Emotional Fluctuations in Women

Thesis
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The writer wishes to thank Dr. G.A. Mixe
by
for his very helpful advice.
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The writer wishes to thank Dr. C.A. Mace for his very helpful advice.
Abstract of Thesis on Emotional Fluctuations in Women.

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The aims of this research were to investigate,
(1) whether the tendency to produce emotionally disturbed behaviour in women varied throughout the monthly cycle.
(2) whether variations occurred more often among one temperamental type than another.

Test Material.
(1) a modification of the Woodworth Neurotic Inventory given every day in the form of a controlled diary.
(2) The Mosaic Test.
(3) Exercise 4 of the Terman Miles Masculine-Femine Test.

Results.
From data obtained from 44 subjects it was found that the tendency to produce emotionally disturbed behaviour did vary throughout the monthly cycle. The largest number of symptoms were produced just before or on the first day of menstruation. Other days prolific in symptoms were the 4th day of menstruation, the 2nd. day of the postmenstrual phase, and the 2nd. and 5th. days of the intermenstrual phase.

Insufficient evidence was obtained to draw conclusions regarding the distribution of symptoms of different temperamental types.
# Index

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td>Description of the Tests</td>
<td>5</td>
</tr>
<tr>
<td>(a) Controlled diary</td>
<td>5</td>
</tr>
<tr>
<td>(b) Mosaic test</td>
<td>10</td>
</tr>
<tr>
<td>(c) Terman Miles Masculine Feminine test</td>
<td>11</td>
</tr>
<tr>
<td>Review of Previous Work</td>
<td>12</td>
</tr>
<tr>
<td>Results</td>
<td>26</td>
</tr>
<tr>
<td>Mean of the symptoms</td>
<td>26</td>
</tr>
<tr>
<td>Groups of symptoms</td>
<td>29</td>
</tr>
<tr>
<td>Results of one record kept for six months</td>
<td>31</td>
</tr>
<tr>
<td>Individual symptoms</td>
<td>33</td>
</tr>
<tr>
<td>Split half reliability</td>
<td>36</td>
</tr>
<tr>
<td>Age and anxiety</td>
<td>36</td>
</tr>
<tr>
<td>Happiness, fitness, and Emotional Stability</td>
<td>37</td>
</tr>
<tr>
<td>Effect of Temperament on Cyclic Variation</td>
<td>42</td>
</tr>
<tr>
<td>(a) Concrete patterns</td>
<td>43</td>
</tr>
<tr>
<td>(b) Introvert-Extrovert categories</td>
<td>45</td>
</tr>
<tr>
<td>(c) Masculine Feminine Tests</td>
<td>47</td>
</tr>
<tr>
<td>Summary</td>
<td>49</td>
</tr>
<tr>
<td>Conclusions</td>
<td>52</td>
</tr>
<tr>
<td>Appendix I</td>
<td>on the Mosaic Test</td>
</tr>
<tr>
<td>------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Appendix 2</td>
<td>- The Masculine</td>
</tr>
<tr>
<td></td>
<td>Feminine Test</td>
</tr>
<tr>
<td>Appendix 3</td>
<td>The mean frequency of occurrence of each symptom for the four phases of the cycle</td>
</tr>
<tr>
<td>Bibliography</td>
<td></td>
</tr>
<tr>
<td>1. Sum of symptoms for different types of emotional disturbance</td>
<td>30</td>
</tr>
<tr>
<td>2. Mean no. of symptoms per day for one subject</td>
<td>51</td>
</tr>
<tr>
<td>3. Sum of symptoms for each day for five months for one subject</td>
<td>32</td>
</tr>
<tr>
<td>4, 10, 11. Tables of Symptom Groups</td>
<td>33</td>
</tr>
<tr>
<td>12. Coefficients of association for happiness, fitness and emotional stability</td>
<td>37</td>
</tr>
<tr>
<td>13. Tables of happiness and fitness</td>
<td>35</td>
</tr>
<tr>
<td>14. &quot; &quot; &quot; Serenity</td>
<td>35</td>
</tr>
<tr>
<td>15. &quot; &quot; &quot; Serenity and Fitness</td>
<td>38</td>
</tr>
<tr>
<td>16. Frequency with which the answer happy was given</td>
<td>59</td>
</tr>
<tr>
<td>17. Frequency with which the answer fit was given</td>
<td>40</td>
</tr>
<tr>
<td>18. Frequency with which the answer serene and emotionally disturbed was given</td>
<td>41</td>
</tr>
</tbody>
</table>
Appendix I on the Mosaic Test . . . . 54

Appendix 2 - The Masculine-Feminine Test . . . . . . 62

Appendix 3. The mean frequency of occurrence of each symptom for the four phases of the cycle . . . . 66

Bibliography . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 69
**Index of Figures.**

<table>
<thead>
<tr>
<th>Fig.</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.</td>
<td>Summary of Previous Work</td>
<td>Facing 25</td>
</tr>
<tr>
<td>2</td>
<td>Example of arrangement of data</td>
<td>26</td>
</tr>
<tr>
<td>3</td>
<td>Graph of mean no. of symptoms for all subjects for each day</td>
<td>28</td>
</tr>
<tr>
<td>4</td>
<td>Correlations between the types of symptoms</td>
<td>on 29</td>
</tr>
<tr>
<td>5</td>
<td>Mean no. of symptoms for each phase of the cycle</td>
<td>Facing 29</td>
</tr>
<tr>
<td>6</td>
<td>Sum of symptoms for different types of emotional disturbance</td>
<td>30</td>
</tr>
<tr>
<td>7</td>
<td>Mean no. of symptoms per day for one subject</td>
<td>31</td>
</tr>
<tr>
<td>8</td>
<td>Sum of symptoms for each day for five months for one subject</td>
<td>32</td>
</tr>
<tr>
<td>9, 10, 11</td>
<td>Tables of Symptom Groups.</td>
<td>33</td>
</tr>
<tr>
<td>12</td>
<td>Coefficients of Association for Happines, Fitness and Emotional stability.</td>
<td>on 37</td>
</tr>
<tr>
<td>13</td>
<td>Tables of Happiness and Fitness</td>
<td>38</td>
</tr>
<tr>
<td>14</td>
<td>&quot; &quot; &quot; Serenity.</td>
<td>38</td>
</tr>
<tr>
<td>15</td>
<td>&quot; &quot; Serenity and Fitness</td>
<td>39</td>
</tr>
<tr>
<td>16</td>
<td>Frequency with which the answer happy was given</td>
<td>Facing 39</td>
</tr>
<tr>
<td>17</td>
<td>Frequency with which the answer fit was given</td>
<td>40</td>
</tr>
<tr>
<td>18</td>
<td>Frequency with which the answer serene and emotionally disturbed was given</td>
<td>41</td>
</tr>
</tbody>
</table>
Fig. 19. Mean no. of symptoms for subjects making concrete designs. . . . . Facing 43

20. Mean no. of symptoms for introverts and extraverts . . . . . . . . . . . . . " 45

21. Scores of the Masculine Feminine Test compared with no. of symptoms . . . . . . . . . . . . . . . . . . " 47

22. Frequency of Incidence of Types of Mosaic patterns in Children . " 54

23. Scheme of Mosaic Pattern Types " 55

24. Frequency of Incidence of Types of Mosaic patterns in Adults " 62

Example of abstract compact pattern " 56

" " scattered " " 57

" " concrete object " " 58

" " symbolical " " 59

" " neurotic pattern . . " 60

" " M.D. " " . . . " 61
Introduction.

More generalizations have been made about the mentality of the human female than about almost anything else. Those made by romantic writers have emphasised that she is above all a creature of extreme variability. From this hypothesis many pieces of research have originated. This work, however, though often excellently planned and carried out, has on the whole been disappointing. It would be expected that emotional changes in women would be connected with the sex cycle and that this relation would be demonstrable in their behaviour. This seems difficult to do as different women appear to react differently to the internal changes caused by the successive functioning of the sex hormones. Some women show increased activity, and even increased efficiency, during the menstrual period while others report and show less activity and decreased efficiency.

This increased efficiency is probably due to over compensation. It is well known that some people produce rather more units of work under distraction than they do under normal working conditions. It is probable that menstruation sets up an analogous condition. Freud discovered a tendency among his subjects to work faster during the menstrual period. There appears to be
some evidence that while greater activity is shown the work produced during the menstrual period is not of as good a quality as that produced at other times.

Again Yoshida and Matsubayashi found that the effect may be shown in work done just after the menstrual period is over. This appears to be a parallel case to the after effects of fatigue reported by May Smith.

Most of the attempts made to assess the influence of menstruation have been physical and indirect rather than psychological and direct. That is, the woman's variability in the performance of some routine work has been measured. Analysis of any curve of work has been shown to consist of many conflicting factors, that is warming up or increased efficiency with practice, may be cancelled by boredom or fatigue. Therefore it does seem possible that various emotions may have conflicting results on efficiency, the effects of which get blurred in the curve of work.

Others have tried to obtain subjective information from the subjects about whether they felt more upset or social etc. during menstruation. Several difficulties arise from this. The most obvious, is, of course, that the majority of the subjects would probably judge from their experiences of their last period which may or may not have been typical. Again it has been shown that to get accurate replies from people the
questions should ostensibly be oblique. Menstruation still seems to be a stronghold of taboo, and direct questions may set up inhibitions which will colour the accuracy of the replies.

Also while menstruation is noted as a probable time of emotional disturbance the other events of the sex cycle are neglected. Now data gained from conversation with women seem to indicate that while some are emotionally upset during menstruation others are more upset during other parts of the cycle, the most usual being a few days before the onset of menstruation. While this cannot, of course, be counted as scientific evidence at least it can be used as a starting point for investigation. These individual differences in regard to disturbance are possibly supported by such work as Myers and Sowton who report that some women did better work during their menstrual period.

One problem arising from these individual variations is whether the differences are caused by psychological type e.g. of the introvert extravert or cyclothyme schizothyme categories, or whether it is due to the different activity potentials of the sex hormones. At present it would not be possible to investigate this directly that is by biochemical analysis, but it might be possible to get an indirect measure by use of the Terman Miles masculine feminine scale. Presumably
women in whom the sex hormones were particularly active would be more feminine according to the tests, than those in whom these hormones were less active or existed in smaller quantities.

The aims of this research were to investigate:

a. whether the tendency to produce emotionally disturbed behaviour varied throughout the monthly sex cycle;

b. if variations occurred more often among one temperamental type of women than another;

c. if certain symptomatic types of behaviour were more prevalent at specific stages of the monthly cycle.
Description of the Tests.

