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Menopause : with special reference to nervous and mental changes

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SENIOR THESIS

THE MENOPAUSE

With special reference to nervous and mental changes

by

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I. INTRODUCTION

The terms "Climacteria" in Latin, "Climacteric Disease", "Change of life", "Turn of life", in English, "Temps Critique", "Age de retour", "Menopause", in French, and "Aufhoren der Weiblichen Reinigung", in German⁵³ are terms which denote the period during which the reproductive functions diminish and become finally extinct.⁴⁰ The term menopause is taken to mean the cessation of the menses whether due to age or oophorectomy, 10, 16 and the term climacteric denotes that period of adjustment with its physical and psychic phenomena, which is commonly called "change of life". 10, 32 In this paper the terms, change of life, climacteric and menopause will be used synonymously, although I feel that the term menopause more accurately describes the manifestations of the multiglandular reaction which is probably due to the decline of the function of the ovaries. The term menopause, further, implies the cessation of menstruation, which is, of course, only one of a train of symptoms that one sees during this transition from the period of being capable of reproduction to that of senility.¹⁶ In fact, the essential part of the climacteric is the number of bodily and mental changes, which may appear at any time during this time of life, even preceding the menstrual irregularity, or continuing for a time after the cessation of menstruation.⁴⁰

Nervous symptoms of one kind or another may be expected to be featured during this involutinal period, as well as numerous physiological and disability effects.¹⁴

Some women suffering from the effects of this change, seek the advice of the physician. Others go to their friends for advice. From their general knowledge of the women who do suffer, a standard for the menopause is set, disregarding the many women who do not undergo such marked changes.³⁴

Tradition and superstition offer many simple explanations for the menopause, but there has been very little done for the correction of the basic facts concerning the menopause. In short it seems that this period has been taken much too seriously by the women, and has been taken equally too lightly by the physician. Numerous authors feel that the menopause is a natural physiological process, and is not a period to be feared.

HISTORY:-

Very little has been written, to my knowledge, on the subject of menopause before the nineteenth century, and the material during this century was largely written in either French or German.

Menstruation itself, however, has been frequently discussed, and various interesting statements have been made concerning it. Currier ⁹ gives the following exam-

ples:- As early as Paracelsus, menstruation was noted, and he believed that "the menstrual blood was the greatest of poisons, and that the devil used the blood to produce spiders in the air; further that fleas, beetles, caterpillars, and other insects were generated by it." Democrates also declared that all those caterpillars and other insects which destroy a garden, fall off and die if a woman with her menses walk three times around each quarter of the garden barefoot and with the hair down.⁹ The Egyptians realized the importance of menstruation. In the books of Moses, much of which was derived from Egyptian sources, menstruation was declared ceremonially unclean, coitus with a menstruating woman was forbidden, etc.

In regard to the menopause, Currier⁹ writes that the "humeral pathologists believed that the humors or juices ascended like gases and that they often settled in the brain and produced great disorder, which required the abstraction of blood from the head, arm, foot or other part. In the cessation of the menstruation, they saw the possibility of serious consequences, and they are probably responsible for much of the foreboding of evil which is associated with the menopause in the minds of so many."

Currier⁹ further gives the example of Hippocrates,

who stated, "We learn from from experience that exulcerations, violent and even scirrhus tumors of the uterus, are sometimes produced by cessation of the menses." (a view that is now again gaining favor in these last few years) "Neither do the external parts of the body escape the fatal consequences of such suppression, since we know from experience that by this means they are frequently affected with the itch, the elephantiasis, boils, erysipelatos disorders, or scirrhus tumors."

Since these times great advancements in medicine, and it is now possible to make some conclusions about the menopause which could not be attempted in the past because of their limited knowledge.

There has been, however, no satisfactory classification for the mental disorders of the menopause. Most of the authors do not even make an attempt at classification. The only classifications available are more of a statistical nature. Jones²³ merely names the types as follows:- Psychoneuroses, depressive psychoses, manic psychoses, paranoid psychoses, alcoholic psychoses, and miscellaneous psychoses. Saunders⁴³ states that in the later period of life, the most common types of psychoses that are found are;

1. The neurotic or eccentric personality.
2. The late developments or recrudescence in

a prolonged illness of schizophrenic nature.

3. The organic-arteriosclerotic or senile manifestations.
4. The affective or manic depressive.

Most authors, however, are very general, implying that any of the functional psychoses may become apparent during the involutinal period.²² To this Jones²⁴ adds that "there is not a definite psychoses that is characteristic of the climacteric. Almost any of the constitutional disorders which eventually result in a psychosis may be incidental to the menopause. Nothing has been accepted as typically incidental to the change of life."

Because these authors and others agree that there is no condition occurring during the menopause which can not occur during any other period of life, it seems to me that any attempt to classify these types of complications or morbid states, is purely a matter of convenience.

Certain questions to be kept in mind while reading this paper, are:-

1. Are mental disorders relatively more frequent in the interval from 40-45 years of age than at other times of life?

2. Are the mental reactions different from those of other periods in life?
3. What are the causes of mental unbalance at this period? Simple or complex etiology?
4. Is this a natural process, and should it be taken as lightly as one takes a birthday?
5. Is there a logical treatment for the disorders of the menopause?
6. Can the general practitioner handle the mental patient, should she see a specialist, or should she be placed in a hospital?
7. Can mental changes of the menopause be prevented?

It is the purpose of this paper to answer these questions, keeping in mind that the medical men, physiologists, neurologists and psychologists are still divided on many of the points to be discussed.

II. ETIOLOGY

Riddock⁴⁰ states that "there is no causation which is simple in any disease, especially mental". This is certainly true for the nervous and mental changes of the menopause. There are, on the other hand, a multitude of causes which have been named as having some part. They may be invoked by circumstances, mental, physical or both. They may only occasionally invoke an abnormal response. So the response may be entirely individual and I believe each case must be considered as such. Further, it is hard to say whether the complications are of nervous or glandular origin.

In 1882, Tilt⁵³ was convinced that the ovaries were the controlling power in the body, but he did not pretend to understand the nature of the action; whether the ovaries exerted their power on the nervous system, or vice versa.

A few years later, Currier⁹ quotes Nowlin as saying that the menstrual flow is due to the influence of the hypogastric plexus, which is in turn controlled by the solar plexus. As long as this plexus has any influence menstruation will be normal, but when the influence of this plexus no longer exerts its controlling effect, the flow stops and atrophy of the structure begins, and the nervous energy expends its force in every direction.

There is good foundation for the ideas of both these

theories, and at this time it is quite logical that both these elements might easily play a part, endocrine and nervous. Evidence will be presented to show that the primary response is endocrine, which exerts a delicate influence on the nervous system. These authors and some of the other earlier writers, however, put much more faith in the theory that the main factor in climacteric nervous and mental conditions was psychic.

There are several reasons why authors have come to recognize the importance of the endocrine glands as an etiological factor:-

1. The endocrine theory is given as one of the possible causes, or contributing factors, for a great many conditions.
2. One sees the results of castration on the female, which closely resemble the symptoms of the menopause.
3. There have been such remarkable experiments with glandular transplants, and remarkable results with substitution glandular therapy.

There is however, no doubt that this is a poly-glandular phenomenon, as shown by Diasio,¹¹ who refers to the endocrinological factors of the menopause in the following form:-

1. Schaefer: "While the ovaries play the chief

role in the production of the menstrual cycle, they are in turn dependent upon the normality of the other interrelated glands, principally the anterior pituitary, the thyroid, and to a lesser degree, on the adrenal cortex."

2. Novak: "The endocrinopathic cause of it is that of the anterior pituitary."
3. Blair Bell: "Insufficiency of the thyroid, pituitary or suprarenals."
4. Oliver: "The two glands which dominate and control the stroma of the ovaries are the anterior pituitary and the thymus."
5. Cobb: "The pituitary has a stimulating effect on the gonads, but these have an inhibiting effect on the pituitary."
6. Hoskins: "That the various structures making up the endocrine system are in intimate functional relation with each other has become a medical truism."

Farrar¹⁴ feels that there is a biological situation existing at the climacteric which includes endocrine, vasomotor and metabolic systems. He is of the opinion that the precise relationship of these changes to concurrent mental phenomena can not as yet be explained.

Similarly, Sawyer⁴⁵ and others, believe that the

anterior pituitary, the ovaries with the corpus luteum and graafian follicles, the uterus, the mammary glands, the thyroid and other ductless glands may cause the menopause syndrome.

To this Werner⁵⁸ adds, that, with the disturbance in ovarian function as well as other related glands, there is a secondary disturbance of the delicate equilibrium existing between the two divisions of the autonomic nervous system, so that symptoms and signs occur which are reflected in the circulatory, nervous and somatic systems. In other words, he feels that the majority of the symptoms are the result of an instability of the nervous system, but that this instability is due to a lack of endocrine balance.

In as much as the symptoms of this period can be produced experimentally, and the physiological process has been worked out fairly well, a further study of this phase will be presented under the topic of physiology.

Many observations have been made along other lines, in regard to the contributing factors to nervous and mental changes, including the question of age, marital status, constitutional make up, etc.

In an attempt to correlate the question of age and frequency of mental disorders, Farrar¹⁴ gives the findings of several men who have made observations along this line. He found that DeFursac felt that the maximum

was incidence between 45 and 65 years of age in mental disease, while Henderson and Gillespi placed the period of maximum incidence between 25 and 35 years. Further; Pollock's figures indicated a practically stationary incidence between the ages of 49 to 50, and a very slight tendency to increase in the period from 35 to 55; that Phelps found that there was a fairly constant level between the ages of 30 to 70, and very slight rise from 40 to 60 years. This author, on the other hand shows that in his experience there was a marked increase from 15 to 25 years, with a steady decrease up to the year 90. Wolf⁶¹ seems to be in accord with the above figures when he states that "there is a great variation in the age factor", and the age of onset of the menopause. The age of onset varies with race, infection, over feeding or under nourishment, and many other factors. In the Chinese the average age of onset is 40, in colored people at 35, and the Eskimo women from 30 to 35.⁵⁴ For the average age of onset Wolf⁶¹ chose Sanes figure of 47.1 years, and he feels that an early onset of menstruation means a late onset of menopause, and vice versa. He has also found that a stormy menstrual life, may mean a stormy menopause.^{7,61} The Council of the Medical Womens Association⁷, in England, however, found in an investigation of 1000 women, that there was no correlation between the age of onset of menstruation and the age of the last period for either married or single women.

