

THE MALADJUSTED WORKER.
A survey by means of the Rorschach
and other indices.

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A C K N O W L E D G M E N T S.

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I N T R O D U C T I O N .

In every work situation, assuming that the conditions of work are reasonably satisfactory, the workers may be divided into two classes. The first type of worker is the individual who is capable of making adjustive reactions to the work situation. The second type is the individual who is unable to adjust himself to the work situation.

The investigation is an attempt to discover features of temperament, intelligence, and socio-economic background which are peculiar to the maladjusted worker, and which differentiate the maladjusted worker from the average worker. It is primarily a survey of maladjustment in workers, but, in order to create an adequate picture of the maladjusted worker it is necessary to draw a comparison between maladjustment and normality. For this reason the survey was extended to include a consideration of the average worker as well.

The investigation has been designed so as to cover three gradations of maladjustment in workers. First there is the maladjusted worker who is engaged in a wage-earning occupation in the open labour market. The types of maladjustment that are considered are marked, in that they represent distinct deviations from the accepted norms of the group to which the individual belongs, but they are not sufficiently serious to warrant a withdrawal from employment in the open labour market. The second gradation of work maladjustment is to be found in the individual who is unable to compete for, or to retain, employment in the open labour market, and who, subsequently to the occurrence of a series of work failures, is relegated to sheltered employment. The third gradation of maladjustment includes those workers who are hospitalized as a result of the occurrence of a series of work failures, or the occurrence of a breakdown in the work situation.

The survey is divided into two sections; the initial investigation, which deals with the first gradation of maladjustment described above, and the main investigation, which is concerned with the second and third gradations of maladjustment.

Whereas the initial investigation is confined to a study of workers belonging to the unskilled or semi-skilled occupational level only, the main investigation comprises workers who are representative of three occupational levels, that is, the unskilled or semi-skilled level, the clerical worker, and the professional occupational level.

What are the characteristic features of the maladjusted worker? In what way does the maladjusted worker differ from the average worker? And what are the causative factors underlying work maladjustment? These are the salient problems to be considered in the ensuing pages.

THE MALADJUSTED WORKER .

The initial investigation comprises a survey of the temperament, intelligence, and socio-economic background of a selected group of maladjusted factory-workers, and a comparison of the results with those obtained from a similar survey of a selected group of average factory-workers.

The first question that arises concerns itself with the definition of the 'maladjusted worker.' In attempting to define this term, it is advisable to begin with a consideration of the underlying factors in work maladjustment.

According to V.V. Anderson, (as quoted by W.V. Bingham),¹ there are three outstanding causative factors commonly underlying work failure. They are

- (a) a maladjusted personality,
- (b) a specialized job disability, and
- (c) a faulty physical condition.

Using these three factors as a basis for the definition to be followed in the present investigation, let us consider each in turn.

(a) An individual who has a maladjusted personality is one in whom there exists a form of temperamental, emotional, or personality imbalance, which manifests itself in a deviation in behaviour and attitude from the accepted norms of the group to which the individual belongs. We are not concerned with the individual causes of a maladjusted personality, which may be of a basic or constitutional nature, or else may be attributed to experiences in the individual's environment.

1. Bingham, W.V. "Achievements of Industrial Psychology."

(b) A specialized job disability implies the inaptitude of a worker for the specific job in which he, or she, is engaged. It is the classic case of the square peg in the round hole.

In many cases a specialized job disability will have an unfavourable effect on the individual only if it is combined with a maladjusted personality. But it is possible for a job maladjustment to give rise to a form of personality maladjustment in a hitherto well-adjusted personality. On the other hand, there exists the possibility of a personality maladjustment being the sole cause of a job maladjustment. A maladjusted personality may affect not only the individual who is well-adjusted to his specific job situation, but also the individual in whom there exists a specific job disability.

(c) The third causative factor underlying work maladjustment, a faulty physical condition, requires further elucidation in that the presence of such a condition in an individual does not imply necessarily the presence of a personality or a job maladjustment. Therefore, for the purpose of this investigation, a faulty physical condition will be regarded as a causative factor in work maladjustment only when it gives rise to a personality or job maladjustment, or a combination of both forms of maladjustment. A faulty physical condition may arise from a variety of causes, some of which are listed by Young,² as follows

1. Congenital factors.
2. Accidental factors.
3. Illnesses; and
4. Defective muscular conditions making co-ordinations difficult or impossible.

2. Young. "Personality and Problems of Adjustment."

In considering the three causative factors in work maladjustment, it is evident that although each is a distinctly separate entity having its own problems of cause and effect, the three factors are closely interrelated and often cannot be divorced from one another.

Thus, the following definition may be derived from a consideration of the factors in work maladjustment.

A maladjusted worker is an individual engaged in a wage-earning occupation in the open labour market, who shows maladaptation to that occupation as the result of the presence in that individual of some form of personality maladjustment or specialized job disability, or a faulty physical condition which in turn gives rise to a personality or job maladjustment. Or else the maladjusted worker is one in whom there exists a combination of two or all three of these factors.

The definition of a work failure is a further extension of the definition of a maladjusted worker. It is the extreme form of work maladjustment, as it is manifested in a failure in competing for, and in retaining, employment in the open labour market, or a complete breakdown on the job, and is to be attributed to one or more of the three causative factors mentioned above.

Beaumont³ refers to an occupational maladjustment as being specific to the job, or indicative of a generally maladjusted personality.

"In the former case the worker may be well-adjusted in his personal and social life, but incapable of acquiring the proper perspective toward his job or maintaining a satisfactory relationship with it. In other cases, failure to adjust to the working situation merely is an instance of the individual's inability to adjust to life in general."

3. Beaumont, H. "The Psychology of Personnel."

Viteles⁴ states that vocational maladjustment is a reflection of emotional maladjustment.

"Adjustment of the individual requires integration of conflicting tendencies to the demands of the activity in which he is engaged. Emotional maladjustment comes from a conflict of impulses incompatible with one another. It is a disturbance in the integration of opposing tendencies into the unified purposive pattern of behaviour characteristic of the 'normal mind' of 'happily-adjusted individuals.' Adjustment requires a congeniality, a compatibility, and a harmonious relation between the individual and the situation."

Beaumont³ refers to objective and subjective factors in specialized job maladjustments. In dealing with objective factors he says that

"The worker whose training has been inadequate and whose intelligence is insufficient to enable him to learn quickly is in no position to adjust adequately to his work, and neither is the employee who is capable, by virtue of training and intellectual capacity, to fill a much more important job than the one which has been assigned to him. Similarly, inadequate conditions of work constitute a challenge to the employees' adjustive capacity which many may be unable to meet."

Beaumont goes on to consider subjective factors in specialized job maladjustments.

"Many workers have unrealistic notions concerning both their own qualifications and the characteristics of the job. As a result, they discover too late that there is no agreement between what they thought they could do and what they actually are capable of doing, nor between what they expected to get out of the job and the actual satisfactions which they derive from it."

In dealing with the problem of maladjustment amongst workers, Young² states that

3. Beaumont, H. (see Page 5.)
 4. Viteles. "Industrial Psychology."
 2. Young. (see Page 4.)

"Even when relations between employees and employers are satisfactory there are cases who are not well-adapted to their families and communities, their work, or themselves. They constitute a small percentage of the total working force. The work situation is social. Maladaptation is related to the worker's efficiency, to his satisfaction with the job, and to his role as a member of society. The maladjusted worker is intellectually and emotionally maladapted to his work and to society. He drifts from job to job because of external pressure (employers' dissatisfaction) or because of internal pressure (attitudes). The maladjusted worker reveals persistent non-adjustive reactions to work situations and to the world."

Viteles⁴ quotes two experiments which are relevant to a discussion of maladjusted workers. The first was conducted by V.V. Anderson who investigated the incidence of maladjustment in two groups of sales-clerks. He found that 24% of the group of inefficient sales-clerks showed serious personality disorders, in contrast to the total absence of any such disorders among the group of efficient sales-clerks. The second investigation is that of Smith, Culpin, and Farmer, who found that in cases of Telegraphist's cramp, 75.6% showed symptoms of maladjustment.

4. Viteles. (see Page 6.)

THE INITIAL INVESTIGATION.

As stated above, the initial investigation comprises a survey of the temperament, intelligence, and socio-economic background of a group of maladjusted workers, and a comparison of the results with those obtained from a similar survey of a group of average workers.

It is confined to a study of cases of maladjustment to be found amongst factory-workers. The investigation was conducted in four separate clothing factories during the period of March-July, 1946, and altogether fifty cases of maladjustment were selected. In each factory the work was limited to a certain section, or to a number of departments, in that factory.

The investigation demands the selection of the maladjusted cases from a given group of employees. This was effected as follows:

1. The workers were discussed with a foreman or a forewoman who was sufficiently familiar with the employees under his (or her) supervision, both as individuals and as workers, to be able to distinguish between those who were satisfactorily adjusted to their work and those who were not, and between those who displayed maladjustments of a personality kind, (as manifested by a deviation in behaviour and attitude from the normal standards of the group), and those who were relatively normal.
2. The subjects selected in this way were then discussed with another reliable and authoritative person, such as a manager or supervisor. If the agreement between the two opinions was found to be reliable, the subject was summoned to a preliminary or introductory interview.
3. Whenever possible, it was endeavoured to obtain a third opinion on each subject, in order to eliminate thoroughly the possibilities of bias, mistaken or hasty

judgments, wrong impressions, the overlooking of significant features, and the over-emphasis of unimportant and trivial details.

In order to facilitate the selection of subjects, a list of the observable or outward manifestations of maladjustment was provided, together with the definition of a maladjusted worker given above, but as such a list cannot be all-inclusive, it served merely as a guide, and the selection of subjects was not limited by it.

The following are the observable forms of maladjustment that were listed:

1. A lack of aptitude for the specific job.
2. A frequent change of jobs.
3. Spasmodic and irregular application to the job in hand.
4. A deficiency in range and power of attention , and marked distractibility.
5. Inability to profit by learning and experience.
6. Excessive fatigue and irritability, and laxness in work.
7. Excessive absenteeism.
8. Accident-proneness.
9. Constant dissatisfaction and resentment.
10. Extreme reticence and withdrawal.
11. An extreme form of day-dreaming.
12. Exaggerated concern expressed by the individual about himself, or about his work.
13. Extreme aggressiveness; attention-getting; lying; and stealing.
14. Constant procrastination, and evasion of responsibility.
15. Impulsiveness and lack of self-control.
16. Chronic fault-finding.
17. The inability to endure even minor discomforts.
18. Seemingly irrational degrees and changes of mood.

19. Excessive fears, and

20. Excessive nervous habits.

In each case it was emphasised that the form of maladjustment must represent a distinct and marked deviation from the normal standards of the group to which the individual belongs. The subjects selected in this manner were summoned individually to an introductory interview, during which the following points of information were extracted from them.

1. Name. (The subject was assured that this was required only in order to be able to summon him, or her, to further interviews, if necessary.)
2. Sex.
3. Age.
4. Race. (Coloured or European.)
5. The specific job held by the individual in the factory.
6. The educational standard attained by the subject.

Following the introductory interview the employee could be regarded as a subject for the investigation only

- (a) if he (or she) fulfilled the necessary qualifications of maladjustment described above, as judged by two or more supervisors;
- (b) if he (or she) could be released from work subsequently for varying periods of time; and if
- (c) the employee was willing to submit to further investigation.

At this point it is necessary to emphasise the fact that none of the subjects were aware of the exact object or nature of the inquiry, as doubtless they would have been prejudiced unfavourably by the knowledge that they were regarded as maladjusted individuals. The only persons to be taken into confidence were the supervisors and managers

who supplied the material and information necessary for the investigation. Having selected the subjects suitable for the purpose of the investigation, each subject was addressed separately thus:

"I come from the University. I am very interested in factory-workers, and I am trying to get to know as many of them as I can. I talk to them, find out everything that I can about them, and also give them some short tests and puzzles to do. I want you to help me in this, and as a beginning, I want you to answer a few questions about yourself that I am going to ask."

The subject was then assured that the inquiry was confidential, in the sense that nothing that he (or she) said would be used in any way that might jeopardise his (or her) position in the factory.

Brief notes were jotted down in as unobtrusive a manner as possible during the interviews, and these were supplemented afterwards.

The interviews were varied according to the trend of the conversation and the degree of interest exhibited by the subject. The degree of contact established with the individual subject, to a great extent depended on the subject's degree of interest, attention, and co-operation.

If a certain degree of rapport was established at the second interview, and if the subject was not required to return to his (or her) work immediately, then a test of temperament was applied. A brief description will be given here of the measure of temperament selected for this purpose, and the method of applying it.

The selected measure of temperament is the Reyburn-Taylor-Guilford's temperament questionnaire.⁵

5. Reyburn, H.A., and Taylor, J.G.
 "Some Factors of Temperament: A Re-Examination."
 (Psychometrika. Vol. 8. No. 2. 1943.)

The questionnaire comprises two sections, Table A and Table B. There are thirty items in Table A, and twenty-three items in Table B. Each item is worded in question form, and requires the subject to give an accurate self-rating or self-judgment.

The questionnaire claims to measure ten factors of temperament. They are

- (1) Surgency; (2) Persistence; (3) Sociability;
- (4) Alertness; (5) Flexibility; (6) Liking for thinking;
- (7) Interest in action; (8) Tension;
- (9) Nervousness; and (10) Inhibition.

As it was impossible to keep the subjects away from their work for any lengthy periods of time, and as it was intended to apply tests of intelligence to them at a later stage, a short but efficient method of temperament testing had to be found, and it was for this reason that the questionnaire method was selected.

A number of questionnaires were considered in an attempt to find the most economical and the most thorough measure of temperament, and of these, two were selected.

- (1) The Reyburn-Taylor-Guilford's questionnaire; and
- (2) The Thurstone-Willoughby Personality Schedule,⁶ which consists of twenty-five questions, in reply to each of which the subject may select one of five given answers.

The Thurstone-Willoughby Personality Schedule was abandoned after it had been applied to a group of twenty subjects, because it was necessary to curtail the interviews as much as possible, and as the method of application required the subject to give not only a self-rating but also a choice as to the degree of possession of various traits of temperament, considerable difficulty was experienced in getting

6. Willoughby, R.R. "Some properties of the Thurstone Personality Schedule." (Journal of Social Psychology. Vol. 3. 1930.)

the subjects to give accurate replies in the time at our disposal.

The Reyburn-Taylor-Guilford's questionnaire was found to be simpler and quicker to administer, as in reply to each item the subject is required to give only one direct answer: "Yes," "No," or in some instances, "I don't know." As the general educational level of the subject's in this group is low, it is obvious that the questionnaire could not be applied in the usual manner. Whereas it is usual for the subject to read the questions and to write down the replies, in this case the questions were read out aloud to the subject, and each item had to be worded in such a way as to make it intelligible to the subject without actually changing the sense or the meaning of the question. The relevant replies given by the subject were recorded. In some cases the interviews were conducted in Afrikaans, and in these instances, the items of the questionnaire were translated into Afrikaans while at the same time retaining the original meaning.

After the application of the test of temperament, and before dismissing the subject, the possibility of applying a test of intelligence in the near future was broached in the following manner.

"I will be coming back soon, and would like to do some short puzzles and tests with you. Would you be willing to try them? I think that you would enjoy doing them very much."

If the subject complied, then nothing further was said. But if the subject hesitated or showed some reluctance to comply with the request, then some additional explanations were given, for example:

"A number of workers have done these tests and puzzles already, and they have found them to be most interesting."

The intelligence test was administered as part of the second or third interview. The selected test is the Differential Test of Intelligence, (Child Guidance Clinic, University of Cape Town), and according to the home-tongue of each individual it was administered either in English or in Afrikaans.

The measure of intelligence is made up of a battery of nine tests of which two are non-verbal tests and seven are verbal tests. There follows now a list of the tests, together with the time-limits that were imposed on them.

A.	<u>Non-Verbal Tests.</u>	<u>Time-limit.</u>
	1. Maze.	4 minutes.
	2. Pattern. (Advanced form.) There are six sections in the Pattern test.	35 minutes. 3, 4, 5, 6, 8, and 9 minutes respectively.
B.	<u>Verbal Tests.</u>	
	1. Anagrams.	5 minutes.
	2. Repetition of digits.	
	3. Repetition of digits backwards.	
	4. Dissected sentences.	5 minutes.
	5. Vocabulary.	
	6. Retention of sentences.	
	7. Absurdities.	15 minutes.

The test was applied as an individual test, and the following order, though not strictly adhered to in every case, was found to be the most suitable.

- (1) Repetition of digits. (2) Vocabulary.
 (3) Repetition of digits backwards. (4) Anagrams.
 (5) Maze. (6) Dissected sentences. (7) Retention of sentences. (8) Absurdities. (9) Pattern.

The intelligence test interview lasted for approximately 1½ hours in each case. Following this interview, final discussions concerning each subject were held with managers or supervisors whenever possible.

THE AVERAGE WORKER .

As outlined above, the initial investigation includes a comparison of the maladjusted workers with a group of average workers.

After the group of maladjusted workers had been selected, interviewed, and tested, the same methods of investigation were applied to a group of average workers.

Using the definition of the maladjusted worker as a basis for describing the average worker, the latter may be defined as an individual engaged in a wage-earning occupation in the open labour market who is adjusted to the work situation, in whom no personality maladjustments exist, who shows little or no deviation in behaviour and attitude from the accepted norms of the group to which the individual belongs, and who has a specialized job ability, or an aptitude for the specific job in which he (or she) is engaged . In addition, the average worker shows no marked physical defects which give rise to personality or job maladjustments.

In selecting the group of average workers, these requirements were satisfied by obtaining judgments from at least two supervisors. The agreement of two or more such independent judgments was considered to be an adequate criterion of normality. All subjects selected in this manner were included in the average group and were interviewed and tested in the same way as were the subjects in the maladjusted group.

THE RESULTS OF THE INITIAL INVESTIGATION.The incidence of maladjustment.

The maladjusted group comprises 50 subjects who were selected from a total group of 916 workers employed in the factories, or factory-departments, accessible to the present investigation.

Thus, 18.32% of the factory-workers falling within the scope of this investigation were rated by two or more supervisors as being maladjusted workers.

Young² quotes percentages of maladjustment amongst factory-workers which were revealed by two American investigations. Jarrett claims that 50% of American workers are emotionally maladjusted. V.V. Anderson quotes 20% as being "problem" cases.

Clinical psychologists and personnel managers, commenting on these estimates, say that they are too high. A great deal depends on the definition of normality that is used, and for this reason the estimate obtained from the present investigation cannot be compared with the results quoted by Young.

The composition of the groups.

	<u>Maladjusted group.</u>	<u>Average group.</u>
Number of subjects.	50	46
Number of European subjects.	22	34
Number of Coloured subjects.	28	12
Number of males.	5	4
Number of females.	45	42
Average age in years.	23	20
Average educational standard.	4	5

2.Young. (See Page 4.)

It will be observed that the average age of the maladjusted group is higher than that of the average group. The average school standard attained by the maladjusted group is lower than that of the average group.

Types of maladjustment.

These are based on the definition of a maladjusted worker given above, in which it was stated that the three outstanding causative factors in work maladjustment are

- (a) a maladjusted personality
- (b) a specialized job disability, and
- (c) a faulty physical condition, which gives rise to a personality or job maladjustment.

An analysis of the percentage of cases to be found in each category of maladjustment reveals the following results.

- A. Personality maladjustments. 24%
- B. Specialized job disabilities. 26%
- C. Personality maladjustments combined with specialized job disabilities. 38%
- D. Personality maladjustments combined with specialized job disabilities and faulty physical conditions. 8%
- E. Personality maladjustments combined with faulty physical conditions. 4%

Although in many cases it is impossible to classify the form of maladjustment that occurs in an individual, it is possible however to state that one or other of the classified forms of maladjustment predominates in the individual. For example, the type of maladjustment existing in an individual in Group A is predominantly a maladjustment of the personality.

The measurement of temperament.

The Reyburn-Taylor-Guilford's temperament questionnaire

was applied to a group of 46 maladjusted workers, and 46 average workers.

Mean Scores and Standard Deviations.

	<u>Maladjusted group.</u>		<u>Average group.</u>	
	<u>Mean</u>	<u>S.D.</u>	<u>Mean</u>	<u>S.D.</u>
Surgency	-1.52	5.90	-2.33	4.59
Persistence	3.11	5.39	1.50	6.13
Sociability	1.70	4.27	0.44	4.24
Alertness	0.41	2.07	0.07	2.22
Flexibility	-2.37	4.67	-3.28	3.50
Liking for thinking	2.13	2.81	2.72	3.19
Interest in action	0.61	2.19	-0.15	1.93
Tension	-3.98	4.48	-4.81	4.70
Nervousness	-0.24	2.99	-0.54	3.23
Inhibition	0.24	2.21	-0.74	2.66

The reliability of the differences
between the means.

	<u>Rel. diff.</u>	<u>P.</u>
Surgency	.73	(40-50%)
Persistence.	1.31	(15-20%)
Sociability	1.42	(10-20%)
Alertness	.78	(40-50%)
Flexibility	1.30	(15-20%)
Liking for thinking	.94	(30-40%)
Interest in action	1.77	(5-10%)
Tension	.86	(35-40%)
Nervousness	.47	(60-70%)
Inhibition	1.90	(5-7%)

The formula used in calculating the reliability of the differences between the means, is

$$\text{Rel. Diff.} = \sqrt{\frac{\text{Mean 1} - \text{Mean 2}}{\frac{\sigma_1^2}{N_1} + \frac{\sigma_2^2}{N_2}}}$$

(For the purpose of this investigation, a reliability below 20% is regarded as being significant. The percentages are arranged in categories.)

In considering those variables in which there is a significant difference between the groups, it is found that the members of the maladjusted group claim to be more inhibited, and to have a greater interest in action, than is claimed by the members of the average group. In addition, the maladjusted individuals claim to be more persistent, more sociable, and more flexible than the average individuals claim to be. To what extent the self-ratings of the maladjusted group are influenced by the "self-halo" effect, or, as Karen Horney⁷ refers to it, the "idealized image" of the self, is not certain.

In claiming to be more persistent, more sociable, more flexible, and more interested in action than the average group, it is possible that the maladjusted individual is attempting to live up to a desired self-image, or else wishes to create a certain impression. On the other hand, the self-ratings of the maladjusted individuals might be caused by a lack of self-insight, or, in other words, the inability to introspect and to give fair and unbiased self-judgments. A further possible cause of the claims made by the maladjusted individuals is the desire to

7. Karen Horney. "Our Inner Conflicts."

possess those traits which they believe to be socially desirable. If this is the case, then it is possible that their claim to be more inhibited than is claimed by the average group, is motivated by a desire to possess those traits which they consider, or believe, to be preferable and acceptable in the individual.

As has been outlined above, under the heading of 'Types of Maladjustment,' the members of the maladjusted group may be divided into five small groups. The greater percentages of cases occur in groups A, B, and C, and each of these three groups in turn will be compared with the total average group.

In calculating the reliability of the differences between the means of each maladjusted group with the means of the average group, this formula was used.

$$t = \frac{\text{Mean 1} - \text{Mean 2}}{\sqrt{\left(\frac{\sum d_1^2 + \sum d_2^2}{N_1 + N_2 - 2}\right) \left(\frac{N_1 + N_2}{N_1 N_2}\right)}}$$

(M) = A difference in favour of the maladjusted group.