The chief test used in this investigation was of the questionnaire type which was modified to form a controlled diary. The questions used were taken from Woodworth's Personal Data Sheet and adapted to meet the requirements of diary form. That is each item was a definite question about the events of the day. Instead of being asked generally for example, "Are you afraid of responsibility?" the subject was asked to state whether during the day she had felt afraid of responsibility.

A general questionnaire given once has so many drawbacks that reliability could hardly be placed on it. Phenomena such as the halo effect and conscious and unconscious lying are so well known as not to need further description. These factors must invalidate to a great extent both the Woodworth and any other questionnaire. However the method of controlled diaries does seem to overcome these objections. In this method a time sample is taken and the subject asked specific questions about his behaviour during this period. For example the question "Did you dislike being in the room with the door shut?" is of very different value when it is possible to count how often this happened during a set period. If the question is put in the form, "Do you dislike being in a
small room with the door shut?" it is likely that the answer is conditioned by the subject's mood at the time for these symptomatic unpleasantly toned feelings are soon forgotten when they have not been very recently operative.

A study of the answers, and conversations with the subjects indicates that they were remarkably pains-taking and seem to have made every effort to answer accurately and carefully. Conscious and unconscious lying is possible, but there is no evidence of it.

The questions were arranged in a calendar like formation so that the subject had simply to put a tick or a cross in a space for each question for each day. The questionnaire is given in full below.

**Questionnaire.**

Name ....................

Age ....................

Married or unmarried ..................

Have you been ill during the month? If so please put the date and length of illness here. E.g. Ill two days from Jan. 2nd. - 4th.

The date and length of your menstrual period during this month. E.g. from Jan. 4th. to 8th.
The letters after the questions indicate the symptom group to which each type of behaviour belongs. The classification has been taken from Cattell's book, "A Guide to Mental Testing".47

Neurasthenic symptoms N
Anxiety " A
Paranoid " P
Obsessional " O
Hysterical " H
Spaces are provided for you to answer each question every day. Put a tick (√) if you mean yes, a cross (X) if you mean no.

Since yesterday

Did you sleep well?  

Were you frightened in the middle of the night?  

Did you have pleasant dreams?

Did you have unpleasant dreams?

Did you walk in your sleep?

Did ideas run through your head so that you could not sleep?

Did you have a feeling of suffocating?

Were you bothered much by blushing?

Were you bothered by fluttering of the heart?

Did you feel tired most of the time?

Did you have fits of dizziness?

Did you have queer, unpleasant feelings in any part of the body?

Did you have bad pains in any part of the body?

Where?

Did you have a headache?

Did you have a strong desire to run away?

Did everyone treat you fairly?

Did you know of anybody who was trying to do you harm?

Did people find fault with you more than you deserved?
Did you make any new friends?
Did you have any great mental shock?
Did you have trouble in walking in the dark?
Did you feel as if some one was hypnotizing you and making you act against your will? P
Were you bothered by the feeling that people were reading your thoughts? P
Were you bothered by a feeling that things were not real? H
Were you troubled with the idea that people were watching you in the street? P
Were you troubled with the fear of being crushed in a crowd? A
Did it make you uneasy to cross a bridge over a river? A
Did it make you uneasy to go into a tunnel or subway? A
Did it make you uneasy to have to cross a wide street or open square? A
Did it make you uneasy to sit in a small room with the door shut? A
Did you usually know just what you wanted to do next? N
Did you worry too much about little things? A
Did you think you had too much trouble in making up your mind? N
Did you get rattled easily? A
Did your mind wander badly so that you lost track of what you were doing? N or A
Did some particular useless thought keep coming into your
mind to bother you?  O
Did you do the little jobs of the day without worrying over them?  A
Did you feel you must do a thing over several times before you could drop it?  O
Were you afraid of responsibility?  N
Did you feel like jumping off if you were on a high place?  A
Were you troubled with the idea that somebody was following you?  P
Did you feel a strong desire to go and set fire to something?  O
Did you feel a strong desire to steal things?  O
Did you feel yourself twitching your face, neck or shoulders?  H
Were you troubled with shyness?  P  N  H
Did you have a good appetite?  A
Was it easy to make you laugh?  P
Was it easy to get you angry?  P
Did you get tired of people quickly?  N
Did you get tired of amusements quickly?  N
Did you get tired of work quickly?  N
Did you feelings keep changing from happy to sad and from sad to happy without any reason?  H
Did you feel sad or low-spirited most of the time?  N
Did you have a strong desire to commit suicide?  O
Did you have difficulty in adjusting yourself to other people?

Did you feel lonely or deserted?

Did you have any particularly strong emotion not specified? If so, which?

If your general state was happy during the day please put H in the space provided, if indifferent put I, if unhappy put U. The appropriate letters to put are shown in brackets after each of the other descriptions.

1. Happy (H); Indifferent (I); Unhappy (U).
2. Serene (S); Normal state of balance (N); Nervously upset (U).
3. Fit and well (F); Not really fit but not unwell (N); Unwell (U).

Section two was included as it was considered advisable to allow the subjects some chance of grading their emotional and physical conditions in general.

The majority of the subjects were also given the mosaic test. This test was devised some years ago by Margaret Lowenfeld as an aid to clinical diagnosis, and has since been standardised by her and the writer. A full description of this test is given in appendix I.
Most of this experimental work was done before the publication of Terman and Miles' book on sex differences. As the standardisation of the Masculine Feminine Test seems very reliable, it was thought possible that some of the differences between subjects in this investigation might correlate with differences on the M.F. scale. As the majority of the subjects had left college, one test only, Exercise 4, was given. This according to Terman and Miles is the most reliable of the battery and can be used alone. If the whole test had been given, the subjects might have been overwhelmed and not replied at all. Exercise 4 is given in full in Appendix 2.
Review of Previous Work.

Work on the physiology of the sexual cycle in man has always been impeded by the difficulty of conducting experiments. Much research in endocrinology involves the killing of the animals concerned in order to estimate changes in the tissues. This is obviously not expedient in the case of man.

There is however a large volume of work on the causes of periodicity in man and animals from which general conclusions can be drawn. Such work will not be described here as it is outside the scope of this thesis. The conclusions given by Marshall in his Croonian lecture will alone be quoted:

"Speaking generally there is an internal rhythm of reproduction depending primarily upon the alternation of periods of rest and activity; in correlation with this rhythm hormones are periodically elaborated by the gonads and act upon the accessory organs and secondary sexual characters. But in the higher animals the internal rhythm is brought into relation with seasonal changes and other external environmental phenomena, these not merely conditioning the metabolic processes (as they do also in all or most of the lower animals, as well as in plants) but, in part at any rate, acting exteroceptively through the nervous system and probably through the hypothalamus upon the interior pituitary and thence upon the testis or ovary."

The human female sex cycle was divided by Papanicolaou into four 'phases' and one 'stage', the distinction being based on data provided by vaginal smears taken from normal women. This classification
is as follows:

1) Congestive (menstrual) phase
2) High follicular (postmenstrual) phase
3) Ovulative stage
4) Proliferative (intermenstrual) phase
5) Secretary (premenstrual) phase

The distinction of premenstrual, menstrual, postmenstrual, and intermenstrual has been used extensively in all research following Papanicolaou and will be used throughout this report.

2. Physiological effects of the cycle in women.

It is most probable that the variations of control, shown by the interaction and the interchanging supremacy of the pituitary and ovarian hormones, will cause some disturbance in other bodily functions. It has been known for a long time that variations in temperature, blood pressure, etc do occur. The problem for physiological investigation was whether these variations were rhythmical and if so how did they correlate with the phases of the menstrual cycle.

Blood Pressure.

Amos, working on 12 subjects, found a decided fall in pressure early in the menstrual phase. There
is often a rise a day or two before menstruation, and a rise towards the end of menstruation or a day or two after it has finished. (This is important for comparison with results of this investigation and will be referred to later.)

Eagleson, working on 4 subjects, concludes that there are rhythmic variations in the circulatory functions. There is a rise in blood pressure in the premenstrual phase while it is low at the end of the menstrual phase. In the intermenstrual phase blood pressure is low at first rising to normal at the end of the first week. Heightened pressure is shown 14 to 18 days after the beginning of menstruation. Eagleson thinks that this may be due to ovulation.

Cullis kept records of the blood pressure of 16 subjects for 6 weeks but found no indication of rhythm.

Temperature.

Harvey and Crocket found that temperature falls just preceding menstruation till slightly after the flow has ceased when it increases to a maximum about the 23rd. day.

Cullis found that the maximum temperature was with few exceptions in the premenstrual phase. There is a rapid fall from the premenstrual phase to menstruation. In 90% of cases there was a slight rise in the postmen-
trual phase which was continued steadily throughout the intermenstrual phase until the maximum was reached again in the premenstrual phase.

Pulse rate.

Cullis\textsuperscript{10} found a rise in the postmenstrual phase, the value for the intermenstrual phase being nearly always as high as that of the premenstrual phase. The menstrual and postmenstrual phases were always lower than the rest of the cycle.

Motor Activity.

Billings\textsuperscript{12} measured the gross amount of motor activity in 6 psychiatric patients by means of a pedometer. He found a consistent postmenstrual burst of activity which gradually declined until after the next menstrual period.

Water Output.

Bond\textsuperscript{13} found that during the premenstrual period there is a marked rise in the ammonia coefficient. This appeared to be due to a rise in total output of urinary ammonia rather than to a decrease in the total output of urinary nitrogen. There is little variation in the coefficient in the post and intermenstrual phases.

Krohn and Zunkerman\textsuperscript{14} investigated the water metabolism of a mature female pig-tailed macaque. The
sexual skin of this animal began to swell regularly during menstruation and began to subside shortly before the middle of the cycle. The body weight fluctuated with the sexual skin. The mean intake of fluid both of free water, and water provided by the food, was lower in the phase of sexual skin swelling than during the phase of subsidence. The amount of urine excreted was much higher during the phase of sexual skin subsidence than in that of swelling. In each of the three observed cycles a rise of up to 645% in the amount of urine excreted occurred within 24 hours of the observed beginning of sexual skin subsidence.

This work is important because Zuckerman's curves of daily variation in the amount of urine excreted show a decided rise at about 5 days after the onset of menstruation before dropping still further. This will be discussed later.

3. Effects of the cycle on Work.

The investigations of the effects of the cycle on work fall into two groups. In the first the subjects are either questioned about their efficiency or else are graded by observers. In the second the subjects work under experimental conditions and their periodic fluctua-
tions in efficiency are measured by the daily output of production.

Hirschmann-Wertheimer questioned subjects on their affective reactions, sensitivity, ability to work and dispositions. Most denied increased sex need during the menstrual period. Eight per cent said that they felt an increased need and love for their husbands and children, while 9% felt hostile towards them. He thinks that there are two main types. One is the woman who stays at home and the other the worker. He thinks that in the menstrual period the worker feels a need for home life and this sets up a conflict.

