHILE  
WALKING  
(Eleventh Phase).

The right leg is  
stretched  
almost straight,  
the left leg is  
drawn forwards.



XII  
32



**FILM 8.**

PELVIC  
MOTION  
SIDEWAYS,  
WHILE  
WALKING  
(Third Phase).

The right leg is  
crossed over the  
left and steps  
forward.

**FILM 10.**

MAJOR  
PELVIC  
ROTATION  
(HORIZON-  
TAL) *(Final  
Phase)*.

The pelvis moves  
sideways to the  
left and back-  
wards.

X  
31



XII  
31



VII  
11



VIII  
11



IX  
11

**FILM 9.**

MINOR  
PELVIC  
ROTATION  
(HORIZONTAL)  
(Fourth  
Phase).

The pelvis is at  
the furthest back-  
ward point of its  
orbit. The knees  
are still bent.

**FILM 10.**

M A J O R  
P E L V I C  
R O T A T I O N  
(H O R I Z O N -  
T A L) (Fourth  
*Phase*).

The pelvis is as  
far forward as  
possible.



**FILM 12.**

S U S P E N S I O N -  
F L E X I O N  
(Ninth Phase).

The legs,  
stretched to full  
length, are  
slowly lowered.

**FILM 7.**

PELVIC  
MOTION FOR-  
WARD S,  
W H I L E  
W A L K I N G  
(Fourth Phase).

The weight of  
the body is  
transferred  
to the right leg,  
which is in ad-  
vance, and the  
position of the  
pelvis changes  
accordingly.



**FILM 9.**

M I N O R  
PELVIC  
ROTATION  
(HORIZON-  
TAL) (Fifth  
Phase).

The pelvis begins  
to move to the  
right.





X  
29



XI



XII  
29

**FILM 11.**  
**PELVIC VER-**  
**SION WHILE**  
**WALKING**  
*(Tenth Phase).*

The legs begin to stretch themselves slowly again, while the pelvis is raised from the sitting posture and slowly turned towards its initial posture (first phase).





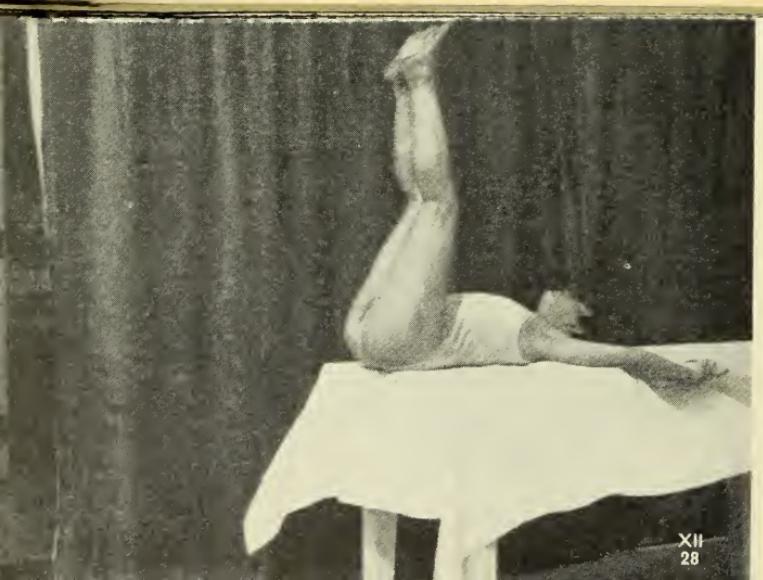
FILM 10.  
MAJOR  
PELVIC  
ROTATION  
(HORIZONTAL)  
(Third  
Phase).

The muscles of  
the groin are  
drawn tense.  
The pelvis con-  
tinues the cir-  
cular movement  
forwards.

X  
28



XI



XII  
28





FILM 10.  
MAJOR  
PELVIC  
ROTATION  
(HORIZON-  
TAL) (Second  
Phase).

The pelvis is as  
far as possible to  
the right.

X  
27



XI  
27



XII  
27

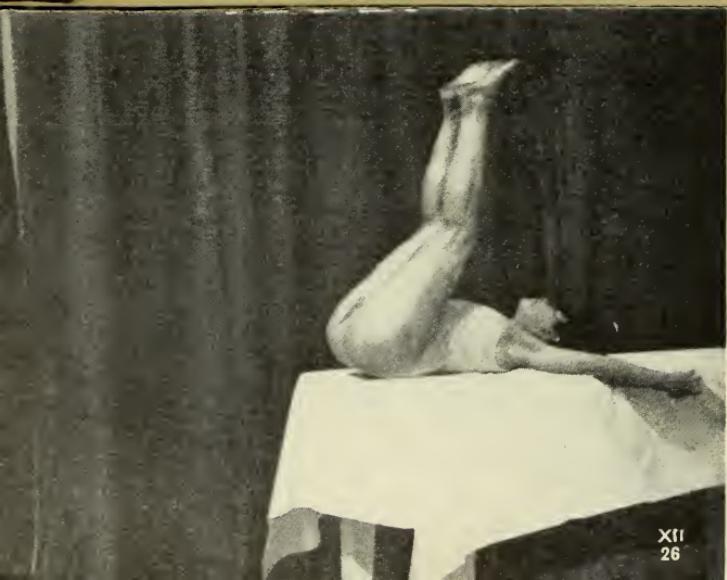




X  
26



XI



XII  
26

**FILM 12.**  
**SUSPENSION-**  
**FLEXION**  
*(Eighth Phase).*

The legs are  
slowly drawn  
together and  
stretched to full  
length.