(A) = A difference in favour of the average group.

Group A.Means and Standard Deviations.

	<u>Mean.</u>	<u>S.D.</u>
Surgency	0.18	4.39
Persistence	3.78	6.40
Sociability	3.91	2.97
Alertness	1.36	1.55
Flexibility	-1.86	4.08
Liking for thinking	2.14.	2.68
Interest in action	0.46	2.23
Tension	-5.22	5.06
Nervousness	-3.14	3.90
Inhibition	0	1.96

The reliability of the differences between
the means of group A and the average group.

	<i>t</i>	<i>p</i>
Surgency	(M) 1.63	(10-15%)
Persistence	(M) 1.10	(20-30%)
Sociability	(M) 2.57	(1-2%)
Alertness	(M) 1.83	(5-10%)
Flexibility	(M) 1.16	(20-30%)
Liking for thinking	(A) .55	(55-60%)
Interest in action	(M) .92	(30-40%)
Tension	(A) 2.58	(1%)
Nervousness	(A) 2.30	(2-4%)
Inhibition	(M) .85	(35-40%)

(M) = A difference in favour of the maladjusted group.

(A) = A difference in favour of the average group.

Group B.Means and Standard Deviations.

	<u>Mean.</u>	<u>S.D.</u>
Surgency	-4.22	5.72
Persistence	3.22	4.38
Sociability	0.22	3.44
Alertness	0.55	2.06
Flexibility	-3.96	4.68
Liking for thinking	3.18	2.37
Interest in action	0.09	1.88
Tension	-5.91	3.73
Nervousness	- 0.36	2.19
Inhibition	-0.27	2.49

The reliability of the differences between
the means of Group B and the average group.

	t	p
Surgency	(A) 1.17	(20-30%)
Persistence	(M) .85	(35-40%)
Sociability	(A) .16	(85-90%)
Alertness	(M) .66	(50-55%)
Flexibility	(A) .54	(55-60%)
Liking for thinking	(M) .45	(60-70%)
Interest in action	(M) .37	(70-75%)
Tension	(A) .72	(40-50%)
Nervousness	(M) .18	(80-90%)
Inhibition	(M) .52	(60%)

Group C.Means and Standard Deviations.

	<u>Mean.</u>	<u>S.D.</u>
Surgency	-1.28	6.46
Persistence	3.28	5.74
Sociability	2.01	4.89
Alertness	0.22	1.87
Flexibility	-3.06	3.92
Liking for thinking	3.83	2.82
Interest in action	0.67	2.11
Tension	-3.72	4.06
Nervousness	0.78	2.72
Inhibition	0.33	2.13

The reliability of the differences between
the means of group C and the average group.

	<i>t</i>	<i>p</i>
Surgency	(M) .74	(40-50%)
Persistence	(M) 1.05	(25-30%)
Sociability	(M) 1.26	(20-25%)
Alertness	(M) .26	(75-80%)
Flexibility	(M) .21	(80-85%)
Liking for thinking	(M) 1.27	(20-25%)
Interest in action	(M) 1.48	(10-20%)
Tension	(M) .84	(40%)
Nervousness	(M) 1.52	(10-15%)
Inhibition	(M) 1.49	(10-20%)

Group A: A comparison of this group and the average group reveals a number of significant differences. The members of group A claim to be more sociable, more alert, and more surgent than is claimed by the average group. In addition the results of group A disclose less tension and less nervousness than those of the average group. Once again, the "self-halo" effect, or the "idealized image" possessed by the individuals having personality maladjustments is evident.

Group B: No significant differences emerged from a comparison of group B with the average group. This group is made up of individuals who are maladjusted predominantly in their work, rather than in their personalities. As the questionnaire measures traits of temperament, it is to be expected that this group will not show any marked temperamental deviations from the average group, as measured by the questionnaire.

Group C: The members of group C claim to be more inhibited, more nervous, more sociable, more interested in action, and to have a greater liking for thinking, than is claimed by the average individuals. The "self-halo" effect is present in their claims to be more sociable, more interested in action, and to have a greater liking for thinking than the average group; but it is significant that in addition they claim to be more inhibited and more nervous than the average group. This might arise from the belief that the items which measure inhibition and nervousness are measuring desirable traits of temperament. The claim to greater nervousness in this group might be accounted for by the fact that the members of the group possess both personality and job maladjustments. Their greater nervousness may be caused by the possession of both forms of maladjustment to an equal degree.

The reliability of the differences between the
Standard Deviations of the maladjusted group
and the average group.

The formula:

$$\text{Rel. } \sigma_{\text{diff.}} = \frac{\sigma_1 - \sigma_2}{\sqrt{\sigma\sigma_1^2 + \sigma\sigma_2^2}}$$

$$\text{where } \sigma\sigma = \frac{\sigma}{\sqrt{2n}}$$

	Rel. $\sigma_{\text{diff.}}$	P
Surgency	(M) 1.71	(5-10%)
Persistence	(A) .85	(35-40%)
Sociability	(M) .05	(Above 90%)
Alertness	(A) .48	(60-70%)
Flexibility	(M) 2.00	(2-5%)
Liking for thinking	(A) .91	(30-40%)
Interest in action	(M) 1.00	(30-35%)
Tension	(A) .30	(70-80%)
Nervousness	(A) .45	(60-70%)
Inhibition	(A) 1.39	(15-20%)

The maladjusted group shows a greater Standard Deviation in Flexibility, Surgency, and Interest in action, than the average group. The average group shows a greater Standard Deviation in Inhibition, than the maladjusted group.

The measure of intelligence.

The tests of intelligence were administered to a group of 24 subjects selected from the maladjusted group, and to a group of 24 subjects selected from the average group. Thus the tests of intelligence were applied to one half of the total number of selected maladjusted and average workers.

It was not possible to test the entire groups, as many of the workers were indispensable to their jobs, for example, those workers who were engaged on the conveyor system, and they could not be spared for the length of time required for the application of the intelligence tests.

Mean Scores and Standard Deviations.

	<u>Maladjusted group.</u>		<u>Average group.</u>	
	<u>Mean.</u>	<u>S.D.</u>	<u>Mean.</u>	<u>S.D.</u>
Maze	32.42	3.32	36.30	10.99
Pattern	31.00	10.50	32.82	10.76
Anagrams	13.15	8.31	14.75	7.11
Repetition of digits	17.83	5.02	17.25	4.42
Digits backwards	11.42	4.20	12.16	4.46
Dissected sentences	23.50	12.34	22.82	11.92
Vocabulary	40.90	17.35	36.33	18.20
Retention of sentences	20.33	4.17	19.50	3.64
Absurdities	16.40	7.24	18.25	7.86

The reliability of the differences between the means of the maladjusted group and the average group.

	t	p
Maze	(A) 1.30	(15-20%)
Pattern	(A) .64	(50-55%)
Anagrams	(A) .87	(35-40%)
Repetition of digits	(M) .70	(40-50%)
Digits backwards	(A) .79	(40-50%)
Dissected sentences	(M) .27	(75-80%)
Vocabulary	(M) .91	(30-40%)
Retention of sentences	(M) .86	(35-40%)
Absurdities	(A) .86	(35-40%)

Only one difference having any significance emerges from a comparison of the means of the maladjusted and the average groups, and that is the difference in the Maze test.

The significance of the Maze test in measuring the differences between groups of maladjusted and average individuals requires further elaboration. As no other significant differences emerged from a comparison of the two groups in the tests of intelligence, a controversial point arises as to the precise nature of the traits measured by the Maze test. What are the factors involved in the successful performance of the Maze test? Is the Maze a test of intelligence only, or does it measure traits of temperament as well?

These questions have been discussed by a number of writers, and the following citations are given in an attempt to elucidate the problem.

Porteus⁸ states that

"Careful observation of subjects when working through the designs indicated that

8. Porteus, S.D. "The Maze Test and Mental Differences."

other traits or abilities besides planning capacity were undoubtedly affecting the results."

He goes on to say that the Porteus Maze has a correlation of .67 (in boys) and .73 (in girls) with industrial ability. He found also that boys make fewer errors than girls, and that the girls ascribed their mistakes to "nervousness." An over-anxiety to succeed caused them to become mentally confused.

Porteus explains further

"All that the Maze test does is to measure approximately the ability of the individual to use planning capacity in a task at or about moron levels and to readapt his methods in the face of increasing difficulties as far as his temperament will allow him to do so."

This stresses the importance of the relationship of temperamental deficiency to successful adaptation. Social adaptability is not a single trait, but is a condition dependent on large numbers of traits of which intelligence is one. Porteus concludes that the Maze gives a fairly reliable estimate of the person's suggestibility, impulsiveness, irresolution, and the tendency to become nervous and confused in a task new to experience.

Burt⁹ refers to the Maze test as being most helpful "in estimating social, as distinguished from educational, efficiency." According to Burt, the traits involved in the causes of failure in the Maze are: (1) A lack of planning ability; (2) the inability to profit by experience (3) over-confidence; (4) carelessness; (5) impulsiveness; (6) mental confusion; and (7) the inability to sustain attention.

In an investigation by L.M. Karpeles¹⁰ it was found that a group of individuals having 'behaviour problems,' (such

9. Burt, Cyril. "Mental and Scholastic Tests."

10. Karpeles, L.M. "A further investigation of the Porteus Maze as a discriminative measure in delinquency."
(Journal of Applied Psychology. Vol. XVI.1932)

as cases of temper tantrums, emuresis, lying, disobedience, and excessive pugnacity), showed low Maze scores, as did a group of delinquents.

Reyburn and Taylor,¹¹ in referring to a factor in the Maze, state:

"The tasks involve the arrangement or rearrangement of sensory material, and the interpretation which we suggest is that it consists in some kind of manipulative fluency or elasticity in dealing with perceived sensory data. It is a form of dexterity, but mental and not manual, and, so far as the present tests go, confined to perceived objects."

They continue thus:

"The third factor conditions the ability to see a path through a Maze and to follow it..... It is the ability to make, or isolate, and follow a plan. It would thus appear to be a synthetic and constructive ability as well as an analytic one. It is the power to find or make a significant pattern in a mass of irrelevant material."

Lundie¹² deals with the problem of Maze performances in maladjusted personalities in these words:

"A common observation is that maladjusted personalities tend to be impulsive and to lack foresight and control. The Porteus Maze Tests which consist of a series of Mazes through which the subject has to find his way with a pencil, are valuable in diagnosing foresight and control..... If a person with normal intelligence does badly on this test, one can suspect emotional instability of some type..... It would seem that the emotionally unstable individual is revealed as erratic in intellectual performances, and unable to work efficiently under pressure. He tends to lack foresight and self-control, to be impulsive and unable to endure discomforts."

Therefore it is concluded that the Maze test gives fairly reliable estimates of the individual's impulsiveness, foresight, irresolution, control, and the tendency to

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11. Reyburn, H.A., and Taylor, J.G.
 "Some factors of intelligence."
 (British Journal of Psychology. Vol 31.1940-1)
12. Lundie, C.F. "Emotional instability testing in industry." (S.A. Psychological Review. 1946.)

become nervous and confused in a task new to experience. The Maze measures the ability to readapt methods in the face of increasing difficulties as far as the individual temperament will allow. It measures social adaptability and also mental dexterity.

Bearing these points in mind, the inferior Maze performance of the maladjusted group to that of the average group assumes a new importance. It reveals the maladjusted group to be less capable of social adaptability and mental dexterity than the average group. The maladjusted group is more impulsive, irresolute, uncontrolled, and lacking in foresight, and also tends to be more nervous and confused in a task new to experience, than the average group.

The reliability of the differences between the Standard Deviations of the maladjusted group and the average group.

	Rel. σ_{diff}	P
Maze	(A) 4.59	(Below 1%)
Pattern	(A) .14	(85-90%)
Anagrams	(M) .76	(40-50%)
Repetition of digits	(M) .62	(50-55%)
Digits backwards	(A) .34	(70-75%)
Dissected sentences	(M) .17	(85-90%)
Vocabulary	(A) .22	(80-85%)
Retention of sentences	(M) .75	(40-50%)
Absurdities	(A) .45	(60-70%)

Only one significant difference is to be found. The average group shows a greater Standard Deviation in the Maze test, than the maladjusted group.

A summary of the results disclosed by the initial investigation.

In the initial investigation it was found that 18.32% of the workers falling within the range of the investigation were rated by two or more supervisors as being maladjusted workers.

This percentage is smaller than that quoted by similar investigations that were conducted by Jarrett and by V.V. Anderson, in America. No comparison can be drawn however, as a great deal depends on each investigator's definition and conception of normality.

The results of the measurement of temperament by the use of the Reyburn-Taylor-Guilford's questionnaire, reveal that the maladjusted group claims to be more inhibited, more interested in action, more persistent, more sociable, and more flexible, than the average group. It may be deduced from these claims that the members of the maladjusted group either feel their inadequacy and attempt to hide it by claiming to possess more desirable traits, or else that they are not aware of their inadequacy. In claiming to be more inhibited, it is likely that the maladjusted individuals regard the qualities that are an index to inhibition as socially-desirable factors.

The claims made by the maladjusted group may be accounted for by

- (i) The "self-halo" effect, or as Karen Horney refers to it, "the idealized image."
- (ii) The desire to live up to the "idealized image".
- (iii) The inability to introspect and to give self-judgments of an unbiased nature.
- (iv) The desire to possess those traits which they believe to be socially desirable.

It was found that the maladjusted group could be divided into five sections, according to the nature of the maladjustment in each individual case.

The sections are:-

- A. Individuals in whom personality maladjustments predominate over any other forms of maladjustment. (24% of the total maladjusted group fall into this category).
- B. Individuals in whom specialized job disabilities are predominant. (26%)
- C. Individuals in whom personality maladjustments are combined with specialized job disabilities. (38%)
- D. Individuals in whom a faulty physical condition is combined with a specialized job disability and personality maladjustment. (8%)
- E. Individuals in whom a faulty physical condition is combined with personality maladjustments. (4%)

Groups A, B, and C, were compared in turn with the total average group.

Group A claims to be more sociable, more alert, and more surgent, and to show less tension and nervousness than the average group. Thus, the individuals having personality maladjustments claim to possess more socially desirable traits than the average individuals. Here, as in the total maladjusted group, the effect of the "idealized image" is apparent. In the case of the individuals having personality maladjustments it may be concluded, as above, that either they feel their inadequacy and attempt to hide it by claiming to possess what they consider to be more desirable traits, or else they are not capable of unbiased introspection, and consequently, are not aware of their inadequacy.

In comparing Group B with the average group, no significant differences in temperament, (as measured by the questionnaire), were found. As Group B is composed of those indivi-

duals in whom specific job maladjustments predominate, no personality deviations of a marked nature are to be found in comparing an assessment of their temperaments with that of an average group.

Group C, (which is comprised of individuals in whom personality and job maladjustments occur to an equal extent), claims to be more nervous, more inhibited, more sociable, more interested in action, and having a greater liking for thinking, than the average group. In all these claims, (except the claim to be more nervous), the "idealized image" of the maladjusted group is evident, as is the desire to possess certain socially-acceptable traits. But Group C differs from Group A in that the members of Group C claim to be more nervous than the members of the average group. As Group A comprises individuals having mainly personality maladjustments, and Group C comprises individuals having a combination of personality and job maladjustments, it may be assumed that the factor of the interrelation of specialized job disabilities with personality maladjustments accounts for Group C's claim to greater nervousness than is claimed by the average group. This may be attributed to the feelings of insecurity, resulting in nervousness, that must accompany a job disability in an individual having a maladjusted personality. The Standard Deviation is a measure of dispersion. It was found that the maladjusted group shows a greater degree of dispersion in the distribution of the scores in Flexibility, Surgency, and Interest in action, than does the average group.

The average group shows a greater degree of dispersion in the distribution of the scores in Inhibition, than is shown by the maladjusted group.

The results of the measurement of intelligence by the use of the Differential Test of Intelligence, reveal that the

average group has a significantly higher mean score in the Maze test, than the maladjusted group.

In comparing the Standard Deviations of the groups, the only significant difference to be found is in the Maze test, the average group showing a greater dispersion of the scores than the maladjusted group.

As no other significant differences emerged from a comparison of the means of the two groups, it is possible to conjecture the likelihood that the Maze test is measuring other factors as well as factors of intelligence. It would appear that the average individual possesses certain traits, and dispossesses others, which cause him (or her) to give a better performance in the Maze test than is given by the maladjusted individual.

From a survey of the available literature, it was found that the Maze may be considered to be a measure of planning activity, social adaptability, and mental dexterity.

Interpreted in this light it would mean that the average group shows a greater measure of planning activity and mental dexterity, and is more capable of social adaptability than the maladjusted group. From the results obtained in the initial investigation, it may be concluded briefly that the picture of the maladjusted worker that presents itself is of an individual who possesses an "idealized self-image" which might be caused by a lack of introspective insight into the existing inadequacies and temperamental deficiencies, or else by a realization of the inadequacy and an attempt to hide it by claiming to possess certain socially-desirable traits. In addition, as revealed by the Maze performances, the maladjusted worker is less capable of social adaptation and mental dexterity than the average worker. Other factors which are associated with the inferior Maze performances of the

maladjusted worker are, a lack of planning activity, the inability to profit by experience, mental confusion, the inability to sustain attention, over-confidence, carelessness, and impulsiveness. The maladjusted worker is unable to work efficiently under pressure, lacks foresight and self-control, and is unable to endure discomforts.

A criticism of the initial investigation, and an
introduction to the main investigation.

The initial investigation serves a dual purpose in that it is not only an investigation of maladjusted workers, but is also a preliminary means of ascertaining the most suitable experimental methods of investigating differences that exist between maladjusted and average workers.

The results of the initial investigation have been given above. The conclusions regarding the methods of conducting such an investigation follow here.

The discussion may be divided into two sections.

(i) A criticism of the tests used in the initial investigation.

(ii) A criticism of the methods employed in selecting the subjects.

(i) In the initial investigation the main emphasis was laid upon temperamental factors, but only one measure of temperament was used. The measure of intelligence that was employed was more reliable, in that it was not based upon the subject's self-ratings, as was the case in the test of temperament.

Thus, a more even balance between the temperament testing and the intelligence testing is required, as well as a more reliable method of temperament testing, and a shorter and more economical method of intelligence testing.

The measure of temperament used in the initial investigation is a questionnaire, and this was found to have many disadvantages. It has been stated by Allport¹³ that questionnaires have value only when "a competent subject is sufficiently motivated to give his replies honestly and carefully."

13. Allport, G.W. "Personality. A Psychological Interpretation."

Questionnaire methods require self-revelation regarding the individual's thoughts and habits. They imply complete and unbiased self-understanding and self-knowledge, as well as introspective ability. The "self-halo" effect is difficult to avoid. Subjects consciously or unconsciously are inclined to give themselves flattering scores, and in general give themselves less extreme scores than would result from the common opinion of their fellows. In addition, subjects tend to reply to questionnaires in the manner which best suits their purpose, or what they assume to be the purpose of the investigation.

(ii) In selecting subjects for the initial investigation, the assessment of two or more supervisors was required. This eliminates to some extent, but not completely, the effects of biased and mistaken judgments. But it is realized that some amount of personal bias must have entered into the judgments that were made, either consciously or unconsciously. In addition it must be emphasised that the differentiation between normality and abnormality, no matter how clearly it is defined, must have a different interpretation and meaning for each individual.

In the main investigation it was decided that the group of maladjusted workers should comprise more extreme and more marked cases of maladjustment, and thus, whereas the initial investigation is concerned with cases of maladjustment to be found in the open labour market only, the main investigation was extended to cover cases of work failure and of hospitalization caused by a complete breakdown of the individual on the job. By using subjects who have been relegated to sheltered employment and to a neuropsychiatric hospital, the necessity of relying on personal judgments in selecting the subjects is obviated to a great extent, as is the initial difficulty of having to differentiate between normality and abnormality.

Therefore, the following modifications of the original plan of research were made.

- (1) In the main investigation a more even balance between the temperament testing and the intelligence testing was established.
- (2) The questionnaire method of temperament testing was abandoned, and a projection technique, the Rorschach ink-blot association technique, which will be described in detail later, was selected.
- (3) More extreme forms of maladjustment were selected to comprise the maladjusted group.
- (4) Whereas the initial investigation includes only factory workers as subjects, in the main investigation a more graded selection of subjects was made. Therefore, the main investigation includes groups of workers from three different occupational levels. They are
 - (a) The unskilled or semi-skilled worker.
 - (b) The clerical worker.
 - (c) Workers representative of the professional occupational level.

THE MAIN INVESTIGATION.

The definition of the maladjusted worker which has been followed in the initial investigation, is applicable to the main investigation as well.

A maladjusted worker is an individual engaged in a wage-earning occupation who is maladapted to that occupation, in whom there exists some form of personality maladjustment, or a specialized job disability, or who has a faulty physical condition which gives rise to a personality or job maladjustment. Or else the maladjusted worker is an individual in whom there exists a combination of two or all three of these factors.

The definition of a work failure is a further extension of a maladjusted worker. It is the extreme form of work maladjustment as it is manifested in a failure in competing for, and in retaining, employment in the open labour market, or a complete breakdown in the work situation, and it is to be attributed to one or more of the three causative factors mentioned above.

The programme of research has been designed so as to cover three gradations of maladjustment in workers. The first gradation of maladjustment, which is that of the maladjusted worker engaged in a wage-earning occupation in the open labour market, has been considered above in the initial investigation. The second and third gradations of maladjustment form the basis for the selection of the subjects in the main investigation. The second and third gradations of maladjustment are concerned with those individuals who, because of the presence of one or more of the three underlying factors of maladjustment, are unable to compete for, or retain, employment in the open labour market, and who, subsequently to the occurrence of

a series of work failures, are relegated to sheltered employment or to a neuropsychiatric hospital, depending on the nature of each individual case.

Thus, the main investigation comprises a survey of the temperament, intelligence, and socio-economic background of a group of maladjusted workers selected from sheltered employment and from a neuropsychiatric hospital, and compares the results with those obtained from a similar survey of a group of average workers who are representative of the same occupational levels as the maladjusted group.

The manner of approach to the subjects is the same as that employed in the initial investigation, as is the method of application of the tests of intelligence. The method of application of the test of temperament is included in the description of that test.

The tests used in the main investigation.

The tests will be described in this order:

- (1) The tests of intelligence.
- (2) The test of temperament.

(1) The tests of intelligence.

The measure of intelligence employed in the main investigation comprises five tests, (three verbal tests, and two non-verbal tests), all of which were applied as individual tests. The three verbal tests are taken from the Differential Test of Intelligence, and were used in the initial investigation. They are

- (a) Vocabulary. (The test was administered in English or in Afrikaans, depending on the home-tongue of each individual.)
- (b) Repetition of digits.
- (c) Repetition of digits backwards.

The two non-verbal tests are taken from the Group Intelligence Test of the University of Cape Town. They are

- (a) Maze. (5 minutes).
- (b) Pattern. (7 minutes).

The time-limits are indicated in parentheses.