Kirihara combined the two methods. He recorded the daily production of 120 women engaged in industry and questioned 2410 women about the effect of menstruation on their work. He found 5 types of response; the type being determined by the personality of the woman combined with the type of work. One interesting conclusion was that less women report a decrease of efficiency as age increased.

A much quoted piece of work is that of G.B. Johnson on the "Effects of Periodicity on Learning to Walk a Tight-Wire". He found that during menstruation his subjects had difficulty in co-ordinating large muscle groups. At the onset of menstruation and during
the period there was a large drop in the learning curve. After the period learning increased rapidly, reaching a peak in about 11 days.

Freund investigated the variations of the inclination to go on working during the menstrual cycle. He got 12 women to work for as long as possible at such simple tasks as stringing beads. There was a decrease firstly in the duration of the work (32%) and secondly in the quantity of work (39%) which showed in all the subjects and all the tasks during the menstrual period. There was also a slight tendency to work faster.

Another paper published by Lewin and Freund substantiates the above conclusions. The subjects all showed a decrease in the impulse to continue the activities that they were engaged in. The quality of the work remained unaffected, and the quantity showed a slight increase this time.

Yoshida and Matsubayashi investigated the effect of the cycle on mental work. Their subjects were 52 girls attending high school. The effect of menstruation on the work of these girls was as follows:

- 54.5% were less efficient.
- 32.2% were more efficient.
- 13.3% showed no change in efficiency.

In those whose work was adversely affected by menstruation the change reached its maximum one or two
weeks after menstruation and then subsided gradually. Those girls who became more active mentally at the onset of menstruation lost this advantage at the end of a week and then gradually recovered it throughout the premenstrual phase.

Tsuji working on 62 girls from a high school found that those girls who have shorter menstrual periods do better work than those whose periods exceed 6 days.

Some research somewhat related to the two investigations just recorded was carried out on English school girls by A.E. Sanderson Clow. Her aims were:
1. To find the proportion of girls having menstrual disability.
2. To enquire into menstrual habits and their effects on health.
3. The effect of school life on health.

Her conclusions were:
1. The majority were free from menstrual disturbance.
2. If no unnatural restrictions were imposed the percentage of freedom from disturbance increased.
3. Baths and exercise should be encouraged.
4. Amenorrhea was not caused by study.
5. Dysmenorrhea was not caused by study unless exercise was neglected.

S.C.M. Sowton and C.S. Myers gave tests of
muscular and mental efficiency daily to 13 university students and 16 factory workers for from 6 to 9 months. They found firstly that the influence of menstruation on production was not greater than other influences of an accidental nature, and secondly that the type of influence varied in different women and with their social position. They used the following tests:

1. Number checking sample form, e.g. cancellation.
2. Number checking modified form.
3. Spearing (Muscio).
4. Dotting.

Of 22 subjects, 5 showed no alteration, 4 showed a better performance, 9 a worse, 4 showed a better or worse according to their stage of familiarity with the test. Of the 5 uninfluenced 4 were university students and one a worker.

4. Effects of the cycle on Emotions.

a. Normal.

Conklin Byrom and Knipps questioned 1586 females of various ages regarding the emotional changes that they experienced during the cycle. In general they found the changes were introvertive in nature.
The frequency of introvertive reactions increased rapidly with increase of discomfort or pain. There was no significant difference between the age groups. About 5% of the college group became more extroverted during the menstrual period.

Buxbaum questioned 30 school girls about their emotions. Of these 28 confessed to fears. These fears fell into 3 groups:
1. Anxiety regarding menstruation.
2. Fear of walking alone in the street.
3. Anxiety in the evening.

Buxbaum thought that all these fears came from sex excitement. This work has been quoted as questions about these fears were asked in the present investigation.

K.B. Davis investigated the periodicity of sex desire. He sent a questionnaire to 1000 married and 1000 unmarried women. Those who admitted periodicity were found to have better health and more sex problems.

K.Horney attempted to find a psychological cause for premenstrual depression, making the physiological changes indirect. Premenstrual was said to be caused in some cases by the reversion of increased libido into anger which had to be repressed. In other cases it was caused by intense but repressed wishes for a child. Menstruation ended this pregnancy phantasy. In another
paper the same writer said that infantile phantasies played the determining role in all cases of menorrhagia and dysmenorrhea.

R.A. McCance, M.C. Luff and E.E. Widdowson obtained records of the psychological and physiological subjective changes which accompany the menstrual cycle. Their subjects were 167 women who kept records for six months. These subjects had to note every day their fatigue, digestive disturbances, bowels, pains, illnesses, breast changes, depression, elation, anxiety and worry, tension, irritability, sudden changes in mood, tendency to cry, social relationships, capacity for intellectual work, length of menstrual period, amount of loss, sexual feelings and sexual intercourse.

They concluded, "Many physical and mental symptoms in women are obviously and in some cases unexpectedly rhythmical. Other phenomena show comparatively little periodic variation although even here a few individuals may show rhythm."

Unfortunately these writers have not discussed the points interesting to psychologists, such as the changes in social relationships etc. but have concentrated more on the more physiological findings. This work will be commented on in more detail when comparison will be made with similar data obtained in this investigation.
b. Pathological.

Middleton\textsuperscript{26} tried to discover if there was a relation between female periodicity and kleptomania. He quoted the case of a girl of 19 who only stole at menstruation as evidence for some connection. He questioned a number of women and concluded that menstruation might lead to kleptomania and other compulsive acts in women who were neurotic.

E.B. Allen and G.W. Henry\textsuperscript{27} investigated the relation of menstruation to personality disorders and found that the menstrual disorders were somewhat characteristic of the different types of personality disorders.

In another paper Allen\textsuperscript{28} reported that depressive moods, physical depletion, and motor underactivity were associated with amenorrhea; while expansive or elated moods with good physical condition and motor overactivity, were associated with a profuse and prolonged menstrual period. Agitation and worry were more frequently associated with a profuse rather than a decreased flow.

Healy\textsuperscript{29} found that patients prone to fits had them more frequently in the premenstrual or menstrual phases.

Conclusions.

It will be seen that though much work has been
Figure I.
Summary of Previous Work.

- indicates a rise, - a fall. eg. - in the premenstrual column for blood pressure means that a premenstrual rise in blood pressure was discovered.

<table>
<thead>
<tr>
<th></th>
<th>Pre- Mens.</th>
<th>Post- Mens.</th>
<th>Inter- Mens.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pulse rate.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cullis</td>
<td>10</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Eagleson</td>
<td>9</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td><strong>Blood Pressure.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amos</td>
<td>8</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Eagleson</td>
<td>30</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>van Ott</td>
<td>30</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Moore and Cooper</td>
<td>31</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Ishikawa</td>
<td>32</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Truetsdell and Croxford</td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Scott and Tuttle</td>
<td>34</td>
<td>insignificant differences</td>
<td></td>
</tr>
<tr>
<td>Eichbaum</td>
<td>35</td>
<td>insignificant differences</td>
<td></td>
</tr>
<tr>
<td>Grollman</td>
<td>36</td>
<td>insignificant differences</td>
<td></td>
</tr>
<tr>
<td><strong>Temperature.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harvey and Crockett</td>
<td>10</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Cullis</td>
<td>37</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Van de Velde</td>
<td>38</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Flaskamp</td>
<td>39</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Jacoby</td>
<td>38</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td><strong>Muscle Strength.</strong></td>
<td>40</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Bossi</td>
<td>42</td>
<td>insignificant differences</td>
<td></td>
</tr>
<tr>
<td>Viville</td>
<td>41</td>
<td>insignificant differences</td>
<td></td>
</tr>
<tr>
<td>Schmoldkin</td>
<td>42</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Moore and Barker</td>
<td>43</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td><strong>Motor Co-ordination.</strong></td>
<td>44</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Fearing</td>
<td>45</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Johnson</td>
<td>17</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Schaare</td>
<td>45</td>
<td>insignificant differences</td>
<td></td>
</tr>
<tr>
<td><strong>Motor Activity.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Billings</td>
<td>12</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td><strong>Psychomotor Efficiency.</strong></td>
<td>9 (tapping)</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Eagleson</td>
<td>(substitution)</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>(adding)</td>
<td>+</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Sowton and Myers</td>
<td>inconclusive.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Inclination to work.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freund</td>
<td>1</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Freund and Lewin</td>
<td>13</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Emotional Responses.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conklin, Byrom, and Knipps</td>
<td>21</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Hornby</td>
<td>24</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Middleton</td>
<td>25</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Healy</td>
<td>29</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>McCance, Luff, and Widdowson</td>
<td>28</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Depression</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Elation</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irritability</td>
<td>+</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Tendency to cry.</td>
<td>+</td>
<td></td>
<td>-</td>
</tr>
</tbody>
</table>
done on the subject of periodic variation, little attention has been given to the direct psychological factors. That is, variations have been measured in terms of output of physical or mental work. Now this is of course only an indirect measurement and therefore has the disadvantage of any purely behaviouristic observation. That is, a variation in output might be the result of any one of a number of psychological processes. For example, it might be found that there was a state of heightened excitability and this might be of either pleasant or unpleasant origin.

When the subjects were questioned about their mental states the questions were general and not specific, e.g., did you feel irritable. This obviously does not allow for errors of interpretation. Again in many cases the subject's social behaviour was not recorded. Conklin, Byrom and Knips were of course exceptions to this.

The writer feels that while most of the above objections and many others could be made to the present investigation the emphasis is psychological and causal. That is, it is the variations in the emotional responses reported that matter. While the causal part must, of course, be speculative until more is known about the integration of endocrine with endocrine the writer feels that there is no reason why possible connections between
the psychological reaction and the physiological events of the sexual cycle should not be tentatively suggested.
### Figure 2.

| Date | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 1 | 2 | 3 | 4 |
|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| No. of Symptoms | 1  | 7  | 10 | 6  | 4  | 5  | 3  | 7  | 1  | 1  | 1  | 1  | 3  | 4  | 4  | 10 | 5  | 2  | 1  | 5  | 1  | 1  | 3  | 1  | 1  | 1  | 1  |
| Arrangement | 2nd | 3rd | 4th | 5th | 6th | 7th | cut | 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 1st | Postmenstrual Phase | Menstrual Phase | Premenstrual Phase | Intermenstrual Phase |
Results.

The data obtained from this investigation can be assessed from two angles. Firstly the material can be arranged so as to show whether periodic variation occurs in one or any number of the subjects taking the symptoms collectively. Secondly the data can be reviewed from the angle of each particular symptom recorded in the controlled diary. That is, an attempt can be made to find if anxiety for example occurs more frequently in the premenstrual phase as might be expected.

The Mean of the Symptoms.