FILM 8.

PELVIC  
MOTION  
SIDeways,  
WHILE  
WALKING  
(Fourth Phase).

The left leg follows the right to the initial position.





X  
25



XI

**FILM 11.**  
**PELVIC VER-**  
**SION WHILE**  
**WALKING**  
*(Ninth Phase).*

The knees are now half-way bent, the pelvis has turned as far as possible to the left, the arms are level with the knees.



XII  
25



**FILM 9.**

M I N O R  
P E L V I C  
R O T A T I O N  
(H O R I Z O N-  
T A L) (Sixth  
*Phase*).

The pelvis is as  
far as possible to  
the right.



**FILM 12.**  
SUSPENSION-  
FLEXION  
(Seventh Phase).

The legs are released,  
the hands again grip  
the table edges.



**FILM 9.**

MINOR  
PELVIC  
ROTATION  
(HORIZONTAL)  
*(Seventh Phase).*

The pelvis moves forward.



X

23



XI



XII

23

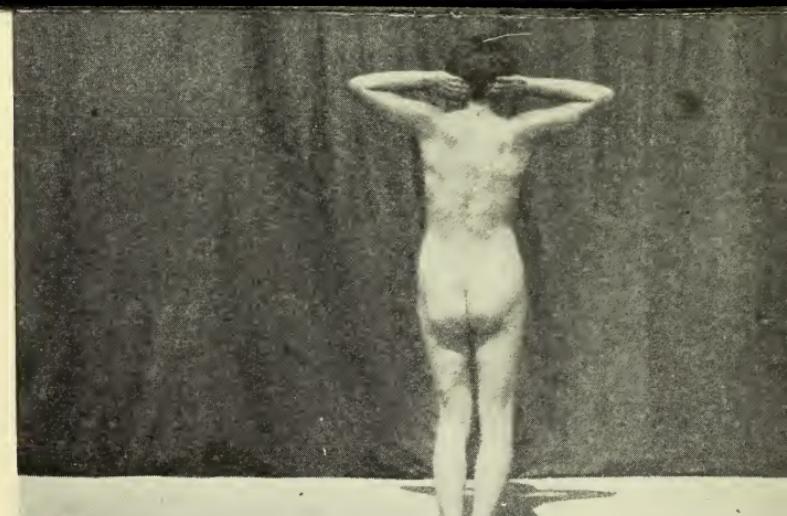
**FILM 7.**

PELVIC  
MOTION FOR-  
WARD S ,  
W H I L E  
WALKING  
(Fifth Phase).

While the body's weight is supported by the right foot and leg, the left is advanced.







**FILM 8.**

PELVIC  
MOTION  
SIDEWAYS,  
WHILE  
WALKING  
*(First Phase).*

Initial position.  
The pelvis is  
drawn to the  
left, while the  
knees are  
slightly bent.

**FILM 10.**

M A J O R  
P E L V I C  
R O T A T I O N  
(H O R I Z O N-  
T A L)      (*First  
Phase*).

Second main position: standing, feet sideways. The knees and groin are thrust forward, and a circular movement to the right begins.

X  
21XI  
21**FILM 12.**

S U S P E N S I O N -  
F L E X I O N  
(*Sixth Phase*).

The woman has grasped her legs and draws them as close to the body as possible at full stretch. Flexion is modified to the "Scissors" attitude of the pelvis.

XII  
21

**FILM 7.**

PELVIC  
MOTION FOR-  
W A R D S,  
W H I L E  
WALKING  
(Sixth Phase).

The left leg is  
now advanced  
and the exercise  
begins anew, as  
from phase I  
above.



**FILM 9.**

M I N O R  
PELVIC  
ROTATION  
(HORI-  
ZON-  
TAL) (Eighth  
Phase).

Return to initial  
position. The  
exercise begins  
anew.





FILM 10.

M A J O R  
P E L V I C  
R O T A T I O N  
(HORI-  
ZON-  
TAL) (Eighth  
Phase).

The pelvis has  
returned to the  
initial position.  
The exercise  
begins anew.

X  
20



FILM 11.