The order of presentation of the tests, although it was not adhered to strictly in each case, was as follows:

- (a) Repetition of digits.
- (b) Vocabulary.
- (c) Repetition of digits backwards.
- (d) Maze.
- (e) Pattern.

(2) The test of temperament.

The questionnaire method of temperament measurement used in the initial investigation was abandoned, for reasons given above in the criticism of the initial investigation and introduction to the main investigation. In its place, a projection technique, the Rorschach ink-blot association test, was selected. The first question that arises is concerned with the words "projection technique." What is meant by a projection technique of personality measurement? According to Cattell,¹⁴ projective tests may be defined thus:

"Some projection of one's own mentality will necessarily take place whenever the nature of some obscure motive has to be inferred or some impulse predicted. It is necessary to avoid situations in which habitual conventional responses would occur, or in which the motive could be arrived at purely by the use of intelligence or in which psychological experience and observation would infallibly point to a certain choice."

Klopfer and Kelley¹⁵ quote L.K. Frank, who describes the projection technique of the Rorschach test in these words:

"The Rorschach method offers a procedure through which the individual is induced to reveal his 'private world' by telling what he 'sees' in the several cards upon which he may project his meanings, significance, and feelings, just because they are not socially standardized objects or situations to which he must give culturally prescribed responses. The Rorschach method is essentially a procedure for revealing the personality of the individual as an individual, as contrasted with rating or assessing him in terms of his likeness or conformity to social norms of action and speech. It is just because a subject is not aware of what he is telling and has no cultural norms behind which to hide himself, that the Rorschach and other projective methods are so revealing."

The difference in reaction to a projective test and to

14. Cattell, R.B. "A Guide to Mental Testing."

15. Klopfer and Kelley: "The Rorschach Technique."

a non-projective test is given by Benton¹⁶ in explaining the behaviour of a group of malingerers in a Rorschach test situation.

"Given an I.Q. test, (that is, one of a rational and understandable nature) the subject behaves normally. But given the unfamiliar and seemingly irrational task of interpreting ink-blot he "smells a rat" and becomes excessively cautious."

A great deal of attention and interest has been focussed on the Rorschach test in the past, and it has been subjected to extensive programmes of experimentation. Its efficacy as a measure of the total personality for clinical uses has been verified by many writers. But in this study, the interest is centred mainly on the use of the Rorschach test in investigating traits of personality in a group of maladjusted workers, and in comparing the results with those revealed by an average group.

Before proceeding to describe the method of application of the test, it is advisable to begin by giving a general descriptive survey of the test.

Beck¹⁷ states that the human mind reveals itself in many ways, and that from the results of a standardised test, for example, an association test, valuable conclusions may be drawn. He continues thus:

"Even when a stimulus is in itself quite casual and without intrinsic significance, the reaction to that test may throw an interesting light upon the structure of the personality. The individual sees in the clouds on a summer day or in the glowing embers on a wintry evening a fabric which is a projection of the structure of his inner being. Even a series of intrinsically meaningless inkblots may prove a most delicate reagent for the analysis of the personality."

16. Benton.: "Rorschach Performances of Suspected Malingerers."
(Journal of Abnormal and Social Psychology. Volume 40. 1945.)

17. Beck, S.J. "Personality Structure in Schizophrenia."

The Rorschach test is a test of perception, and not of imagination, although almost all subjects regard the experiment as a test of imagination. Nevertheless, the interpretation of the figures actually has little to do with imagination, and it is unnecessary to consider imagination as being a prerequisite. All perception is recognized as being an elaboration of the sensory experience in terms of needs, drives, interests, attitudes, and the experience of past and present in relation to them. The Rorschach ink-blot tests are intentionally unstructured, therefore, the test consists in the interpretation of accidental or non-specific forms.

Rorschach¹³ states that

"If perception can also be called an associative integration of available engrams (memory pictures) with recent complexes of sensations, then the interpretation of chance forms can be called a perception in which the effort of integration is so great that it is realized consciously as an effort. This intrapsychic realization that the complex of sensations and the engrams are not perfectly identical gives the perception the character of an interpretation."

Rorschach defines perception as "assimilation without consciousness of assimilative effort," and interpretation as "perception with consciousness of assimilative effort." The responses given by the subjects to the ink-blot forms are moulded by a perceptual organizing process which is peculiar to each individual subject.

The function or purpose of administering the Rorschach test is the acquisition of projective raw material for future evaluation. The two main objectives are (a) to get as much rich projective material as possible, and (b) to avoid any distortion of this material by influencing the subject during the administration of the test.

18. Rorschach, H. "Psychodiagnostics."

The testing apparatus consists in ten ink-blots which are all symmetrical. Five of the ink-blots consist of grey only, in various depths of shading; in two a small amount of bright red contrasts with the grey; and the other three are in various colours. All are on white backgrounds.

The ten ink-blots are always presented in the same order, and always in the same orientation. Each subject is thus free to act as his own personality dictates, and at the same time each subject starts with exactly the same stimulus and under the same conditions as all others.

The method of administration of the Rorschach test in the present investigation is as follows.

Before the subject entered the room in which the test was to be administered, the test cards, stop watch, and writing materials were laid out on the table in readiness for the test.

In most cases, the Rorschach test was not applied during the first interview, but rather in the second or third interviews. Consequently, a certain amount of rapport with the subject had been established before the Rorschach test actually was administered. The subject was made to feel at ease by a number of preliminary remarks of a general nature, and in some cases by the use of one or two short introductory tests of intelligence, for example, the repetition of digits. In this way contact with the subject was established or re-established.

The subject was addressed as follows:

"I am going to show you a number of cards, one by one. Each card has on it a design made up of blots of ink. I want you to look at the card and tell me what you see there. You can look at each card for as long as you like, and be sure to tell me everything that you see."

It is important to obviate any idea that the subject might have of the test being a form of competition, and of having to obtain "good" marks in the competition. It was emphasised that there are no specific "right" or "wrong" answers to this test.

Care was taken that the subject did not catch a glimpse of the plates from a distance, as this would alter the conditions of the experiment. Each card in turn was handed to the subject who took it in his (or her) hand. The subject was asked a question such as "What does this look like to you?" or "What do you see here?"

An attempt was made to get at least one answer to every plate, though suggestion, in any form whatsoever, was excluded and avoided.

The subject was permitted to turn the card in any axis, but was not told to do so.

If the subject gave only one response to a card and then showed an inclination to stop, a further question, such as "Is that all?" was asked. Any questions asked by the subject during the course of the test were answered in as non-committal a manner as possible.

No time-limit was imposed. However, a stop-watch was used in order to record the reaction-time of the first response to each of the ten cards, and also, if possible, the reaction-times of all the responses.

In recording the test, an attempt was made to obtain as literal a transcription as possible of everything said by the subject during the test, as well as descriptive remarks about the subject's behaviour. The turning of the cards by the subject was recorded by the use of the symbols $\wedge V > <$, in which the peak of the symbol represents the top of the card. For the sake of clarity in the scoring of the records, each response given by the subject was given a

mark corresponding to the specified areas in the photostatic cards that were provided. (For example, if in Card 1 the response given was, "There is a man in the middle," then that response was recorded, and D4 was written alongside it, as D4 is the number which indicates the area in the middle of Card 1, as outlined in the photostatic copies).

Before presenting a card to a subject, and after the subject had finished with it, the card was placed face down on the table.

The inquiry is yet another facet of the technique used in the administration of the Rorschach test. In it, an attempt is made to clear up all the doubtful points in the subject's response record. The function of the inquiry is to make the scoring and interpretation of the spontaneous reactions possible. The inquiry is concerned with the location and the determinants of the responses.

(For example, in a case in which a "butterfly" had been perceived by the subject, the position of the response was determined by asking: "Where is the butterfly?" The determinants were ascertained by asking: "In what way does this resemble a butterfly?" or "What made you think of a butterfly?", and other similarly worded questions.)

No attempt will be made to give a detailed account of the methods used in scoring the Rorschach records, as a standardized system of scoring was employed. In this investigation, the scoring systems described by Beck¹⁹ and by Bochner and Halpern²⁰ were used as a basis, and were supplemented with suggestions advocated by Professor Reyburn. For the purpose of scoring individual results, the protocols of the experiment were examined according to the following scheme.

19. Beck, S.J. "Rorschach's Test."

20. Bochner and Halpern. "The Clinical Application of the Rorschach Test."

1. How many responses are there? What is the reaction time?
2. Is the answer determined only by the form of the blot, or is there also a consideration of movement, colour, and light and dark shadings?
3. Is the figure conceived and interpreted as a whole or in parts? Which are the parts that are selected?
4. What does the subject see?

Given below is a brief résumé of the main scoring features in the Rorschach test and their interpretative values. The summaries are based on material extracted from the writings of Beck,¹⁹ Rorschach,¹⁸ and Klopfer and Kelley.¹⁵ In most cases, the variables are considered independently. As this is to be a very general survey, no attempt will be made here to describe the differences in these variables that occur in certain cases of mental abnormality.

W: The W response implies that the subject uses the whole of the ink-blot figure in the formation of a concept. The higher the intelligence potential of an individual, the more W he (or she) can produce. The number of W responses is therefore an index to the individual's present functioning intelligence. The word 'present' must be stressed, as affective factors, (either euphoric or dysphoric), may inflate or depress the W score. A relatively high number of W represents an emphasis on the abstract forms of thinking and the higher forms of mental activity, for example, the logical or constructive activities, philosophical speculation, and ethical

19. Beck. (See Page 48.)

18. Rorschach. (See Page 45.)

15. Klopfer and Kelley. (See Page 43.)

understanding. W has been interpreted as the readiness to face situations as a whole. An excessively high W score indicates the tendency to tackle problems without facing up to details. An excessively low W is an indication of the inability to see things in their proper perspective.

Additive W is of a poorer quality. In it, the analysis-synthesis process is very slow. It is the work of the low or lowered intelligence.

DW or dW: The subject talks around some detail, and emerges with an association that yields a Whole form. The percept is a conclusion as to the entirety, which is based on a glance at some portion.

D: The details are certain portions in each figure that attract attention to themselves most prominently. The frequency of selection is the difference between D and d. The psychologic value of the D percept lies in exposing the subject's attention to the obvious. A very high D score is interpreted as meaning that the individual tends to neglect the real issues. It represents an interest in crude facts rather than a search for the more unusual aspects.

d: (Dd or rare details). These are the details which are not as obvious as D, but which are conspicuous enough to attract the attention. They infer attention to minute detail. An excessively high d score is indicative of an avoidance of the obvious.

de: (Edge detail). In this, the contour of the blot area is used as a sole basis for the percept. Klopfer and Kelley¹⁵ interpret the frequent occurrence of de scores in an individual thus: "This clinging to the edge de-

15. Klopfer and Kelley. (See Page 43.)

tails seems to indicate a fear to go deeply into anything."

The Approach is the $W\%:D\%:d\%$ ratio. The norms, as supplied by Rorschach, are 24:68:9. Any deviation from the norms is interpreted according to the significance of each variable, as outlined above.

S: (White space percepts). Reactions to the white spaces occur in four varieties. (i) The subject selects one of the major white spaces or S; (ii) the subject selects a minor white space or s; (iii) the subject selects a major solid portion and a major or minor white space as a unit (DS or Ds); and (iv) a minor solid portion is seen as a unit with the inclusion of a minor white form (ds).

The S response involves a complete reversal of the figure and ground relationship between the blot area and the white space. The personality significance of S includes always a nucleus of contrariness. The oppositional tendencies may be directed against the environment or individuals in it (SX); or they may be directed against the self as manifested in feelings of inadequacy and in indecision (XS).

The occurrence of S in a strong personality will reinforce it and so prove to be the equivalent of determination or will-power. In a weak personality, or in a low intelligence, it implies obstinacy and contumacy.

F: (Form responses). Most interpretations are determined by the form of the ink-blot. Form answers which were given most frequently were collected and used as the basis for scoring F. Those which recurred most frequently were called "good" forms or F+. Those which were less clear were called F-. The number and quality of the responses which use the shape of the blots as a

determinant, either exclusively or predominantly, is interpretatively a keystone between intellectual and emotional aspects of the personality structure. A high $F+\%$ presumes (a) the ability to maintain attention throughout the whole of the test, that is, a real ability to concentrate; (b) the possession of clear memory images; (c) the ability to recall, and to select the memory images.

Intelligent subjects show a high $F+\%$. In addition, the $F+$ potential is a measure of the stability of the personality. An excessively high $F+\%$ is abnormal, as it reveals that the intellectual control is too rigid.

F-: This is a sign of weakness. It may be a form of adjustment, as the individual, in preference to making the effort essential for responding with $F+$, gives any response that comes to mind or that meets his (or her) need. It is a means of taking the easier way out of the task presented by the test. According to Beck,¹⁹ the weaker the ego, the more $F-$ percepts appear.

Non-F: This is the total number of associations in which the determinants include any factor other than F . In the $Non-F$ responses is projected some activity other than an intellectual one. It is a gage of the extent to which the individual is ruled by non-intellectual factors, that is, by fantasy or by any form of affective experience. The percentage is high in the gifted individual, and low in the depressed, anxious, or rigid personality.

The $F\%$, $F+\%$, and $Non-F\%$, are calculated in this way.

19. Beck. (See Page 48.)

$$F\% = \frac{(F+) + (F-)}{R} \times 100$$

$$F+\% = \frac{F+}{(F+) + (F-)} \times 100$$

$$\text{Non-F}\% = 100 - F\%$$

M: (Human movement). As Rorschach interprets it, the M response really reproduces movements or activities that the subject is carrying on within his mental life. They are the wish-fulfilling activities or the fantasy life of the individual. The projection of action on to the objectively static ink-blot, presupposes the use of imagination. M is an index of the richness of the inner life and the creative powers.

A well-adjusted subject of more than average intellectual capacity should produce a minimum of three M responses.

FM: (Animal movement). These responses represent the influence of the most instinctive layers within the personality, and it is assumed that the subject who reacts with many FM is emotionally infantile, and is living on a level of instinctive prompting below his chronological and mental age. FM is also an avoidance reaction in that there might exist a complex which is causing the projection of action on to animals instead of humans.

m: This represents the effect of inanimate forces working upon objects or figures, as for example in abstract concepts. Klopfer and Kelley¹⁵ state:

"Such m's appear where the subject experiences his promptings from within as hostile and uncontrollable forces working upon him, rather than as sources

15. Klopfer and Kelley. (See Page 43.)

of energy at his disposal. If m reaches or outnumbers M or FM, it seems to be a danger signal indicating that these inner conflicts are too strong to permit a close cooperation between the inner and outer life."

C: Colour is scored as a determinant only when the colour actually present in the blot plays a recognisable role in the concept formation. Colour here includes only stimuli with chromatic value. The grouping of the colour responses is (a) pure colour or C; (b) colour form or CF; and (c) form colour or FC.

(a) Pure C. Reactions like "blood" or "fire" given to any red spot, are examples of pure C responses. These primary C answers are the representatives of impulsiveness, and a lack of any desire for adaptability. They are very rare emotional reactions.

(b) CF. In these responses the consideration of rational elements is not abandoned entirely, but the emotional stimulus has assumed a dominating role. CF answers are indicative of emotional instability, irritability, sensitivity, and suggestibility, but there remains in them a desire for, and an attempt to achieve, adaptation.

(c) FC: These responses are the most common in normal individuals. They are representative of the more adaptive affective responses. They indicate that the subject is open to the emotional stimulus implied in the colouring, but is not willing to react to it unless it can be done within the limits of rational considerations.

Csum is the sum of the colour values when each pure C is scored $1\frac{1}{2}$, each CF is scored 1, and each FC is scored $\frac{1}{2}$. The Csum shows the extent to which the individual's affective energy is available for response to the environment. The greater the Ctotal, the more

capable the subject is of feeling contact with his (or her) world, either through an irritable self-centred demanding display, or in an understanding emotional identification with those around him. The avoidance of colour implies emotional timidity.

c This refers to achromatic colour, that is, the black and grey nuances or the white colour of the white spaces. Klopfer and Kelley¹⁵ state that these responses are found in two situations.

"First, they occur in records of subjects with a very rich and variegated reaction to all sorts of stimuli from without. This combination clearly represents an artistic impressionability. Second, they may represent a "burnt child" reaction, the reaction of people who are basically responsive to emotional stimulation from outside, but have experienced a series of traumatic experiences. Such subjects tend to withdraw from the "hot" bright-coloured area into the safer realm of the less affective grey, black, and white hues."

c: This infers the use of shading as surface impression. Interpretatively, c is related to contact sensations. It is a texture response. The reaction might be so strong that the subject strokes the card as if actually expecting to feel the texture of the object that is perceived. A combination of F and c represents what is commonly called 'tact.' A pure c reaction indicates an absence of adequate control of contact impulses. Klopfer and Kelley¹⁵ suggest that this indicates either a gross sensuality or a general sensitiveness, or "just a somewhat hazy desire for contact."

M:C ratio. This is the experience type, or, as is termed by Rorschach,¹⁸ the "Erlebnistyp." The spontaneity of action responses points to "promptings from within," and the spontaneity expressed in the colour responses seems to reflect the reaction to "stimuli from without",

15. Klopfer and Kelley. (See Page 43.)
18. Rorschach. (See Page 45.)

The ratio of M to sum C is the basis of the experience balance. According to Rorschach, the difference between those individuals showing a predominance of kinaesthetics, and those showing colour predominance, may be categorized thus:

Movement predominant. ($M > C$) Such persons have a more individualized intelligence, greater creative ability, more "inner" life, stable affective reactions, more intensive rapport, measured and stable motility, awkwardness, clumsiness, and they are less adaptable to reality.

Colour predominant. ($C > M$) Such persons have a stereotyped intelligence, a more reproductive ability, more "outward" life, labile affective reactions, more extensive rapport, restless and labile motility, skill, adroitness, and they are more adaptable to reality. The normal subject of the M type is not "introverted" but rather "capable of introversion" or "introversive," thus indicating that this is not a fixed characteristic but a mobile trait. The psychological processes producing introversion and extraversion are not opposite, but different. The "extraverted" individual corresponds to the C type, of which the general characteristics are

- (a) an urge to live in the world outside oneself;
- (b) restless motility; and
- (c) unstable affective reactions.

FM + m : C^l + c. This ratio represents introversial and extraversial tendencies not fully accepted or utilised by the subject. If the weight is the same as in the M:C ratio, it serves to strengthen and confirm the impression conveyed by the M:C ratio. If however the weight has changed sides as compared with the M:C ratio,

the subject seems to be in a state of transition as far as the "Erlebnistyp" is concerned. Therefore, the FM+m: C¹+c ratio points to the direction in which the subject is heading.

The light-determined responses (Y and V).

Y: The darker and lighter shading nuances appear in every one of the ten cards. In the brightly coloured blots the shading effects are usually overshadowed by the colour effects.

The Y responses are the flat-grey responses in which the light values as such recall the object seen; for example, X-rays are typical.

Y represents a personality trend diametrically opposite to the elation with which colour is connected. The greys are associated with depression, insecurity, and anxiety. The Y response stems from an anergic state in which the vigour apparently has been drawn out of the organism. The subject is listless, and a disquieting, oppressive affect essentially always accompanies the response as the emotional tone.

V: In Vista responses the variations in shading give a three-dimensional effect, with the consequence that the associational content is perceived as at a distance. It may be something seen on a height (with the subject standing below), or from a height (with the subject above), or in depth, (for example, reflections). Self-appraisal appears to be the psychologic activity that emerges in V responses. It follows that the more the individual is given to evaluating himself, the more self-depreciating he is. Thus, a feeling of inferiority is involved. The logic behind this relation lies in Alfred Adler's²¹ theory of the problem of.

21. Adler, A. "Individual Psychology."

distance. Therefore, according to Rorschach, vista or depth perceptions are correlated with affectivity of an anxious, cautious, depressive nature, and often with certain feelings of insufficiency, or a consciousness of the absence of support and of stability.

A: Animal content responses are an index of the adaptive thinking of the individual. They tell how closely the subject adheres in his percept to the most obvious forms. The blots easily take on animal shapes, and therefore, A responses are the most "stereotyped" percepts.

Individuals having a low intelligence do not have the mental capacity to match the blot with any content other than the most obvious. They do not have the capacity in the beginning and consequently have accumulated fewer mental pictures. Thus the significance of A is primarily structural, as an index of stereotypy and of adaptivity.

H: These are the human content responses.

The more intelligent individuals produce many H responses and fewer Hd (or human detail) responses. The lower the ability, the fewer the H responses of any kind.

A:H. The normal ratio is 2:1.

A% and H% are calculated thus:

$$A\% = \frac{(A) + (Ad) + (Adx)}{R} \times 100$$

$$H\% = \frac{(H) + (Hd) + (Hdx)}{R} \times 100$$

X: In an Adx or Hdx response, the subject sees a part of

a human or animal where most healthy subjects, if they react with that content at all, see the whole human or animal. It is concluded therefore that this response stems from a limited vision, and perhaps from a low intelligence. The finding of an x reaction in a non-feeble-minded individual is evidence of the presence of some form of anxiety. Rorschach referred to this factor as "oligophrenic detail."

P: The twenty specific associations designed as 'Popular' responses are those which occurred with the greatest frequency in investigations conducted by Beck.¹⁹

The number of popular responses is a factor which is indicative of adaptive thinking. These responses project the ability to participate in the common or popular thinking of the group, or the conformity of the subject's thinking with that of the group. The production of less than four P concepts points to a lack of conformity on the part of the subject. It may mean that the subject is not able, or not willing, to think along the lines accepted by other individuals.

R: The response total is of interest only when it is considered in conjunction with the quality of the responses. In itself it may be indicative of abnormality in very extreme cases, as for example in a record of fewer than nine responses or of more than seventy-five responses. Beck¹⁹ claims that the higher the intelligence the greater is the productivity, and he points to the fact that R is influenced by affective factors, for example, the depressed subject shows a restricted response total.

19. Beck. (See Page 48.)

Last three cards: The number of responses given to cards VIII, IX, and X, according to Klopfer and Kelley,¹⁵ indicates

"a responsiveness to stimuli from without which is even less under the conscious control of the subject than the use of action and colour elements."

A tendency to underproduction in the last three cards can be assumed where the last three cards produce less than one third of the total responses to the test. The cause is either that the colour has no particularly stimulating effect, or else that the colour actually has a disturbing effect on the subject.

$$\text{The last three cards\%} = \frac{\overline{\text{VIII}} + \overline{\text{IX}} + \overline{\text{X}}}{R} \times 100$$

T/R and T/IR:

T/R is the average reaction time per response.

T/IR is the average reaction time of the first response given to each of the ten cards. A marked prolongation of T/IR may be due to some form of blocking.

Behavioural factors: Certain behavioural reactions occur frequently in the course of the test performances, and they have been found to be of great value in filling in the personality pictures etched out from the quantitative summary. No attempt will be made to give a detailed account of these factors, but in passing, mention will be made of some of the more significant behavioural factors.

They are:- the excessive qualification of the association; the depreciation of the association; the expression of doubt and uncertainty about the percepts; the stating of the response as a question, or in the negative; the negation of responses; the occurrence of

15. Klopfer and Kelley. (See Page 43).

description, self-reference, and verbosity; the attitude to the test; the occurrence of contaminated responses (that is, impossible combinations in single percepts of forms belonging to different categories in nature); the occurrence of perseveration ; and the turning or edging of the card.