The means of all the symptoms for all the subjects for every day was first found. In order to do this the data had to be arranged in the following manner. As the subjects all began recording at different phases of the cycle the menstrual phase was used as a focussing point. If the subject began recording say two days before her menstrual period the data was so arranged that 5 days from the end were put onto the beginning to count as the first 5 days of the premenstrual cycle. They would of course be the first 5 days of the premenstrual phase of the succeeding month. Fig. 2 illustrates this point. The dates are given above and the arrangement below.
Figure 3. The mean number of symptoms for all subjects. The black line shows the mean number of symptoms per day, the green the correction mentioned on page 27.
The next difficulty was that the length of the menstrual period was not the same for all the subjects. McCance, Luff, and Widdowson found that the average was 5.3 days with a standard deviation of 1.2. For the plotting of the graph the length of the period was taken as 6 days, in this investigation. The first day of the postmenstrual phase for each subject was, of course, the first day of this phase specific to each subject. As there was found to be a large rise in the number of symptoms the 8th. day after the onset of menstruation the data was examined again and rearranged so that the 8th. days were literally the 8th. day after the onset. e.g.

<table>
<thead>
<tr>
<th>Menstrual Phase</th>
<th>Postmenstrual Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6</td>
<td>1 2</td>
</tr>
<tr>
<td>7 8</td>
<td></td>
</tr>
</tbody>
</table>

For subject 1 the 2nd. postmenstrual day is obviously the 8th. after the onset of menstruation. For subject 2 it is the 7th., and for subject 3 it is the 6th. Another curve was made ignoring the length of menstruation and counting from the onset. This may be seen in dotted lines in Fig.3. As there was so little difference the original arrangement was adhered to.

Examination of Fig.3 will show that the mean
number of symptoms per day rises steadily throughout the premenstrual phase up to the first day of menstruation. It then drops through the menstrual phase with the exception of the 4th day, and rises steeply the 2nd day of the postmenstrual phase. Reference has been made before to Krohn and Zuckerman's work on the water metabolism of the pig tailed macaque. They found that there was a decided increase in the amount of urine excreted by the macaque 5 days after the onset of menstruation. In Fig.3 it can be seen that there are increases in the mean number of symptoms 4 and 8 days after menstruation. It is possible that the larger number of symptoms is due to increased irritability owing to the greater loss of water sustained at this time.* There is another rise the 15th day after the onset which is probably due to ovulation. This rise is not very marked, possibly because not all the subjects would be likely to ovulate. The next point of interest is the 5th day of the intermenstrual phase when there is a sharp rise. The writer is unable to offer any explanation, however tentative for this last fluctuation.

Even from this rather crude analysis it does appear that the menstrual cycle influences directly the emotional behaviour and attitudes of the subjects. It is possible that certain groups of symptoms may be more

* It will be recalled that Amos found a rise in blood pressure a day or two after menstruation.
Figure 5. The mean number of symptoms for each phase of the cycle for different types of emotional disturbance.
frequent at different stages of the cycle. The next step therefore was to group together symptoms belonging to particular states to see if this was so.

Symptom Groups.

First the sums of the different types of symptoms for each day of the cycle were calculated. The correlations between the different symptoms are shown in Fig.4.

**Figure 4.**

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Anxiety</th>
<th>Paranoia</th>
<th>Obsessional</th>
<th>Hysteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neurasthenia</td>
<td>0.35 ± 0.014</td>
<td>0.35 ± 0.014</td>
<td>0.46 ± 0.013</td>
<td>0.35 ± 0.014</td>
</tr>
<tr>
<td>Anxiety</td>
<td>0.76 ± 0.007</td>
<td>0.48 ± 0.012</td>
<td>0.33 ± 0.015</td>
<td></td>
</tr>
<tr>
<td>Paranoia</td>
<td>0.35 ± 0.014</td>
<td>0.31 ± 0.015</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obsessional</td>
<td></td>
<td></td>
<td>0.67 ± 0.012</td>
<td></td>
</tr>
</tbody>
</table>

From Fig.4 it can be seen that among these subjects anxiety and paranoid symptoms seem very likely to occur at the same stages of the cycle. The next most likely to occur together are obsessional and hysterical symptoms.

Next the mean number of symptoms for each phase of the cycle was found. The result is expressed graphically in Fig.5. The chief points of interest are:
Figure 6. The sum of the symptoms for each day for different types of emotional disturbance.
1. The premenstrual rise and menstrual drop in neurasthenic symptoms.
2. The premenstrual drop in obsessional symptoms.
3. The intermenstrual drop in paranoid and rise in anxiety symptoms.
4. The other groups all show the general tendency of a premenstrual rise.

As the possible differential distribution of symptoms is an important point it was decided to plot the groupings for each day in case the summing for the mean of each phase obscured anything of importance.

It can be seen from Figure 6 that the same tendencies are shown that are demonstrated in Figure 5. The premenstrual rise and menstrual fall in the number of anxiety symptoms is however much more marked. It is also interesting to note the sharp rise in the number of neurasthenic, anxiety, paranoid and hysterical symptoms on the second day of the postmenstrual phase.
Intermenstrual phase

Figure 7. The mean number of symptoms per day for six months for one subject.
Results of one record kept for 6 months.

It would have been ideal if all the subjects had been able to keep their records for periods of about 6 months. There is, however, a limit to what voluntary subjects can be asked to do. As very few subjects would have persevered for this length of time it was thought better to concentrate on averages for general purposes and to obtain one six months record for comparison. Fig. 7 shows the average number of symptoms per day for six months calculated in the same way as the group average. Fig. 8 shows the total number of symptoms for each day for five of the months which ran consecutively.

From Fig. 7 it can be seen that there is a steep premenstrual fall followed by a high peak on the first day of menstruation, then a steep drop followed by a rise on the 6th. day. Other peaks are on the 6th. day of the postmenstrual phase and on the 4th. day of the intermenstrual phase. From this comparison it appears that the peaks of the individual record are sometimes identical and always similar to those of the group. Differences of one or two days are only to be expected.

If the symptoms for each phase are summed and then averaged the results are as follows:
Figure 7: The sum of the symptoms for each day for five consecutive months for one subject.

<table>
<thead>
<tr>
<th></th>
<th>Indiv.</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.95</td>
<td>3.34</td>
</tr>
<tr>
<td>1.4</td>
<td>.75</td>
<td>3.56</td>
</tr>
<tr>
<td>.7</td>
<td>.7</td>
<td>3.05</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.0</td>
</tr>
</tbody>
</table>

These figures show that the general trend is similar to that of the group, though this subject reported fewer instances of emotional disturbance than the majority of other subjects.

Figure 2A is composed of the sum of the symptoms for each day for 5 months for one subject. It is included as the rhythmic nature of the fluctuations in the number of symptoms is rather well illustrated.
Figure 9.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Premenstrual</th>
<th>Menstrual</th>
<th>Postmenstrual</th>
<th>Intermenstrual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor appetite</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Unpleasant feelings</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Slept badly</td>
<td>6</td>
<td>2</td>
<td>1,2</td>
<td>2</td>
</tr>
<tr>
<td>Tired</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Pains</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Headaches</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Twitching</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 10.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Premenstrual</th>
<th>Menstrual</th>
<th>Postmenstrual</th>
<th>Intermenstrual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treated unfairly</td>
<td>4</td>
<td></td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Sad</td>
<td>2</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Lonely</td>
<td>6</td>
<td></td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Difficult to adjust</td>
<td>4</td>
<td></td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Feelings changing</td>
<td>1</td>
<td></td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Angry</td>
<td>4</td>
<td></td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Not easy to laugh</td>
<td>2</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Shyness</td>
<td>2</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Rattled easily</td>
<td>4,7</td>
<td></td>
<td>1,5</td>
<td>1,6</td>
</tr>
<tr>
<td>Tired of people</td>
<td>4,7</td>
<td></td>
<td>2</td>
<td>6</td>
</tr>
</tbody>
</table>

Figure 11.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Premenstrual</th>
<th>Menstrual</th>
<th>Postmenstrual</th>
<th>Intermenstrual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worry over little things</td>
<td>4</td>
<td>1</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Tired of amusements</td>
<td>4,5</td>
<td>2</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Useless thoughts</td>
<td>5</td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Worry over little jobs</td>
<td>2,3</td>
<td></td>
<td>4</td>
<td>3,4</td>
</tr>
<tr>
<td>Doing things several times</td>
<td>3</td>
<td></td>
<td>3,7</td>
<td>3</td>
</tr>
<tr>
<td>Tired of work</td>
<td>7</td>
<td></td>
<td>7</td>
<td>1,4</td>
</tr>
<tr>
<td>Unpleasant dreams</td>
<td>3,6</td>
<td></td>
<td>7</td>
<td>1,6</td>
</tr>
<tr>
<td>Ideas preventing sleep</td>
<td>6</td>
<td></td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>
Individual Symptoms.

Each symptom will next be considered individually. Graphs were made of the sum of all the subjects' symptoms for each day. These graphs were drawn on Cellophane so that comparisons could be easily made. To facilitate description the symptoms have been divided into 3 main groups.

1. Physical.
2. Anti-social.
3. Uneasy.

Physical.

Fig. 9 shows the days on which the physical symptoms reached their peaks. These are very similar in all cases with the exception of "Tired". As fatigue and boredom appear to be closely related, possibly "Tired" is a synonym for bored or in many cases for some psychological constellations of feelings. The irregularity of agreement in the premenstrual days is not as great as it seems as most subjects show a gradual premenstrual rise in the number of symptoms recorded.

Anti-Social.

The peaks of the anti-social symptoms are shown in Fig. 10. Here again the peaks show quite a degree of concurrence. If the means for the four phases of the
cycle are calculated from Difficulty in Adjustment, Tired of People, Angry, and Shyness, they are as follows:

<table>
<thead>
<tr>
<th>Phase</th>
<th>Premenstrual</th>
<th>Menstrual</th>
<th>Postmenstrual</th>
<th>Intermenstrual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficulty</td>
<td>3.55</td>
<td>3.6</td>
<td>3.3</td>
<td>2.75</td>
</tr>
</tbody>
</table>

that is, on the average subjects are more sociable in the intermenstrual phase. It is interesting to compare these means with those obtained in answer to the question "Did you make any new friends?" These are:

<table>
<thead>
<tr>
<th>Phase</th>
<th>Premenstrual</th>
<th>Menstrual</th>
<th>Postmenstrual</th>
<th>Intermenstrual</th>
</tr>
</thead>
<tbody>
<tr>
<td>New friends</td>
<td>6</td>
<td>4.6</td>
<td>4.7</td>
<td>5.0</td>
</tr>
</tbody>
</table>

In this case it appears that the subjects were more inclined to make new contacts in the premenstrual phase.