According to Farrar¹⁴, women of the asthenic or robust types, showing conspicuous intersexual traits, are held to be more liable to menopausal disturbances. In addition, he found that 1/3 of the cases of his series showed in the immediate family, history of mental disease, or were abnormal enough to be conspicuous to the layman. D'arcy¹⁰ and Riddock⁴⁰ also agree that heredity is a factor. Thus, it is obvious that in certain cases, factors which are present during the menopause have been present during the entire life of the woman, and so it might easily be that, in these cases, heredity plays as big a part in the production of mental disorders, and perhaps in hospitalization, as any other factor. Farrar¹⁴ cites a case of Wiesel's in which twin sisters who had been living under different life conditions and different life interests, had the onset of menopause on almost the same day, and had almost identical symptoms, somatic and psychic.

There are a number of factors which contribute to the mental and nervous disorders by psychic changes. Among these, one of the most outstanding is that of fear, which stands in the way of adjustments at this period. Fear, Dospit¹² relates, is generally a conscious or unconscious feeling of a real inadequacy by the woman; fear of having to meet some actual or fancied

difficulty. Dospit states that "without fear there would be no psychoneurosis at any stage." The young and active person is able to make his adjustments and put the past out of his life, but the elderly person at the climacteric brings forth these ghosts. This is no doubt endocrine. Dospit continues that, "it is reasonably much more difficult to adapt oneself to deprivation when one has previously enjoyed luxuries". Psychologically it is a development somewhat analogous to that of the fellow in the shadow of the rope, who reacts into a situation psychosis as the result of the unescapability of his difficulties.¹² To this Farrar¹⁴ and Riddoch⁴⁰ add that there is the age old tradition which exaggerates the climacteric and the features thereof. Thus, there was a dread or fear in most women of the menopause, so that when the change comes, the reaction according to Farrar, is similar to the reaction seen in many people going to sea; they expect to be seasick long before they go to sea. The medical profession too often encourages this line of thought. To this may be added that D'arcy¹⁰ feels that in the modern conception, fear in children plays an important part in the production of psychoses in later life. Thus, it is only logical that the menopause has come to be treated with fear and apprehension, leading to troubles which really should not belong to this

period, in that the menopause is not primarily responsible for them, but is merely the result of a near obsession.

One of the main psychic factors present at this stage, according to many authors, is sex. Stevenson⁵¹ relates that fear in many cases, especially in the paranoid, is the result of the conflict against homosexuality, but he adds that all paranoid reactions are not built upon this conflict. D'arcy¹⁰ concluded that if the ovaries are removed after a woman has had sex experience her sex appetite is little altered (the posterior pituitary being the active agent), but if the ovaries are removed before psychic sexual puberty, the sexual instinct is lost. Thus, it is the loss of this sexual instinct which is the provoking element in many mental changes. In a like manner, a woman cries out that "there has been an injustice suffered by women, and men own the world", yet the same women would feel that it was the greatest of tragedies if she should become a man. To this, Riddock⁴⁰ adds that all thought and obsessions have a sexual coloring. However, Dospit¹² fears that sex has been overstressed, and that sex has been stated to be the foundation of race preservation instead of self-preservation.

Jones²⁴, in accordance with Dospit, agrees that no one can really determine how much the sexual life has to do with the mental life of the individual, with the exception of easily demonstrated cases, due to the fact that

there are a great many disappointed women in this world. He states that, "they have no consciousness of the cause of their disappointments, of their peculiar nervous symptoms" — "because of a state of mind which has kept them in a repressed zone." These types, thus go thru life with ideas which are peculiar, but have kept them in the background, and they are only revealed by the physician after a long and careful investigation. Jones continues, that this is probably the type that "falls under the Freudian enthusiast, who is constantly searching for the one thing, the one object, the one feature which the investigator has in mind and which he develops and into which the patient is led."

That sex may play a part is found in the report by the Council of Medical Womens Association⁷, whose studies revealed that the percentage of women free or relatively free from all symptoms was higher in single women. In addition, they found that single women made up the greater percentage showing changes in nervous instability. Thus, there are more women insane who are married, at all ages, but the single women are more apt to break down at the climacteric.⁵⁰

On the other hand, Jones²³ found that at present a greater incidence of insanity in single women at all ages, with a greater discrepancy at the climacteric.

Jones thinks that this may be due to the fact that the single state itself predisposes women to psychoses, or they are single because of their psychopathic disposition. To illustrate, they give the pitiful circumstances which may exist when one girl in a family remains at home with the parents, or does not have the opportunity of meeting men, so that when the involutorial period arrives she is at the age when her parents are gone and she is thrown out into the world on her own resources, at a time when she is least fitted to establish herself.

Thus, it follows, that the suspicious, jealousies and false accusations directed against the husband or any other man are, when without justification, due to faulty adjustment to the loss of reproductive power and ideas of deminished physical attractiveness, fostered by the appearance of grey hair, wrinkles, and other signs.⁴⁰ Shock, fright, and mental emotions may intensify all symptoms.

Beyond this, there may be various organic disorders. The physical disorder may be inherent or due to some infection. Infection may play a part early in life. Thus in childhood, an infection may damage the delicate blood vessels, with a change in the normal physiology of the uterus, tubes, etc., effecting the ovaries either direct-

ly or indirectly thru the blood supply. There is, therefore, either arrested development of the ovary, or connective tissue ingrowth with arrest of the normal evolution of the Graafian follicle, with the lack of corpus luteum which normally follows.¹ Andrews¹ feels that the corpus luteum is needed to exert a restraining effect upon the thyroid, but that the body should be able to accommodate itself to this loss, thru the sympathetic nervous system.

Infection at the menopause may be due to stagnation of menstrual blood or other discharges, thus being ascending in type, or it may be due to an old gonococcus infection, or even septic in nature.^{34,15} That infection may play some part may be seen by the fairly good results in selected cases, as shown by Fitzgibbon¹⁵ and Moorehead³⁴. These two men found that total hysterectomies seemed to show remarkable cures in a short length of time, with elevation of all mental symptoms. Sawyer⁴⁵ also notes the value of hysterectomy.

There is an absorption of toxins from any infective lesion, so that such absorption is of marked importance in influencing the onset and severity of menopausal symptoms.

Of course, an exact etiological factor in the production of the menopause is that of x-ray, or radium directed over the ovaries, or the removal of the ovaries

by surgery. Due to the lack of estrin from the ovaries, there is an attempted compensation by the other glands, such as the pituitary, adrenals, and thyroid. In time the nervous and psychic adjustment to the new endocrine balance may be achieved, with a deminished activity of the other glands, a reorientation, which takes from one to five years.⁶¹ It seems to me, then, that if this period of involution could be made more gradual, the adjustment could be made without any great discomfort by the woman, and the menopause would cease to be such a bugaboo.

Further etiological factors will be brought out from time to time in explanation of certain symptoms, so that a better correlation of cause and effect may be had.

III. PHYSIOLOGY

The problem of the physiology of the menopause resolves itself into the general interaction of the ovaries and other glands. Although the adrenals, pituitary and thyroid glands especially play a part, the general response seems to be that of deprivation of ovarian substance. There is, of course, the reaction of the nervous system which is in close relationship with the glandular reaction.

OVARIAN FACTOR IN THE MENOPAUSE:-

Atrophy of the ovaries with a decrease in the production of estrin, and corpus luteum, causes a complexity of events, due to the lack of correlation between the various other glands. The corpus luteum is the first to suffer from the progressive sclerosis of the menopausal age.^{1,32} That this is true is shown by the fact that there is estrin present in the urine of women in near normal or larger amounts when they are suffering from symptoms of the menopause.²⁶ According to Drips¹³, Zondek divided the climacteric into three periods:-

1. Excess of ovarian estrogenic hormone is found in the urine. The ovary can not respond to the luteinization stimuli from the anterior pituitary, so that progesterin is lacking and is no longer able to balance the estrin produced.
2. Estrogenic hormone secretion begins to fail.

Small amount or none in urine, with vasomotor disturbances at their height.

3. Excess of follicle ripening hormone of anterior pituitary, which is significant of ovarian failure. Hot flashes subside during this period and atrophy of genitalia occur.

As stated previously, there is a thickening of the ovarian coverings, so that the graafian follicles have difficulty in rupturing normally.¹ As a result, there is a follicular cyst formed which eliminates the corpus luteum as a factor in the control of the menstrual cycle. This lack of corpus luteum will then be a cause of abnormal uterine bleeding, and in addition the normal restraining effect on the thyroid is no longer present. Mazer³² confirms this by mentioning that neuro-circulatory instability may accompany and even precede the abnormal uterine bleeding, which indicates that the corpus luteum is an important factor in the maintenance of the normal endocrine interrelationship. This further accounts for the constitutional and uterine symptoms.

Clark,³ states further, that the ovarian substance enhances metabolism, increases the excretion of urea, and favors the oxidation of hydrocarbons, fats, and phosphorized organic substances, so that the removal of both ovaries is followed by a reduction of the oxygen intake

by about 10%.

The ovarian hormone also has the effect of inhibiting the pituitary activity and the thyroid. Therefore, there must follow an increase in the amount of pituitary secretion, and the pituitary in turn will further stimulate the thyroid and adrenals. This, however, will be discussed further in later paragraphs.

Several other functions have been attributed to the ovary, mainly that estrin may play some part in the immunity to cancer, and that a hormone from the liquor folliculi has been isolated which apparently influences fat metabolism.

THE PITUITARY FACTOR:-

The actual change in the structure of the pituitary will be discussed more fully under pathology. It is sufficient to say that there is an increase in the acidophiles and a modified form of basophil (castration cell) appear. The change in castrates is more marked.³²

The action of the pituitary, is not confined to stimulating the ovary, but in addition secretes a thyrotropic hormone, a lactogenic hormone, a parathyroid stimulating hormone, a hormone for the control of metabolism, and perhaps many others.

Harris²¹ has found that, by animal injection of a woman's urine, there is definitely a follicle stimulat-

ing hormone from the pituitary. He was able to show that the ovaries increased in size in proportion to the amount of hormone injected. Further, he found that the daily excretion of the gonadal stimulating substance varied from day to day, but that the amount of hormone excreted also varied with the type of psychosis. Severinghaus⁴⁹ has shown that the injection of estrin will decrease the amount of secretion of this hormone, or will at least decrease the potency of the hormone.