The maladjusted group.

The main investigation comprises a survey of the temperament, intelligence, and socio-economic background of a group of maladjusted workers. The results are compared with those obtained from a similar survey of a group of average workers.

The maladjusted group is made up of 60 subjects selected from two separate groups.

- (a) Twenty subjects selected from a group of workers in sheltered employment.
- (b) Forty subjects selected from the patients in a neuropsychiatric hospital.

The subjects are representative of three occupational levels.

- (i) The unskilled or semi-skilled level includes the twenty workers in sheltered employment and twenty hospital cases.
- (ii) The clerical worker. This occupational level is represented by fourteen hospital cases.
- (iii) The professional level includes six hospital cases, (two nursing sisters, two engineers, and two school-teachers.)

The common factor in these cases is the inability of the maladjusted individual to compete for, or to retain, employment in the open labour market, as the result of the presence in each individual of a maladjusted personality, or a specialized job disability, or

a faulty physical condition which gives rise to a personality or job maladjustment, or else a combination of these factors. In almost every case it is impossible to isolate the existence of only one of these three factors in the individual. In every instance, the case-history of the subject reveals that subject to have been maladapted to the occupation in which he (or she) was engaged in the open labour market, before being relegated to sheltered employment or to the neuropsychiatric hospital.

The main investigation is concerned with more extreme forms of maladjustment than the initial investigation, and consequently, in the main investigation, medical diagnoses of the form assumed by each case of maladjustment were available to the investigation. In this connection it must be emphasised that all classifications are arbitrary. There is no strict line of demarcation between them, and in many cases there is an overlap.

<u>Diagnoses.</u>	<u>Number of cases.</u>
Psychoneurosis	34
Reactive depression	10
*Psychopathic personality	9
Schizophrenia	5
Obdurate chronic hysteria	1
Functional paresis	1

*The psychopathic personalities in this group may be divided into two types.

Type I (the emotionally unstable type): 3 cases.

Type II (the anti-social type): 6 cases.

The occurrence of a faulty physical condition combined with personality and job maladjustments is to be found

in 22% of the cases, that is, in 13 cases. The types of faulty physical conditions are, 4 cases of fibrositis; 3 cases of chronic bronchitis; 2 cases of partial deafness; 3 cases of partly defective vision; and 1 case of plantar callosities. The cases are divided between the two groups in this way:

The sheltered employment group.

Fibrositis.	3 cases.
Chronic bronchitis.	2 cases.
Partial deafness.	1 case.
Partly defective vision.	1 case.

The hospital group.

Fibrositis.	1 case.
Chronic bronchitis.	1 case.
Partial deafness.	1 case.
Partly defective vision.	2 cases.
Plantar callosities.	1 case.

The information was obtained by referring to the case-histories, and by the method of interviewing each individual that has been described in the initial investigation. The information was supplemented by holding discussions with supervisors and other authoritative persons whenever possible.

The socio-economic background.

Average age	33 years
Range of ages	20-53 years
Number of married subjects	25
Number of unmarried subjects	28
Number of divorced subjects	7
Average number of unemployed dependants	2
Range of number of dependants	0 - 7
Average school standard attained	7
Range of school standards attained	1 - 10
Average number of work failures	3
Range of number of work failures	1 - 10

The intelligence tests: The results of the application of the tests to the maladjusted group.

	<u>Mean.</u>	<u>Standard Deviation.</u>
Maze.	48.68	15.06
Pattern.	8.20	3.42
Vocabulary.	71.09	31.30
Repetition of digits.	17.85	5.49
Digits backwards.	13.65	5.15
Total score.	160.14	49.12

The Rorschach test: The results of the application of the test to the maladjusted group.

	<u>Mean.</u>	<u>Standard Deviation.</u>
F+%	68.40	15.70
F%	57.20	10.50
Non-F%	42.80	10.50
R	43.68	18.65
W%	17.46	12.96
D%	65.80	10.81
d%	16.60	9.22
M	3.45	3.18
M%	7.60	6.27
C (sum)	3.50	2.78
C (sum)%	7.73	5.92
S	3.10	2.72
S%	7.35	5.82
P	6.88	3.17
P%	16.85	8.60
Y	4.28	2.91
Y%	10.91	8.05
V	2.72	4.82
V%	6.80	5.72
A%	41.10	14.14
H%	20.50	12.31
Last 3 cards%	38.25	7.10
FM+m	3.72	3.34
FM+m%	7.67	4.75
C ¹ +c	.98	1.18
C ¹ +c%	2.56	2.78
C (pure)	.70	.99
C (pure)%	1.53	2.22
CF	.72	1.04
CF%	1.63	2.95
FC	3.87	2.83
FC%	9.31	6.66

In the above results, the Rorschach variables are considered independently. However, an examination of the significant ratios reveals the percentages of cases showing each one of three possible balances of weight on the ratios.

(The symbol $>$ signifies "greater than"; and $<$ signifies "smaller than"; the symbol $=$ may be interpreted as meaning "equal to.")

<u>M : C (sum) ratio.</u>		<u>%</u>
M $>$ C	(Introversive)	47
M $<$ C	(Extraversive)	48
M = C	(Ambiequal)	5

<u>FM + m : C^f + c ratio</u>		
FM + m $>$ C ^f + c		75
FM + m $<$ C ^f + c		10
FM + m = C ^f + c		15

<u>A% : H% ratio</u>		
A% $>$ H%		87
A% $<$ H%		8
A% = H%		5

<u>SX : XS ratio.</u>		
SX $>$ XS		8
SX $<$ XS		62
SX = XS		30

<u>W% : M% ratio.</u>		
W% $>$ M%		77
W% $<$ M%		21
W% = M%		2

<u>C + CF : FC ratio.</u>		
C + CF $>$ FC		10
C + CF $<$ FC		80
C + CF = FC		10

The maladjusted group is composed of two smaller groups.

- (a) A group of workers who have been relegated to sheltered employment, and
- (b) A group of workers who are undergoing treatment in a neuropsychiatric hospital.

(a) The sheltered employment group.

This section of the investigation may be referred to as a consideration of the second gradation of maladjustment in workers. It includes all those workers who have failed in competing for, or in retaining employment in the open labour market, and who have been relegated to sheltered employment. Thus, the aim of sheltered workshops is to provide employment for the sub-standard worker, that is, the worker who, because of the occurrence of personality or job maladjustments, or physical disabilities, is unable to retain employment in the open labour market.

The purpose of sheltered employment is to restore mentally and/or physically handicapped individuals to a place as economic units in the affairs of the community to which they belong.

Waller²² stresses the importance of the individual in any programme of rehabilitation.

"The individual must be understood before he can be rehabilitated. To do this, we must learn all we can about him, his attitudes and habits, and his behaviour in past times."

Neuschutz²³ discusses the problem in these words:

"The temperamentally maladjusted are unable to work with others. Many who, with suitable employment could be helped, deteriorate physically and mentally through lack of such suitable employment. Physical defects may influence the personality adversely."

22. Waller, W. "Veteran Comes Back."

23. Neuschutz, L. "Jobs for the Physically Handicapped."

In the account of the total maladjusted group given above, it was explained that the medical diagnoses of the form assumed by the maladjustment in each case were accessible to the investigation.

The group of 20 subjects in sheltered employment show the following diagnoses:

<u>Diagnoses.</u>	<u>Number of cases.</u>
Psychoneurosis	17
Obdurate chronic hysteria	1
Schizophrenia	1
Functional paresis.	1

The socio-economic background.

Average age	33 years
Range of ages	20-53 years
Number of married subjects	12
Number of unmarried subjects	6
Number of divorced subjects	2
Average number of unemployed dependants	2
Range of number of dependants	0 - 6
Average school standard attained	3
Range of school standards attained	1 - 8
Average number of work failures	3
Range of number of work failures	1 - 5
Number of Coloured subjects	20

The intelligence tests.

The five tests of intelligence were applied to the group of 104 cases.

	<u>Mean</u>	<u>Standard Deviation.</u>
Maze	42.13	13.68
Pattern	6.45	2.28
Vocabulary	40.41	12.06
Repetition of digits	13.84	3.66
Digits backwards	9.39	3.70

The 20 selected cases were removed from the total group. The following are the results of the application of the tests to the group of 84 unselected subjects.

	<u>Mean.</u>	<u>Standard Deviation</u>
Maze	42.57	11.77
Pattern	6.29	2.76
Vocabulary	39.79	13.86
Repetition of digits	14.54	4.60
Digits backwards	9.31	3.34

The following are the results of the application of the tests to the selected group of 20 subjects.

	<u>Mean.</u>	<u>Standard Deviation.</u>
Maze	42.50	11.77
Pattern	7.20	2.76
Vocabulary	40.51	13.86
Repetition of digits	13.90	4.60
Digits backwards	9.70	3.34
Total Score.	114.30	32.27

The reliability of the differences between the means of the group of 84 unselected workers and the group of 20 selected workers.

	Rel. diff.	P.
Maze	.23	(80-85%)
Pattern	1.36	(15-20%)
Vocabulary	.21	(80-85%)
Repetition of digits	.58	(50-60%)
Repetition of digits backwards	.46	(60-70%)

The only significant difference is to be found in the Pattern test, the selected group obtaining the greater mean.

Therefore, the group of subjects who fulfill the requirements of maladjustment laid down by this investigation show a superior performance in the Pattern test than the group of subjects in whom the only form of abnormality that exists is a faulty physical condition.

(The total score is calculated only in considering the group of selected subjects.)

The Rorschach test: The results of the application of the test to a group of 20 subjects in sheltered employment.

	<u>Mean.</u>	<u>Standard Deviation.</u>
F+%	60.70	20.10
F%	55.75	13.30
Non-F%	44.25	13.30
R	33.50	9.80
W%	18.50	18.10
D%	61.00	13.26
d%	21.50	9.48
M	3.00	3.49
M%	8.35	8.13
C (sum)	2.75	2.70
C (sum)%	8.00	6.98
S	2.20	1.89
S%	6.60	5.68
P	3.60	1.96
P%	10.75	5.45
Y	4.65	3.14
Y%	12.10	11.97
V	2.60	3.65
V%	6.70	7.24
A%	37.80	14.40
H%	19.30	11.96
Last 3 cards%	38.00	7.65
FM + m	1.85	1.65
FM + m%	5.40	4.40
C' + c	1.20	1.44
C' + c%	3.55	4.34
C (pure)	.60	.97
C (pure)%	1.80	2.87
CF	.55	.81
CF%	1.35	1.88
FC	3.20	3.01
FC%	10.00	9.15

(b) The group of hospitalized workers.

This section of the investigation may be referred to as a consideration of the third gradation of maladjustment in workers. It includes all those individuals who have failed in competing for, or in retaining, employment in the open labour market, and who, at the time that the investigation was conducted, were undergoing treatment in a neuropsychiatric hospital.

The investigation.

A group of 40 subjects was selected from the cases which were accessible to the investigation in the neuropsychiatric hospital.

The selected subjects are those who fulfilled the requirements of maladjustment as laid down in the definition of the maladjusted worker. Thus, the common factor in this group is the occurrence of a work failure or a breakdown in the work situation which may be attributed to the existence of combinations of personality and job maladjustments in each individual, or a combination of faulty physical conditions with personality and job maladjustments.

The subjects were selected by referring to the detailed individual case-histories that were available to the investigation. The case-history of each of the selected subjects revealed that individual to have been maladapted to the occupation in which he (or she) was engaged in the open labour market. Each subject was discussed with a number of authoritative persons in the hospital who were associated with, and familiar with, the case.

The method of interviewing subjects and of applying the intelligence tests is similar to that employed in the initial investigation. Medical diagnoses of the form assumed by the maladjustment in each case were accessible to the

investigation. Once again it must be stressed that all classifications are arbitrary.

<u>Diagnoses.</u>	<u>Number of cases.</u>
Psychoneurosis	17
Reactive depression	10
*Psychopathic personality	9
Schizophrenia	4

*The types of psychopathic personalities have been described in the consideration of the total maladjusted group.

The socio-economic background.

Average age	32 years
Range of ages	20 - 51 years
Number of married subjects	13
Number of unmarried subjects	22
Number of divorced subjects	5
Average number of unemployed dependants	1
Range of number of dependants	0 - 7
Average school standard attained	8
Range of school standards attained	5 - 10
Average number of work failures	3
Range of number of work failures	1 - 10
Number of European subjects	40

The intelligence tests: The results of the application of the tests to the group of 40 hospitalized workers.

	<u>Mean.</u>	<u>Standard Deviation.</u>
Maze	51.65	14.28
Pattern	9.84	3.60
Vocabulary	88.00	21.80
Repetition of digits	19.65	5.10
Digits backwards	15.75	4.86
Total score	183.70	37.71

The Rorschach test: The results of the application of the test to the group of 40 hospitalized workers.

	<u>Mean.</u>	<u>Standard Deviation.</u>
F+%	72.71	10.01
F%	58.65	8.79
Non-F%	41.35	8.79
R	47.90	20.05
W%	17.20	7.89
D%	68.24	7.80
d%	14.44	7.62
M	3.60	3.43
M%	7.20	5.02
C (sum)	3.70	2.76
C (sum)%	7.50	5.16
S	3.50	3.01
S%	7.54	5.82
P	8.53	2.26
P%	20.19	8.40
Y	4.75	2.74
Y%	10.16	4.82
V	3.13	2.51
V%	6.90	4.74
A%	43.42	12.52
H%	20.82	11.88
Last 3 cards%	37.98	6.72
FM + m	4.63	3.55
FM + m%	8.80	4.48
Cl + c	.87	1.11
Cl + c%	1.72	1.69
C (pure)	.70	.93
C (pure)%	1.40	1.80
CF	.80	1.12
CF%	1.78	2.87
FC	4.18	2.71
FC%	8.76	5.02

The average group.

In order to discover the significance of the results obtained from the survey of the maladjusted worker in the main investigation, the results are compared with those obtained from a similar survey of a group of average workers.

The definition of a maladjusted worker may be used as a basis for defining the average worker. Thus, the average worker is the individual engaged in a wage-earning occupation in the open labour market who is adjusted to that occupation, in whom no personality maladjustments exist, who shows little or no deviation in behaviour and attitude from the accepted norms of the group to which the individual belongs, and who has a specialized job ability, or an aptitude for the specific job in which he (or she) is engaged. In addition, the average worker shows no marked physical defects which give rise to personality or job maladjustments.

A group of 60 average workers was selected. The judgments of two or more authoritative and reliable persons were used in the selection of the average group. The agreement of two or more independent judgments was considered to be an adequate criterion of normality. The subjects selected in this manner were interviewed and tested in the same way as were the members of the maladjusted group.

As in the maladjusted group, the average group is not confined to members of one occupational level only, but is extended to cover three different occupational levels.

The selection of the average group.

The definition of the average worker, as given above, was used as a basis for the selection of the average group; that is, the average worker is the individual who has a specific job adjustment, in whom no personality maladjustments exist, and who shows little or no deviation in behaviour and attitude from the accepted norms of the group to which the individual belongs. In addition, the average worker shows no marked physical defects, which give rise to personality or job maladjustments.

In the initial investigation, a list of the observable or outward manifestations of maladjustment was provided as a guide in the selection of the maladjusted group. In the main investigation this list was used as a basis for the exclusion of unsuitable subjects from the average group; that is, those subjects who exhibited one or more of the traits indicated in the list, to any marked degree, and who did not satisfy the necessary qualifications of the average worker, (as outlined in the definition given above,) were excluded from the average group.

Of the sixty workers included in the average group, forty are unskilled or semi-skilled workers, and twenty are clerical and professional workers. The unskilled or semi-skilled workers were selected from a clothing factory and a furniture factory; and the members of the clerical and professional occupational levels were selected by the supervisors in an organisation of clerical workers.

The investigation demands the selection of the average workers, (and the exclusion of the maladjusted cases), from a given group of workers in the open labour market. This was effected as follows:

The workers were discussed with a foreman or a supervisor who was sufficiently familiar with the employees under his (or her) supervision, both as individuals and as workers, to be able

to distinguish between those who were satisfactorily adjusted to their work and those who were not, and between those who displayed maladjustments of a personality kind, (as manifested by a deviation in behaviour and attitude from the normal standards of the group,) and those who were relatively normal. The subjects selected in this way were then discussed with another reliable and authoritative person, such as a manager or a second supervisor. Whenever possible, it was endeavoured to obtain a third opinion on each subject, in order to eliminate thoroughly the possibilities of bias, mistaken or hasty judgments, wrong impressions, the overlooking of significant features, and the over-emphasis of unimportant and trivial details.

As in the maladjusted group, the unskilled workers and the semi-skilled workers are considered to be representative of one occupational level, and no attempt has been made to place them in separate categories. It was necessary to avoid any such classification, as in many instances the semi-skilled workers were required to perform unskilled jobs, either temporarily or permanently, due to existing conditions of work. The members of the professional occupational level were selected in the first place by the supervisors in the organisation of clerical workers, but they were not included in the average group until one or more further assessments from work supervisors had been obtained. The agreement of two or more independent judgments was considered to be an adequate criterion of normality.

The composition of the groups.

Sex: Whereas the maladjusted group is composed of 51 male subjects and 9 female subjects, the average group is composed of 46 male subjects and 14 female subjects.

The occupational levels.

They are:

- (i) The unskilled or semi-skilled worker. (40 subjects.)
- (ii) The clerical worker. (14 subjects.)
- (iii) The professional occupational level. (6 subjects, comprising 2 nursing-sisters, 2 engineers, and 2 school-teachers).

The socio-economic background.

Average age	25 years
Range of ages	20 - 47 years
Number of married subjects	28
Number of unmarried subjects	32
Average number of unemployed dependants	1
Range of number of dependants	0 - 6
Average school standard attained	7
Range of school standards attained	3 - 10

The intelligence tests: The results of the application of the tests to the group of 60 average workers.

	<u>Mean.</u>	<u>Standard Deviation.</u>
Maze	53.10	14.04
Pattern	8.02	3.31
Vocabulary	69.55	26.74
Repetition of digits	19.20	5.12
Digits backwards	12.96	5.46
Total score.	162.78	41.67

The Rorschach Test: The results of the application of the test to the group of 60 average workers:

	<u>Mean.</u>	<u>Standard Deviation.</u>
F+%	74.11	12.04
F%	56.50	10.16
Non-F%	43.50	10.16
R	36.62	10.44
W%	16.05	8.04
D%	71.61	8.34
d%	12.44	7.82
M	3.14	2.20
M%	6.24	4.96
C(sum)	1.92	1.36
C(sum)%	5.70	3.86
S	2.30	2.20
S%	5.74	4.80
P	7.44	2.38
P%	21.70	6.78
Y	3.52	1.85
Y%	9.86	4.96
V	2.52	2.21
V%	6.74	5.06
A%	46.39	8.94
H%	19.42	9.00
Last 3 cards %	37.42	5.60
FM+m	4.36	2.64
FM%	10.39	4.86
C'+c	0.65	0.87
C'+c%	2.04	2.20
C(pure)	0.22	0.45
C(pure)%	0.57	1.23
CF	0.57	0.84
CF%	1.96	2.30
FC	2.37	1.42
FC%	6.94	4.60

In the above results the Rorschach variables are considered independently of one another.

An examination of the significant ratios reveals the percentages of cases, showing each one of three possible balances of weight on the ratios.

(The symbols used here to indicate the balance of weight between the variables, are the symbols which were used for the same purpose in considering the results of the maladjusted group.)

<u>M:C (sum) ratio.</u>		%
M > C	(Introversive)	52
M < C	(Extratensive)	32
M = C	(Ambiequal)	16

<u>FM+m : C'+c ratio.</u>		
FM+m > C'+c		93
FM+m < C'+c		0
FM+m = C'+c		7

<u>A% : H% ratio.</u>		
A% > H%		97
A% < H%		1.5
A% = H%		1.5

<u>SX : XS ratio.</u>		
SX > XS		8
SX < XS		47
SX = XS		45

<u>W% : M% ratio.</u>		
W% > M%		78
W% < M%		15
W% = M%		7

<u>C+CF : FC ratio.</u>		
C+CF > FC		8
C+CF < FC		75
C+CF = FC		17

The maladjusted group is composed of two smaller groups, the sheltered employment group, and the group of hospital cases. Therefore, for purposes of comparison, the average group is divided into two smaller groups as well.

The first average group will be used in comparing the worker in sheltered employment with the average worker. It comprises 20 subjects belonging to the unskilled or semi-skilled occupational level. As in the sheltered employment group, the members of the first average group all served in the army for a short period of time, but their army service consisted in unskilled or semi-skilled labour within the Union of South Africa, and was regarded by each subject merely as being another form of work situation.

The socio-economic background.

Average age	26 years
Range of ages	20 - 47 years
Number of married subjects	10
Number of unmarried subjects	10
Average number of unemployed dependants	2
Range of number of dependants	0 - 6
Average school standard attained	5
Range of school standards attained	3 - 8
Number of Coloured subjects	20

The intelligence tests: The results of the application of the tests to the first average group.

	<u>Mean.</u>	<u>Standard Deviation.</u>
Maze	54.90	10.29
Pattern	6.40	2.65
Vocabulary	53.50	20.10
Repetition of digits	17.40	4.32
Digits backwards	9.50	3.29
Total score.	141.30	33.93

The Rorschach test: The results of the application of the test to the first average group.

	<u>Mean.</u>	<u>Standard Deviation.</u>
F+%	76.20	11.82
F%	53.55	6.60
Non-F%	46.45	6.60
R	32.40	8.04
W%	14.85	7.38
D%	76.20	6.93
d%	9.00	5.55
M	2.35	1.96
M%	7.50	5.96
C (sum)	2.20	1.57
C (sum)%	7.00	4.68
S	1.55	1.66
S%	4.65	4.37
P	7.10	1.73
P%	23.10	6.46
Y	3.70	2.24
Y%	11.30	5.68
V	2.40	2.61
V%	6.60	5.94
A%	46.15	9.03
H%	19.90	9.81
Last 3 cards%	38.00	3.68
FM + m	3.90	1.92
FM + m%	11.80	4.44
C' + c	.70	.71
C' + c%	2.20	2.36
C (pure)	.10	.30
C (pure)%	.30	.95
CF	.70	1.01
CF%	2.15	3.04
FC	3.05	1.77
FC%	9.80	5.64

A second average group may be extracted from the total average group for purposes of comparison with the group of hospital cases. The group comprises 40 average subjects, including 20 representatives of the unskilled or semi-skilled level, 14 clerical workers, and 6 members of the professional occupational level.

The socio-economic background.