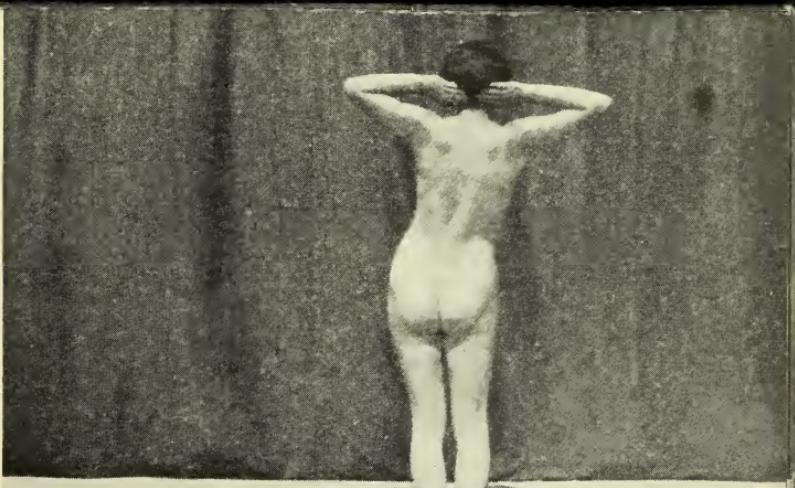
P E L V I C  
V E R-  
S I O N  
W H I L E  
W A L K I N G  
(Eighth Phase).

The thighs and  
knees are thrust  
more forward  
and the pelvis  
moves more to  
the right.

XI  
20



XII  
20



**FILM 9.**

M I N O R  
P E L V I C  
R O T A T I O N  
(H O R I Z O N -  
T A L) (First  
*Phase*).

Initial position.  
The pelvis begins  
a c i r c u l a r  
movement to the  
left.



**FILM 7.**

P E L V I C  
MOTION FOR-  
W A R D S ,  
W H I L E  
WALKING  
(First Phase).

The left leg steps forward, the upper part of the body slightly inclined with arched loins. The weight rests equally on both feet.

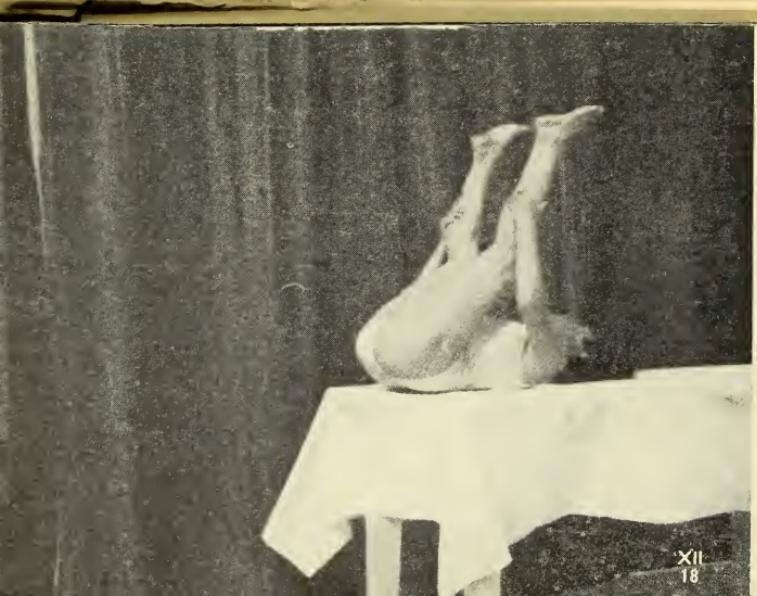




X  
18



XI  
18



XII  
18

**FILM 11.**

PELVIC VERSION WHILE WALKING  
(Fourth Phase).

The legs begin to stretch themselves slowly again, while the pelvis is raised from the sitting posture and slowly revolves towards the right.





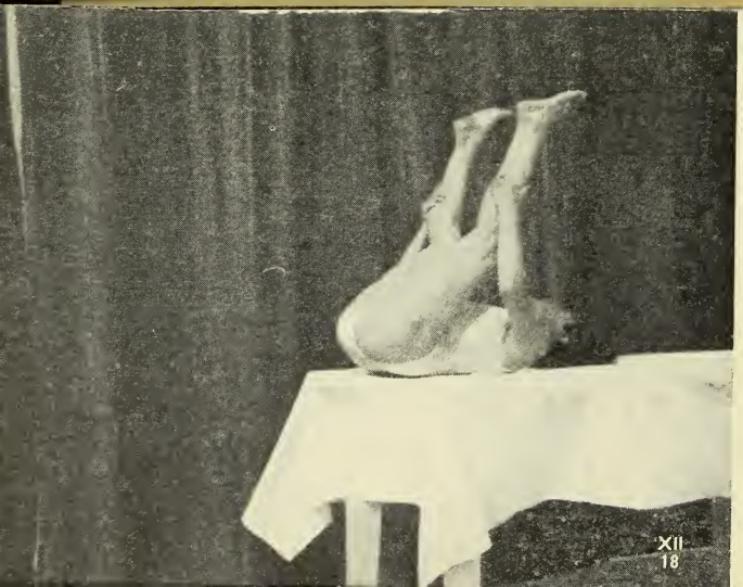
X  
18



XI

**FILM 11.**  
PELVIC VER-  
SION WHILE  
WALKING  
(Fourth Phase).

The legs begin to stretch themselves slowly again, while the pelvis is raised from the sitting posture and slowly revolves towards the right.



XII  
18





FILM 10.  
MAJOR  
PELVIC  
ROTATION  
(HORIZONTAL)  
(Seventh  
Phase).