Uneasy.

Fig.11 shows the rest of the symptoms grouped under the Uneasy heading. The same agreement is not shown here as it was in the other two categories.

Special Items.

Not knowing what to do.

Here rhythm is not marked though there is a postmenstrual drop. Presumably indecision is due to psychological causes rather than to physical influences of a cyclic nature. It may, of course, be an attribute of a particular type of temperament.
Lonely.
There is no evidence of cyclic rhythm here though the main peaks are those of the other symptoms classified in the anti-social group.

Shyness.
On the whole this curve is fairly level except for the peaks on the 6th. day of the premenstrual phase, the 1st. day of the menstrual phase and the 2nd. day of the postmenstrual phase. The writer cannot think of any explanations of why subjects should feel particularly shy on this last day.

In general the symptoms when arranged separately show quite definite tendencies of variation with the monthly cycle.

The first 22 subjects were correlated with the last 32.

\[ r = 0.28 \pm 0.12 \]

While the reliability is low, the variation among the coefficients is equally great.
Split Half Reliability.

The data was divided into 2 lots and then correlated.
a. The first 22 subjects were correlated with the last 22.
\[ r = 0.27 \pm 0.12 \]
b. Every other subject was placed in list A, and the remainder in list B. Lists A and B were then correlated.
\[ r = 0.17 \pm 0.19 \]
c. The 10 subjects with the most erratic scores were eliminated, and the rest of the subjects placed alternatively into two lists.
\[ r = 0.37 \pm 0.16 \]
d. Next the subjects were divided into two groups according to their predominant type of symptom, eg., equal numbers of subjects who showed predominantly anxious behaviour were put into each list.
\[ r = 0.26 \pm 0.19 \]

While the reliability is low, the variation among the coefficients is equally great.
The data was divided into 3 sets and then correlated.

The first 22 subjects were correlated with the rest of the 31 subjects in Set A and the remaining in Set B, pairs A and B were then correlated.

\[ t = 0.71 + 0.10 \]

The IO subjects within each erotic scores were eliminated and the rest of the subjects placed alternatively into two sets.

\[ t = 0.70 + 0.10 \]

Next, the subjects were divided into two groups according to their photographic type of symptom. The number of subjects who showed photographic errors in personality evaluation were put into each half.

\[ t = 0.10 + 0.06 \]

While the test reliability is low, the variation among the coefficients is extremely great.
Age and Anxiety.

It was thought possible that there might be a relation between the tendency to have anxiety symptoms and age. Therefore the percentage of anxiety symptoms for each age (ranging from 18 to 46) was calculated and plotted against the percentages of the other symptoms excluding anxiety. The two groups are remarkably similar except at age 25 where there is a much higher percentage of anxiety over the other symptoms. However the numbers in the groups are so small that it is improbable that this is a real and not an accidental difference.
Happiness, Fitness and Emotional Stability.

This section of the questionnaire was included for two reasons:

a) It was felt that the subjects ought to have a chance to report on the more cheerful and pleasant aspects of their emotional lives.

b) That happiness, fitness and emotional stability easily lent themselves to grading. It would therefore be interesting to see if rhythmical variation in these states would be revealed.

The coefficients of association shown below were calculated to see if these conditions appeared to be in any way related or interdependent.

Figure 12.

<table>
<thead>
<tr>
<th></th>
<th>Happiness</th>
<th>Fitness</th>
<th>Emotional Stability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Happiness</td>
<td></td>
<td>.550</td>
<td>.905</td>
</tr>
<tr>
<td>Fitness</td>
<td></td>
<td></td>
<td>.630</td>
</tr>
</tbody>
</table>

The coefficient of association was used as the coefficient of contingency would not be valid for a 9 celled table.*

However contingency tables were drawn up as the coefficient of association table blurs the distinction between indifference and unhappy for example. These tables are reproduced below. No coefficients are of course calculated from them.

**Figure 13.**

<table>
<thead>
<tr>
<th></th>
<th>Happy</th>
<th>Indifferent</th>
<th>Unhappy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fit</td>
<td>402</td>
<td>302</td>
<td>29</td>
</tr>
<tr>
<td>Not fit but not ill</td>
<td>77</td>
<td>170</td>
<td>32</td>
</tr>
<tr>
<td>Unwell</td>
<td>8</td>
<td>15</td>
<td>12</td>
</tr>
</tbody>
</table>

Happiness and fitness seem to be the most usual condition of the subjects with fit and indifferent next. It appears that more people can be fit and yet unhappy (29) than be happy and unfit (8).

The next table is that for happiness and stability. In this case the coefficient of association (.905) is probably unduly high as some subjects had difficulty in distinguishing between happiness and serenity.

**Figure 14.**

<table>
<thead>
<tr>
<th></th>
<th>Happy</th>
<th>Indifferent</th>
<th>Unhappy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serene</td>
<td>118</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>Normal</td>
<td>379</td>
<td>453</td>
<td>36</td>
</tr>
<tr>
<td>Unstable</td>
<td>6</td>
<td>38</td>
<td>31</td>
</tr>
</tbody>
</table>
Figure 16. The frequency with which the answer "Happy" was given each day for all the subjects.
Evidence that the distinction was not properly understood is, in the writer's opinion, shown by the fact that no subjects were serene and yet unhappy, yet 6 felt emotionally unstable and yet happy.

In the next table the majority distribution came into the fitness and normal stability cell as might be expected.

**Figure 15.**

<table>
<thead>
<tr>
<th></th>
<th>Serenity</th>
<th>Normal</th>
<th>Unstable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fitness</td>
<td>123</td>
<td>640</td>
<td>27</td>
</tr>
<tr>
<td>Not fit but not ill</td>
<td>9</td>
<td>216</td>
<td>40</td>
</tr>
<tr>
<td>Unfit</td>
<td>0</td>
<td>26</td>
<td>8</td>
</tr>
</tbody>
</table>

The only point of interest is in the fitness and unstable cell. This appears to be more evidence that mental factors operate in emotional conditions apart from the purely physical.

In all three cases the largeness of the coefficients association do appear to indicate some common factor.

**Evidence of Cyclic Variation.**

1. Happiness.

**Figure 16 shows how the recording of happiness**
Figure 16. The frequency with which the answers "Serene" and "Emotionally Disturbed" were given for each day for all subjects. The black line is the curve for serenity, the green that for emotional disturbance.
by the subjects fluctuated during the month. The happiness curve is composed of the sum of the number of times the answer happy was given by all the subjects for each day. The Serenity, Emotional Instability, and Fitness curves were similarly composed.

It is difficult to see any evidence of rhythmic variations closely connected with the cycle in Fig. 16. The variations seem to occur at fairly regular intervals. If the mean is found for each phase it can be seen that the answer happy is given less often during the menstrual phase. The following figures show the mean for each phase.

<table>
<thead>
<tr>
<th></th>
<th>Premenstrual</th>
<th>Menstrual</th>
<th>Postmenstrual</th>
<th>Intermenstrual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Happiness</td>
<td>17.0</td>
<td>13.8</td>
<td>17.4</td>
<td>17.2</td>
</tr>
</tbody>
</table>

2. Fitness.

Fig. 17 shows the drop in the curve of fitness during the menstrual phase. This of course is what might be expected. No other rise or fall appears large enough to be of any significance. The means for each phase are as follows.

<table>
<thead>
<tr>
<th></th>
<th>Premenstrual</th>
<th>Menstrual</th>
<th>Postmenstrual</th>
<th>Intermenstrual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fitness</td>
<td>28.5</td>
<td>16.8</td>
<td>29.5</td>
<td>29.0</td>
</tr>
</tbody>
</table>


Fig. 18 records both the curves for serenity
and emotional disturbance. The most serene days are the 5th. premenstrual, the 1st. and 7th. postmenstrual and 6th. and 7th. intermenstrual. The most disturbed days are the 4th. and 5th. premenstrual, and the 2nd. postmenstrual. It may be remembered that the 2nd. postmenstrual day was one where a peak occurred in the sum of the symptoms curve (Fig.2). If the means of the phases are calculated the following results are obtained.

<table>
<thead>
<tr>
<th></th>
<th>Premenstrual</th>
<th>Menstrual</th>
<th>Postmenstrual</th>
<th>Intermenstrual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serene</td>
<td>5.4</td>
<td>3.0</td>
<td>5.1</td>
<td>5.8</td>
</tr>
<tr>
<td>Emotionally</td>
<td>2.7</td>
<td>3.1</td>
<td>2.8</td>
<td>2.8</td>
</tr>
<tr>
<td>Disturbed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The differences between the means of the emotionally disturbed section are obviously too small to be of value, but those between the means of the serene section do indicate that emotional balance is disturbed during the menstrual phase.

It appears then that the menstrual phase does influence happiness, serenity and fitness. In none of these three cases however is there much indication of further disturbances due to the other events of the cycle such as ovulation.
Effect of Temperament on Cyclic Variation.

The next section of the results deals with an attempt to find whether differences of temperament have any influence on the temporal and quantitative distribution of symptoms. The method used was to divide the subjects into groups according to some classification based on either the mosaic or the Terman Miles tests and see if any striking differences appeared in the two groups thus constructed.

Groupings Obtained from the Mosaic Test.

Most of the subjects who kept the controlled diary were also given the mosaic test. As the interpretations of this test depends very much on the integration of many factors in any one pattern, it is not always feasible to isolate one aspect only for comparison. Therefore where comparison has been attempted it is with classes of pattern. The classes utilised were:

a) Concrete Patterns

b) Designs containing a cross

c) Designs showing emotional instability.

One attempt was made to find a grouping based on the interpretation of the patterns as a whole. This was an introvert extravert classification.
Figure 19. The mean number of symptoms for each day for 8 subjects who made concrete designs.
Concrete Patterns.

Eight subjects made concrete designs. First the total number of symptoms per day for this group of subjects was found. The peaks were the first day of the menstrual period and the fifth day of the intermenstrual phase e.g. 18 days after the onset of menstruation. Fig. 19 shows the distribution of symptoms of these subjects who made concrete designs. Though the highest peak is on the sixth day of menstruation this is probably not significant as it is composed of an average of two only.

The next step was to find if these subjects showed any common peculiarities regarding the type of prevalent symptom. When all the accounts of disturbed behaviour produced by these subjects were analysed it was found that in every case the highest percentage of symptoms were neuroasthenic with anxiety coming second. The probability that eight out of a possible 27/40 would be of the same symptom type is one in thirty four.

Designs with a Cross.

This category was included because it seemed to occur rather frequently. It usually indicates a rather high degree of conscience. It was therefore likely to be fairly frequent among a group of students many of whom
were taking the Social Studies Diploma.