Average ages	25 years
Range of ages	20 - 39 years
Number of married subjects	18
Number of single subjects	22
Average number of unemployed dependants	1
Range of number of dependants	0 - 2
Average school standard attained	8
Range of school standards attained	5 - 10
Number of European subjects	40

The intelligence tests: The results of the application of the tests to the second average group:

	<u>Mean.</u>	<u>Standard Deviation.</u>
Maze	52.35	15.60
Pattern	8.83	3.31
Vocabulary	77.43	21.42
Repetition of digits	20.20	5.48
Digits backwards	14.60	5.54
Total score	173.22	41.40

The Rorschach Test: The results of the application of the test to the second average group:

	<u>Mean.</u>	<u>Standard Deviation.</u>
F+%	72.75	11.22
F%	57.70	10.74
Non-F%	42.30	10.74
R	39.10	10.64
W%	16.50	8.12
D%	69.20	7.96
d%	14.00	7.84
M	3.50	2.36
H%	8.83	4.89
C (sum)	1.78	1.21
C (sum)%	5.05	3.20
S	2.60	2.32
S%	6.10	4.80
P	7.65	2.64
P%	20.88	6.35
Y	3.43	1.61
Y%	9.10	4.22
V	2.60	1.96
V%	6.75	4.38
A%	46.40	8.72
H%	19.00	8.05
Last 3 cards %	37.60	6.16
FM+m	4.55	2.92
FM%	10.48	5.31
C'+c	0.63	0.94
C'+c%	1.80	2.12
C (pure)	0.28	0.50
C (pure)%	0.70	1.33
CF	0.50	0.74
CF%	1.75	1.98
FC	2.03	1.06
FC%	5.50	3.14

The occupational levels.

Both the maladjusted and the average groups comprise representatives of three occupational levels.

The percentages given below, which are the same in both the maladjusted and the average groups, indicate the percentage of subjects to be found in each occupational category.

Unskilled or semi-skilled worker.	67%
Clerical worker.	23%
Professional occupational level.	10%

The results of the application of the intelligence tests and the Rorschach test to the groups of 60 maladjusted workers and 60 average workers will be considered in terms of the division of the subjects into occupational levels.

The clerical and the professional occupational levels will be considered conjointly.

In considering the Rorschach test variables, only the relative amounts of those variables, (or the percentages), will be taken into account.

The results of the application of the intelligence tests and the Rorschach test to the group of 40 maladjusted workers belonging to the unskilled or semi-skilled occupational level.

	<u>Mean.</u>	<u>Standard Deviation.</u>
Maze	46.90	13.28
Pattern	7.82	2.93
Vocabulary	63.90	27.12
Repetition of digits.	17.14	5.82
Digits backwards	12.09	4.56
Total score	147.69	44.07
F+ %	67.25	17.55
F %	55.75	11.65
W %	19.65	14.65
D %	64.25	11.85
d %	16.70	9.84
R	39.80	16.87
M %	7.45	6.93
C (sum) %	8.40	6.58
S %	7.30	5.24
P %	16.30	8.82
Y %	11.75	9.10
V %	7.30	6.26
A %	39.91	15.05
H %	18.58	12.90
Last 3 cards %	38.15	7.23
FM %	6.60	4.65
C'+c %	2.66	3.24
C (pure) %	1.60	2.36
CF %	2.14	2.64
FC %	9.70	7.32

The results of the application of the intelligence tests and the Rorschach test to the group of 20 maladjusted workers belonging to the clerical and professional occupational levels.

	<u>Mean.</u>	<u>Standard Deviation.</u>
Maze	52.60	16.14
Pattern	8.50	4.08
Vocabulary	89.80	26.46
Repetition of digits	18.85	4.41
Digits backwards	16.90	4.62
Total score	188.50	44.20
F+ %	71.70	8.94
F %	60.50	6.98
W %	13.60	4.98
D %	69.10	6.54
d %	17.30	7.00
R	49.10	20.00
M %	7.70	4.56
C (sum) %	6.40	3.66
S %	6.20	4.44
P %	18.90	7.50
Y %	9.10	4.90
V %	5.90	4.18
A %	44.00	11.15
H %	24.25	9.70
Last 3 cards %	38.30	6.32
FM %	6.50	4.52
C'+c %	1.90	1.70
C (pure) %	1.40	1.91
CF %	1.20	1.86
FC %	8.20	4.62

The results of the application of the intelligence tests and the Rorschach test to the group of 40 average workers belonging to the unskilled or semi-skilled occupational level.

	<u>Mean.</u>	<u>Standard Deviation.</u>
Maze	49.50	11.88
Pattern	6.80	2.87
Vocabulary	57.70	19.20
Repetition of digits	17.10	4.00
Digits backwards	10.40	3.68
Total score	141.00	30.06
F+ %	75.65	11.83
F %	55.70	9.16
W %	14.79	7.23
D %	73.20	7.92
d %	12.30	8.14
R	35.90	7.92
M %	7.50	5.32
C (sum) %	6.20	4.20
S %	5.30	4.96
P %	22.60	6.84
Y %	10.90	5.38
V %	7.10	5.58
A %	46.00	9.06
H %	19.30	9.12
Last 3 cards %	37.82	5.20
FM %	9.61	4.86
C'+c %	1.68	2.14
C (pure) %	.55	1.28
CF %	1.93	2.69
FC %	7.80	5.18

The results of the application of the intelligence tests, and the Rorschach test to the group of 20 average workers belonging to the clerical and professional occupational levels:

	<u>Mean.</u>	<u>Standard Deviation.</u>
Maze	60.10	15.18
Pattern	10.50	2.50
Vocabulary	93.25	12.15
Repetition of digits	23.90	3.81
Digits backwards	18.40	4.80
Total score	205.60	21.78
F+%	71.40	10.30
F%	58.30	11.34
W%	18.50	8.76
D%	68.30	8.36
d%	12.70	6.52
R	37.90	10.08
M%	9.65	5.25
C (sum)%	4.70	2.82
S%	6.40	4.20
P%	20.25	5.75
Y%	7.80	3.06
V%	5.90	3.74
A%	47.30	8.20
H%	19.00	8.30
Last 3 cards %	37.10	5.64
FM%	12.05	4.86
C'+c%	2.10	2.58
C (pure)%	0.60	1.11
CF%	1.50	1.96
FC%	5.20	2.30

The comparison of the groups.

The results of the survey of the maladjusted workers are given in the preceding pages. The significance of those results will be considered in the following pages. An account of maladjustment can achieve significance only if it is compared with normality. For this reason, the significance of the results of the present investigation will be expressed in terms of comparisons with the results obtained from a similar survey of a group of average workers.

The comparisons will be presented in this order:

- (a) A comparison of the sheltered employment group and the first average group.
- (b) A comparison of the group of hospitalized workers and the second average group.
- (c) A comparison of the sheltered employment group and the group of hospitalized workers.
- (d) A comparison of the first average group and the second average group.
- (e) A comparison of the maladjusted unskilled or semi-skilled workers and the average unskilled or semi-skilled workers.
- (f) A comparison of the maladjusted clerical and professional workers and the average clerical and professional workers.
- (g) A comparison of the total maladjusted group and the total average group.

The comparisons drawn in each section, except in (e) and (f), will be concerned with three aspects of the individual. They are

- (i) socio-economic background
- (ii) intelligence, and
- (iii) temperament.

(The consideration of the socio-economic background is omitted from comparisons (e) and (f).)

In considering the differences between the groups in the Rorschach test variables, only the percentages, or the relative amounts of the variables will be taken into account. The occurrence of significant differences in the absolute amounts of the variables will be indicated, but will not be used in analysing the results.

In comparisons (a) and (f), the reliability of the differences between the means will be calculated thus:

$$t = \frac{M_1 - M_2}{\sqrt{\frac{(\sum d_1^2 + \sum d_2^2)(N_1 + N_2)}{(N_1 + N_2 - 2)(N_1 N_2)}}$$

In comparisons (b), (c), (d), (e) and (g), the reliability of the differences between the means will be calculated thus:

$$\text{Rel. diff.} = \frac{M_1 - M_2}{\sqrt{\frac{\sigma_1^2}{N_1} + \frac{\sigma_2^2}{N_2}}}$$

In comparison (g), the reliability of the differences between the Standard Deviations will be calculated as follows:

$$\text{Rel. } \sigma_{\text{diff.}} = \frac{\sigma_1 - \sigma_2}{\sqrt{\frac{\sigma_1^2}{2} + \frac{\sigma_2^2}{2}}}$$

$$\text{where } \sigma_{\sigma} = \frac{\sigma}{\sqrt{2n}}$$

For the purpose of this investigation, a reliability below 5% is regarded as being significant.

(a) A comparison of the sheltered employment group and the first average group.

(i) The socio-economic background.

	<u>Maladjusted group.</u>	<u>Average group.</u>
Number of subjects	20	20
Average age (in years)	33	26
Range of ages (in years)	20 - 53	20 - 47
Average school standard attained	3	5
Range of standards attained	1 - 8	3 - 8
Number of married subjects	12	10
Number of unmarried subjects	6	10
Number of divorced subjects	2	0
Number of Coloured subjects	20	20
Average number of dependants	2	2
Range of number of dependants	0 - 6	0 - 6

This reveals that the average age of the maladjusted group is greater than that of the average group, and that the average school standard attained by the maladjusted group is lower than that attained by the average group. Two cases of divorce occur in the maladjusted group, but there are no cases of divorce to be found in the average group.

The conclusions which may be drawn from these results are discussed under the heading of 'the socio-economic background' in comparison (g).

(ii) The intelligence tests. The reliability of the differences between the means of the sheltered employment group and the first average group.

	<u>Maladjusted</u> <u>group.</u>	<u>Average</u> <u>group.</u>	<u>Reliability of</u> <u>the difference.</u>	
	<u>Mean</u>	<u>Mean</u>	<u>t</u>	<u>p</u>
Maze	42.50	54.90	3.45	(Below 1%)
Pattern	7.20	6.40	.90	(30-40%)
Vocabulary	40.51	53.50	2.34	(2%)
Rept. of digits	13.90	17.40	2.41	(1-2%)
Digits backwards	9.70	9.50	.19	(80-90%)
Total score	114.30	141.30	2.49	(1-2%)

The most significant difference is to be found in the Maze test. The greater mean obtained by the average group bears out the discussion of the Maze given in the initial investigation. It will be recalled that success in the Maze test is correlated with a capacity for social adaptability and mental dexterity. The poorer performance of the maladjusted group reveals the members of the group to be impulsive, irresolute, uncontrollable, and lacking in foresight. They also tend to be more nervous than the members of the average group, and to become confused in a task new to experience. They are erratic in their performances, and unable to work efficiently under pressure.

In the repetition of digits forwards, the average group again shows its superiority over the maladjusted group. Therefore, the maladjusted group is inferior to the average group in the measurement of the memory span.

Another significant difference between the two groups is to be found in the Vocabulary test, the average group once again showing a significantly greater mean than the

maladjusted group. It is possible that the superior vocabulary of the average group may be accounted for by the superior educational level of that group, which has allowed the average subjects to accumulate a more extensive vocabulary than the maladjusted subjects.

Finally, in comparing the total scores, it is found that the maladjusted group is inferior to the average group in the total intelligence test performance.

In analysing the Rorschach test results, each variable that shows a significant difference between the mean percentages of the two groups is considered in turn, in the order of significance. The most significant difference is to be found in the $P\%$, the average group having the greater mean $P\%$. P responses project the ability to participate in the common or popular thinking of the group. Therefore, the maladjusted individual shows less conformity with the thinking of the group to which he belongs, and is less capable of adaptive thinking than the average individual. The maladjusted individual either is not able, or else not willing, to think along the lines accepted by other individuals.

$d\%$: The greater mean is to be found in the maladjusted group. Thus, the maladjusted individual pays more attention to minute detail than the average individual.

$D\%$: The greater mean percentage of the average group reveals that the average subject pays more attention to obvious details than the maladjusted subject.

If the $d\%$ and $D\%$ differences are considered conjointly, the maladjusted individual is revealed to be one who is inclined to overlook the obvious facts and to concentrate on minor, and often very trivial details.

The norms of the $W\%:D\%:d\%$ ratio are 24:68:9. The ratio of the maladjusted group is 18:61:21; and that of the average group is 15:76:9. The $W\%$ difference is not significant, but a comparison of the ratios indicates the over-emphasis of $D\%$ in the average group, and the over-emphasis of $d\%$ in the maladjusted group.

A further significant difference between the groups is to be found in the $FM+m\%$. The average group has a greater mean percentage than the maladjusted group.

In both groups, the FM scores occur with much greater frequency than the m scores, and consequently, in considering the significance of the differences between the groups, greater stress is laid on FM than m. FM implies the ability to project movement on to the inkblots, and therefore the average group is more capable of using the imagination in responding to the test than the maladjusted group.

The mean F+ of the average group is significantly greater than that of the maladjusted group. The F+ is an index to the individual's intelligence, and is also a measure of the stability of the personality. The lower F+ of the maladjusted group is a sign of weakness, in that it points to a tendency to take the easier way out of the task set by the test, by selecting F-, rather than F+, responses.

The greater mean A of the average group is evidence of the greater capacity of that group for adaptive thinking. In addition, it indicates that the average individual adheres more closely to the most obvious, palpable forms, than the maladjusted individual.

The latter is less stereotyped in his percepts.

The pure C mean is greater in the maladjusted group than in the average group. This reveals greater impulsiveness in the maladjusted individual, (a factor which emerged previously in considering the Maze test differences), and also a lack of any desire for adaptability.

(b) A comparison of the hospital group and the second average group.

(1) The socio-economic background.

	<u>Maladjusted group.</u>	<u>Average group.</u>
Number of subjects	40	40
Average age (in years)	32	25
Range of ages (in years)	20-51	20-39
Average school standard attained	7	8
Range of standards attained	5-10	5-10
Number of married subjects	13	18
Number of unmarried subjects	22	22
Number of divorced subjects	5	0
Number of European subjects	40	40
Average number of dependants	1	1
Range of number of dependants	0-6	0-6

The average age of the maladjusted group is greater than that of the average group; and the educational level of the maladjusted group is lower than that of the average group.

Whereas five cases of divorce occur amongst the maladjusted subjects, no such cases are to be found amongst the average subjects.

These results are similar to those revealed by the comparison of the sheltered employment group and the first average group. The significance of these differences will be discussed under the heading of 'the socio-economic background' in comparison (g).

(ii) The intelligence tests. The reliability of the differences between the means of the hospital group and the second average group.

	<u>Maladjusted</u> <u>group.</u>	<u>Average</u> <u>Group.</u>	<u>Reliability</u> <u>of the</u> <u>difference.</u>	
	<u>Mean.</u>	<u>Mean.</u>	<u>Rel.diff.</u>	<u>P.</u>
Maze	51.65	52.35	.21	(80-90%)
Pattern	9.84	8.83	1.32	(15-20%)
Vocabulary	88.00	77.43	2.19	(2- 5%)
Repetition of digits	19.65	20.20	.47	(60-70%)
Digits backwards	15.75	14.60	.98	(30-40%)
Total score	183.70	173.22	1.18	(20-30%)

The only significant difference between the groups is to be found in the Vocabulary test, in which the greater mean is obtained by the maladjusted group. In this case, the superior Vocabulary performance of the one group is not correlated with a higher educational level.

In comparison (a), which is concerned with only unskilled and semi-skilled workers, the significant differences in intelligence test performance may be related to the difference in educational achievement; but this is not the case in comparison (b), which deals with unskilled, semi-skilled, clerical, and professional workers.

(iii) The Rorschach Test. The reliability of the differences between the means of the hospital group and the second average group:

	<u>Maladjusted</u>	<u>Average</u>	<u>Reliability of the</u>	
	<u>group.</u>	<u>group.</u>	<u>differences.</u>	
	<u>Mean.</u>	<u>Mean.</u>	<u>Rel.diff.</u>	<u>P.</u>
F+%	72.71	72.75	.02	(Above 90%)
F%	58.65	57.70	.43	(60-70%)
Non-F%	41.35	42.30	.43	(60-70%)
R	47.90	39.10	2.45	(1-2%)
W%	17.20	16.50	.39	(65-70%)
D%	68.24	69.20	.55	(55-60%)
d%	14.44	14.00	.25	(80%)
M	3.60	3.50	.15	(85-90%)
M%	7.20	8.83	1.47	(10-20%)
C(sum)	3.70	1.78	4.00	(Below 1%)
C(sum)%	7.50	5.05	2.55	(1%)
S	3.50	2.60	1.50	(10-15%)
S%	7.54	6.10	1.21	(20-25%)
P	8.53	7.65	1.60	(10-15%)
P%	20.19	20.88	.41	(60-70%)
Y	4.75	3.43	2.64	(Below 1%)
Y%	10.16	9.10	1.05	(25-30%)
V	3.13	2.60	1.06	(25-30%)
V%	6.90	6.75	.15	(85-90%)
A%	43.42	46.40	1.24	(20-25%)
H%	20.82	19.00	.80	(40-45%)
Last 3 cards %	37.98	37.60	.26	(75-80%)
FM+m	4.63	4.55	.11	(90%)
FM%	9.65	10.48	.78	(40-50%)
C'+c	.87	.63	1.04	(30%)
C'+c%	1.72	1.80	.19	(80-90%)
C(pure)	.70	.28	2.47	(1-2%)
C(pure)%	1.40	.70	2.00	(2-5%)
CF	.80	.50	1.43	(10-20%)
CF%	1.78	1.75	.06	(Above 90%)
FC	4.18	2.03	4.67	(Below 1%)
FC%	8.76	5.50	3.47	(Below 1%)

The most significant difference is to be found in the FC%, with the maladjusted group showing a superiority over the average group. All C responses are indicative of response to colour, and therefore it is shown that the maladjusted group is more sensitive to colour than is the average group. As colour responses are concerned with the affects, this difference points to a greater degree of emotionality in the maladjusted group. This indicates that the maladjusted individual is more open to emotional stimulation than the average individual, even though the combination of F and C reveals the emotional responses to be under intellectual control.

The next most significant difference is to be found in the C(sum)%, where once again the maladjusted group shows a greater mean percentage than the average group. This confirms the greater colour sensitivity and emotional stimulability of the maladjusted group, as shown in the discussion of the FC% above. The C(sum)% is concerned with the affects and their expression, and therefore it provides a clue to the emotional experience of the individual. The mean R, or response total, of the maladjusted group is significantly greater than that of the average group. Thus, the maladjusted group is more productive in the performance of this test than the average group.

C(pure)%: The maladjusted group has the greater mean percentage than the average group. Once again, the greater emotional sensitivity of the maladjusted group becomes apparent. The pure C response is indicative of impulsiveness and a lack of any desire for adaptability. It denotes an infantile affective level.

(c) A Comparison of the sheltered employment group and the hospital group.

In tabulating the results, for the sake of brevity, the sheltered employment group will be designated the S.E. group.

(1) The socio-economic background.

	<u>S.E.</u> <u>group.</u>	<u>Hospital</u> <u>group.</u>
Number of subjects	20	40
Average age (in years)	33	32
Range of ages (in years)	20-53	20-51
Average school standard obtained	3	7
Range of standards attained	1-8	5-10
Number of unmarried subjects	6	22
Number of married subjects	12	13
Number of divorced subjects	2	5
Average number of dependants	2	1
Range of number of dependants	0-6	0-6

A significant difference in educational level is apparent. The hospital group has the higher average educational level.

(ii) The intelligence tests. The reliability of the differences between the means of the S.E. group and the hospital group.

	<u>S.E.</u>	<u>Hospital</u>	<u>Reliability of</u>	
	<u>group.</u>	<u>group.</u>	<u>the difference.</u>	
	<i>Mean</i>	<i>Mean</i>	<i>Rel. diff.</i>	<i>P.</i>
Maze	42.50	51.65	2.63	(Below 1%)
Pattern	7.20	9.84	3.11	"
Vocabulary	40.51	88.00	10.24	"
Rept. of digits	13.90	19.65	4.39	"
Digits backwards	9.70	15.75	5.65	"
Total score	114.30	183.70	7.43	"

In each case the difference between the means is a significant one, and the greater mean is to be found in the hospital group.

The superiority of the hospital group may be attributed to the higher educational level of that group.

Whereas the sheltered employment group comprises unskilled or semi-skilled workers only; the hospital group is extended to include the clerical and professional occupational levels as well as the unskilled or semi-skilled worker.

(iii) The Rorschach test: The reliability of the differences between the means of the sheltered employment group and the hospital group.

	<u>S.E.</u>	<u>Hospital</u>	<u>Reliability of</u>
	<u>group.</u>	<u>group.</u>	<u>the difference.</u>
	Mean	Mean	Rel. Diff. P.
F+ %	60.70	72.71	2.52 (1-3%)
F %	55.75	58.65	.88 (35-40%)
Non-F %	44.25	41.35	.88 (35-40%)
R	33.50	47.90	4.17 (Below 1%)
W %	18.50	17.20	.31 (70-80%)
D %	61.00	68.24	2.24 (2-5%)
d %	21.50	14.44	2.89 (Below 1%)
M	3.00	3.60	.63 (50-55%)
M %	8.35	7.20	.58 (55-60%)
C (sum)	2.75	3.70	1.27 (20-25%)
C (sum) %	8.00	7.50	.28 (75-80%)
S	2.20	3.50	2.03 (2-5%)
S %	6.60	7.54	.60 (50-60%)
P	3.60	8.53	8.50 (Below 1%)
P %	10.75	20.19	5.22 (Below 1%)
Y	4.65	4.75	.12 (Above 90%)
Y %	12.10	10.16	1.70 (7-10%)
V	2.60	3.13	.58 (50-60%)
V %	6.70	6.90	.11 (Above 90%)
A %	37.80	43.42	1.49 (10-20%)
H %	19.30	20.82	.46 (60-70%)
Last 3 cards %	38.00	37.98	.01 (Above 90%)
FM+m	1.85	4.63	4.03 (Below 1%)
FM+m %	5.40	8.80	2.81 (Below 1%)
C'+c	1.20	.87	.92 (30-40%)
C'+c %	3.55	1.72	1.83 (5-10%)
C (pure)	.60	.70	.39 (65-70%)
C (pure) %	1.80	1.40	.56 (55-60%)
CF	.55	.80	1.35 (15-20%)
CF %	1.35	1.78	.69 (45-50%)
FC	3.20	4.18	1.23 (20-25%)
FC %	10.00	8.76	.56 (55-60%)

P%: The most significant difference between the groups is to be found in the mean P%. The greater P% is found in the hospital group. Thus, the hospital group is more capable of adaptive thinking than the sheltered employment group. The sheltered employment group is not able, or else not willing, to think along the lines accepted by other individuals.

The mean response total, R, of the hospital group is greater than that of the sheltered employment group. Therefore, the hospital group is more productive in the performance of the Rorschach test.

In comparing the mean FM+m% of the groups it is revealed that the hospital group shows a greater mean than the sheltered employment group. Thus, a greater percentage of non-human movement responses is to be found in the hospital group than in the sheltered employment group. Next in order of significance is the mean d% difference, with the sheltered employment group obtaining the greater mean. This infers a greater tendency on the part of the sheltered employment group to attend to minute detail, and it is also an indication of the avoidance of the obvious facts.

The F+ of the hospital group is superior to that of the sheltered employment group. This is indicative of the superior intellectual abilities of the hospital group, a factor which emerged from a consideration of the intelligence test results as well. The F+ is also a measure of the stability of the personality.

D%: The mean D% of the hospital group is greater than that of the sheltered employment group. This signifies the greater tendency of the hospital group to pay attention to the obvious details.

(d) A comparison of the first average group and the second average group.

The first average group comprises members of the unskilled or semi-skilled occupational level only. The second average group is extended to include members of the clerical and professional occupational levels, as well as unskilled or semi-skilled workers.