The pelvis moves  
backwards.

X  
17



XI  
17



XII  
17

**FILM 7.**

P E L V I C  
MOTION FOR-  
W A R D S,  
W H I L E  
WALKING  
(Second Phase).

The left hip is  
v i g o r o u s l y  
thrust forwards,  
while the whole  
p e l v i s i s  
slightly raised.



VII  
25



VIII  
25



IX  
25



FILM 10.

M A J O R  
P E L V I C  
R O T A T I O N  
(H O R I Z O N -  
T A L)  
(Sixth  
Phase).

The pelvis is as  
far as possible to  
the left.

X  
16

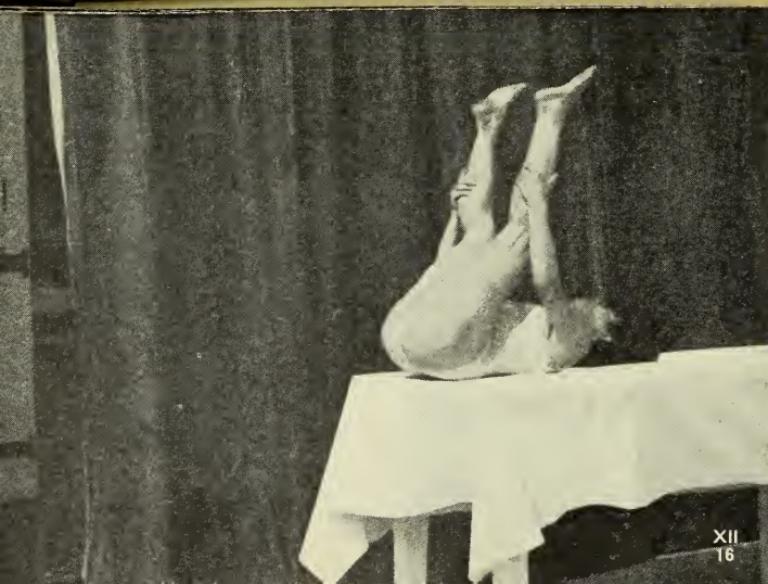


FILM 11.

P E L V I C  
V E R S I O N  
W H I L E  
W A L K I N G  
(Seventh Phase).

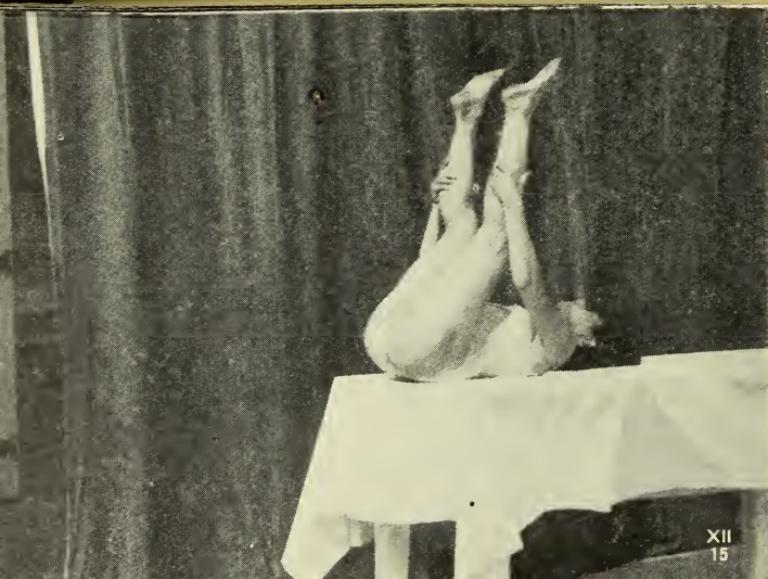
The feet are  
drawn upwards,  
resting the  
weight on the  
ball of the soles.  
The pelvis begins  
to turn from left  
to right.

XI  
16



XII  
16







**FILM 9.**

MINOR  
PELVIC  
ROTATION  
(HORIZONTAL)  
*(Second  
Phase).*

The knees are  
bent. The pelvis  
is as far as pos-  
sible to the left.



X  
14



XI  
14



XII  
14

**FILM 11.**  
**PELVIC VER-**  
**SION WHILE**  
**WALKING**  
**(Sixth Phase).**

The pelvis is in its normal posture and the right leg steps forward.