PITUITARY-OVARIAN INTERRELATIONSHIP:-

To continue, it has been shown that the amount of effective stimulation to the ovary depended to a great extent upon the state of the ovary. The ovaries of the women during menopause, as has been shown, is no longer capable of responding to the excess quantities of the pituitary due to its degeneration. A somewhat similar situation is shown by Collip⁵ in his studies on rats, in which he found that no amount of anterior pituitary sex hormone could evoke a response in the ovaries of rats less than eighteen days old. The parallelism between the pituitary hyperfunction of castration and that of the menopause, which occurs from lack of estrin, is shown by the excess amount of the gonad-stimulating hormone in the blood as well as in the urine. This occurs in the castrate as well as in the menopausal woman.³² Mazer³² believes that the ovarian deficiency at any early

age is not accompanied by the pituitary hyperactivity seen during the climacteric. He feels that the dependence of the pituitary gland upon ovarian control is acquired during adolescence. The pituitary gland can, therefore, function normally without the controlling influence of the ovarian hormones, if the ovarian function is lost early enough, or before the establishment of the dependency.

After a varying length of time there is an adjustment made, in the normal menopause. The pituitary no longer has its stimulating effect, for, following its initial hyperactivity, there is a decrease in hormone production of all types.⁶¹ As a result, there is a decreased activity of all the related glands, but there is again a more normal relationship established between the glands, on a lower level.

The pituitary hyperactivity, has some action, about which we are not primarily interested in this paper, but which might be mentioned in passing. For example, lactation, is prolonged and increased by castration and inhibited by estrin. In a like manner, the adrenal gland is so stimulated, so the diabetic glycosuria of depancreatized dogs can be reduced by estrin.

Kerlin²⁵ throws an interesting light on the balance of the pituitary and ovary. As a result of animal exp-

eriments, he found that in a spontaneous climacteric there is a gradual diminishing of ovarian secretion, and that it is possible for the genital hormone to remain active in the organism for some time after the gland is removed or no longer functions. Nervous tissue contains this hormone, and sexual desire continues as long as the tissue is so impregnated.

THYROID GLAND AND ITS RELATIONSHIP TO MENOPAUSE:-

As previously states, there is a thyrotropic hormone from the pituitary gland and a thyroid inhibiting function of the ovary. Thus, as there is an increase in the pituitary stimulation, and a decrease in the ovarian inhibition to the thyroid, there is a resulting thyroid hyperfunction.^{3,6,32,40,61} In the castrated woman during adult life, thyroid hypertrophy is commonly seen, caused by the above mentioned factors, which is the opposite of the condition of atrophy which is the common thing in young castrates.³² In accordance with the thyroids seen in other conditions, however, the fact that there is an enlarged thyroid does not necessarily mean that there is an increase in the amount of activity of the gland. It is necessary to determine the activity of the thyroid by the symptoms which are present during this period, such as emotional state of fright, a pulse rate of 90 or more, and loss of weight. The predispos-

ition of the individual determines whether the response will be explosive or almost indistinguishable. Thus, the nervous, active, and excitable woman with simple goiter will react adversely, and often become frank hyperthyroid.³²

The thyroid, which has been stimulated by the pituitary, and as a result becomes overactive, soon becomes exhausted.⁶¹ There follows, therefore, a state of hypothyroidism, with a lowered metabolism, sluggishness, phlegmatic temperament, and may even go as far as myxedema. The persistent symptoms of hyperthyroidism may be explained in several ways, as follows:-

1. "Sensitization of the autonomic nervous system occasioned by the withdrawal of folliculin".⁶¹
2. "There is a lowered threshold of response of the sympathetic nervous system."⁴⁰
3. "The direct stimulative effect of the anterior pituitary lobe hormones upon the sympathetic divisions of the autonomic nervous system".³⁰ Mariene proved this by injecting anterior pituitary lobe extract into thyroidectomized animals.

There is a fine line between the first and the last of these theories. It seems to me that the reason that the anterior pituitary lobe extract is able to stimulate

the sympathetic divisions of the autonomic nervous system is because of the sensitization of the autonomic nervous system. Perhaps this is what the author had in mind.

Riddock⁴⁰ feels that the affective reaction types may be attributed to dysthyroidism.

THE ADRENAL GLAND AND ITS RELATION TO THE MENOPAUSE:-

In a manner likened to that of the thyroid, the adrenal gland is stimulated by the adrenotropic hormone from the pituitary, resulting in a hyperadrenalism. The flushings of the climacteric can be produced experimentally by the subcutaneous injection of adrenaline. The symptoms of the pre-climacteric and climacteric may resemble the pre-aclamptic stage symptoms which may be produced in a manner similar to the above.⁴⁰ Further, Mazer³² draws attention to the fact that chromaffin-cell tumors of the adrenal medulla produce symptoms which are also to be likened to those of the climacteric, such as paroxysmal hypertension, tachycardia, vasoconstriction followed by vasodilation, headache, choking sensations and glycosuria. Riddoch⁴⁰ also makes note of the fact that the hypertension and glycosuria might be due to hyperadrenalism.

Myers and King³³ have shown rather conclusively that women of the menopause, are very sensitive to the

injections of adrenalin. This seems to indicate that the vasomotor instability with the blood pressure variations of the climacteric, is due to the hyperactivity of the adrenals.

The adrenal gland is also responsible for the symptoms which are related to emotion, such as fear and anger. Further, the skin pigmentation is adrenal in origin. 10

Hyperactivity of the adrenal cortex is likewise evidenced in certain women, who develop certain masculine characteristics, such as coarse hair on the arms, legs, face and trunk, a more masculine voice, and greater aggressiveness.^{32,40} This syndrome is evidenced in cases of adenoma of the cortex of the adrenal.

The hyperactivity of the adrenals may also play a part in obesity seen at this period.

THE VEGETATIVE NERVOUS SYSTEM IN THE MENOPAUSE:-

The instability of the nervous system is not a primary or causative factor of the symptomatology of this period. This has been shown by the fact that the nervous system is under the control of the hormones produced by the glandular system. The sympathetic system which controls the blood vessels and sweat glands, both of which are active during the menopause, may be reinforced or even supplanted by adrenalin administration.

Small doses cause inhibition, and large doses stimulation of the sympathetic system.

As has already been shown, the pituitary may stimulate the sympathetic divisions of the autonomic nervous system. Pituitary extract may also act through the brain, by excitation of the sympathetic center of the midbrain, with stimulation of adrenalin, as well as stimulation of the thyroid.

IV. PATHOLOGY

The general pathological changes which are brought on by, or occur during the menopause are fairly well known. We are primarily interested here in the changes of the various glands, disregarding the fact that there is little known about the glandular pathology with the possible exception of the ovary. The pathology at the menopausal period is primarily that of a gradual incroachment of senile degeneration with the infiltration of connective tissue, sclerosis, and degenerative changes. Wolf⁶¹ describes the pathology of the ovaries in much the following manner:- A connective tissue increase resulting in a decrease in the amount of parenchymatous epithelial tissue. A thickening of the stroma first appears on the surface of the gland. This extends into the center of the gland as wide bands, and the process is most rapid in the center of the gland. In as much as the graafian follicles are becoming fewer in number and are no longer able to rupture through the coverings of the ovary, degeneration of the follicles takes place. Fatty degeneration is the first to effect the ovary, leaving, in the place of the follicular fluid, fatty droplets. Later, there is shrinking of the size of the cavities, the follicular membranes thus become wrinkled, and the granulosa cells are slowly absorbed.

Now, in the final stage, the theca cells also disappear, leaving nothing but fibrous tissue. The interstitial tissue has also atrophied and disappeared. There is a greater amount of fibrous tissue in the nulliparae than in those women who have borne children.

The pituitary gland has rather constant changes following castration or during the menopause. There are changes which are seen as early as the fourth or fifth day, or as late as 13 years or more after castration. The characteristic cells called "castration cells", which are modified forms of basophiles, are seen.³² The cells which are seen when there is decreased potency, are a degranulation and retrogressive changes in the basophils. With the cytological technique employed by Severinghaus⁴⁹, the blue granules are depleted. At times these cells are replaced by irregular cytoplasmic masses which stain yellow. Small basophilic cells with prominent enlarged Golgi cells are also seen, sometimes in large numbers. The latter are believed to be newly formed basophiles which become active before reaching normal size.

Branching areas of deeply staining degenerate cell masses are always present. These areas are made up to a large extent of angular, shrunken basophilic cells with deep blue, pyknotic nuclei and a dense granule-free, blue cytoplasm, against which the Golgi ring is prominently

contrasted. Occasionally, in supposedly normal pituitaries will show small branching areas of degeneration. There is no increase in chromophobes, although there may seem to be. The acidophils are normal in size and character, but there is some evidence that they are reduced in number.

These changes, do not appear immediately after castration as a rule, and in the natural menopause there is a much more gradual change. The chromophobe cells are associated with hypopituitarism and symptoms like obesity, decreased metabolic rate, increased sugar tolerance, and decreased sexual function.

The thyroid gland although increasing in size becomes less active, forming a colloid goiter. In this type of goiter, there is an increase in the amount of colloid in the acinae, but there is less activity of the gland due to the pressure of the epithelial cells by the colloid, with atrophy of the gland. Thus there is a lowering of the basal metabolism. At times, however, this does not occur, and a true toxic goiter results. The latter occurs particularly when there has previous hyperthyroid tendency.

The adrenal gland changes, if such do occur, are not mentioned.

Atrophy of the accessory genital organs takes place

after the menopause is well established. The degeneration is well marked in the uterus, with a change in the uterine mucosa to a thin layer of columnar epithelium. There is also a loss of tone in the muscle, and there is degeneration and atrophy. The tubes grow thinner, shorter, the fimbriae disappear and the mucous glands atrophy; a process similar to that in the uterus. The cervix shortens and thins out and the external os narrows. The vagina also narrows down and contracts, its mucosa becomes thin and pale. The glandular tissue of the breast also becomes atrophic.

In a like manner most of the body tissues undergo more or less atrophy. Fatty degeneration also occurs due to the faulty fat metabolism, which is on a glandular basis.

In conclusion it must be remembered that the pathology of the various parts concerned will be in various stages of atrophy, degeneration, hypertrophy etc. The pathology is dependent upon the glandular activity, balance or ~~un~~balance, previous diseases, development, and any variety of other points mentioned under etiology.

V. SYMPTOMS

INTRODUCTION:-

As has been stated several times previously, and is again given here for emphasis, the change of life is an abnormal period, but does not in itself make one sick. There is no mysterious significance attached to it, but instead it is as a rule, uneventful. Often there are no symptoms at all other than amenorrhea following a gradual diminution of the menstrual flow. During the first phase of the menopause there may be episodes of prolonged menorrhagia due to an abundance of estrin, or to poor contractility of the uterine muscle. Where the endocrine balance is good, there is no discomfort and the last period occurs from 6-8 months after the beginning of the tapering off process.

Breuer² states, "This is truly a change of life, for at this time the patient has just about received the longed for rest, and play that she has not been able to have, for at this time her children are more or less grown and the family should be on a more substantial financial basis; so the occasion is more or less glorified, and possibly is worthy of a celebration".