On analysis of the scores made by this group of subjects it was found that the prevailing symptom of the majority was (1) neurasthenic and (2) paranoid or obsessional. In two out of the seven cases the second symptom was anxiety, but both these subjects admitted paranoid and obsessional symptoms. The chances that there should be two anxiety cases is 1:1, the chances that there should be two paranoid cases are one in twenty seven, and the chances that there should be three obsessional cases are one in seventy seven. It seems likely therefore that the paranoid obsessional constitution of this group is not due to chance.

**Designs Showing Emotional Instability.**

One interesting fact emerges from the typological distribution of the subjects who showed signs of emotional disturbance in their mosaics. Out of a total of 12, 7 were introverts and 3 extraverts, 2 were unclassified.

The peaks in the curve when the sums of the symptoms of this group were calculated for each day were the 2nd. day of the menstrual period, and the 2nd. and 6th. days of the postmenstrual phase.
Figure 20. The mean number of symptoms for each day for 9 introverts and 14 extraverts. The extraverts' curve is drawn in black, the introverts' in red.
Introvert Extravert Categories.

Only those subjects were put into these categories whom the experimenter was able to diagnose with some degree of certainty from the mosaic test. There were nine introverts and 14 extraverts. The curves of symptoms obtained from the extraverts and introverts are shown in Fig. 20. The main points of difference are:

1) On the whole the extraverts show more symptoms. This is interesting to compare with the statement made above, that more introverts than extraverts were diagnosed as emotionally disturbed by the mosaic test.

2) The extravert peak is the first day of menstruation, while the introverts' peak is the 7th. day of the pre-menstrual phase. It seems quite legitimate to speculate that this might be due to the introvert's tendency to think ahead.

3) The extraverts show a rise on the 6th. day of menstruation, the introverts a drop.

4) The 2nd. introvert peak is the 6th. day of the post-menstrual phase. (12 days after the onset). The extraverts do not show another definite peak though minor rises on the 2nd. and 5th. days of the inter-menstrual phase are present.
No very satisfactory method of dividing the subjects by the mosaic test to demonstrate any bimodal influence of temperament on the results has been obtained so far. There are two possible reasons for this:

1. The mosaic test might not be a valid diagnostic instrument.

2. Temperamental differences may not influence behaviour induced by the sex cycle in a quantitative or temporal manner. That is, temperament may not be the deciding factor in the quantity of symptoms produced, and it may have no effect also on the time at which they are produced. That is, subjects of one temperamental type do not produce more symptoms in one phase of the cycle, and subjects of another temperamental type in another phase.

It is unlikely that the first reason is correct as the mosaic test has proved a valuable aid to clinical diagnosis. This can also be demonstrated from the work quoted above in this investigation. Therefore until further evidence is procured the second reason must be accepted tentatively.
Figure 21. The mean scores for each phase expressed as percentages for different types of emotional disturbance plotted against scores in the Terman Miles Test.
Twenty three subjects did Exercise 4 of the Terman Miles Masculine-Feminine Test. Their scores ranged from -11 to +53. The minus score indicates a feminine and the plus a masculine type of personality.

As only a small group did the test the scores were grouped as follows.

<table>
<thead>
<tr>
<th>Scores</th>
<th>-11</th>
<th>0</th>
<th>11</th>
<th>21</th>
<th>31</th>
<th>41</th>
<th>51</th>
</tr>
</thead>
<tbody>
<tr>
<td>to</td>
<td>to</td>
<td>to</td>
<td>to</td>
<td>to</td>
<td>to</td>
<td>to</td>
<td></td>
</tr>
<tr>
<td>-1</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td></td>
</tr>
</tbody>
</table>

| Frequency of Incidence | 2 | 2 | 3 | 3 | 5 | 6 | 2 |

From this it can be seen that the distribution is obviously skewed. The writer can see no reason why this should be as the group appeared quite average in every respect.

An attempt was made to find if there was any correlation with the mosaic test. Unfortunately not enough of those who did the Terman Miles Test did the mosaic test as well. The correlation, if any, between these two tests would be a most fruitful subject for further investigation.

The average score, expressed as a percentage, of all the subjects who did the Terman Miles test for
each type of symptom was calculated for each grouping of the Terman Miles scores. *e.g.* The average percentage of paranoid symptoms shown by the 11-20 group is 17.6. Fig. 21 shows these percentages expressed graphically.

There is one more interesting point in connection with this test. In the distribution of subjects into the groups described above it was found that 3 out of 4 obsessionals fell into the 41-50 scoring group. The chances of this are 1 in 443. As this is likely to be significant therefore it appears that subjects who have predominantly obsessionall scores have also a high + score in the Terman Miles test.

General Conclusions on the Relation of Temperamental Types to the Sex Cycle.

Little evidence has been obtained that temperamental differences influence the distribution of symptomatic behaviour. While the introverts and extraverts have their main crises on different days there is not sufficient differentiation between the two curves for any far reaching conclusions to be drawn.
Summary.

1. When the means of the symptoms for all the subjects for each day were calculated and recorded graphically a premenstrual rise was observed followed by a menstrual fall, with the exception of a peak on the fourth day after the onset of menstruation. Other peaks were on the second postmenstrual day and the second and fifth intermenstrual days.

2. From correlations obtained from the symptom scores when they were classified into types it appeared that anxiety and paranoid symptoms were most likely to occur together, \( r = 0.76 \pm 0.007 \). The next most likely to were obsessional and hysterical, \( r = 0.67 \pm 0.012 \).

3. The main peaks in the curve of the frequency of occurrence of symptoms from records kept by one subject for 6 months were found to be similar to those of the main group.

4. When the mean number of symptoms for each phase was found the following results were obtained:
   a) The quantity of symptoms for the whole cycle was in the following order:
      (1) neurasthenia
      (2) anxiety
50

(3) paranoia
(4) obsessional
(5) hysteria

b) Generally there was a premenstrual rise in the number of symptoms followed by a menstrual fall. In the case of the obsessional group there was a premenstrual fall and a postmenstrual rise.

5. For convenient comparison the symptoms were divided into:
(a) physical
(b) antisocial
(c) uneasy.

This classification was justified as the days which showed symptom peaks corresponded fairly well.

(a) Most of the physical sympyoms showed peaks on the first day of menstruation and the first or second day of the postmenstrual and the second day of the intermenstrual phase.
(b) The peaks of the antisocial symptoms were the fourth day of menstruation, the second and sixth postmenstrual, and the fifth and sixth intermenstrual days.

(c) There was not such a unanimous correspondance of peaks in the uneasy group.

6. The results of the split half reliability correlations
were:

(a) \( r = 0.27 \)  
(b) \( r = 0.17 \)  
(c) \( r = 0.37 \)  
(d) \( r = 0.26 \)

7. No definite relation was found to exist between age and anxiety.

8. Subjects were less happy during menstruation than at other phases of the cycle.

9. Subjects were less fit during menstruation than at other phases of the cycle.

10. Subjects were less well balanced at menstruation than at other phases of the cycle.

11. When comparisons were made with mosaics done by the subjects the following results were obtained.

(a) Most subjects who made concrete designs had predominantly neurasthenic symptoms.

(b) Most subjects who did cross designs were predominantly paranoid or obsessional.

(c) When extraversion introversion was diagnosed by the mosaic test it was found that the introvert peak was on the 7th. day of the premenstrual phase and the extraverts' on the first day of menstruation.

12. Little definite information was obtained from the comparison with the Terman Miles Test as the number of subjects who did this test was rather small. However
one result appeared significant, that is subjects with predominantly obsessional symptoms had a high + score (masculine) on the Terman Miles Test.

Conclusions.

In the introduction the three main objects of this investigation were enumerated. These were as follows:

1. Whether the tendency to produce emotionally disturbed behaviour varied throughout the monthly cycle.
2. Whether variations occurred more often among one temperamental type of women than another.
3. Whether certain symptomatic types of behaviour were more prevalent at specific stages of the monthly cycle.

From the results previously discussed it can be seen that the answer to the first question is positive, that is, the tendency to produce emotionally disturbed behaviour does vary throughout the monthly cycle. The largest number of symptoms are produced just before or on the first day of menstruation, other peaks are on the 4th. day of menstruation, the 2nd. day of the post-menstrual phase, and the 2nd. and 5th. days of the inter-menstrual phase.
On the whole the answer to the second question is negative or at least unproved.

In the case of the third question the neurasthenic symptoms show a great premenstrual increase and the obsessional a premenstrual drop. The paranoid, anxiety and hysterical symptoms all show a slight premenstrual rise. In the intermenstrual phase there is a difference between the anxiety and paranoid group. The number of paranoid symptoms drop while the number of anxiety rise. It does seem therefore that some types of symptoms are more prevalent in one phase, and other symptoms in other phases of the cycle.
TABLE SHOWING
FREQUENCY of INCIDENCE of TYPES of PATTERNS
EXPRESSED IN PERCENTAGES.

ANALYSIS OF PATTERNS MADE BY NORMAL CHILDREN.

<table>
<thead>
<tr>
<th>No in Group (Boys)</th>
<th>No in Group (Girls)</th>
<th>AGE</th>
<th>ABSTRACT</th>
<th>CONCRETE</th>
<th>INCOHERENT</th>
<th>COMPACT</th>
<th>SCATTERED</th>
<th>INTERMEDIATE</th>
<th>SUCCESSFUL</th>
<th>Total No, Boys and Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>68</td>
<td>60</td>
<td>4-7</td>
<td>± 30.8</td>
<td>± 31.1</td>
<td>± 41.3</td>
<td>± 46.8</td>
<td>± 42.2</td>
<td>± 31.3</td>
<td>± 36.8</td>
<td>± 25.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4-7</td>
<td>± 5.6</td>
<td>± 5.4</td>
<td>± 5.9</td>
<td>± 6.4</td>
<td>± 6.9</td>
<td>± 6.3</td>
<td>± 7.0</td>
<td>± 5.1</td>
</tr>
<tr>
<td>71</td>
<td>76</td>
<td>8-11</td>
<td>± 74.6</td>
<td>± 74.6</td>
<td>± 10.0</td>
<td>± 10.6</td>
<td>± 60.0</td>
<td>± 50.0</td>
<td>± 35.0</td>
<td>± 84.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8-11</td>
<td>± 5.1</td>
<td>± 4.2</td>
<td>± 3.5</td>
<td>± 5.5</td>
<td>± 6.3</td>
<td>± 2.8</td>
<td>± 6.1</td>
<td>± 4.2</td>
</tr>
<tr>
<td>101</td>
<td>103</td>
<td>12-15</td>
<td>± 88.9</td>
<td>± 7.4</td>
<td>± 3.7</td>
<td>± 1.9</td>
<td>± 67.0</td>
<td>± 12.0</td>
<td>± 21.0</td>
<td>± 79.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12-15</td>
<td>± 5.0</td>
<td>± 2.5</td>
<td>± 1.8</td>
<td>± 1.3</td>
<td>± 4.7</td>
<td>± 5.2</td>
<td>± 4.1</td>
<td>± 5.8</td>
</tr>
</tbody>
</table>
Appendix I.