VII  
28



VIII  
28



IX  
28

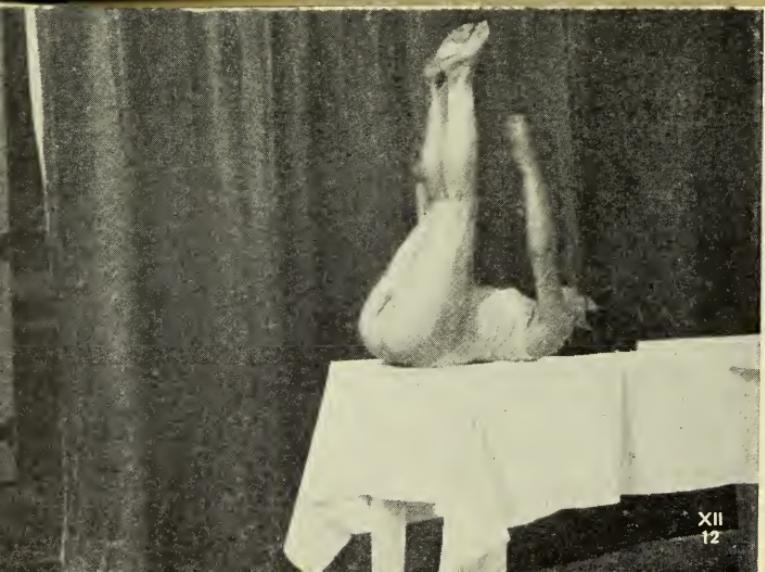
**FILM 9.**

MINOR  
PELVIC  
ROTATION  
(HORIZON-  
TAL) (*Third  
Phase*).

The pelvis begins  
to move back-  
wards from the  
left.







**FILM 7.**

PELVIC  
MOTION FOR-  
WARDS,  
WHILE  
WALKING  
*(Third Phase).*

The pelvis has  
now been drawn  
forward as far as  
possible and the  
left hip raised.  
The upper part  
of the body is  
quite erect.



30

**FILM 8.**

PELVIC  
MOTION  
SIDEWAYS,  
WHILE  
WALKING  
*(Second Phase).*

The pelvis is as  
far to the left as  
possible.

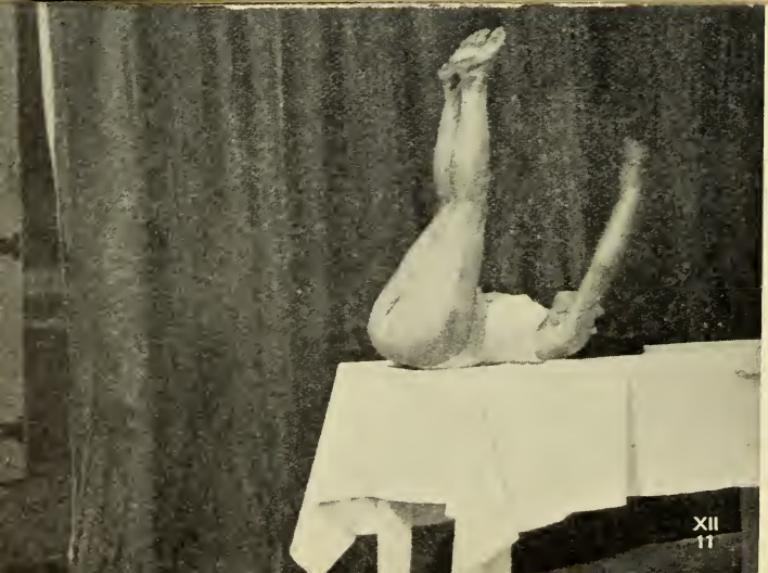




X  
11



XI  
11



XII  
11

**FILM 12.**  
**SUSPENSION-**  
**FLEXION**  
*(Fifth Phase).*

The woman  
grasps her legs,  
which are now  
again somewhat  
apart in the  
attitude of  
flexion.



**FILM 9.**

MINOR  
PELVIC  
ROTATION  
(HORIZONTAL)  
*(Fourth  
Phase).*

The pelvis is at the furthest backward point of its orbit. The knees are still bent.



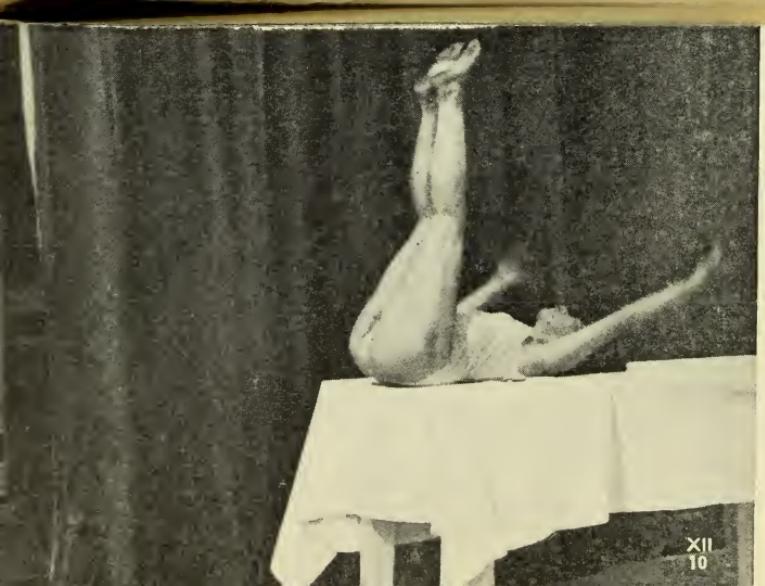
**FILM 10.**  
MAJOR  
PELVIC  
ROTATION  
(HORIZON-  
TAL) (Fifth  
Phase).

The pelvis moves sideways to the left and backwards.