(1) The socio-economic background.

	<u>First average group.</u>	<u>Second average group.</u>
Number of subjects	20	40
Average age (in years)	26	25
Range of ages (in years)	20-47	20-39
Average school standard attained	5	8
Range of standards attained	3-8	5-10
Number of married subjects	10	18
Number of unmarried subjects	10	22
Average number of dependants	2	1
Range of number of dependants	0-6	0-2

The educational level attained by the second average group is greater than that attained by the first average group.

(ii) The intelligence tests. The reliability of the differences between the means of the first average group and the second average group:

	<u>First</u> <u>average</u> <u>group.</u>	<u>Second</u> <u>average</u> <u>group.</u>	<u>Reliability of the</u> <u>difference.</u>	
	<u>Mean.</u>	<u>Mean.</u>	<u>Rel.diff.</u>	<u>P.</u>
Maze	54.90	52.35	2.38	(1-2%)
Pattern	6.40	8.83	3.07	(Below 1%)
Vocabulary	53.50	77.43	4.25	(Below 1%)
Repetition of digits	17.40	20.20	2.15	(2-5%)
Digits backwards	9.50	14.60	4.46	(Below 1%)
Total score	141.30	173.22	3.19	(Below 1%)

Significant differences are to be found between the groups in all the intelligence tests, and in the total score. In each test, except the Maze, the superiority of the second average group is revealed. The first average group is superior only in Maze performance. The difference between the first and second average groups is a difference of educational level and of occupational level. The superior intelligence test performance of the second average group may be attributed to the higher educational level of that group. From this we may conclude that Maze performance is not dependent on educational achievement.

(iii) The Rorschach Test. The reliability of the differences between the means of the first average group and the second average group:

	<u>First average</u>	<u>Second</u>	<u>Reliability</u>	
	<u>group.</u>	<u>average</u>	<u>of the</u>	
		<u>group.</u>	<u>difference.</u>	
	<u>Mean.</u>	<u>Mean.</u>	<u>Rel.diff.</u>	<u>P.</u>
F+%	76.20	72.75	1.09	(25-30%)
F%	53.55	57.70	1.85	(5-10%)
Non-F%	46.45	42.30	1.85	(5-10%)
R	32.40	39.10	2.72	(Below 1%)
W%	14.85	16.50	.79	(40-50%)
D%	76.20	69.20	3.51	(Below 1%)
d%	9.00	14.00	2.85	(Below 1%)
M	2.35	3.50	1.98	(2-5%)
M%	7.50	8.83	.86	(35-40%)
G(sum)	2.20	1.78	1.05	(25-30%)
C(sum)%	7.00	5.05	1.68	(5-10%)
S	1.55	2.60	2.02	(2-5%)
S%	4.65	6.10	1.17	(20-30%)
P	7.10	7.65	.97	(30-35%)
P%	23.10	20.88	1.26	(20-25%)
Y	3.70	3.43	.48	(60-70%)
Y%	11.30	9.10	1.54	(10-15%)
V	2.40	2.60	.30	(70-80%)
V%	6.60	6.75	.10	(Above 9%)
A%	46.15	46.40	.10	(Above 9%)
H%	19.90	19.00	.35	(70-75%)
Last 3 cards %	38.00	37.60	.31	(70-80%)
Fl+m	3.90	4.55	1.03	(30%)
Fm%	10.75	10.48	.23	(80-85%)
C'+c	.70	.63	.32	(70-80%)
C'+c%	2.20	1.80	.64	(50-55%)
C(pure)	.10	.28	1.80	(5-10%)
C(pure)%	.30	.70	1.34	(15-20%)
CF	.70	.50	.80	(40-45%)
CF%	2.15	1.75	.53	(55-60%)
FC	3.05	2.03	2.37	(1-2%)
FC%	9.80	5.50	3.16	(Below 1%)

The mean $\underline{D\%}$ of the first average group is greater than that of the second average group. It implies a greater tendency on the part of the first group to pay attention to the obvious details.

The mean $\underline{d\%}$ of the second average group is greater than that of the first group, a factor which is indicative of the greater tendency of the second group to pay attention to minute details in responding to the figures.

The mean $\underline{FC\%}$ is greater in the first average group, thus indicating that the occurrence of adaptive emotional responses is more frequent in the first average group than in the second average group.

R: The second average group shows a greater degree of productivity in the performance of this test, than the first average group.

- (e) A comparison of the 40 maladjusted unskilled or semi-skilled workers, and the 40 average unskilled or semi-skilled workers.

The reliability of the differences between the means:

	<u>Maladjusted group.</u>	<u>Average group.</u>	<u>Reliability of the difference.</u>
	<u>Mean</u>	<u>Mean</u>	<u>Rel. Diff. p.</u>
Maze	46.90	49.50	.93 (30-40%)
Pattern	7.82	6.80	1.57 (10-15%)
Vocabulary	63.90	57.70	1.19 (20-30%)
Rept. of digits	17.14	17.10	.04 (Above 90%)
Digits backwards	12.09	10.40	1.82 (5-7%)
Total score	147.69	141.00	.80 (40-45%)
F+ %	67.25	75.65	2.46 (1-2%)
F %	55.75	55.70	.02 (Above 90%)
W %	19.65	14.79	1.86 (5-7%)
D %	64.25	73.20	3.93 (Below 1%)
d %	16.70	12.30	2.17 (2-5%)
R	39.80	35.90	1.31 (15-20%)
M %	7.45	7.50	.04 (Above 90%)
C (sum) %	8.40	6.20	1.72 (7-10%)
S %	7.30	5.30	1.79 (7-10%)
P %	16.30	22.60	3.60 (Below 1%)
Y %	11.75	10.90	.51 (60-65%)
V %	7.30	7.10	.15 (85-90%)
A %	39.91	46.00	2.18 (2-5%)
H %	18.58	19.30	.29 (75-80%)
Last 3 cards %	38.15	37.82	.51 (60-65%)
FM %	6.60	9.61	2.81 (Below 1%)
C'+c %	2.66	1.68	1.49 (10-20%)
C (pure) %	1.60	.55	2.44 (1-2%)
CF %	2.14	1.93	.36 (70-75%)
FC %	9.70	7.80	1.34 (15-20%)

The intelligence tests.

The only difference of any significance is to be found in the Repetition of digits backwards. In this case, the maladjusted group is superior to the average group.

The Rorschach Test.

The most significant difference is to be found in the D%. The greater mean is obtained by the average group, which reveals the greater tendency of that group to concentrate on the obvious details. The P% of the average group is superior to that of the maladjusted group. This reveals the greater conformity of thought of the average group. The maladjusted individual is less capable of thinking along the lines accepted by other individuals. The mean FM% of the average group is greater than that of the maladjusted group. Thus, more non-human movement percepts are given by the average individuals.

The F₁% of the average group is superior to that of the maladjusted group. The F₁% is a measure of the stability of the personality and of the intellectual level. The lower F₁% of the maladjusted group is an index of the existence of a weakness. It implies a tendency to take the easiest way out of the task presented by the test.

C(pure)% is a measure of the unadapted affects. The greater mean is to be found in the maladjusted group, thus revealing that the maladjusted individuals are impulsive and uncontrolled in their emotional reactions.

A%: The greater mean is to be found in the average group, which implies that the members of that group are more capable of adaptivity of thought. On the other hand, the maladjusted individuals are less stereotyped in their percepts.

Distractibility in the direction of the unessential, as measured by the d%, is more marked in the maladjusted group than in the average group. The maladjusted individuals are inclined to pay much attention to minute details.

- (f) A comparison of the 20 maladjusted members of the clerical and professional occupational levels, and the 20 average members of the clerical and professional occupational levels.

The reliability of the differences between the means.

	<u>Maladjusted group.</u>	<u>Average group.</u>	<u>Reliability of the difference.</u>	
	<u>Mean.</u>	<u>Mean.</u>	<u>t</u>	<u>P.</u>
Maze	52.60	60.10	1.52	(10-15%)
Pattern	8.50	10.50	1.87	(5-10%)
Vocabulary	89.80	93.25	.53	(55-60%)
Repetition of digits	18.85	23.90	3.89	(Below 1%)
Digits backwards	16.90	18.40	1.01	(30-35%)
Total score	188.50	205.60	1.55	(10-15%)
F+%	71.70	71.40	.10	(Above 90%)
F%	60.50	58.30	.72	(40-50%)
W%	13.60	18.50	2.12	(2-5%)
D%	69.10	68.30	.33	(70-80%)
d%	17.30	12.70	2.10	(2-5%)
R	49.10	37.90	2.18	(2-5%)
M%	7.70	9.65	1.22	(20-25%)
C(sum)%	6.40	4.70	1.60	(10-15%)
S%	6.20	6.40	.14	(85-90%)
P%	18.90	20.25	.62	(50-60%)
Y%	9.10	7.80	.98	(30-40%)
V%	5.90	5.90	0	
A%	44.00	47.30	1.04	(25-30%)
H%	24.25	19.00	1.79	(5-10%)
Last 3 cards %	38.30	37.10	.06	(Above 90%)
FM%	6.50	12.05	3.65	(Below 1%)
C'+c%	1.90	2.10	.28	(75-80%)
C(pure)%	1.40	.60	1.57	(10-20%)
CF%	1.20	1.50	.48	(60-70%)
FC%	8.20	5.20	2.54	(1-2%)

The intelligence tests.

The most significant difference between the groups is to be found in the Repetition of digits forwards, in which the average group is superior to the maladjusted group.

The Rorschach Test.

The most significant difference occurs in the FM%. The average group shows a greater mean percentage of non-human movement responses than the maladjusted group.

The FC% is greater in the maladjusted group than in the average group, and this is indicative of the attention to colour that is found in maladjusted individuals, and which is representative of the emotional sensitivity of those individuals. The FC% is a measure of the adaptive affective responses. It denotes the preoccupation of the maladjusted group with affective stimuli.

R: The mean response total of the maladjusted group is significantly greater than that of the average group. Thus, greater productivity on this test is shown by the maladjusted individuals.

The mean W% of the average group is greater than that of the maladjusted group. The W% is an index of the ability to face a situation as a whole. It reflects a capacity for abstract thinking and reasoning.

The greater mean d% of the maladjusted group indicates the greater tendency on the part of that group to concentrate on minor details. It shows a distractibility in the direction of the unessential.

(g) A comparison of the total maladjusted group and the total average group.

(1) The socio-economic background.

	<u>Maladjusted group.</u>	<u>Average group.</u>
Number of subjects	60	60
Average age (in years)	33	25
Range of ages (in years)	20-53	20-47
Average school standard attained.	6	7
Range of standards attained.	1-10	3-10
Number of married subjects.	25	28
Number of unmarried subjects.	28	32
Number of divorced subjects.	7	0
Average number of dependants.	1	1
Range of number of dependants.	0-7	0-6

In considering each maladjusted group separately, and in considering the total maladjusted group, it was found that the maladjusted individuals show a higher average age and a lower school educational level than the average individuals. Similar results were found in the initial investigation. The socio-economic status of both groups,

(in the main investigation), is approximately equal, as both groups contain an equal number of representatives of three different occupational levels. Thus, the groups fall into similar wage-earning categories, and the average number of unemployed dependants per individual is the same in both groups. Because of this similarity in socio-economic status, it is not possible to attribute the lower educational level of the maladjusted individual to an inferior socio-economic level which might cause the individual to leave school at an earlier age in order to enter a wage-earning occupation. How then is the lower school educational level related to the existence of work maladjustments? One or other of two possible interpretations may be applied. The lower educational level of the maladjusted group may be attributed to the existence of maladjustments in that group even during the school years. This implies an initial inability to progress further at school. Therefore, the individual begins with a weakness which forms a basis for the occurrence of maladjustments at a later stage. The other possible interpretation is that a low educational standard results in a lack of opportunity to learn and to receive occupational training, and this in turn leads to the occurrence of job and personality maladjustments when the individual enters a wage-earning occupation. The inability to learn and to receive specialized training may result in the individual being forced into an uncongenial occupation for which he (or she) has no special aptitude. The average age of the maladjusted group is higher than that of the average group. This factor emerged in the initial investigation and in the main investigation.

Thus, the maladjusted worker tends to be the older worker. This may be attributed to the fact that after a number of years in uncongenial employment, the psychosocio-economic background of the individual becomes more and more complex, and the manifestations of maladjustment are reinforced and become habits of behaviour. This necessitates the eventual withdrawal of the individual from employment in the open labour market.

From a consideration of the socio-economic background of the groups, we may conclude that the basis of work maladjustment is laid during the school-going years.

The maladjustment is either of a personality kind, (which prevents the individual from making progress at school), or else, through lack of specialized training, or a lack of the capacity to receive specialized training, a job maladjustment will arise. But the maladjustment usually will not manifest itself immediately that the individual enters a wage-earning occupation. As time passes, the uncongenial work and the inaptitude of the individual for the specific job in which he (or she) is engaged, combined in many cases with forms of personality maladjustment which existed previously or which arose as a result of the work situation, will result in the occurrence of work failures.

Yet another factor which emerges from a comparison of the socio-economic backgrounds of the two groups is the incidence of seven cases of divorce in the maladjusted group, and the absence of any such cases from the average group.

(ii) The intelligence tests. The reliability of the differences between the means of the total maladjusted group and the total average group.

	<u>Maladjusted</u>	<u>Average</u>	<u>Reliability of</u>	
	<u>group.</u>	<u>group.</u>	<u>the difference.</u>	
	<u>Mean.</u>	<u>Mean.</u>	<u>Rel.diff.</u>	<u>P.</u>
Maze	48.68	53.10	1.78	(5-10%)
Pattern	8.20	8.02	.30	(70-80%)
Vocabulary	71.59	69.55	.38	(70%)
Repetition of digits	17.85	19.20	1.39	(15-20%)
Digits backwards	13.65	12.96	.71	(40-50%)
Total score	160.14	162.78	.32	(70-80%)

The only difference of any significance is to be found in the Maze. The average group is superior to the maladjusted group in Maze performance. The implications of success in Maze performance have been discussed in the initial investigation, where it was shown that a good Maze performance may be correlated with social adaptability and mental dexterity. Therefore, in this instance, the maladjusted group is shown to be more impulsive, irresolute, uncontrolled, and lacking in foresight, and also tends to be more nervous and confused in a task new to experience, than the average group.

The Standard Deviations.

In comparing the Standard Deviations of the two groups, no significant differences were revealed.

The reliability of the differences between the Standard Deviations.

	<u>Maladjusted</u>	<u>Average</u>	<u>Reliability of</u>	
	<u>group.</u>	<u>group.</u>	<u>the difference.</u>	
	<u>S.D.</u>	<u>S.D.</u>	<u>Rel.diff.</u>	<u>P.</u>
Maze	15.06	14.04	.54	(55-60%)
Pattern	3.42	3.31	.26	(75-80%)
Vocabulary	31.30	26.74	1.21	(20-25%)
Repetition of digits	5.49	5.12	.54	(55-60%)
Digits backwards	5.15	5.46	.45	(60-70%)
Total score	49.12	41.67	1.27	(20-25%)

(iii) The Rorschach Test. The reliability of the differences between the means of the total maladjusted group and total average group.

	<u>Maladjusted</u>	<u>Average</u>	<u>Reliability of</u>	
	<u>group.</u>	<u>group.</u>	<u>the difference.</u>	
	<u>Mean</u>	<u>Mean</u>	<u>Rel.diff.</u>	<u>P.</u>
F+%	68.40	74.11	2.24	(2-5%)
F%	57.20	56.50	.37	(70-75%)
Non-F%	42.80	43.50	.37	(70-75%)
R	43.68	36.62	2.56	(1-2%)
W%	17.46	16.05	.72	(40-50%)
D%	65.80	71.61	3.30	(Below 1%)
d%	16.60	12.44	2.67	(Below 1%)
M	3.45	3.14	.62	(50-60%)
M%	7.60	6.24	1.32	(15-20%)
C (sum)	3.50	1.92	3.95	(Below 1%)
C (sum)%	7.73	5.70	2.23	(2-5%)
S	3.10	2.30	1.78	(5-10%)
S%	7.35	5.74	1.66	(5-10%)
P	6.88	7.44	1.10	(20-30%)
P%	16.85	21.70	3.44	(Below 1%)
Y	4.28	3.52	1.69	(5-10%)
Y%	10.91	9.86	.86	(35-40%)
V	2.72	2.52	.29	(70-80%)
V%	6.80	6.74	.06	(Above 90%)
A%	41.10	46.39	2.45	(1-2%)
H%	20.50	19.42	.55	(55-60%)
Last 3 cards %	38.25	37.42	.71	(40-50%)
FM+m	3.72	4.36	1.16	(20-30%)
FM%	6.40	10.39	4.64	(Below 1%)
C'+c	.98	.65	1.74	(5-10%)
C'+c%	2.56	2.04	1.13	(20-30%)
C (pure)	.70	.22	3.43	(Below 1%)
C (pure)%	1.53	.57	2.91	(Below 1%)
CF	.72	.57	.88	(30-40%)
CF%	1.63	1.96	.69	(45-50%)
FC	3.87	2.37	3.66	(Below 1%)
FC%	9.31	6.94	2.26	(2-5%)

The interpretative value of the results is as follows. (The variables in which significant differences occur between the mean percentages of the two groups are considered in the order of their significance.)

FM%: The greater mean percentage is to be found in the average group. The FM reactions may be regarded as a combination of animal percepts and the projection of movement on to those percepts. The mean A% of the average group is significantly greater than that of the maladjusted group. The A% registers adaptivity in the sense that the subject recognises intellectually the common stimuli of existence. That is, his (or her) mind easily follows the everyday channels of thought and perception. In this way, the greater mean FM% of the average group may be explained as the greater tendency of that group to give animal percepts, and to project movement on to the percepts. The projection of movement on to the objectively static ink-blot also implies the possession of a certain amount of fantasy activity.

P%: The superior mean P% of the average group indicates a greater capacity for adaptive thinking. Therefore, the maladjusted individual is less able to participate in common or popular thinking; that is, the maladjusted individual is not able, or not willing, to think along the lines accepted by other individuals.

D%: The greater mean D% of the average group represents a greater interest in the obvious details.

C(pure)%: This is greater in the maladjusted group. The C(pure)% is a measure of the uncontrolled emotional reactions. Therefore, the maladjusted individuals are more uncontrolled and impulsive in their affective responses.

d%: The maladjusted individuals tend to pay more attention to minute detail than the average individuals.

This is indicative of an avoidance of the obvious facts.

R: The greater mean score is obtained by the maladjusted group. Therefore, the maladjusted individual shows greater productivity in the performance of the test than is shown by the average individual.

A‰: The greater mean of the average group is indicative of the greater capacity of the group for adaptive thinking, and it indicates also that the maladjusted individual tends to give less stereotyped percepts than the average individual. The latter is inclined to adhere to the more obvious forms in his (or her) percepts.

FC‰: In comparing the mean FC‰ it is found that the maladjusted group is superior to the average group. Thus the maladjusted individuals show a greater degree of colour sensitivity and emotional stimulability. FC is an index of the adaptive affective reactions, and may also be regarded as a measure of reactivity to colour.

F+‰: The mean of the average group is superior to that of the maladjusted group. The F+‰ is a measure of intelligence and of the stability of the personality. The lower F+‰ of the maladjusted individual implies a form of adjustment which provides a means of taking the easier way out of the task presented by the test.

C(sum)‰: This is greater in the maladjusted group, and, as has been shown above in the discussion of the C(pure)‰ and the FC‰, it reveals the greater preoccupation of the maladjusted group with affective stimuli. The mean S‰ is greater in the maladjusted group. The S‰ is a measure of the expression of oppositional tendencies and negativistic behaviour. The occurrence of ego weakness, (as represented by the low F+‰), together with a high S‰ in the maladjusted group, is evidence of the presence of traits of obstinacy and contumacy in that group.

The S% shows the least significant difference between the groups of all the variables considered above.

The Standard Deviations.

In comparing the Standard Deviations of the Rorschach variables of the total maladjusted group with those of the total average group, the following significant differences are revealed.

(The variables are placed in categories according to the degree of significance of the differences between the two groups. Those variables listed in the category 'Below 1%' show the most significant differences between the groups.)

In every case, the Standard Deviations of the maladjusted group are greater than those of the average group.

Below 1%: C(pure)%; R; Y%; W%; A%; C(sum)%; FC%.

1 - 2%: H%.

2 - 5%: F+%; D%.

The Rorschach Test. The reliability of the differences between the Standard Deviations of the total maladjusted group and the total average group.

	<u>Maladjusted</u>	<u>Average</u>	<u>Reliability of the</u>	
	<u>group.</u>	<u>group.</u>	<u>difference.</u>	
	<u>S.D.</u>	<u>S.D.</u>	<u>Rel.diff.</u>	<u>F.</u>
F+%	15.70	12.04	2.03	(2 - 5%)
F%	10.50	10.16	.25	(80%)
Non-F%	10.50	10.16	.25	(80%)
R	18.65	10.44	4.21	(Below 1%)
W%	12.96	8.04	3.54	(Below 1%)
D%	10.81	8.34	1.98	(2 - 5%)
d%	9.22	7.82	1.27	(20-25%)
M	3.18	2.20	2.80	(Below 1%)
M%	6.27	4.96	1.80	(5 -10%)
C (sum)	2.78	1.36	5.07	(Below 1%)
C (sum)%	5.92	3.86	3.22	(Below 1%)
S	2.72	2.20	1.63	(10-15%)
S%	5.82	4.80	1.48	(10-20%)
P	3.17	2.38	2.20	(2 - 5%)
P%	8.60	6.78	1.83	(5 -10%)
Y	2.91	1.85	3.42	(Below 1%)
Y%	8.05	4.96	3.59	(Below 1%)
V	4.82	2.21	5.44	(Below 1%)
V%	5.72	5.06	.94	(30-40%)
A%	14.14	8.94	3.40	(Below 1%)
H%	12.31	9.00	2.38	(1 - 2%)
Last 3 cards %	7.10	5.60	1.40	(10-20%)
FM+m	3.34	2.64	1.80	(5 -10%)
FM%	4.60	4.86	.43	(60-70%)
C'+c	1.18	.87	2.39	(1 - 2%)
C'+c%	2.78	2.20	1.81	(5 -10%)
C (pure)	.99	.45	5.40	(Below 1%)
C (pure)%	2.22	1.23	4.30	(Below 1%)
CF	1.04	.84	1.67	(5 -10%)
CF%	2.95	2.30	1.91	(5 -10%)
FC	2.83	1.42	4.86	(Below 1%)
EC%	6.66	4.60	2.78	(Below 1%)

The ratios: A comparison of the significant ratios of the total maladjusted group with those of the total average group.

The percentage of cases showing each one of three possible balances of weight on the ratios is indicated below. The weight may fall on either one of the two variables involved in each ratio, or else the weight may be equally distributed between the two variables in the ratio.

(The symbols $>$ $<$ and $=$ signify "Greater than", "Smaller than", and "Equal to", respectively.)