It must be kept in mind, however, that women between the ages of 40 and 50 can have organic diseases as easily as at any other time of life. Diseases such as

Addisons disease, Brights disease, diabetes melitus, heart disease and tuberculosis should always be looked for.⁶⁰ Heart disease may begin with hot flashes, diabetes with capricious appetite, tuberculosis with nervousness, etc. Further, the cure is much more difficult if these symptoms are fixed in the patients mind as being due to the menopause.

On the other hand, organic symptoms which may simulate organic disease may be psychic or glandular in origin. Palpitations, spells of dyspnea, periods of high blood pressure may make you think of cardiovascular disease; and hiccough, vomiting, hyperacidity, constipation, or diarrhea may confuse the picture by simulating gastro-intestinal disease; severe joint and bone pain may simulate some actual bone pathology, etc.⁵⁴

The organic syndrome may occur coincidently with that of psychogenic origin, or may precipitate a later depressive reaction. So, organic syndromes may occur before, during, or after the psychic, or vice versa.⁴³

The symptoms found may be from five sources:²

1. A disease which may come on at any age.
2. A disease which comes on gradually through the years.
3. Magnification of the symptoms by the nervous type of individual.
4. Purely psychic.

5. Genuine glandular disturbances.

There is no definite psychoses that is characteristic or definitely due to the climacteric. Almost any of the constitutional disorders that may eventually result in a psychosis, may be incidental to the menopause.²⁴ In other words, there is nothing which is typically caused by the menopause.

It is not known whether women of hypothetically sound constitution, mental and physical, develop psychotic or neurotic reactions at the menopause, but certainly the majority of women never develop such symptoms.¹⁴ At any rate, a definite line can not be drawn between the stages of normalcy and the pre-climacteric, but the difference is marked between the climacteric proper and senescence.

NORMAL MENOPAUSE:-

In order to separate the normal from the abnormal, a hypothetical standard of normality should be mentioned, with the thought in mind that normality is a relative term. Comparative individual psychological methods are used in determining such standards, and it is the deviation from the hypothetical standards that determine the abnormal.

Fitzgibbon¹⁵ lists the following as criteria of normal menopause:-

1. The menopause consists of an atrophy of the genital organs from the developed state adaptable to childbearing to a state closely resembling that of the organs before puberty.
2. This change should occur with either physiological or mental disturbance.
3. It normally commences between the ages of 42 and 46, and is completed within two to three years.
4. The uterus at the beginning of the menopause should be little if at all larger than the uterus of a young nulliparous woman - this is three inches in length, with a proportion of body to cervix of two to one, and the cavity two and a half inches long.
5. When the atrophy of the menopause is complete, the uterus is considerably reduced in size in all its parts, being two to two and a half inches in length and no vaginal portion of the cervix.

To this of course, should be added, that a change in most any part of the body is apt to change the personality of the individual, for the state of any of the body parts is as much a part of personality as memory or emotional reaction.³⁵

Riddock⁴⁰ gives a discription of what he considers to be a fairly normal menopause:- "A married woman who has had, on the whole, a healthy life, a small, well doing family, a moderate share of difficulties, and has delt with them courageously and successfully. At the onset of the climacteric, slight changes in temperment are noticed by the members of her family and her intimate friends. She becomes more easily worried and upset by trifles, is apt more than before to take a gloomy view of events, and to be obsessed with the difficulties that crop up in ordinary domestic and social life. Phases of depression distress her, and she surprises her friends by breaking into tears for insufficient reason. She becomes irritable and fault-finding, especially with her husband, children, and servants, and may at times be peevish and complaining, so that nothing seems to be right. She appears to live in a state of mild anxiety and apprehensiveness, and will say that she does not understand what has come over her. Her sleep is disturbed by flushes; dreams of domestic difficulties trouble her, and she is liable to wake early with her mind full of worries. As the day goes on she improves, and by the afternoon, is almost herself again. In spite of it all, she manages to run her house, see her friends, and carry out her other duties in an apparently compet-

ent fashion, but she and her family feel the strain.

When the change occurs she realizes it, and bears it philosophically and regains her emotional balance gradually, and the symptoms become less and no longer are noticed - peace is restored."

GENERAL SYMPTOMS:-

Sawyer⁴⁵ found that it was not uncommon to have women report that they had ceased their menses two or more years before coming for treatment, and to find that at they were suffering from a definite neurological and psychiatric menopausal syndrome. However, he found that the reverse was also true, that is, the neurological and psychiatric syndrome preceded by several years, the actual menopause.

In an investigation of the menopause of one thousand women, by the Council of Medical Women's Association,⁷ a report was made which stated that the symptoms which occurred most frequently were flushing, headache, giddiness, rheumatic pains, hemorrhage, pains in the breast, and especially obesity. These symptoms were found most frequently in the married women, while the most frequent in the single women were nervous instability and thyroid changes.

The severity of the symptoms is dependent upon the degree of their effects, the variety they present, and the general nervous stability of the patient. Neurotic

types of individuals are always more severely affected than others.⁴⁵ "The entire realm of nervous and psychic reactions are easily disturbed by minimal stimuli."³²

THE FLUSH, AND OTHER VASOMOTOR DISTURBANCES:-

Smith's⁵⁰ statement that "many normal symptoms, bodily or mental, which may occur with the menopause may be so exaggerated as to become morbid", holds true for the vasomotor disturbance. Of the vasomotor symptoms, the flushes, called hot flashes at times, are perhaps the most familiar.

The flushes occur in attacks. The attacks may last a fairly long time, a matter of a half hour or longer, or may be only momentary.⁵⁶ They may vary in intensity as well as in length. The attacks may appear as often as every ten minutes, which is one of the causes of severe insomnia.³² The flush usually occurs with some warning, but in some cases it is free from other phenomena. In the longer attacks they may be preceded by headaches, palpitation, or a sense of apprehension in the chest. These all disappear with the onset of the flush.⁴⁰ There may be a characteristic sensation of epigastric warmth, or an aura of slight nausea, which is immediately followed by a wave of heat and visible though momentary erythema. The erythema usually involves the face, or head and neck and anterior part of the upper chest. At times

the flush may spread over the whole body, associated with or followed by sweating⁶¹ or even a chill.³² The severity and frequency of these symptoms vary with different individuals, with the period of the menopause, with changes in the climate and environment, the state of the nervous mechanism, etc.⁶¹ Warmth seems to excite the attacks. Due to the hot spells which are often accompanied by a feeling of suffocation, a woman will have to run to an open window and gasp for air. At night, the recurring spells of heat and cold keep the patient awake in her attempt to regulate the amount of bed covers. It has been shown that the skin temperature is actually raised.⁴⁵

It is the triad, flushes, cold sweats, and insomnia, more than any other single factor or symptom that brings the menopausal woman to the physician begging for relief.³²

Wolf⁶¹ found that the flushes occur at times when the estrin in the urine was abnormally low and the prolan abnormally high. The adrenal glands may play a part in flushes by stimulating the sympathetic nerves, causing a dilation of the capillaries.

Most of the nervous changes are said to originate in the vasomotor center and a stimulus is transmitted along the splanchnic nerves, which are to some extent

under hormonal control. The entire vascular system of the abdomen is contracted and a large amount of blood is suddenly forced into the peripheral vessels. There is an active dilation of the peripheral vessels at this same time, with a resulting sudden displacement of a large quantity of blood from the large vessels to the peripheral vessels. Thus, the symptoms of faintness, oppression and air hunger, anxiety, palpitation, heat and perspiration.¹¹ The resulting fear now becomes directed to one of the organs of the body.¹¹

The flushes usually subside during the lessening of the amount of anterior pituitary hormone production.

VERTIGO:-

Vertigo is a fairly common symptom, and along with tinnitus, is one of the most annoying. As in other types of neurological manifestations at this period, fear, etc. may intensify the symptoms.

Balance is, of course, controlled mainly by the vestibular mechanism, so that any lesion in any part of the vestibular apparatus, a general toxemia, cardiovascular disease, renal disease, or ocular disturbance may upset this mechanism.

The exact cause of vertigo is not known, although vasomotor disturbances are ascribed as the cause.⁴² The circulation is disturbed in the vestibular apparatus which in turn disturbs the sense of balance. This

vasomotor derangement is thought to be due to the loss of ovarian secretion. The lowered metabolism of this period may be the cause(intoxication). Sanes⁴²as shown before, believes vertigo is on an endocrine basis, but adds that hypertension is a possibility. He found that 46% of 102 cases had blood pressures of over 150. Mazier³²was unable to find any such relationship.

Vertigo may be constant, or evanescent, diurnal or nocturnal, when at rest or in motion. It may come on at irregular intervals, or may appear days or weeks apart, and again may come on several times daily. It also varies with different motions or actions, or with the time of day, or even in different situations. A very interesting variety of vertigo occasionally described by the patient is a sensation of swimming in the air, or partial intoxication(pseudonarcotism).³²

Most of the cases are of the objective types. They experience a sense of rotation around them of the visible or palpable environments. Subjective symptoms, a sensation of motion of the body itself, is present at times.⁴²

The sensation of fainting, is often present, although this may not be really a true fainting spell. The patient becomes limp and loses consciousness and slumps down. This is really more of a sensation of weakness. The patient feels that ~~she~~ is going to fall or can not

hold herself up, or that she is going to lose consciousness.⁴⁵

PALPITATION AND OTHER HEART CONDITIONS:-

Wolf⁶¹ states that, "of the nervous complications, palpitation is the most frequent, and is sometimes associated with tachycardia". This of course, would be expected when there is a relative hyperthyroidism resulting from an increase in pituitary thyrotropic secretion, and the sensitization of the autonomic nervous system occasioned by the withdrawal of folliculin (in cases of hypothyroid this symptom should be lacking, and bradycardia will take the place of tachycardia).