**FILM 11.**  
PELVIC VER-  
SION WHILE  
WALKING  
(Fifth Phase).

The left leg is almost straight, the right leg is drawn forwards, the pelvis has not quite reverted to its normal posture.





**FILM 9.**

M I N O R  
P E L V I C  
R O T A T I O N  
(H O R I Z O N -  
T A L) (*Fifth  
Phase*).

The pelvis begins  
to move to the  
right.

**FILM 10.**

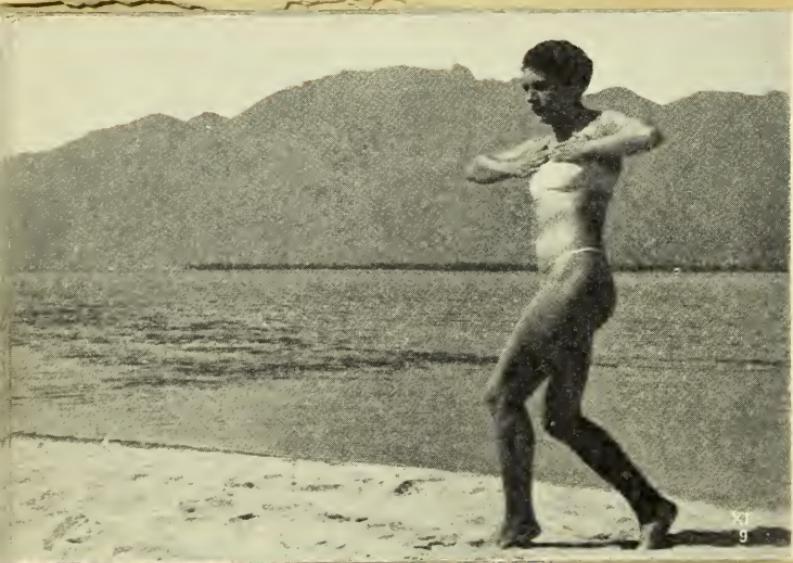
M A J O R  
P E L V I C  
R O T A T I O N  
(H O R I Z O N-  
T A L) (*Fourth  
Phase*).

The pelvis is as  
far as possible  
forwards.

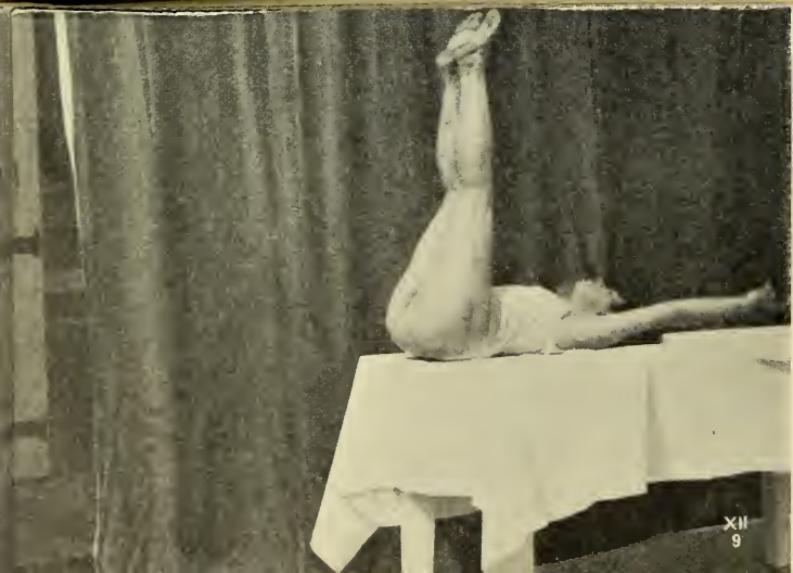


X

9



X



**FILM 12.**

S U S P E N S I O N -  
F L E X I O N  
(*Fourth Phase*).

The woman has  
now raised her  
legs high enough  
to enable her to  
let go of the  
table edges with-  
out risk of slip-  
ping off.

XII

9

**FILM 7.**

P E L V I C  
M O T I O N  
F O R-  
W A R D S  
W H I L E  
W A L K I N G  
*(Fourth Phase).*

The weight of the body is transferred to the left leg, which is in advance. The position of the pelvis changes accordingly.



**FILM 8.**

P E L V I C  
M O T I O N  
S I D E W A Y S,  
W H I L E  
W A L K I N G  
*(Third Phase).*

The right leg is crossed over the left and steps forward.









X  
7



X  
7



XII  
7

**FILM 12.**  
**SUSPENSION-**  
**FLEXION**  
*(Third Phase).*

The legs are  
gradually raised.



**FILM 8.**

PELVIC  
MOTIONS  
SIDEWAYS,  
WHILE  
WALKING  
(Fourth Phase).

The left leg fol-  
lows the right.