The Mosaic Test.

The Test Material.

The test material consists of a box of mosaic pieces which are standardised so that each shape is available in every colour. The pieces are square, right angled triangles, diamonds, equilateral and scalene triangles. The colours are red, blue, green, yellow, black and white.

Instructions to Subjects.

The subject is presented with the box of mosaics and is shown the relation between the pieces. The actual instructions are, "Make anything you like with the pieces."

There is no time limit. The only restriction is that the subject must find his final product pleasing.

Classification of Patterns.

All mosaic patterns can be classified into the following three categories:

1. Abstract
2. Concrete or Representational.
3. Incoherent.

Abstract patterns are arrangements of the pieces
Figure 22.3

Abstract

representation of actual object

Concrete

fantastic object

conventional design

representation of abstract idea

Incoherent

Compact

Scattered

Intermediate

Cross Circle Rectangle Swirling Empty frame etc.
into geometrical designs which have no objective or symbolical significance. Concrete, or representational, design is the name given to a pattern which represents a person, animal, object or scene. Patterns which are symbols of abstract ideas e.g. flight, death, or revolution, are also included in this category. Incoherent patterns are those in which the pieces are grouped on the tray at random and which display no coherent idea or order.

Abstract patterns can be further subdivided into compact, scattered and intermediate. In the compact type all the pieces fit closely together, while in the scattered type the pieces do not touch and the spaces in between the pieces are often as an important element in the designs as the pieces themselves. Intermediate patterns contain elements of both the compact and scattered types. Obviously the further subdivisions e.g. cross, rectangle and circle designs can be of either compact, scattered or intermediate types. A schematic classification of the types of pattern is shown in fig. 21.3

Standardisation of the Test.

The conclusions about the meaning of the various types of pattern are based on data gained from over 1000 subjects. These subjects can be grouped as follows:
Example of an abstract compact design.
1. Normal adults. (University type.)
2. Normal adults. (Working class.)
5. Normal children from elementary schools.
6. Emotionally disturbed children. (Private patients.)
7. Emotionally disturbed children. (Clinic patients.)

This rather extensive classification of the subjects was found to be necessary owing to the quite marked differences found in the designs made by children and adults from comfortably off homes and those from very poor ones. This appears to be another verification of Buhler's conclusions that children from poor homes are backward in the manipulation of materials owing to lack of opportunity and practice. Therefore it was considered safer to divide the norms according to social background as well as sex. The norms for the ordinary classifications for normal children and adults are given in tables 22 and 23.

Fig. 22 shows the frequency of incidence of the various types of patterns among all the normal children. These frequencies are expressed in percentages and the standard deviations are given with them. From this table the influence of age and sex on the types of patterns produced can be seen. For example the influence of age
Example of an abstract scattered design.

*Note.* The reason for the excess of working class women over university women is probably because the university women contain a large percentage of Arts people. Women doing scientific subjects usually make compact designs of a very complicated nature. This has been proved in some unpublished work by V. Coppen and the writer. The compact designs of the working class women are simple in form.
can be seen in the increase of abstract patterns and the corresponding decrease in incoherent patterns. The sex difference can be seen mainly in the concrete and compact types where boys exceed girls except in the 12 to 15 year old group.

Fig. 23 shows a similar classification of mosaics obtained from adults. It can be seen that sex differences are more important than differences due to environment except for the case of scattered designs where there is an appreciable difference between the two groups of women. The working class women exceed the university women by 15.9 to 8.1.

The making of compact designs appears to indicate a more masculine type of mentality. Women who have had intellectual training usually make this type, while male actors usually make scattered designs. The difference between the males intermediate patterns is probably caused by the introduction of artistic males in the University group.

In general more men than women make concrete designs; and more women than men make abstract designs of the scattered type.

The category successful or unsuccessful simply means whether the subject achieved what he set out to do. Slips of colour or form are counted as unsuccessful and
A man
Exemplar of a concrete design of an objective type.
are indicative of emotional disturbance. It is thus possible for children and adults of high intelligence to make unsuccessful designs.

It was found practically impossible to obtain satisfactory evidence of the validity of the test by the use of ordinary statistical methods. As in the case of the Rorschach Test it is not the individual's score in each classified type of response that counts, but the interrelation and combination of the types of response. In the mosaic test the interpretation depends on the general type of pattern, the interrelation of colours and shapes, whether the parts of the pattern achieve unity, or whether they pull in opposite directions, the position of the pattern in regard to the tray etc. It can be seen that it is practically impossible to express these rather subtle relations statistically. Interpretation is therefore a practical application of the Gestalt slogan that the whole is always more than the sum of the parts.

There is however, another method which does demonstrate the validity of this type of test. This is the matching method advocated by P.E.Vernon.\textsuperscript{46} The practical technique of this method is as follows: one

Death.

Example of a concrete symbolical design.
experimenter gives the test to a limited number of subjects and at the same time writes a short character sketch. The test results and the character sketches are numbered differently and sent to the second experimenter who matches them. The percentage of successful matchings is recorded and transformed to a mean square contingency coefficient by means of the modified technique suggested by Vernon and discussed in the paper mentioned on the previous page.

Miss P. Traill and the writer carried out three experiments on the mosaic test using this method. The results were reported to the General Section of the British Psychological Society in July 1937.

Experiment I.

Miss Traill tested 10 adult subjects, wrote their character sketches and sent them to the writer to match. Six out of ten were correctly matched.

\[ C = .86 \pm .025 \]

C and PE in both cases were calculated from the graph in Vernon's paper.

Experiment 2.

In the second experiment Miss Traill did the matching. It was a miscellaneous group including M.D. children, neurotic children, highly intelligent but
Boy of 14, I.Q. 104, referred to a clinic for bullying and fears.
emotionally disturbed adults, a stable adult and an insane adult. Ten out of ten were correctly matched. $C = .96 \pm .02$

Experiment 3.

Miss Traill again sent the writer ten mosaics and sketches of normal adults to match. Seven out of ten were correctly matched. $C = .89 \pm .14$

The writer has further experimented with a modification of this method with Dr. M. F. Lowenfeld. In this case normal mosaics were mixed with abnormal ones and Dr. Lowenfeld was required to say which was which.

Experiment 1.

10 mosaics from normal and 10 from neurotic children were used. 15 out of 20 correct identifications were made. Of the 5 incorrect choices Dr. Lowenfeld reported that three of them were doubtful, that is the children, though actually considered normal, did show some symptoms of emotional disturbance.

Experiment 2.

3 mosaics from neurotic and 3 from mentally defective children were used. Five out of six were correctly identified.

Experiment 3.

Mosaics from 10 normal and 10 psychotic adults were used. 16 out of 20 were correctly identified.
Two of the normal adults were considered doubtful by Dr. Lowenfeld. Both these subjects were at the time of making the mosaic under quite intense emotional strain.

The two groups of matching experiments do indicate both the validity of the test and the objectivity of diagnosis made from the patterns alone. Further experiments of a similar nature are being designed by the writer, and it is hoped that a full account of the criteria used for interpretation will soon be published by Dr. Lowenfeld.
Table 24: Normal Adults.
Frequency of Incidence of Types of Patterns expressed in Percentages.

<table>
<thead>
<tr>
<th></th>
<th>Abstract</th>
<th>Concrete</th>
<th>Incoherent</th>
<th>Compact</th>
<th>Scattered</th>
<th>Intermediate</th>
<th>Successful</th>
<th>Unsuccessful</th>
<th>No. in Group</th>
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<tbody>
<tr>
<td>Working Class</td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Women</td>
<td>84.3</td>
<td>13.7</td>
<td>2.0</td>
<td>70.4</td>
<td>15.9</td>
<td>13.7</td>
<td>86.3</td>
<td>13.7</td>
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<td>Men</td>
<td>78.1</td>
<td>18.1</td>
<td>3.8</td>
<td>86.7</td>
<td>2.2</td>
<td>11.1</td>
<td>89.1</td>
<td>10.9</td>
<td>55</td>
</tr>
<tr>
<td>University</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>86</td>
<td>12.3</td>
<td>1.7</td>
<td>61.5</td>
<td>8.1</td>
<td>30.4</td>
<td>89.0</td>
<td>11.0</td>
<td>172</td>
</tr>
<tr>
<td>Men</td>
<td>80</td>
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<td>2</td>
<td>70.7</td>
<td>2.4</td>
<td>26.8</td>
<td>87</td>
<td>13</td>
<td>100</td>
</tr>
</tbody>
</table>
Appendix 2.

Terman - Miles Questionnaire, Exercise 4.

Below is a list of things that sometimes cause anger. After each thing mentioned draw a circle around VM, M, L, or N to show how much anger it causes you. VM means VERY MUCH; M means MUCH; L means A LITTLE; N means NONE.

1. Being blamed for something you have not done ................ VM M L N
2. Being called lazy ........................................ VM M L N
3. Being called stupid ........................................ VM M L N
4. Being called a thief .......................................... VM M L N
5. Being deceived by a supposed friend. ....................... VM M L N
6. Being disturbed when you want to work ..................... VM M L N
7. Being snubbed by an inferior ................................. VM M L N
8. Being unexpectedly slapped on the back as a joke ........ VM M L N
9. Hearing someone make fun of your clothes ................ VM M L N
10. Hearing your political views ridiculed ....................... VM M L N
11. Seeing boys make fun of old people ........................ VM M L N
12. Seeing an honest official thrown out of office by politicians. ................................. VM M L N
13. Seeing a person laugh at a cripple .......................... VM M L N
14. Seeing people disfigure library books ....................... VM M L N
15. Seeing someone cheat in an examination ..................... VM M L N
16. Seeing someone trying to discredit you with your employer. ................................. VM M L N
17. Seeing someone laugh when a blind man runs into an obstacle ................................. VM M L N

Below is a list of things that often cause fear. After each thing mentioned draw a circle around VM, M, L, or N to indicate how much fear it causes you. Be honest and admit all the fears you have. Fears are not disgraceful. VM means VERY MUCH; M means MUCH; L means LITTLE; N means NONE.

1. Cars ......................................................... VM M L N
2. Being lost .................................................. VM M L N
3. Being in a closed room ...................................... VM M L N
4. Becoming deaf or blind ..................................... VM M L N
5. Bulls
6. Burglars
7. Contagious diseases
8. Deep water
9. End of the world
10. Floods
11. Snakes
12. Graveyards at night
13. Heart trouble
14. Insects
15. Lightning
16. Negroes
17. Pain
18. Punishment in the next world
19. Thunder
20. Windstorms

Below is a list of things that sometimes cause disgust. After each thing mentioned draw a circle around VM, M, L, or N to indicate how much disgust it causes you. VM means VERY MUCH; M means MUCH; L means A LITTLE; N means NONE.