Although Drip's¹³ gave the same mechanism for the production of palpitation as for flushes, Mazer³² found there was no relation in the incidence and frequency of the two conditions. The following facts conclusions:-

1. The objective paroxysmal tachycardia and the subjective palpitation are often accompanied by a moderate dyspnea.
2. Gaseous distention of the stomach, which is relieved by atropin and a smooth diet, may also cause palpitation. Tachycardia, and dyspnea on exertion, may be compared to the so called effort syndrome or neurocirculatory asthenia. ⁵⁹

HYPERTENSION:-

Blood pressure variations which may occur at the menopause are the subject of much dispute. The hypertension is transient and unstable in character, with hourly variations from high to low. The symptoms associated are quite heterogeneous, such as vertigo, palpitation, faintness, tachycardia, gastrointestinal disorders, numbness and tingling of hands and feet. Accompanying these symptoms, are mental reactions varying in severity from irritability to phobias or actual insanity. As given under the discussion of vertigo, Sanes⁴² and Mazer³² do not agree on the role of hypertension. Macier does feel, however, that there is undoubtedly some relationship between the incidence of hypertension and the menopause, but at this time there is the added factor of age, which is also the age when arteriolar and nephritic changes become manifest. Against the climacteric age factor is the fact that there is also some relationship between the artificial menopause and hypertension. Then, too, there is a change of blood pressure from time to time, which is independent of organic disorders of the heart and kidney.^{32,61}

The picture of the glandular relationship of hypertension is also confused. Harris²¹ found that hypertension was not necessarily associated with a high level of hormone excretion. That is, some of the patients with

low blood pressure excreted more hormone in the urine, than some of the patients with hypertension. This does not exclude the possibility of hypertension being on a glandular basis. It must be remembered that most of the symptoms of the menopause are not due to an overemphasis or overfunction of any one gland or underfunction of any other, but are due to an upset in the equilibrium of glands and their relationship to the nervous system.

It is logical to assume, therefore, that the following is true:- There is a loss of ovarian secretion causing a hyperactivity of the pituitary gland. This gland stimulates the adrenal into hyperactivity by means of its adrenotropic hormone, and through the sympathetic nervous system, which now has a low threshold. The sympathetic nervous system now is able to stimulate the blood vessels to contract, thus raising the blood pressure. The pressure will vary with the amount of secretion, will be transient in character, and will rise with exertion or mental stimulus.

PARESTHESIA:-

Paresthesias are constant symptoms of the climacteric.¹⁷ In a few patients it may assume major proportions as a constant symptom. It may lead to hypochondriacal depressions or suicidal tendencies.

Wechsler⁵⁵ describes this as "an ill-defined syndrome

which occurs mainly in women at about the climacteric, though artificial menopause is also capable of giving rise to it. Precipitating factors, such as infections, pregnancy exertion and exposure to cold, are predicated on quite fortuitous grounds. The symptoms are mainly subjective in nature and consist of various dysesthesias".

The paresthesias may assume any variety of forms and occur anywhere in the body. The patient complains of numbness and hotness or coldness of the extremities, especially the fingers. May have tingling or crawling sensations. The paresthesias may take the form of formications.³¹ The patient may say that she has had to resort to massage of the fingers because the "fingers have gone to sleep or feel dead", or that "it feels as though worms are crawling" on her skin. Pains are occasionally present. The hands are stiff and need to be limbered up. Occasionally paresthesias are part of a refractory type of neuralgia, affecting the small joints and knees with persistent tingling.⁵² At times, however, there may be actual thickening of the digital joints with deformity and pain, which yield to endocrine therapy.⁶¹ This, so called "menopausal arthritis may be due to vascular spasm and to a nervous response incident to temperature changes.

The neuroses of the throat at this period are apt

to be of a paresthetic type. Smith⁵⁰ states that women feel that "the food stops in the throat, bones and muscles of the throat are broken, throat feels constricted, choking feeling, feeling that the throat is clogged up, and that the patient may clutch at her at her throat."

The condition is practically constant, but considerably worse at night and toward morning.⁵⁵

No objective signs are present as a rule, although occasionally one observes a pallor of the fingers and slight diminution of sensation.¹⁷ Goldberg¹⁷ quotes Strauss and Gutman as saying that acroparesthesia "occurring at the menopause" resembles "tetany, with exaggerated electric and mechanical irritability of nerves, but without vasomotor symptoms. The clinical picture develops gradually, runs a chronic course for years, and ultimately disappears."

Pruritus vulvae, which occurs most commonly in women passing through the climacteric,⁵⁰ may also be of the same nature as paresthesias.

HEADACHE:-

Headache is another frequent complaint during the menopause, but very little has been written on this subject. Headache is usually not the only symptom. It is more pronounced when other symptoms are present. In some cases, it is more than an ache, and at times feels like the blow of a hammer.³² The typical menopausal head-

ache is an occipital headache, but in the experience of Mazer³² such a headache was rare. Werner⁵⁶, however, found that 50% of castrated women and 38% of the natural climacteric women point to the occipitocervical region as the site of pain. As this is a common type of headache in retro-displacement of the uterus, there may be a reflex set up during menopause which is similar to that occurring in retro-displacement of the uterus. This may be due to congestion in the pelvis as a result of vasomotor disturbance. On the other hand, the pain may be due to "menopausal arthritic" changes of the occipital, or cervical joints.

CONVULSIVE DISORDERS:-

Some cases of epilepsy come on during puberty, and end after menopause. These attacks may get worse with each menstrual cycle, and may have alternate as better or worse with each cycle, but may be definitely associated with the menstrual cycle.^{16,46} Schaefer⁴⁶ quotes Banus as having studied six thousand cases in which he found that in 196 the attacks were considerably changed and some initiated during the menopause. Schaefer gives the following case history as fairly typical:- "A woman age 48, housewife. Six weeks ago the patient retired feeling well. At 6:00 A.M. she went into a generalized clonic convulsion, with foaming at the mouth, cyanosis,

biting of the tongue. She had four such convulsions that same day. Loss of memory of previous attack during the interval while resting between attacks. Aural symptoms were headache with slight vertigo --- hot flashes for past year --- physical examination, moderate girdle obesity. She had an average of two injections of theelin each week, with no seizures for more than six months."

Gordon¹⁸ has found that some seizures were brought on by an escape mechanism. The flight from reality, intolerable situation led them to seizures which served a certain purpose, to escape from unavoidable physiological function necessitating some responsibility on their part and at the same time to avoid adjustment.

The hypophysis, one of the components of the diencephalon, is in close relation to the infundibulum, and the tuber cinerium which are the other two portions of the diencephalon and which if stimulated also produce convulsive disorders. It is said that stimulation of one or of all these anatomical elements is followed by hypersecretion of pituitrin which possesses convulsive properties, either directly through its toxic characteristics or through a considerable increase of the cerebro-spinal tension.¹⁸ Further, it has been shown before that there is a hypersecretion of pituitrin due

to the lack of ovarian inhibition. Thus, if urinary content of the female sex hormone is normal, theelin will do no good, or may tend to aggravate the symptomatology of the menopause.

OTHER NERVOUS CHANGES:- Excluding psychoses.

As a background for the psychoneuroses and the psychoses, the most common nervous changes are those of depression, fatigue, excitability, irritability, emotional instability, fear, worry decreased memory and inability to concentrate.

Most of these symptoms can be explained on an endocrinological basis. Thus, excitability, irritability, emotional instability, etc., are due to hyperthyroidism with the resulting increase in metabolism, the adrenal hyperactivity, and hyperpituitarism. The low threshold of the nervous system also plays a part.

In hyperthyroidism, there is an increase in iodine which accelerates the conductivity of the nerves, due to accelerating the chemical activity of chemical interchange of all body cells. A woman with this condition is excitable, jumps at slamming of doors, can't control herself in emergencies, is fault finding, argumentative, angry, expresses fear, hate, rage, depression; and elation with a rapidity of change from one to the other.

On the other hand, hyp-activity of the thyroid and other glands, decrease the interchange of all body cells, and body functions are slowed down. The patient, there-

fore, is easily fatigued, daily tasks become burdensome and in many instances she is totally unable to go on with her usual line of work. This may be described as a "nervous exhaustion", which is a decrease in all muscle tonus and a relative vagotonia, due to decreased sympathetic stimulation. There is an impairment of cerebration, decreased memory especially for recent events, inability to concentrate, and mental depression. Women who have made a study of foreign languages find they can no longer memorize new vocabularies and idioms. That this is transient is shown by Queen Victoria who acquired a new language - Hindustani - at seventy five years.¹⁰

The fact that these symptoms are functional in origin, is evidenced by their disappearance as the woman recovers her glandular equilibrium after the menopause.

Worry is an important factor in the formation of neuroses and psychoses. The worry may be unfounded and unnecessary. Worry is usually over trivialities, while larger things may be handled well. The worry makes the patient undecided, changeable, and she may do things which are unwise, and which she may regret, going to great trouble to make amends for her mistakes. The patient may wreck her home and other's through worry, suspicion, and unpleasantness.

A speck of dust becomes a mountain, she worries about her husband, and may walk miles to see that he got to work without being killed, or she may take offense at her husband asking about dinner, and saying "So, you don't trust me even to arrange that", flies out of the house. Sometimes she may come back, but she may commit suicide.⁴⁴

In the psychoneuroses, anxiety, gloominess of outlook are the basic symptoms, differing only in degree from the disturbances that can be regarded as normal at this involutinal period. The line between normal and abnormal has just been crossed, for the emotionalism is persistent and severe enough to lead to more or less pronounced changes in behavior and to invalidism. The psychoneurotic has full insight into her condition, but she can not overcome her difficulties without help.

The term psychoneurotic should strictly be confined to anxiety states precipitated by domestic or other worries or fears, and not showing psychotic features. This differs from the anxiety neuroses of earlier periods only in that it is colored by the significance of menopause and physical discomforts.⁴⁰

The woman who is lonely, unmarried (male has passed) her by, or who no longer has an outlet for emotional deviation, is the woman who develops a neurosis. This, of

course, may continue into melancholia, manic depressive, or other psychoses. These women almost always are obsessed with the ideas that they are the victim of some obscure or malignant disease⁶⁰

All of these reactions are a part of the menopause and are on a glandular basis.

Retrograde changes are expected by most women at the menopause, but the feeling of incompetence, etc., are destructive in their potentialities.⁴³ Neglect arising from too implicit acceptance of invalidism at the menopause may cause the woman to be discouraged and she may lose constructive physical or mental initiative. She feels that she no longer is attractive, and is not able to react to any sexual feeling that may flare up. She may become "self-centered, auto-erotic, and narcissistic".⁴³ The loss of the specific feminine function is a big loss and adjustment is difficult.

Culbertson⁸ feels that psychic manifestations occur in practically all menopausal patients, but in most they do not reach a pathologic degree. The background of the patient determines to a large part how the patient will react to the menopause. He goes further by saying that the psychic symptoms of the menopause are merely manifestations of a previously existing abnormal mental state. One should, then, look beyond the menopause for possible causes of the mental symptoms.

PSYCHOSES:-

Psychoses appearing during the changing period of life can not really be considered a part of the menopause as such, but should be considered as a complication.⁴⁵ It is difficult to determine in many cases when the neurotic symptoms have really and truly become psychotic, for it is the severity of the symptoms and not the presence of them that determines their seriousness.