**FILM 9.**

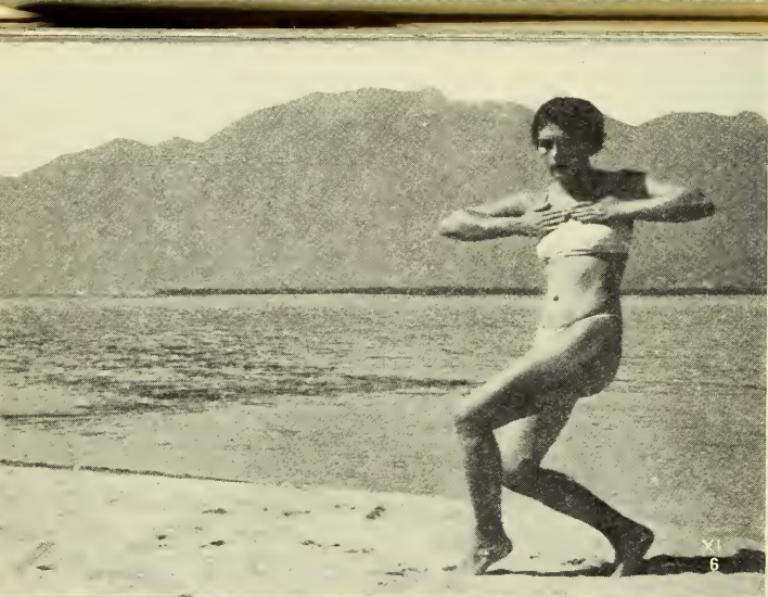
MINOR  
PELVIC  
ROTATION  
(HORIZON-  
TAL)  
(Sixth  
Phase).

The pelvis is as  
far as possible to  
the right.





X  
6



XI  
6



XII  
6

**FILM 11.**  
PELVIC VER-  
SION WHILE  
W A L K I N G  
(Third Phase).

The pelvis is now turned as far as possible from right to left. The arms are in a line with the knees which are bent.

**FILM 7.**

PELVIC  
MOTION FOR-  
WARDS,  
W H I L E  
WALKING  
(Fifth Phase).

While the body's weight is supported by the left foot and leg, the right is advanced.



**FILM 9.**

MINOR  
PELVIC  
ROTATION  
(HORIZON-  
TAL) (Seventh  
Phase).

The pelvis begins to move forwards.



FILM 10.

M A J O R  
P E L V I C  
R O T A T I O N  
(H O R I Z O N -  
T A L) (Third  
Phase).

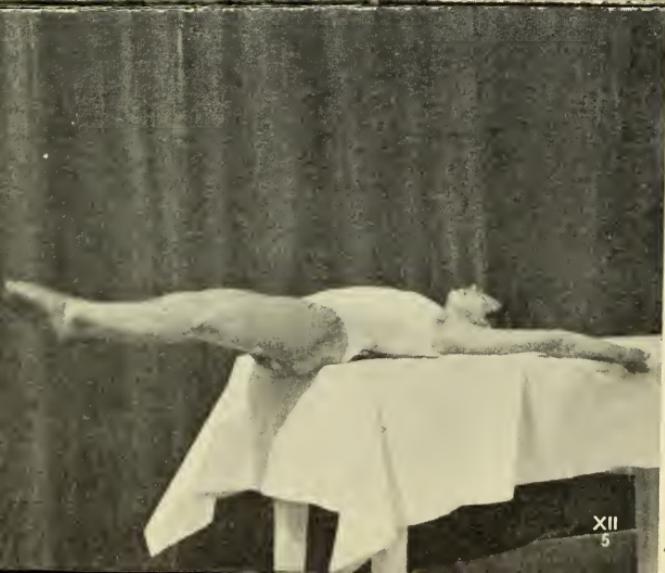
The pelvis con-  
tinues the cir-  
cular movement  
forwards. The  
muscles of the  
groin are drawn  
tense.



X  
5



XI  
5



XII  
5





FILM 10.

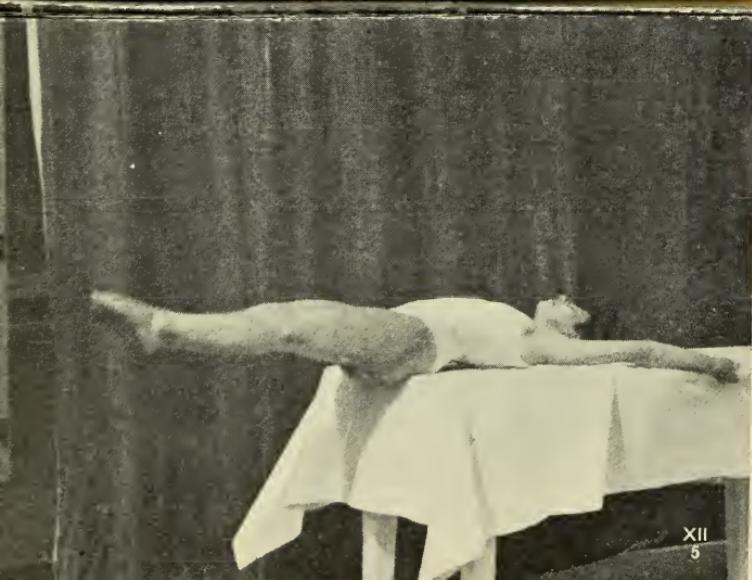
M A J O R  
P E L V I C  
R O T A T I O N  
(H O R I Z O N-  
T A L)  
*(Third  
Phase).*

The pelvis con-  
tinues the cir-  
cular movement  
forwards. The  
muscles of the  
groin are drawn  
tense.