1. An unshaven man
2. A butcher shop
3. A drunken man
4. Crooked teeth
5. Food stains on clothing
6. Foul language
7. Gum chewing
8. Mushy food in your mouth
9. Offensive breath
10. Pimples
11. Sagging socks on a man
12. Seeing a woman smoking
13. Sight of slimy water
14. Smell of decaying fish
15. Soiled or ragged fingernails
16. Spitting in public
17. Untidy clothes
18. Word "gent" used for gentleman

Below is a list of things that sometimes arouse pity. After each thing mentioned draw a circle around VM, M, L, or N to indicate how much pity it arouses in you.
VM means VERY MUCH; M means MUCH; L means A LITTLE; N means NONE.

1. A bee that is drowning       VM  M  L  N
2. A dog that must be killed for biting people VM  M  L  N
3. A man who is cowardly and can't help it VM  M  L  N
4. An insane person            VM  M  L  N
5. An old person with a fatal disease VM  M  L  N
6. An orphan girl              VM  M  L  N
7. Overworked horses           VM  M  L  N
8. Overworked children         VM  M  L  N
9. A fly caught on sticky paper VM  M  L  N
10. An underfed child          VM  M  L  N
11. Very old people            VM  M  L  N
12. A wounded deer             VM  M  L  N
13. A baby bird whose mother is dead VM  M  L  N
14. A wounded soldier who must beg for a living VM  M  L  N
15. A young person totally paralysed VM  M  L  N

Below is a list of acts of various degrees of wickedness or badness. After each thing mentioned draw a circle around 3, 2, 1, or 0 to show how wicked or bad you think it is.
3 means "EXTREMELY WICKED"; 2 means "DECIDEDLY BAD"; 1 means "SOMETHING BAD"; 0 means "NOT REALLY BAD".

| 1. Picking flowers in a public park | 3 2 1 0 |
| 2. Stealing a ride on a truck      | 3 2 1 0 |
| 3. Telling a lie to avoid punishment | 3 2 1 0 |
| 4. Whispering in school            | 3 2 1 0 |
| 5. Boys teasing girls              | 3 2 1 0 |
| 6. Making fun of cripples          | 3 2 1 0 |
| 7. Using slang                      | 3 2 1 0 |
| 8. Breaking windows                | 3 2 1 0 |
| 9. Boys smoking before they are 21 | 3 2 1 0 |
| 10. Indulging in "petting"          | 3 2 1 0 |
| 11. Moderate drinking              | 3 2 1 0 |
| 12. Excessive drinking             | 3 2 1 0 |
| 13. Putting pins on the teacher's chair | 3 2 1 0 |
| 14. Swiping fruit out of orchards  | 3 2 1 0 |
| 15. Laziness                        | 3 2 1 0 |
| 16. Going to bed without saying your prayers | 3 2 1 0 |
17. Not brushing your teeth. ............... 3 2 1 0
18. Boys fighting. ......................... 3 2 1 0
19. Being a slacker in time of war .... 3 2 1 0
20. Boy running away from home ........ 3 2 1 0
21. Neglecting to study your lesson ... 3 2 1 0
22. Being a Bolshevik. .................... 3 2 1 0
23. Not standing up when "God Save the King" is played . ... 3 2 1 0
24. Drinking a great deal of coffee and tea ....... 3 2 1 0
25. Being cross to your brother or sister 3 2 1 0
26. Shooting rabbits just for fun. ....... 3 2 1 0
27. Having fits of temper. ................. 3 2 1 0
28. Insulting the defenceless. ......... 3 2 1 0

In each comparison below draw a circle around 1 or 2 or S to show how well you like the things mentioned. Around 1, if you like the FIRST thing better, Around 2, if you like the SECOND thing better, Around S, if you have the SAME LIKING for both.

1. (1) Make plans. (2) Carry out plans .... 1 2 S
2. (1) Work involving many details
   (2) Work involving few details ....... 1 2 S
3. (1) Interesting work with small income
   (2) Uninteresting work with large income 1 2 S
4. (1) Give a report in writing. (2) Give a report verbally ....... 1 2 S
5. (1) Work with men. (2) Work with women. .... 1 2 S
6. (1) A car with scruffy paint but excellent motor. (2) A car with fresh paint but only fairly good motor. .............. 1 2 S
7. (1) Live in the country. (2) Live in the city. .......... 1 2 S
Appendix 3.

The means of the frequency of occurrence of each symptom for each of the four phases of the monthly cycle are given below. It was thought that they might possibly be of interest for future investigation.

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Premenstrual</th>
<th>Menstrual</th>
<th>Postmenstrual</th>
<th>Intermenstrual</th>
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</thead>
<tbody>
<tr>
<td>Walk in sleep</td>
<td>0</td>
<td>0</td>
<td>.2</td>
<td>0</td>
</tr>
<tr>
<td>Unpleasant dreams</td>
<td>7.1</td>
<td>5.4</td>
<td>3.4</td>
<td>4.2</td>
</tr>
<tr>
<td>Pleasant dreams</td>
<td>11.1</td>
<td>8.8</td>
<td>10.2</td>
<td>10.5</td>
</tr>
<tr>
<td>Frightened in night</td>
<td>1.1</td>
<td>.4</td>
<td>0</td>
<td>.7</td>
</tr>
<tr>
<td>Sleeping badly</td>
<td>4.1</td>
<td>7</td>
<td>5.7</td>
<td>6.8</td>
</tr>
<tr>
<td>Door shut</td>
<td>1.4</td>
<td>1.0</td>
<td>1.8</td>
<td>1.4</td>
</tr>
<tr>
<td>Lonely</td>
<td>2</td>
<td>3.2</td>
<td>2.5</td>
<td>2.5</td>
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<tr>
<td>Difficulty in Adjustment</td>
<td>3.5</td>
<td>3.0</td>
<td>3.2</td>
<td>2.5</td>
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<tr>
<td>Suicide</td>
<td>.5</td>
<td>0</td>
<td>0</td>
<td>.4</td>
</tr>
<tr>
<td>Sad</td>
<td>4.5</td>
<td>6.0</td>
<td>3.8</td>
<td>5.1</td>
</tr>
<tr>
<td>Feelings changing</td>
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<td>3.4</td>
<td>2.1</td>
<td>2.4</td>
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<td>Tired of work</td>
<td>8.5</td>
<td>9.2</td>
<td>8.5</td>
<td>7.1</td>
</tr>
<tr>
<td>Tired of amusements</td>
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<td>4.4</td>
<td>3.4</td>
<td>4.0</td>
</tr>
<tr>
<td>Tired of people</td>
<td>4.1</td>
<td>3.6</td>
<td>4</td>
<td>4.0</td>
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<tr>
<td>Angry</td>
<td>3.4</td>
<td>4.2</td>
<td>2.8</td>
<td>1.8</td>
</tr>
<tr>
<td>Not easy to laugh</td>
<td>8.2</td>
<td>9.4</td>
<td>6.7</td>
<td>7.5</td>
</tr>
<tr>
<td>Poor appetite</td>
<td>5.2</td>
<td>6.8</td>
<td>6</td>
<td>4.7</td>
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<tr>
<td></td>
<td>Premenstrual</td>
<td>Menstrual</td>
<td>Postmenstrual</td>
<td>Intermenstrual</td>
</tr>
<tr>
<td>-----------------------</td>
<td>--------------</td>
<td>-----------</td>
<td>---------------</td>
<td>---------------</td>
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<td>Shyness</td>
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<td>3.2</td>
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<td>Twitching</td>
<td>1.4</td>
<td>1.2</td>
<td>2.4</td>
<td>2.5</td>
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<tr>
<td>Steal</td>
<td>0.1</td>
<td>0</td>
<td>0.4</td>
<td>0.2</td>
</tr>
<tr>
<td>Set fire</td>
<td>0.4</td>
<td>0</td>
<td>0.5</td>
<td>0.8</td>
</tr>
<tr>
<td>Being followed</td>
<td>0.7</td>
<td>0.6</td>
<td>1.4</td>
<td>0.7</td>
</tr>
<tr>
<td>Jumping off high place</td>
<td>0.2</td>
<td>0</td>
<td>0.2</td>
<td>0.4</td>
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<tr>
<td>Afraid of responsibility</td>
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<td>1.2</td>
<td>1.2</td>
<td>1.2</td>
</tr>
<tr>
<td>Doing things again</td>
<td>3.2</td>
<td>4</td>
<td>3.4</td>
<td>3</td>
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<tr>
<td>Worry over little jobs</td>
<td>3.4</td>
<td>3.2</td>
<td>2.7</td>
<td>2.7</td>
</tr>
<tr>
<td>Useless thoughts</td>
<td>3.1</td>
<td>2.4</td>
<td>3</td>
<td>3.2</td>
</tr>
<tr>
<td>Mind wandering</td>
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<td>4.6</td>
<td>5.5</td>
<td>4.7</td>
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<tr>
<td>Rattled easily</td>
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<td>3.4</td>
<td>2.8</td>
<td>3.8</td>
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<td>Trouble making up mind</td>
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<td>6.6</td>
<td>4.4</td>
<td>3.2</td>
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<td>Worry about little things</td>
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<td>5.2</td>
<td>4.2</td>
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<td>Crushed in crowd</td>
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<td>1</td>
<td>1.4</td>
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<td>Premenstrual</td>
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<td>Postmenstrual</td>
<td>Intermenstrual</td>
</tr>
<tr>
<td>------------------------</td>
<td>--------------</td>
<td>-----------</td>
<td>---------------</td>
<td>----------------</td>
</tr>
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<td>Hypnotised</td>
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<td>0</td>
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<td>Walking in dark</td>
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<td>1.2</td>
<td>0.7</td>
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<tr>
<td>Mental shock</td>
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<td>1.0</td>
<td>0.4</td>
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<td>4.6</td>
<td>4.7</td>
<td>5</td>
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<tr>
<td>Find fault</td>
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<td>0.8</td>
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<td>1.5</td>
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<td>4.4</td>
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<td>4.4</td>
<td>1.2</td>
<td>1.0</td>
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<td>.5</td>
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<td>Tired</td>
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<td>10</td>
<td>8.1</td>
<td>6.4</td>
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<td>1.4</td>
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<td>Suffocation</td>
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<td>0.2</td>
<td>.5</td>
<td>.2</td>
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<tr>
<td>Ideas preventing sleep</td>
<td>5.8</td>
<td>4.4</td>
<td>5.5</td>
<td>4.7</td>
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