The form of psychoses, when "the patient takes a flight from reality," is usually dependent upon neurotic inheritance and history of neuroses and of former mental disorder.³⁵ In frank psychoses, over one half have a neurotic inheritance.

It is fortunate, however, that the proportion of cases of serious mental disorder is small.⁴⁰ Yet, this period is admittedly a crisis during which insanities are apt to appear in susceptible women.

In way of repetition, Harris²⁰ found that female patients in the involutinal period excreted large amounts of follicle stimulating hormone similar to that found in normal females during menopause. This was more marked in the patients with the more marked mental disturbance. In another article, Harris²¹ found that patients with manicdepressive psychosis and involutinal melancholia appear to excrete larger amounts of follicle

stimulating hormone than those suffering from paranoid dementia praecox and psychoses with cerebral arterio-sclerosis. The manic and melancholia patients also had less variation of excretion from day to day.

INVOLUTIONAL MELANCHOLIA:-

Of the psychotic syndromes at the climacteric, involu-
tional melancholia is the most common. In a series
of 219 cases of menopausal psychoses studied by Percy
Smith⁵⁰, 66% belonged under this heading. Involutional
melancholia has existed through out the ages, and is con-
sidered as inevitable by a small percentage of people.²²
It seems to me that the study of the mental disorders of
menopause is mainly a study of involutional melancholia.

Apart from the frequency and duration of psychotic
depressions at the change of life, there is the debat-
able question of whether there is such a condition as
involutional melancholia peculiar to the climacteric,
or is it a part of manic depressive psychoses. Strecher
and Ebaugh⁵² say it may be a division of manic depressive
psychosis, but due to distinctive symptomatology, length
of course and association with the climacteric, it mer-
rits separate description. Noyes³⁶ states that due to
its effective characteristics there are special phy-
siological factors of such dynamic importance and so
peculiar to that period of the individuals life during

which the mental disturbance occurs that separate consideration is justified. Noyes further states that other men feel it is a manic depressive psychosis occurring at a particular physiological epoch. Werner⁵⁷ found that still other investigators associate the condition with presinile and arteriosclerotic changes.

The diagnostic difficulty lies largely in the fact there is no direct or specific cause, and that the reactions of the individual with a varying background of situations and condition can not be constant.

Further evidence in support of such a diagnosis is given as follows:-

1. There is an absence of previous history of mental disease in a large proportion of cases. Jones²³ in his series, found this amounted to between 70 and 80%, and in Smith's⁵⁰ series to 66%.
2. Mental and physical retardation, in a considerable proportion of cases of depression, is relatively absent, restlessness being more common.
3. Attacks may appear to be precipitated more often by mental and physical disturbances, and so tend less to develop without apparent reason than clear manic depressive attacks.
4. Involutional melancholia, if severe, may run a

more chronic course characterized by almost constant peevishness, hypochondria, ideas of death and poverty and insufficiency of affect.⁴⁰

The differences in the reactions of involuntional melancholia and manic depressive insanities may depend on constitution, heredity, and mental adaptability alone, or there may be the additional factor of emotional responsiveness to endocrine instability which occurs at the climacteric. To repeat what has been mentioned several times thus far in this paper, Riddock⁴⁰ says that "depression and anxiety severe enough to be looked upon as psychotic, and appearing for the first time at the climacteric, differ only in degree from reactions which may be considered normal or neurotic at other times of life."

Prodromal symptoms are commonly present, often in the premenopausal stage of the climacteric. This stage may be called melancholia, to differentiate it from the true psychotic state. The former is more apt to be present as a result of the surgical menopause, while in the spontaneous climacteric, involuntional melancholia along with paranoia and depressive psychoses are more frequent conditions.²⁵

Melancholia is characterized by more or less intense emotional depression which is manifested by facial expression; depression or intense misery. This

stage is usually accompanied by psychomotor retardation, anorexia, constipation, indigestion, headache, breathlessness, tachycardia, and pains in different parts of the body. There may be simple depression with lack of energy, slowness of thought and reaction, inability to concentrate, lack of volition, or anxiety. Anxiety may be manifested with vague apprehensiveness, or special fears, for example of cancer.⁴⁰ She may be a potential suicide, but the impulse toward self destruction is hindered by the prevailing psychomotor inhibition, - she may be reluctant to admit a morbid outlook because of the suicidal ideas associated with it. The anxiety form is associated with an intense and continuous state of extreme apprehension, the expression of the anticipation of some frightful impending har.²³

On the other hand, the intense depression may gain motor expression, The patient may walk or shuffle aimlessly about, wringing the hands or tearing the hair and repeat a stereotyped phrase which is expressive of her misery, such as "Oh, my God!"

The classes of the mild melancholia are not hard and fast, for they tend to merge into one another, and the patient may pass thru one or more of the different phases with little noticeable change.²³

In the delusional class, involitional melancholia, the psychic changes may precede to a definitely pathol-

ogical degree in that the patient no longer has mere variations of moods, but actually develops delusions. Up to this stage the woman may be thought of as neurotic.

Savage⁴⁴ feels that delusions may be formed as follows:- " A woman who has hot flashes may say, "I am blushing, and people look at me, and they think there is something I am ashamed of". She misinterprets and it slowly develops into delusions that people are watching and following her, looking after her and scandalizing her, and the like. Or, a fullness of the head may lead her to say, "There is something wrong with my brain; I have cancer there". Itching or any other trouble with the skin may make her think that she has some terrible disease. She will accuse her husband of giving her the disease and persecutory ideas will ensue. She may feel that she is no longer a woman, then no longer human, or that her children no longer love her because she has hair on her face. She may even wish she were dead.

The delusions are most frequently persecutory. It is common for the patient to think that her neighbors are injuring her. In some of the delusions the patient has a strong sexual coloring. For example, one woman said two thousand men wanted her.

Delusions also tend to be associated especially with ideas of moral inferiority. The woman may cry that she has "No money, no food, no clothes," or that she has committed the unpardonable sin.⁵⁰ Here the delusion of committing the unpardonable is found in its most typical form, and is probably the most characteristic delusion of the disorder.

Expansive delusions may be present such as saying that she gave birth to three hundred children every day.²³

The patient may recall a minor delinquency of early life, and magnify its importance to such an extent that it occupies the whole of her consciousness, so that she becomes obsessed with the certainty of eternal damnation.

Hypochondriacal delusions and gross somatic delusions are common. Somatic delusions are sometimes of a bizzare character, such as saying that the ward washing was done in her mouth, or that the doctor put drugs on her ovaries to prevent conception.²³ Further, complaints referring to imperfections of the intestinal tract, heart or other organs are almost constant. Smith⁵⁰ gives these two examples; "A woman of 49, with delusions that she smells, and is decaying and is rotten with syphilis, asks her husband to shoot her, committed suicide at home by hanging, her husband having refused to put her under care." Another case, "A woman

of 53, complains that her tongue is too big, that her head will burst, that the left side of her head is getting bigger, that her chin and forehead are alternating, and her legs also, and that she has nothing to sit on".

The women are not only delusional about themselves but often about their family, their friends, the city, the state, the nation or even the entire world.

It is obvious therefore, that the delusional formation is extremely variable--more so than in any other group of psychoses.⁵²

Hallucinations of any of the special senses may occur.²³ Hallucinations and illusions especially of sight and hearing are not to be thought of as characteristic of this condition. Although they may be present their presence does not negative the diagnosis.⁵²

Jones²³ found however, that hallucinations were present in 50% of the delusional patients. The auditory hallucinations are the most common, generally tending toward abusive or threatening voices. Visual hallucinations are rare, but when present are mostly concerned with ideas of moral inferiority, and in some a vision of God or the Devil appear. Olfactory and gustatory hallucinations may also be present, frequently related with somatic or persecutory delusions.²³

It is seen then that the attitude and general behavior of involuntional melancholia is that of depressive-apprehensive affect. There may be a motor over-activity, with restlessness or aggitation. The patient's face is drawn, she wrings her hands, pulls her hair or may have impulsive acts as striking at those around her. She may use abusive and filthy language.^{40,52}

Catatonic states may be present also. Strecher found that 10% of involuntional melancholia psychoses exhibited this phase in one of these forms; fixed attitudes, catalepsy, negativism, steriotypy, grimacing, mannerisms, automatic movements, etc.⁵² Other signs observed in some patients were; refusal of food, impulsive violence, restiveness, destructiveness, violent scolding, unapproachability, mutism and retention of urine and feces. There is usually a poverty of thought, monotonous and often repetitive speech.

The physical characteristics may be of any variety or form. There is nothing constant, although there is usually some pathology present which should be looked for and cleared up.

Usually there is excellent orientation and some insight is present. That is the patient is able to recognize that there is something grossly wrong with her, but she is faulty with her analysis.⁵²

Involuntional melancholia is not to be considered

an acute disease. The prodromal period lasts several months, while the psychosis has a duration of about twelve months, but may last two, four, or more years without ultimate chronicity.⁵²

It must be remembered that because there is melancholia, there can not be some underlying abnormal organic or functional condition which is being covered up by the melancholia.

MANIC DEPRESSIVE PSYCHOSES OF THE MENOPAUSE:-

Riddok⁴⁰ states that "brief mention only need be made of other varieties of mental illness met with at the climacteric, because of their relative infrequency compared with melancholia." Jones²³ found that only 8% of the cases were effected with this psychosis.

It is interesting to note that mania is comparatively rare, even in obvious cases of cyclothymia, which further shows the favoritism toward depression at the climacteric. Jones²³ states that "the manic group is characterized by emotional exaltation and increased psychomotor activity and is the complement of melancholia in the manic depressive syndrome of Kraepelin". He divides it into two groups; acute mania without predominating delusional symptoms, and delusional mania, comprising cases in which delusions were strongly in evidence.

The manic depressive of the menopause is the same in mature life as during the earlier years. The symptoms are fairly characteristic. There is a rapid change from exhilaration and euphoria to various emotional expressions such as irritability, impatience, anger and rage in the manic, but the change is to depression in the melancholic patient. The faces, posture, speech, general behavior and motor activity all show this change. There may even be various muscle phenomena which may indicate catatonia.⁵²

There is characteristically a flight of ideas, rhyming, sound association, poverty of thought, distractibility, or volubility.

There may be feelings of inadequacy, etc. so that suicide

is to be guarded against. In the stupor, power to feel seems to be lost. The emotionalism parallels the ideation and psychomotor activity.