X  
5



XI



XII  
5





FILM 10.

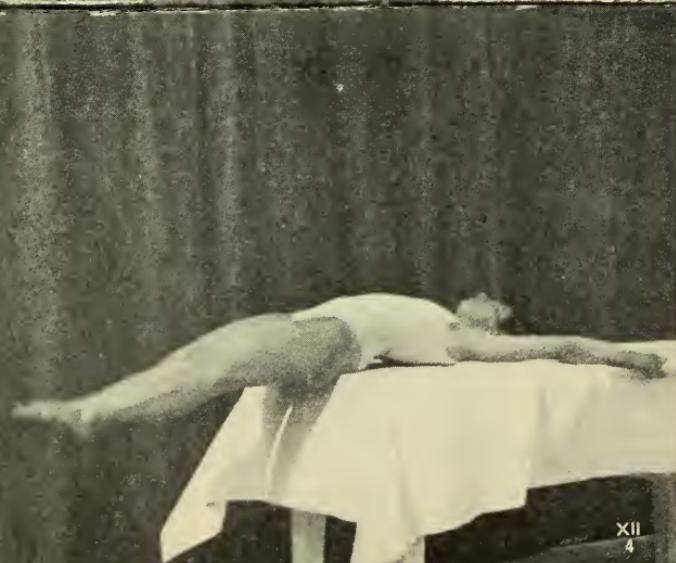
M A J O R  
P E L V I C  
R O T A T I O N  
(H O R I Z O N -  
T A L)  
*(Second  
Phase)*

The pelvis is as  
far as possible to  
the right.

X 4



X I

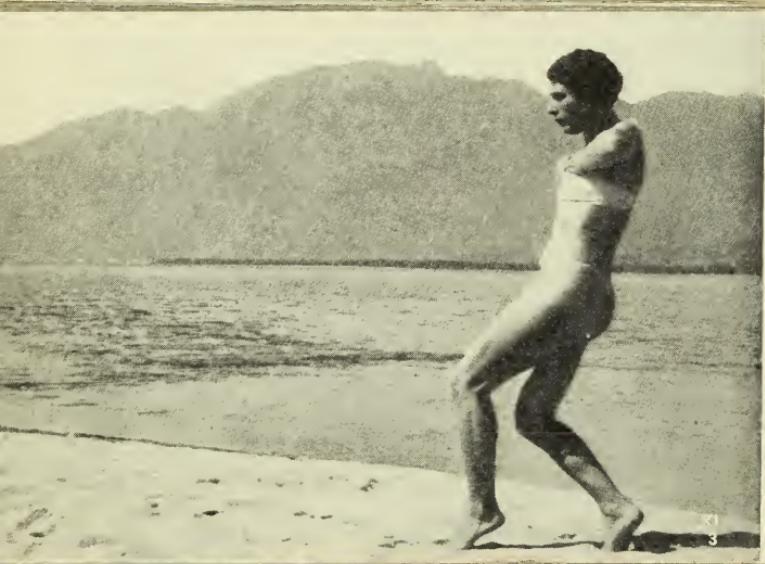


X II  
4





X  
3



3

**FILM 11.**

**PELVIC VERSION WHILE WALKING (Second Phase).**

The pelvis and the erect upper part of the body are turned slowly towards the left. At the same time, the left knee and thigh are thrust forward.



XII  
3

**FILM 12.**

**SUSPENSION-FLEXION (Second Phase).**

The woman begins to close her legs, keeping them stretched out and, at the same time, raising them slowly.





**FILM 7.**

PELVIC  
MOTION FOR-  
W A R D S,  
W H I L E  
WALKING  
(Sixth Phase).

The right leg is  
now in advance  
and the exercise  
begins anew.



**FILM 8.**

PELVIC  
MOTION  
SIDEWAYS,  
W H I L E  
WALKING  
(Fifth Phase).

Return to initial  
position. The  
exercise begins  
anew.



**FILM 9.**

M I N O R  
PELVIC  
ROTATION  
(HORIZON-  
TAL).

Return to initial  
position. The  
exercise begins  
anew.



#### FILM 10.

M A J O R  
PELVIC  
ROTATION  
(HORI-  
ZON-  
TAL)  
*(First  
Phase).*

Standing, feet sideways. The knees and groin are thrust forwards and a circular movement to the right begins.



#### FILM 11.

PELVIC VER-  
SION WHILE  
WALKING  
*(First Phase).*

The left leg steps forward. The arms are bent at the elbows and the fingers touch across the breast. The muscles of the legs and feet are drawn tense from the groins downwards so that the weight rests on the ball of the feet.



#### FILM 12.

SUSPENSION-  
FLEXION, OR  
ALTERNATE  
STRETCHING  
AND BENDING  
*(First Phase).*

The woman lies on an oblong table so that the sacrum is just above the edge of the narrow side and the legs hang down at full length and unsupported. They are slightly apart and the pupil supports her weight by gripping the edges of the table with her hands on either side.