	<u>Maladjusted group.</u>	<u>Average group.</u>
<u>M : C (sum) ratio.</u>	%	%
M $>$ C	47	52
M $<$ C	48	32
M = C	5	16
<u>FM+m : C+e ratio</u>		
FM+m $>$ C+e	75	93
FM+m $<$ C+e	10	0
FM+m = C+e	15	7
<u>A% : H% ratio.</u>		
A% $>$ H%	87	97
A% $<$ H%	8	1.5
A% = H%	5	1.5
<u>SX : XS ratio.</u>		
SX $>$ XS	8	8
SX $<$ XS	62	47
SX = XS	30	45
<u>W% : M% ratio.</u>		
W% $>$ M%	77	78
W% $<$ M%	21	15
W% = M%	2	7
<u>C+CF : FC ratio.</u>		
C+CF $>$ FC	10	8
C+CF $<$ FC	80	75
C+CF = FC	10	17

M:C (sum) ratio: In the maladjusted group 48% of the cases show an extratensive balance of weight, 47% show an introversive balance, and 5% show an ambiequal relationship between M and C (sum). In the average group 52% of the cases are introversive, 32% are extratensive, and 16% are ambiequal. In comparing the groups it is found that the average group shows a greater tendency towards the introversive balance; whereas the maladjusted group shows a greater tendency towards the extratensive balance of weight.

The three main factors in extratensiveness are

- (a) an urge to live in the external environment;
- (b) restless motility; and
- (c) unstable affective reactions.

Therefore, these factors are more characteristic of the maladjusted group than of the average group. In comparing the frequency of occurrence of the ambiequal ratio in the two groups, it is found that the average group shows the greater frequency. Ambiequality implies stability which is expressed by an equal balance between the fantasy life and the affects.

FM+m:C'+c ratio: In the maladjusted group 75% of the cases show a greater balance of weight on FM+m; 15% show an equal balance between FM+m and C'+c; and 10% show a greater balance of weight on C'+c.

In the average group 93% of the cases show a greater balance on FM+m; and 7% show an equal balance between FM+m and C'+c. The occurrence of a greater balance of weight on C'+c is not to be found at all in this group. In comparing the groups it is revealed that the frequency of the occurrence of the $FM+m > C'+c$ balance is greater in the average group; and the $FM+m = C'+c$ balance occurs more frequently in the maladjusted group.

Whereas the M:C ratio represents the experience type, the FM+m : C'+c ratio represents the direction in which the individual is heading in the experience type. In the M:C ratio the ambiequal balance of weight is found most frequently in the average group, but in the FM+m:C'+c ratio it is found most frequently in the maladjusted group. In the average group 32% of the cases show extratensiveness, but no such cases, that is, cases of a greater balance on C'+c, occur in considering the FM+m:C'+c ratios of the average group.

Therefore it would appear that the maladjusted group is heading away from extratensiveness towards introversiveness and ambiequality; and that the average group is heading away from extratensiveness and ambiequality towards introversiveness.

A%:H% ratio. In both groups, the greatest number of cases shows a greater balance of weight on A% than on H%. In the maladjusted group, 8% show a greater balance on H%, and in the average group, 1.5% show a greater balance on H%. An equal balance between the A% and the H% is to be found in 5% of the maladjusted cases, and in 1.5% of the average cases.

Thus, a greater percentage of $A% < H%$ ratios and $A% = H%$ ratios occurs in the maladjusted group than in the average group, and a greater percentage of $A% > H%$ ratios occurs in the average group than in the maladjusted group.

SX:XS ratio. Of the maladjusted cases, 62% show a greater balance of weight on XS, 30% show an equal balance between SX and XS, and 8% show a greater balance of weight on SX. In the average group, 45% of the cases show an equal balance between SX and XS, 47% show a greater weight on XS, and 8% show a greater weight on SX. The white space

percept is indicative of the presence of oppositional tendencies in the individual. These oppositional tendencies may be directed outwards in an aggressive attitude to the external environment of the individual, or else they may be directed inwards in a criticism of the self. SX implies the direction of these forces onto the external world, and XS implies self-criticism. In the maladjusted group, the greater percentage of individuals giving white space percepts show self-criticism, rather than hostility to the external environment. In the average group, the greater percentage of S responses show self-criticism, and next an equal balance between SX and XS, which reveals that in this group, where oppositional tendencies do exist, they are either turned inwards or else not in any specific direction at all. Cases of $SX < XS$ occur in both groups, but they occur more frequently in the maladjusted group. Both groups have the smallest percentage of cases in the $SX > XS$ balance of weight. This points to the fact that in both groups the direction of the oppositional tendencies on to the external environment occurs most infrequently. Therefore we may conclude that when oppositional tendencies are present in the maladjusted group they are directed against the self most frequently.

W% : M% ratio. The frequency with which the different balances of weight occur is similar in both groups. In both the maladjusted and the average groups the greater number of cases show a greater balance on the W% than on the M%. The smallest percentage of cases, in both groups, occurs in the $W% = M%$ category. In comparing the $W% < M%$ ratio in both groups, it is found that the maladjusted

group has a greater percentage of cases showing this balance than the average group. The occurrence of too few W responses and many more M responses implies the existence of too much fantasy, and an insufficient number of W responses with which to stabilise the M responses. This form of the ratio occurs in the average group as well, but not to the extent to which it is found in the maladjusted group.

C+CF:FC ratio. In both groups the greater percentage of cases is to be found in the $C+CF < FC$ form of the ratio. In the maladjusted group 10% of the cases show an equal balance between C+CF and FC, and 10% show a greater balance on C+CF. In the average group, 17% of the cases show an equal balance between C+CF and FC, and 8% show a balance of weight on C+CF. Although the greater number of cases in both groups occurs in the $C+CF < FC$ category, the maladjusted group shows a greater percentage here than does the average group. The maladjusted group also shows a greater percentage of $C+CF > FC$ ratios than the average group; and in the equally-balanced form of the ratio, (that is, $C+CF=FC$), the average group shows a greater percentage than the maladjusted group.

A summary of the comparison of the groups in the intelligence tests and the Rorschach test.

Only those tests and variables which show a significant difference between the means of the compared groups are considered.

(a) A comparison of the sheltered employment group and the first average group.

The average group shows the greater mean in the Maze; Vocabulary; Repetition of digits forwards; Total intelligence test score; P%; D%; FM+m%; F+%; and the A%. The maladjusted group shows the greater mean in the d% and the pure C%.

(b) A comparison of the hospital group and the second average group.

The maladjusted group shows the greater mean in the Vocabulary; C(sum)%; R; and C(pure)%.

(c) A comparison of the sheltered employment group and the hospital group.

The hospital group shows the greater mean in the Vocabulary; Total intelligence test score; Repetition of digits backwards; Repetition of digits forwards; Pattern; Maze; P%; R; FM+m%; F+%; and the D%. The sheltered employment group shows the greater mean in the d%.

(d) A comparison of the first average group and the second average group.

The second average group shows the greater mean in the Repetition of digits backwards; Vocabulary; Total intelligence test score; Pattern; Repetition of digits forwards; d%; and R.

The first average group shows the greater mean in the Maze; D%; and the FC%.

(e) A comparison of the 40 maladjusted unskilled or semi-skilled workers, and the 40 average unskilled or semi-skilled workers.

The average group shows the greater mean in the D%; P%; FM%; F₁% and the A%.

The maladjusted group shows the greater mean in the Repetition of digits backwards; pure C%; and the d%.

(f) A comparison of the 20 maladjusted members of the clerical and professional occupational levels, and the 20 average members of the clerical and professional occupational levels.

The average group shows the greater mean in the Repetition of digits forwards; FM%; and the W%.

The maladjusted group shows the greater mean in the FC%; R; and the d%.

(g) A comparison of the total maladjusted group and the total average group.

The average group shows the greater mean in the Maze; P%; D%; A%; and the F₁%.

The maladjusted group shows the greater mean in the C(pure)%; d%; R; FC%; C(sum)%; and the S%.

The Factor Analysis.The Computation of a Correlation Table.

In considering the total maladjusted group and the total average group it was found that a number of significant differences emerged from a comparison of the intelligence test performance and the Rorschach performance of the two groups.

It was decided to select and intercorrelate those tests and test variables in which a reliable difference between the two groups was apparent.

The selected variables are: F+%, D%; α%; R; C(sum)%; P%; A%; FM%; C(pure)%; FC%; S%; and the Maze. For the purpose of computing a correlation table the maladjusted and average groups were combined, and the total group comprises 120 subjects.

In every case the product-moment method of correlation was employed. In addition, it was decided to institute a method of correlating each of the selected variables with normality. In this case, the biserial correlation was employed. As the two sub-groups, (the average and the maladjusted groups), are equal in number, the formula for the calculation of the biserial correlation is as follows:

$$r_{\text{bis}} = \frac{1.2533 (\bar{x} - \bar{x}_2)}{\sigma_x}$$

where \bar{x} is the mean of the selected variable, and \bar{x}_2 is the mean of the selected variable in the maladjusted group only.

In presenting the table of correlations each variable is numbered as follows:

- I F+%
- II D%
- III α %
- IV R
- V C(sum)%
- VI P%
- VII A%
- VIII FM%
- IX C(pure)%
- X FC%
- XI S%
- XII Maze

XIII Biserial correlation of each variable with normality.

In this, and in the following tables of correlations, the coefficients are taken correct to 3 decimal places, and the decimal point is omitted.

The Centroid Analysis.

Following the computation of a table of correlations it was decided to attempt the extraction of factors from the table. The centroid method was employed in the factorial analysis, and it was possible to extract five factors.

Table of Correlations.

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
I		363	-127	-215	-037	501	269	070	-002	-071	069	268	263
II			-371	-069	003	299	194	141	-036	043	-105	235	354
III				390	-257	-410	004	-051	-030	-191	142	-067	-263
IV					-024	-406	-048	089	069	-095	032	047	-298
V						-043	-166	-163	567	616	049	-146	-238
VI							290	091	-140	-053	-136	193	349
VII								409	-145	015	-158	178	330
VIII									-097	062	-171	117	564
IX										143	228	-095	-081
X											-095	-134	-237
XI												095	-186
XII													193
XIII													

Correlation Matrix, with Guessed Communalities.

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
I	(501)	363	-127	-215	-037	501	269	070	-002	-071	069	268	263
II	363	(371)	-371	-069	003	299	194	141	-036	043	-105	235	354
III	-127	-371	(410)	390	-257	-410	004	-051	-030	-191	142	-087	-263
IV	-215	-069	390	(406)	-024	-406	-048	089	069	-095	032	047	-298
V	-037	003	-257	-024	(616)	-043	-166	-163	567	616	049	-146	-238
VI	501	299	-410	-406	-043	(501)	290	091	-140	-053	-136	193	349
VII	269	194	004	-048	-166	290	(409)	409	-145	015	-158	178	330
VIII	070	141	-051	089	-163	091	409	(564)	-097	062	-171	117	564
IX	-002	-036	-030	069	567	-140	-145	-097	(567)	143	228	-095	-081
X	-071	043	-191	-095	616	-053	015	062	143	(616)	-095	-134	-237
XI	069	-105	142	032	049	-136	-158	-171	228	-095	(228)	095	-186
XII	268	235	-087	047	-146	193	178	117	-095	-134	095	(268)	193
XIII	263	354	-263	-298	-238	349	330	564	-081	-237	186	193	(564)

P.E. Median $r = \pm .0603.$

The Reflection of the Correlations Before the Extraction of the
First Factor.

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	Total Negatives.
Before reflection	5	4	9	7	8	6	4	4	8	7	6	4	6	78
III reflected	4	3	3	8	7	5	5	3	7	6	7	3	5	66
IV reflected	3	2	2	4	6	4	4	4	8	5	8	4	4	58
IX reflected	2	1	3	3	7	3	3	3	4	6	9	3	3	50
XI reflected	3	0	2	2	8	2	2	2	3	5	3	4	2	38
V reflected	2	1	3	3	4	1	1	1	2	6	2	3	1	30
X reflected	1	2	4	4	3	0	2	2	1	6	3	2	0	30

The Reflected Correlation Matrix, with 1st Factor Loads.

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
I	501	363	127	215	057	501	269	070	002	071	-069	268	263
II	363	371	371	069	-003	299	194	141	036	-043	105	235	354
III	127	371	410	390	-257	410	-004	051	-030	-191	142	087	263
IV	215	069	390	406	-024	406	048	-089	069	-095	032	-047	298
V	057	-003	-257	616	043	043	166	163	587	616	049	146	238
VI	501	299	410	043	501	290	290	091	140	053	136	193	349
VII	269	194	-004	048	166	290	409	409	145	-015	158	178	330
VIII	070	141	051	-089	163	091	409	564	097	-062	171	117	564
IX	002	036	-030	069	567	140	145	097	567	143	226	095	081
X	071	-043	-191	-095	616	053	-015	-062	143	616	-095	134	237
XI	-069	105	142	032	049	136	158	171	228	-095	226	-095	186
XII	268	235	087	-047	146	193	178	117	095	134	-095	268	193
XIII	263	354	263	298	238	349	330	564	081	237	186	193	564
Totals of Columns:-	2618	2492	1769	1678	2357	3412	2577	2287	2140	1369	1176	1772	3920
1st Factor loads:-	4814	4583	3253	3086	4334	6274	4739	4206	3935	2518	2163	3259	7209

$$\begin{aligned} \sum r &= 29.567 \\ \sqrt{\sum r} &= 5.438 \\ \frac{1}{\sqrt{\sum r}} &= .183891 \end{aligned}$$

Table showing Residuals after the Extraction of the 1st Factor.

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	
I	(269)	142	-030	066	-172	199	041	-133	-187	-050	-173	111	-084	
II	142	(161)	222	-072	-202	011	-023	-052	-144	-158	006	086	024	
III	-030	222	(304)	290	-398	206	-158	-086	-158	-273	072	-019	028	
IV	066	-072	290	(311)	-158	212	-098	-219	-052	-173	-035	-148	075	
V	-172	-202	-398	-158	(428)	-229	-039	-019	396	507	-045	005	-074	
VI	199	011	206	212	-229	(107)	-007	-173	-107	-105	000	-012	-103	
VII	041	-023	-158	-098	-039	-007	(184)	210	-042	-134	055	024	-012	
VIII	-133	-052	-086	-219	-019	-173	210	(387)	-069	-168	080	-020	261	
IX	-187	-144	-158	-052	396	-107	-042	-069	(412)	044	143	-033	-203	
X	-050	-158	-273	-173	507	-105	-134	-168	044	(553)	-150	052	055	
XI	-173	006	072	-035	-045	000	055	080	143	-150	(181)	-166	030	
XII	111	086	-019	-148	005	-012	024	-020	-033	052	-166	(162)	-042	
XIII	-084	024	028	075	-074	-103	-012	261	-203	055	030	-042	(044)	
Totals of Columns:--	-001	001	000	-001	000	-001	001	-001	000	000	-002	000	-001	= - 005
														Median residual = .148

The Reflection of the Residuals after the Extraction of the 1st Factor.

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	Total Negatives.
Before reflection	7	6	7	8	9	7	8	9	9	8	5	7	6	96
V reflected	6	5	6	7	3	6	7	8	10	9	4	8	5	84
IX reflected	5	4	5	6	2	5	6	7	2	10	5	7	4	68
X reflected	4	3	4	5	1	4	5	6	1	2	4	8	5	52
XII reflected	5	4	3	4	0	3	6	5	2	1	3	4	4	44

Reflected 1st Factor Residual Table, with 2nd Factor Loads.

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
I	269	142	-030	066	172	199	041	-133	187	050	-173	-111	-084
II	142	161	222	-072	202	011	-023	-052	144	158	006	-086	024
III	-030	222	304	290	398	206	-158	-086	158	273	072	019	028
IV	066	-072	290	311	158	212	-098	-219	052	173	-035	148	075
V	172	202	398	158	428	229	039	019	396	507	045	005	074
VI	199	011	206	212	229	107	-007	-173	107	105	000	012	-103
VII	041	-023	-158	-098	039	-007	184	210	042	134	055	-024	-012
VIII	-133	-052	-086	-219	019	-173	210	387	069	168	080	020	261
IX	187	144	158	052	396	107	042	069	412	044	-143	-033	203
X	050	158	273	173	507	105	134	168	044	553	150	052	-055
XI	-173	006	072	-035	045	000	055	080	-143	150	181	166	030
XII	-111	-086	019	148	005	012	-024	020	-033	052	166	162	042
XIII	-084	024	028	075	074	-103	-012	261	203	-055	030	042	044
Totals of Columns:-	595	837	1696	1061	2672	905	383	551	1638	2312	434	372	527
2nd Factor Loads:-	1591	2238	4536	2837	7146	2420	1024	1474	4380	6183	1161	0995	1409

$$\begin{aligned} \sum r &= 13.983 \\ \sqrt{\sum r^2} &= 3.7394 \\ \frac{1}{\sqrt{\sum r^2}} &= .267423 \end{aligned}$$

Table showing Residuals after the Extraction of the 2nd Factor.

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	
I	(244)	106	-102	021	058	160	025	-157	117	-048	-192	-127	-106	
II	106	(111)	120	-136	042	-043	-046	-085	046	020	-020	-108	-008	
III	-102	120	(098)	161	074	096	-205	-153	-041	-008	019	-026	-036	
IV	021	-136	161	(230)	-045	143	-127	-261	-072	-002	-068	120	035	
V	058	042	074	-045	(-083)	056	-034	-086	083	065	-038	-066	-027	
VI	160	-043	096	143	056	(048)	-032	-209	001	-045	-028	-012	-157	
VII	025	-046	-205	-127	-034	-032	(173)	195	-003	071	043	-034	-026	
VIII	-157	-085	-153	-261	-086	-209	195	(365)	004	077	063	005	240	
IX	117	046	-041	-072	083	001	-003	004	(220)	-227	-194	-077	141	
X	-048	020	-008	-002	065	-045	071	077	-227	(171)	078	-010	-142	
XI	-192	-020	019	-068	-038	-028	043	063	-194	078	(167)	154	014	
XII	-127	-108	-026	120	-066	-012	-034	005	-077	-010	154	(152)	028	
XIII	-106	-008	-036	035	-027	-137	-026	240	141	-142	014	028	(024)	
<u>TOTALS:</u>	-001	-001	-003	-001	-001	-002	000	-002	-002	000	-002	-001	000	$\Sigma = -.016$

Median residual = .086

The Reflection of the Residuals after the Extraction of the 2nd Factor.

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	Total Negatives.
Before reflection	6	7	7	7	6	7	8	6	6	7	6	8	7	88
VII reflected	7	6	6	6	5	6	4	7	5	8	7	7	6	80
X reflected	6	7	5	5	6	5	3	8	4	4	8	6	5	72
XI reflected	5	6	6	4	5	4	2	9	3	3	4	7	6	64
VIII reflected	4	5	5	3	4	3	1	3	4	2	3	8	7	52
XII reflected	3	4	4	4	3	2	2	2	3	3	2	4	8	44
XIII reflected	2	3	3	5	2	1	3	1	4	4	1	3	4	36

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Reflected 2nd Factor Residual Table, with 3rd Factor Loads.

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
I	244	106	-102	021	058	160	-025	157	117	048	192	127	106
II	106	111	120	-136	042	-043	046	085	046	-020	020	108	008
III	-102	120	098	161	074	096	205	153	-041	008	-019	028	036
IV	021	-136	161	230	-045	143	127	261	-072	002	068	-120	-035
V	058	042	074	-045	*086	056	034	086	083	-065	038	066	027
VI	160	-043	096	143	056	048	032	209	001	045	028	012	137
VII	-025	046	205	127	034	032	173	195	003	071	043	-034	-026
VIII	157	085	153	261	086	209	195	365	-004	077	063	005	240
IX	117	046	-041	-072	083	001	003	-004	220	227	194	077	-141
X	048	-020	008	002	-065	045	071	077	227	171	078	-010	-142
XI	192	020	-019	068	038	028	043	063	194	078	167	154	014
XII	127	108	026	-120	066	012	-034	005	077	-010	154	152	028
XIII	106	008	036	-035	027	137	-026	240	-141	-142	014	028	024
<u>TOTALS:</u>	1209	493	815	605	540	924	844	1892	710	490	1040	591	276
<u>3rd Factor Loads:</u>	3744	1527	2524	1873	1672	2861	2614	5659	2199	1517	3220	1830	0855

* Diagonal replaced because residual in this case is negative.

$\sum r = 10.429$
 $\sqrt{\sum r} = 3.2294$
 $\frac{1}{\sqrt{\sum r}} = .309655$

Table showing Residuals after the Extraction of the 3rd Factor.

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
I	(104)	049	-197	-049	-005	053	-123	-062	035	-009	071	058	074
II	049	(088)	081	-165	016	-087	006	-005	012	-043	-029	080	-005
III	-197	081	(034)	114	032	024	139	005	-097	-030	-100	-020	014
IV	-049	-165	114	(195)	-076	089	078	151	-113	-026	008	-154	-051
V	-005	016	032	-076	(058)	008	-010	-012	046	-090	-016	035	013
VI	053	-087	024	089	008	(-034)	-043	041	-062	002	-064	-040	112
VII	-123	006	139	078	-010	-043	(105)	042	-055	031	-041	-082	-048
VIII	-062	-005	005	151	-012	041	042	(022)	-133	-012	-126	-102	190
IX	035	012	-097	-113	046	-062	-055	-133	(172)	194	123	037	-160
X	-009	-043	-030	-026	-090	002	031	-012	194	(148)	029	-038	-155
XI	071	-029	-100	008	-016	-064	-041	-126	123	029	(063)	095	-014
XII	058	080	-020	-154	035	-040	-082	-102	037	-038	095	(118)	012
XIII	074	-005	014	-051	013	112	-048	190	-160	-155	-014	012	(017)
TOTALS:	-001	-002	-001	001	-001	-001	-001	-001	-001	001	-001	-001	-001

$\Sigma = -.010$

Median residual = .063

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The Reflection of the Residuals after the Extraction
of the 3rd Factor.

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	Total Negatives.
Before reflection	6	6	5	7	6	5	7	7	6	8	7	6	6	82
X reflected	5	5	4	6	5	6	8	6	7	4	8	5	5	74
XI reflected	6	4	3	7	4	5	7	5	8	3	4	6	4	66
IX reflected	7	5	2	6	5	4	6	4	4	2	3	7	3	58
XII reflected	8	6	1	5	6	3	5	3	3	3	2	5	4	54
I reflected	4	7	0	4	5	4	4	2	2	4	1	4	5	46
II reflected	3	5	1	3	6	3	5	1	1	5	2	3	4	42

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Reflected 3rd Factor Residual Table, with 4th Factor Loads.

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
I	104	049	197	049	005	-053	123	062	035	-009	071	058	-074
II	049	088	-081	165	-016	087	-006	005	012	-043	-029	080	005
III	197	-081	034	114	032	024	139	005	097	030	100	020	014
IV	049	165	114	195	-076	089	078	151	113	026	-008	154	-051
V	005	-016	032	-076	058	008	-010	-012	-046	090	016	-035	013
VI	-053	087	024	089	008	*112	-043	041	062	-002	064	040	112
VII	123	-006	139	078	-010	-043	105	042	055	-031	041	082	-048
VIII	062	005	005	151	-012	041	042	022	133	012	126	102	190
IX	035	012	097	113	-046	062	055	133	172	194	123	037	160
X	-009	-043	030	026	090	-002	-031	012	194	148	029	-038	155
XI	071	-029	100	-008	016	064	041	126	123	029	063	095	014
XII	058	080	020	154	-035	040	082	102	037	-038	095	118	-012
XIII	-074	005	014	-051	013	112	-048	190	160	155	014	-012	017
TOTALS:	617	316	725	999	027	541	527	879	1147	561	705	701	495
4th Factor Loads:	2149	1101	2526	3480	0094	1885	1836	3062	3996	1954	2456	2442	1724

* Diagonal replaced.