Here again there is a great change and variety in the delusional trend. They change and vary with the prevailing mood. They may be grandiose, inconstant and shifting. The delusions may be typically depressive in nature, corresponding with the feeling of committing the unpardonable sin. Hypochondriacal and somatic delusions are not infrequent. Paranoid trends may be present, and illusions are not unusual.⁵²

This type of psychosis does not usually exhibit any memory defects, Orientation, retention and recall are all quite normal. There is however disturbance of the sensorium. The insight is faulty as a rule, but it may be remarkably good.⁵²

PARANOID REACTION OF THE MENOPAUSE:

Paranoid reactions seem to be present in many of the other reaction types, namely, manic states, schizophrenia, paranoid personalities, paranoid states and true paranoia, as well as chronic alcoholism, paresis and senile dementia.⁵¹ Jones²³ found paranoid reactions in 4% of his cases.

Stevenson and Montgomery⁵⁰ do not believe that all paranoid reactions are based on conflict against homosexuality and on narcissism. They feel that the persecutory delusions must have some common factor, which they feel is a defence reaction against fears as the result of the conflict, loss of potency, fear of one's own inferiorities, and fears of conscience.

Stevenson⁵¹ feels that the specific factor in the etiology is the "imagined sinful act on the part of the patient, which is not sinful to the patient. She either projects the blame on others or denies that it would have been consciously desired by her".

When the situation is not dealt with adequately and honestly, an emotional conflict occurs. As a result persecutory delusional trends (eventually psychoses) is set up to ease her conscience.

In this type of psychosis, the chief symptom is persecutory delusions, with or without hallucinations and without obvious personality or intellectual changes. These delusions have a systematization which may vary from looseness to logical development of delusions upon false premises. Ideas of grandeur are prominent. There may be a long prodromal period with such a gradual change that it is hardly noticeable.

Stevenson⁵¹ gives a rather typical case of paranoid reaction which may be summarized as follows; a woman who had not been satisfied with her husband, submitted to an abortion upon the advice of her husband. She later blamed her husband, and as a result of the conflict, had delusions of people looking in the windows at her.

Paranoia is extremely rare at any age, and paranoid may occur in any psychosis. For this reason very little time is spent of this topic.

OTHER TYPES:

Little is given in the literature on any of the other types of mental reactions at this period in life. Those which may occur

however are cerebral syphilitic disorders, parietic psychosis, schizophrenia, psychopathic personality, mental deficiency, confusional psychoses, and alcoholic psychoses.

DIAGNOSIS:

The diagnosis of the menopause syndrome is comparatively easy. The history of such common symptoms as hot flashes, tinglings, tachycardia, etc., age of the patient, and amenorrhea make the diagnosis rather obvious. There is a very definite problem however in determining which gland is at fault in the vasomotor and psychic symptoms.

The menopausal disturbance must be differentiated from thyrotoxicosis. An adenomatous thyroid may be present in the patient with menopausal symptoms, without the thyroid tumor being at all responsible for the disturbance.⁴⁷ Or an adenomatous thyroid may become toxic at this time of life, in which case the ^{is} thyrotoxicosis is similar to that of younger patients, and must be distinguished from the newly formed personality of the patient. The diagnosis is made more difficult due to the fact that symptoms of the menopause are usually associated with thyrotoxicosis. Hence tremors, sweating, tachycardia, and increased pulse pressure are equivocal in both.

Several basal metabolic rates should be taken. The thyrotoxicosis remains rather constant while the results vary greatly with each test in the usual menopause. Estrin therapy may be used as a test. Therapy of this type will bring the rate down, and relieve symptoms if it is due to the menopause, but has no effect on

the thyrotoxicosis.

Further, the thyroid patient complains of a constant need for more ventilation, less clothing and less bed covering than before while the woman in the climacteric always tells of hot flashes.⁴⁷

Tests should be run to rule out extra and intra-uterine pregnancy. This is done by the Aschheim-Zondek or Friedman tests of the urine. In pregnancy there is an increase in the size of the uterus and softening, while in menopause it is opposite.

Urinary tests for the quantity of follicle stimulating hormone should be done also, on both the urine and blood. The hormone is increased during menopause.

The initial increase in bleeding must be differentiated from endometrial disease, missed abortion and neoplasm by the usual gynecologic procedures; careful bimanual examination, diagnostic curettage, etc..

The gastro-intestinal symptoms and nervous manifestations are frequently difficult to interpret, but for therapeutic results it is essential to determine whether they are due to organic lesions or to endocrine unbalance. The diagnosis is made by exclusion, submitting the patient to most pains-taking gastro-intestinal or neurologic survey, as well as to an examination of the endocrines by means of special physical and laboratory examinations. If for any reason such exhaustive examination is impossible, the therapeutic test is given--theelin in oil intramuscularly in doses of 300-400 rat units two or three times a week, and perhaps mild X-ray to the pituitary may reluctantly be resorted to.

Because of the great variety of symptoms presented at this time, and the possibility of almost any disease being present, it is necessary that the matter should not be taken lightly. One must not be satisfied with the simple listing of the symptoms in diagnosing menopause.

VII. PROGNOSIS

The prognosis is difficult to give in these cases, for there is a great variety of cases; a variety of cases with varying background, heredity. There are those cases which have been treated promptly, those who have paid no attention to their symptoms but have finally been committed to a hospital. There are thousands of conditions which might easily affect the severity of the patient's symptoms and retard or inhibit recovery.

Involuntional melancholia has, according to Jones,^{23a} a varying prognosis according to the type. He states that 60-80% of the simple and anxiety forms recover after a period of four to seven months, but that a more grave prognosis is seen in the stuporous types. In the delusional melancholia he states that the prognosis is 43% for recovery. Werner⁵⁷ states that patients with treatment may recover in from 23-40% of the cases. In involuntional melancholia, the prognosis may be lowered by the increase in the number of suicides. Between 1925 and 1930 there was an increase of 46% in the number of white males and 40.5% in white females. There was practically no increase in the suicide rate of negroes.¹²

For the paranoid reactions the recoveries were 42.3%.⁴⁹ For the chronic paranoid state, the prognosis is bad.⁴⁰

In manic depressive states recovery is the expected as well as in those cases of melancholia appearing for the first time. Different authors give from six to nine months or longer as the time necessary for recovery. The prognosis is worse if agitation, delusions and stupor are pronounced and persistent, and is due largely

to difficulty in nourishment.

Whatever the mental illness may be, if it is complicated by cerebral arterio-sclerosis, the prognosis is worse.

Infection, a severe or septic malady, as a pelvic or an abdominal, may seriously complicate the condition.

The prognosis for psychoneuroses, depends upon how far the environmental incompatibilities can be overcome, and the attitude of the woman adjusted to the disappearance of youth and reproduction. Domestic happiness, intellectual interests and physical health are invaluable assets, and much can be done by means of psycho therapy.⁴⁰

Norburg³⁵ states that the prognosis is good in at least 80% of all psychoses of the climacteric.

VIII. TREATMENT

Treatment of the symptoms of the menopause should be along two lines, glandular and psychotherapeutic. Neither can be used without the other.³¹

MENTAL HYGIENE

The treatment can begin long before the menopause occurs. In fact the proper time to start such treatment is during childhood. This line of treatment should be directed along the lines of "mental hygiene".

We must certainly be laying the foundation in the children for the best possible character and personality so that they will be able to meet the problems which will confront them in the future.¹² One of the main things to be avoided in children is fear. Fear during childhood seems to leave its mark, and during later years fear may form the basis for some nervous or mental upset.

It must be remembered also that our contacts with the adults may in some way influence their menopause. What has the adult to meet in the unescapable limitations of advancing age? Should economic security be removed by the death of a mate or unanticipated financial disaster, what have the adults of today to fall back on?¹²

It is therefore the duty of the physician to help the patient broaden her interests and prepare her mentally for the things to come. This should be done regardless of the age of the patient or the reason for her visit.

At the present time the physicians are dealing with patients

who did not have the advantage of the modern methods of child psychology, and of course it will be years or generations before such methods will be effective. The psychiatrist is helpless, for he is the one man from which many people stay away.

Complete confidence of the patient must be obtained by the physician. The patient should never be told that "this is only the change of life", for it seems to make fun of her complaints and closes forever all psychic approach. The process may be explained on the basis of fatigue and starvation of the nerves from lack of endocrine food, so that there is a nervous instability and loss of adequate cerebral control.⁵¹ The patient should never be told that there is nothing wrong with her.

The husband should also understand the patient's situation so that his attitude may be more sympathetic but not indulgent. Firm--but not hard--all of which is very hard indeed.

Many women are introspective and worry about themselves, about cancer etc.. These women have little knowledge of medicine so that they are unable to realize that their condition is lamentable and at the same time more or less natural. They can get some comfort from a careful explanation which will give them a clearer understanding of the situation. The doctor should insist that they make frequent visits to his office.

The most successful women are those with a good education and who can direct their maternal instincts to social welfare, their physical activities to gardening, and their fantasies to literature or to their church.⁶⁰

There is no set formula or procedure which is suggested in the line of mental hygiene. There has been a great deal written on this subject, but the general practitioner or the public will never see it. It will first have to be brought to their attention through an educational program.

It is generally accepted that mental hygiene instructions to the laity can utilize all the material which is now available, with particular honesty to the patient and physician, along the lines of temptation, sin and the conscience.⁵¹

Breuer² advises: "Forget the change of life. It is a natural function. It does not make women sick. Do not attach any mysterious significance to it. When it comes take it as a matter of course, as you would your birthday".

MEDICAL TREATMENT

There has been quite a remarkable change in the treatment of the menopausal syndrome since the time of Tilt⁵³ who in 1882 used as his principal means of treatment bleeding or blood-sucking insects. Leuf²⁸ as early as 1902 found that he was able to get some improvement in a very few patients by means of oral glandular therapy.

The work on glandular therapy has been centered mainly around ovarian preparations, for the pathology in this gland is the underlying etiological factor in most menopausal disturbances. A great deal of work has been done on this subject, and this paper will be concerned with the "high spots".

As there are periods of hypofunction and hyperfunction in a patient the practitioner must be on guard, and each patient studied should be individualized. If one gland does not work another should be tried.¹⁰

It is much better however, to determine the gland or glands which are primarily responsible and direct the treatment in this direction. In many cases no treatment will be necessary, for the symptoms may be self-limited, and sooner or later a new endocrine balance may be established.

In the early stages of the menopause there is an over-supply of estrin in the blood and urine. In this case ovarian therapy is contraindicated, but this stage soon passes, and there is an underfunction of the other glands, particularly the pituitary.

Wolf⁶¹ recommends the administration of 500-10,000 international units of theelin given intramuscularly or even subcutaneously, one to seven times a week, depending of the severity of the symptoms and the times of their recurrence after each injection. He states that the dosage should be the smallest possible which will give relief, starting with 20-300 units. He recommends further that between injections, theelin should be given orally in 1000-4000units daily, divided into three doses one before each meal. Sedatives should not be given while the dosage is being determined for he found that 50 units was enough to produce full effect in one case.

Fletcher¹⁶ states that theelin in oil and Progynon-B may be used but whatever is given should be given in large enough doses and

over a long enough period of time to get results, and then to maintain the patient at the desired level by frequent oral doses or occasional injection.^{16,39,59} He feels that large doses of 10,000 rat units every fourth day will relieve the most serious symptoms of the menopause in the majority of patients within three weeks. After this reduce the dose to half for a period of a month and then gradually reduce the dosage until it is stopped at the end of six months.

Mazer⁵² has found that he got the best results by using huge preliminary doses of 10,000 rat units (50,000 international units) hypodermically every four days. He agrees with Fletcher that the symptoms are usually relieved within three weeks if the symptoms are truly menopausal. Oral administration of 6000 rat units in three divided doses daily is equal to the hypodermic injection of 1000 rat units every fourth day.

Werner⁵⁸ states that the dosage ~~etc~~ for his patients is arbitrarily set at 1cc of aqueous solution of theelin (50 rat units) daily for six months. He feels that if theelin does not benefit them in this time, this line of treatment never will. However if the patients improved at all they continued the treatment. One cc of theelin in oil (300 rat units) twice a week is just as effective.

Mayes⁵¹ using Progynon, gave one cc (100 mouse units per cc) on alternate days for six days and repeated them in second or third courses if necessary. In severe cases he gave concentrated form, Progynon Boleosum (10,000 mouse units per cc) using one cc on ater-

nate days for six doses. He used tablets in each case as well. No effect from over-production was noticed.

Drips¹³ got good results using 1000-5000 mouse units of estrogenic hormone. She found further, that the use of sistomensin 2cc, which contains 10 units of standardized estrogenic hormone, once a week, was of value when there were symptoms present, with an excess of the estrogenic hormone in the urine.

Vaginal smears should be used as a check on the effectiveness of the treatment. The smears may be prepared as follows: The patient is provided with a blunt pointed short pipette which has a rubber bulb at the other end. She prepares a clean slide and is given a jar with fixing solution containing one third water and two thirds alcohol. She draws a little of the vaginal secretion into the pipette and smears it thinly on the slide, allows it to dry and immediately drops it into the fixing solution, leaving it there for forty minutes. She then takes the slide from the jar and allows it to dry and sends it to the laboratory or physician for staining with eosin and hematoxylin. A great preponderance of flat cornified epithelia as compared with the number of leukocytes constitutes a positive smear and indicates that the dosage of theelin has been at least sufficient.⁶¹ A negative smear means a predominance of squamous epithelial cells or leukocytes. The positive smear should also show the squamous cells as large with clear staining small nuclei, with no leukocytes and no compact cells. These smears may be graded as 1, 2, 3, or 4 plus.

Salmon⁴¹ found that following administration of Progynon-B the smears which were negative changed to strong positive within five days. He found also that symptoms varied correspondingly with the change of the smear. The dosage used varied from 4,000 rat units to 36,000 rat units given in divided doses of 4,000 rat units at three to four day intervals. In the untreated cases it was found that there was no correspondence between the severity of the symptoms and the character of the smear. Padanicolaou³⁷ found that a minimum of from 15-20 times the hypodermic dose was required to include the changes in the smears and disappearance of the symptoms.

Macfarlane²⁹ made the following observation on the product Emmenin, which is an extract from human placentas produced by Collip, and originally by Frankl in 1898 in the form of tablets called "Lutein Tablets" which were ineffective. It acts through stimulation of the intact ovary. Macfarlane gave liquid emmenin, with the associated other soluble placental principles, by mouth one teaspoonful in water three times a day, with some improvement in the symptoms of menopause. He noticed also that some patients improved who had bilateral surgical removal of the ovaries.

Anterior pituitary and thyroid substances have also been used in some cases with very good results.^{19,25} Diasio¹¹ used a pluri-glandular therapy using Colwells hormones solution with good results. This is, thyroid 1/10 grain, whole pituitary 1/20 grain, supra-renal 1/10 grain and gonads 3/4 grains.

If the B.M.R is low and blood cholesterol is high, thyroid

extract in 1/4 to 1 grain doses is given three times a day before meals. This may be combined with anterior pituitary lobe extract in 2-5 grain doses. This may control the constricting headaches.⁶¹

This is a substitutive treatment, in part, as shown in cases who get effect from large doses when they all ready have nearly normal follicular hormone content. However, Kurzrok²⁶ states that in this case small doses are no less effective than those which show no estrin excretion. Thus, it is not purely a substitutive treatment.

With the hypertonicity of the sympathetic nerves, which is the cause of many of the somatic symptoms, 40% solution of calcium chloride or calcium gluconate, 10cc intravenously may be used. This is used to reestablish the normal equilibrium of the vegetative nervous system. It should be repeated on one or two succeeding days.⁵⁴

Goldberg¹⁷ found that acroparesthesia was not completely relieved in any of his twenty cases in which theeling was injected, 300 rat units subcutaneously once a week. He did notice however that all were made more comfortable and two almost obtained complete relief. This dosage does not correspond in size with that used by other men. Werner⁵⁸ feels that this is only a maintenance dosage to be used after preliminary treatment.

The use of whole ovarian extract has been abandoned by most authorities because it has a doubtful effect, but when used it is given in doses of 3-10 grains three times a day.⁶¹

X-ray has been used to good advantage in recent years. Collins⁴ states that "castration cells" may at times be found as early as 4-5

days in the pituitary gland of the castrate. He states that Borak in 274 cases found 80% were relieved by irradiation of the pituitary and the other 20% were relieved by irradiation of the thyroid. Relief in these cases lasted from six months to four years. The irradiation dose for each exposure was 148r, 12 inch distance, 5 Ma, 120 K.V.P., 1mm filter of aluminum, and 0.25 cu, for eight minutes. Total dosage for each series was 296 r. The first exposure was through the right temporal region, the following day on the left. Then with an interval of three weeks between treatments, the treatment is repeated making a total series of four exposures, with a total dosage of 592 r to the skin surface. He states that Huet used 2000 r with no harmful consequences. In these cases tests must be run to determine the amount of follicle stimulating hormone present.

X-ray may be used over the ovaries in cases of bleeding.²⁷

Wolf⁶¹ feels that pruritus which is not controlled by sedatives or 2-5% phenol applied locally as a lotion, should be treated by X-ray.

Fitzgibbon¹⁵ and Moorhead³⁴ believed that hysterectomy was the answer to the problem of menopausal symptoms especially insanity, when there was anything abnormal in the pelvis such as retroversion, tumors, subinvolitional or sepsis. In other words, they felt that there was the factor of focal sepsis, and that in a pelvis with any abnormality, there was congestion. They believe the latter to be a strong etiological factor in menopausal insanity. Thus, hysterectomy relieves the absorption of toxins from this area. Moorhead gives a case wherein a woman was hopelessly insane, and completely

recovered immediatly after the operation (removal of the ovaries).

Parfitt⁵⁸ in his article in response to Moorhead and Fitzgibbon on total hysterectomy, presented 17 cases. Total hysterectomy was performed in 10 cases and subtotal in the remaining 7, but no appreciable difference in the effect on the mental state was observed between the two operations. Of the seven cases, three recovered (recoveries expected on clinical grounds), two died, one discharged with nonmental change and one with progressive dementia. Of the ten, two were discharged to friends, with no mental change, three died, two recovered (diagnosis confusional psychosis, and alcoholic confusional), one recovery from a recurrent mania, one progressive dementia and one no mental change. They conclude that hysterectomy should be done for severe demonstrable pelvic lesions.

Included in the treatment is that of sedation, the excessive use of which is contraindicated, especially opiates. The reason for this is obvious when one realizes that these conditions may last for months or even years--an acute toxic state may be caused. General measures such as warm baths, warm packs, elimination of toxic features, regulated exercise, diet, fresh air, sleep, massage and healthy mental contacts are important in the beginning of treatment.^{22,61} In the hospital it is difficult for the patient who has not been used to this type of restrained existance, so an effort must be made to direct her interests into socialized and group activities. The regular hospital schedule provides a stimulus to return to normal living.²²

Jammison²² quotes Tuke as saying, "Close confinement at York

Retreat of melancholic and hipocondraic cases is of all things most unsuitable". Jammison states that few cases of melancholy are cured in asylums in general. "It seems a rare event for a melancholic patient to recover fully while still in the hospital. The return to complete normality occurs at home in the patient's normal envoinment".

Mazer³² says that the symptoms of the climacteric are not static, often leaving the patient in a state of chronic exhaustion. Only 1/3 of the women entering the natural menopause require medical attention. These women he suggests should be given prophylactic treatment of estrin. The oral administration of the hormone is best for this purpose. One may give the patient 600 rat units of the dihydrofollicular hormone daily, in three divided doses. The dosage should be decreased gradually. A larger dose of theelol is required to produce the same effect.

IX. CONCLUSIONS

1. Mental disorders are relatively more frequent in the interval from 40 to 50 years of age, than at any other time during the adult life.
2. The mental reactions are of the same nature as at other times of life, except for the coloring which the menopause adds.
3. The mental unbalance of the menopause has a complex etiology.
 - a. Menopause syndrome is a polyglandular reaction, primarily due to ovarian deficiency.
 - b. Insecurity and fear form a background for mental changes at at menopause.
 - c. Inheritance is of marked etiological importance in mental changes of the menopause.
4. Most women pass through the menopause without great discomfort, but the process is of a pathological nature.
5. It seems to me that prophylactic treatment will play a large part in reducing the number of complications of the menopause.
6. Psychoses of menopause are merely an excentuation of the normal reaction of menopause.
7. Involutional melencholia is a seperate psychosis, related, but not a part of manic depressive psychosis.
8. The castrate and the natural menopause show the same symptoms.
9. Treatment by x-ray is a valuable asset in menopause.
10. Surgery should be limited to selected cases.
11. There should be a careffl study of the amount of glandular secretion present before treatment is started.

12. The amount of follicular stimulating hormone in the urine varies with the type of mental reaction.
13. The glandular preparations on the market are of value in treatment.
14. Drugs are necessary, in addition to the hormonal therapy.
15. Psychic therapy is as necessary as glandular or drug therapy.
16. The earlier the symptoms of the menopause are recognized and treated, the better the prognosis.
17. The prognosis of mental reactions at the menopause is good.
18. The general practitioner is perfectly ~~as~~ able to handle the mental patient as the specialist, if the patient is seen early enough.

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