$\sum r = 8.240$
 $\sqrt{\sum r} = 2.8706$
 $\frac{1}{\sqrt{\sum r}} = .348359$

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Table showing Residuals after the Extraction of the 4th Factor.

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	
I	(.058)	.025	.143	-.026	.003	-.094	.083	-.004	-.051	-.051	.018	.005	-.111	
II	.025	(.076)	-.109	.127	-.017	.066	-.026	-.029	-.032	-.065	-.056	.053	-.014	
III	.143	-.109	(-.030)	.026	.030	-.024	.093	-.072	-.004	-.019	.038	-.042	-.030	
IV	-.026	.127	.026	(.074)	-.079	.023	.014	.044	-.026	-.042	-.094	.069	-.111	
V	.003	-.017	.030	-.079	(.058)	.006	-.012	-.015	-.050	.088	.014	-.037	.011	
VI	-.094	.066	-.024	.023	.006	(.076)	-.078	-.017	-.013	-.039	.018	-.006	.079	
VII	.083	-.026	.093	.014	-.012	-.078	(.071)	-.014	-.018	-.067	-.004	.037	-.080	
VIII	-.004	-.029	-.072	.044	-.015	-.017	-.014	(-.072)	.011	-.048	.051	.027	.137	
IX	-.051	-.032	-.004	-.026	-.050	-.013	-.018	.011	(.012)	.116	.025	-.061	.091	
X	-.051	-.065	-.019	-.042	.088	-.039	-.067	-.048	.116	(.110)	-.019	-.086	.121	
XI	.018	-.056	.038	-.094	.014	.018	-.004	.051	.025	-.019	(.003)	.035	-.028	
XII	.005	.053	-.042	.069	-.037	-.006	.037	.027	-.061	-.086	.035	(.058)	-.054	
XIII	-.111	-.014	-.030	-.111	.011	.079	-.080	.137	.091	.121	-.028	-.054	(-.013)	
TOTALS:	-.002	-.001	.000	-.001	.000	-.003	-.001	-.001	.000	-.001	-.002	-.002	-.002	$\leq = -.013$

Median residual = .051

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The Reflection of the Residuals after the Extraction of
the 4th Factor.

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	Total Negatives.
Before reflection	6	8	7	6	6	7	8	7	8	9	5	6	7	90
X reflected	5	7	6	5	7	6	7	6	9	3	4	5	8	78
IX reflected	4	6	5	4	6	5	6	7	3	2	5	4	9	66
XIII reflected	3	5	4	3	7	6	5	8	2	1	4	3	3	54
VIII reflected	2	4	3	4	6	5	4	4	1	2	5	4	2	46
V reflected	3	3	4	3	6	6	3	5	2	1	6	3	1	46
VI reflected	2	4	3	4	5	6	2	6	3	2	7	2	0	46
XI reflected	3	3	4	3	4	5	1	5	2	3	5	3	1	42

Reflected 4th Factor Residual Table, with 5th Factor Loads.

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
I	058	025	143	-026	-003	094	083	004	051	051	-018	005	111
II	025	076	-109	127	017	-066	-026	029	032	065	056	053	014
III	143	-109	*143	026	-030	024	093	072	004	019	-038	-042	030
IV	-026	127	026	074	079	-023	014	-044	026	042	094	069	111
V	-003	017	-030	079	058	006	012	-015	-050	088	014	037	011
VI	094	-066	024	-023	006	076	078	-017	-013	-039	018	006	079
VII	083	-026	093	014	012	078	071	014	018	067	004	037	080
VIII	004	029	072	-044	-015	-017	014	*137	011	-048	051	-027	137
IX	051	032	004	026	-050	-013	018	011	012	116	025	061	091
X	051	065	019	042	088	-039	067	-048	116	110	-019	086	121
XI	-018	056	-038	094	014	018	004	051	025	-019	003	-035	-028
XII	005	053	-042	069	037	006	037	-027	061	086	-035	058	054
XIII	111	014	030	111	011	079	080	137	091	121	-028	054	*137
TOTALS:	578	293	335	569	224	223	545	304	384	659	127	362	948
<u>5th Factor Loads:</u>	2453	1244	2422	2415	0951	0947	2313	1290	1630	2797	0539	1536	4024

* Diagonals replaced.

$$\begin{aligned} \sum r &= 5.551 \\ \sqrt{\sum r} &= 2.3561 \\ \frac{1}{\sqrt{\sum r}} &= .424430 \end{aligned}$$

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Table showing Residuals after the Extraction of the 5th Factor.

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	
I	(-002)	-006	108	-085	-026	071	026	-028	011	-018	-031	-033	012	
II	-006	(060)	-127	097	005	-078	-055	013	012	030	049	034	-036	
III	108	-127	(123)	-008	-044	010	060	054	-019	-021	-046	-064	-027	
IV	-085	097	-008	(016)	056	-046	-042	-075	-015	-026	081	032	014	
V	-026	005	-044	056	(049)	-003	-010	-027	-066	061	009	022	-027	
VI	071	-078	010	-046	-003	(067)	056	-029	-028	-066	013	-009	041	
VII	026	-055	060	-042	-010	056	(017)	-016	-020	002	-009	001	-013	
VIII	-028	013	054	-075	-027	-029	-016	(120)	-010	-084	044	-047	085	
IX	011	012	-019	-013	-066	-028	-020	-010	(-015)	070	016	036	025	
X	-018	030	-021	-026	061	-066	002	-084	070	(032)	-034	043	008	
XI	-031	049	-046	081	009	013	-009	044	016	-034	(000)	-043	-050	
XII	-033	034	-064	032	022	-009	001	-047	036	043	-043	(034)	-008	
XIII	012	-036	-027	014	-027	041	-013	085	025	008	-050	-008	(-025)	
<u>TOTALS:</u>	-001	-002	-001	001	-001	-001	-003	000	-001	-003	-001	-002	-001	$\Sigma = -.016$

Median residual = .034.

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After the extraction of the 4th factor, the median residual is .051, which is smaller than the probable error of the median correlation of the original correlation table (.0603). Thus, the possibility arises that these residuals might be due to chance; but, on the other hand, they might be significant, and therefore it was decided to extract a 5th factor.

A factor matrix was compiled from the results of the centroid analysis.

(In this, as in the following tables, the factor loads are taken correct to 3 decimal places, and the decimal point is omitted.)

Centroid matrix, showing the factor loadings for the five factors.

	1.	2.	3.	4.	5.	h^2 .
I	481	159	374	-215	-245	.5028
II	458	224	153	-110	-124	.3108
III	-325	-454	-252	-253	-142	.4594
IV	-309	-284	-187	-348	-242	.3908
V	-433	715	167	009	-095	.7357
VI	627	242	286	189	-095	.5782
VII	474	102	-261	-184	-231	.3904
VIII	421	147	-586	-306	129	.6525
IX	-394	438	220	-400	163	.5821
X	-252	618	-152	195	-280	.5850
XI	-216	-116	322	-246	054	.2272
XII	326	-100	183	-244	-154	.2330
XIII	721	141	-086	-172	402	.7383

The Rotation of the Axes.

The first factors which emerge from the centroid process need not have psychological significance, and in order to interpret the factors psychologically, the reference axes have to be rotated to a significant position.

According to Reyburn and Taylor (On the Interpretation of Common Factors: A criticism and a statement. Psychometrika March 1943).

" common factors, to be of value to us, must not be relative to the batteries of tests into which they enter and by which they are measured all that the analysis of a battery can yield is a hypothesis or the confirmation of a hypothesis."

Using all the established information about the tests in a battery, a hypothesis is constructed concerning a common factor, and a single axis is located which is provisionally accepted only if the factor loadings measured on it are reasonable and intelligible for all the variables in the battery.

On inspection of the variables in the present centroid matrix, it appeared that items VI and XIII had some factor in common. Therefore, the first axis was passed through the centre of gravity of these variables, and the second axis was drawn at right angles to it. A hypothesis was then formulated concerning a second factor which would have heavy loads on variables V and IX, on the assumption that these variables involved a sort of colour factor. Therefore, the axis was passed through the centre of gravity of variables V and IX. Next, a hypothesis was formulated concerning a third factor which would have heavy positive loads on I, VII and XII. In order to locate this factor, the axis was passed through the centre of gravity of these variables. The remaining two axes were graphically plotted, and by inspection it was decided to plot the fourth axis through VIII.

The Rotation of the Axes.

The axes were rotated in order to give psychological significance to the factors.

The first factor was located by passing the axis through VI and XIII.

First Orthogonal Transformation Matrix.

930	-368	0	0	0
264	667	-375	-033	-576
138	349	717	576	-033
012	031	-576	717	375
212	536	033	-375	717

(In this, as in the following orthogonal transformation matrices, the figures are taken correct to 3 decimal places, and the decimal point is omitted.)

Factorial matrix, after the first rotation.

	1.	2.	3.	4.	5.	h^2 .
I	486	-078	324	148	-360	.4988
II	479	-036	085	048	-264	.3100
III	-490	-355	131	-258	073	.4552
IV	-444	-282	165	-257	-134	.3879
V	-211	644	-157	115	-482	.7295
VI	669	-015	002	328	-146	.5767
VII	381	-327	127	-199	-285	.3891
VIII	373	-202	-295	-610	-088	.6468
IX	-191	589	229	-236	-293	.5774
X	-149	308	-462	137	-479	.5787
XI	-179	136	418	-007	003	.2253
XII	267	-213	304	-009	-150	.2317
XIII	779	009	-002	-328	145	.7355

The second factor was located by passing the axis through V and IX.

Second Orthogonal Transformation Matrix.

843	-049	083	530
049	843	-530	083
-083	530	843	049
-530	-083	-049	843

Factorial matrix, after the second rotation.

	1.	2.	3.	4.	5.	h^2 .
I	486	129	385	-036	-311	4991
II	479	110	121	005	-232	3100
III	-490	-310	-015	-320	-128	4552
IV	-444	-137	028	-321	-261	3879
V	-211	781	-063	257	-072	7297
VI	669	038	188	281	-115	5765
VII	381	-102	041	-248	-413	3893
VIII	373	-088	-555	-370	-236	6475
IX	-191	683	063	-257	073	5783
X	-149	480	-292	409	-272	5791
XI	-179	134	342	-216	109	2255
XII	267	-084	274	-179	-215	2317
XIII	779	-042	-188	-282	111	7358

The third factor was located by passing the axis through I, VII and XII.

Third Orthogonal Transformation Matrix.

556	-851	0
-368	-246	898
-746	-499	-445

Factorial matrix, after the third rotation.

	1.	2.	3.	4.	5.	h^2 .
I	486	129	459	-156	106	4991
II	479	110	239	014	107	3103
III	-490	-510	205	155	-231	4556
IV	-444	-137	328	186	-173	3880
V	-211	781	-076	025	263	7301
VI	669	038	087	-168	303	5766
VII	381	-102	422	233	-040	3895
VIII	373	-088	004	670	-228	6478
IX	-191	683	075	-026	-263	5784
X	-149	480	-110	278	488	5801
XI	-179	134	188	-286	-242	2257
XII	267	-084	379	-076	-066	2321
XIII	779	-042	-084	170	302	7358

The remaining two axes were graphically plotted. The fourth factor was located by passing the axis through VIII.

-7

IX

IV

I

III

VI

5+

I

II

7-

III

II

VI

III

V

4+

VII

AXES 4
AND
5

Orthogonal factor matrix, showing the final positions of the five axes.

	1.	2.	3.	4.	5.	h^2 .
I	486	129	459	-182	050	4991
II	479	110	239	-021	106	3103
III	-490	-310	205	221	-169	4556
IV	-444	-137	328	232	-104	3881
V	-211	781	-076	-061	257	7300
VI	669	038	087	-257	333	5769
VII	381	-102	422	233	037	3893
VIII	373	-088	004	707	000	6467
IX	-191	683	075	060	-257	5782
X	-149	480	-110	106	551	5795
XI	-179	134	188	-193	-321	2256
XII	267	-084	379	-051	-087	2322
XIII	779	-042	-084	064	340	7358

These five factors account for certain of the variances of the thirteen variables employed in the factorial analysis. From the h^2 of each variable it may be seen that these factors account for more than 57% of the variance in the case of variables V (C sum %), VI (P%), VIII (FM%), IX (C pure %), X (FC%) and XIII (Normality); for more than 38% of the variance in the case of variables I (F+%), III (d%), IV (R) and VII (A%); and for more than 22% of the variance in the case of variables II (D%), XI (S%) and XII (Maze).

The Interpretation of the Factors.

The First Factor.

The heaviest positive loads occur on VI (P%) and XIII (Normality). There are also fairly heavy positive loads on I (F+%), II (D%), VII (A%), VIII (FM%) and, to a lesser degree, on XII (Maze). The variables P%, F+% and D% are concerned with the selection of popular responses, good form percepts and obvious details. It would appear then, that this factor, which has a high positive correlation with normality, deals with the recognition and selection of forms, and the conformity of the thought processes. Thus it reflects adaptivity, and it projects the ability to think along the lines accepted by other individuals. The fairly heavy positive loads on variables VII and VIII which are concerned with Animal responses, register adaptivity in the sense that the subject is able to recognise the common and palpable stimuli of existence. There is also a positive load on the Maze test. For the successful performance of the Maze it is necessary to be able to select and trace a single pathway from a number of alternatives. The activity necessary for such selective adaptivity may be compared with that required in selecting F+, rather than F-, percepts. There are fairly heavy negative loads on III (d%) and IV (R), which indicate that the selection of minute details is not characteristic of this factor. On the other hand, this factor is concerned with the selection of those forms and percepts which are most frequently recognised by other individuals. Therefore, the first factor is one of social adjustment.

The Second Factor has heavy positive loads on V (C sum %) and IX (C pure %), and a fairly heavy positive load on X (FC%). Therefore it would appear that this factor is concerned with responsiveness to colour. There is a negative load on III (d%) which suggests that the colour percepts that are selected are the

more obvious ones, and are not associated with obscure details. There are no other significant loads on this factor. The positive loads on C sum % and C pure % are heavier than on FC%, and therefore it may be concluded that this factor is more concerned with colour as a separate entity than with the combination of colour and form percepts. Colour in the Rorschach test is used as a measure of emotional activity, and is considered to be indicative of the extent to which the individual is governed by the emotions rather than the intellect. Therefore, the second factor is one of affective feeling tone or sensitivity.

The Third Factor has fairly heavy positive loads on I(F+%), VII(A%) and XII (Maze). Therefore, this factor is concerned not only with the selection of obvious details, but with the selection of "good" form percepts. Thus it goes beyond the "popular thinking" or social adjustment of the first factor, and reveals a refinement of the thought processes and ability to discriminate in the choice of percepts. It is the same selective adaptivity which leads to success in Maze performance. It is the ability to select a single pattern or plan from a number of alternatives, and to readjust that plan in the face of increasing difficulties. The activity necessary for such selective adaptivity may be compared with that required in selecting F+, rather than F-, percepts, as has been pointed out in the discussion of the first factor.

There are also positive loads on IV (R), II (D%) and III (d%), thus indicating that this form of perceptual selection may be applied both to obvious and minute details, as the emphasis here lies on the selection of "good" forms as well as on the more common ones. It is a factor of perceptual discrimination.

The Fourth Factor. There is only one heavy positive load, and that is on VIII (FM%). This variable is concerned with Animal Movement responses, and therefore, as is to be expected, there is

also a positive load on VII (A%). The projection of movement on to the objectively static ink-blot, (in this case, on to the animal forms), implies the use of the subject's imagination. The occurrence of positive loads on IV (R), and III (I%), indicates an association between this factor and the production of a large number of responses, particularly in the form of minute or less obvious details. This is in accordance with the negative load on VI (P%) which implies the absence of the more popular or obvious percepts. Therefore this factor is concerned with the use of the imagination rather than the intellect, and is coupled with high productivity. It implies the existence of fantasy activity.

The Fifth Factor has a fairly heavy positive load on X (FC%), and there are also positive loads on V (C sum %), VI (P%) and XIII (Normality). There are negative loads on XI (S%) and IX (C pure %). This factor is thus concerned with refinements within the category of the colour responses. Thus it is shown that the FC% is the more adaptive type of emotional response in which an attempt is made to control colour by the use of form. Thus there is a negative load on IX (C pure %) in which the affects have broken away from the intellect; and there is a positive load on V (C sum %), in which colour and form combinations occur with pure colour responses. The median residual is low and therefore too much confidence should not be placed in the interpretation of this factor.

The application of the results of the factor analysis to the results of the main investigation.

The results described below are concerned with factors of temperament and intelligence. If the findings of the factor analysis are applied to the comparison of the total maladjusted group and the total average group, the following results are revealed.

1. Social adjustment. The average group shows greater evidence of social adjustment than the maladjusted group. The maladjusted individual is lacking in conformity and adaptivity of perception and thought processes. This inability (or unwillingness) to think along the lines accepted by other individuals is a reflection of social maladjustment.
2. Affective feeling tone or sensitivity. There is greater evidence of responsiveness to colour in the maladjusted group than in the average group. This is indicative of the greater affective sensitivity of the maladjusted individuals, who are inclined to be governed by the emotions rather than the intellect.
3. The factor of perceptual discrimination has fairly heavy positive loads on the variables I (F+%), VII (A%), and XII (Maze). In considering the significant differences between the means of the groups, it was found that the average group is superior to the maladjusted group in these three variables. This factor is concerned with the ability to discriminate in the choice of percepts. It is the ability to select a pattern or plan from a number of alternatives, and to modify that plan in the face of increasing difficulties. In this investigation, the average individual shows a greater capacity for selective adaptivity than the maladjusted individual.
4. Fantasy activity. As measured by the FM%, it would appear that this factor is characteristic of the average

group. Thus the average individual shows a greater capacity for the constructive use of the imagination in responding to the Rorschach figures. The ability to project movement on to the inkblots occurs more frequently in the average group.

5. The fifth factor is concerned with colour responses that are controlled by considerations of form. It has been shown above that the maladjusted group manifests a greater degree of sensitivity towards colour than the average group. This preoccupation with colour is to be found in the C sum %, the C pure %, the CF%, and the FC%. When comparing the total maladjusted group with the total average group, it was found that the FC% occurs more frequently in the maladjusted group. This was interpreted as being part of the general affective stimulability of that group. Although it occurs more frequently in the maladjusted individual, it does not imply that the maladjusted individual is more capable of controlled emotionality than the average individual. It must be remembered that the FC% occurs most frequently of all the colour responses in both the average and the maladjusted groups. Thus in both groups, 'form-controlled' colour occurs more frequently than uncontrolled colour, but in the maladjusted group, colour responses, whether uncontrolled or controlled, occur more frequently than in the average group. In addition, the $C+CF > FC$ ratio occurs more frequently in the maladjusted group. Thus, the 'form-colour' combination cannot be isolated or separated from the total colour reactivity. When considered separately, it reflects a modified form of colour sensitivity. It must be emphasised that the median residual is low, and therefore it is not possible to place overmuch confidence in this factor.

The investigation is an attempt to discover features of temperament, intelligence, and socio-economic background which are peculiar to the maladjusted worker, and which differentiate the maladjusted worker from the average worker.

The results of the investigation have been given above. The conclusions drawn from a consideration of the socio-economic factors are to be found under the heading of 'the socio-economic background' in comparison (g), or the comparison of the total maladjusted group and the total average group.

The results of the investigation of the features of temperament and intelligence have been given above. The significant variables were intercorrelated, and five factors were extracted from the correlation matrix. The conclusions to be drawn from the consideration of the traits of temperament and intelligence are to be found in the application of the results of the factor analysis to the findings of the comparison of the total maladjusted group and the total average group in the main investigation. The results reveal a lack of social adjustment, perceptual discrimination, and fantasy activity, coupled with the presence of affective sensitivity, in the maladjusted worker. The work situation is one of social interaction, so that the absence of social adjustment is closely interrelated with the presence of work maladjustment, or, in more extreme cases, work failure. The lack of perceptual discrimination implies an inability to select the most appropriate method of dealing with a situation, and also an inability to modify a plan in the face of increasing difficulties. In addition, the maladjusted individual is lacking in the creative use of the imagination. Therefore, the deficiency of the maladjusted group lies in the perceptual and fantasy activity, as

well as in the high degree of emotional reactivity. These then are the features of temperament and intelligence which are peculiar to the maladjusted worker, and which differentiate the maladjusted worker from the average worker.

The Main Investigation.

Summary and Conclusions.

The investigation is an attempt to discover features of temperament, intelligence, and socio-economic background which are peculiar to the maladjusted worker, and which differentiate the maladjusted worker from the average worker.

The main investigation is concerned with the second and third gradations of work maladjustment described above. The second gradation of work maladjustment is to be found in the individual who is unable to compete for, or to retain, employment in the open labour market, and who, subsequently to the occurrence of a series of work failures, is relegated to sheltered employment. The third gradation of maladjustment includes those workers who are hospitalized as a result of the occurrence of a series of work failures, or a breakdown in the work situation.

The results of the survey of the maladjusted workers are compared with those obtained from a similar survey of a group of average workers. The maladjusted group comprises sixty subjects, (twenty workers in sheltered employment, and forty hospitalized workers); and the average group is composed of sixty subjects as well. Both the maladjusted and the average groups may be divided into three occupational categories.

67% of the subjects in each of the two groups are unskilled or semi-skilled workers.

23% of the subjects are clerical workers; and

10% of the subjects are members of the professional occupational level.

In investigating traits of temperament and intelligence, the Rorschach test, and five tests of intelligence were

applied individually to each subject.

The significance of the results is considered in terms of comparisons with the average group. A series of seven comparisons were drawn.

(a) A comparison of the sheltered employment group and the first average group reveals the average group to be superior to the sheltered employment group in three tests of intelligence, and in the total intelligence score. The Rorschach results reveal the maladjusted individual to be impulsive and emotional, and lacking in adaptivity and conformity of the thought processes. In addition, the maladjusted individual is inclined to avoid the obvious, and instead pays attention to minor details. Stability of the personality is lacking in these individuals.

(b) A comparison of the hospital group and the second average group reveals the maladjusted group to be superior to the average group in the Vocabulary test. In addition, the maladjusted group shows a greater degree of colour responsiveness and productivity in the Rorschach test. Thus, the hospitalised individual shows a great deal of emotionality, coupled with a tendency to let the attention wander in a superficial manner from one minor detail to another.

(c) A comparison of the sheltered employment group and the hospital group reveals the superiority of the hospital group in intelligence test performance. It must be noted that there are marked differences in educational and occupational level between the groups. The hospital group has the superior educational level, and it comprises clerical and professional workers as well as unskilled or semi-skilled workers. The sheltered employment group consists in unskilled or semi-skilled workers only.

In addition, the hospital group is superior to the sheltered employment group in the P%; R; FM+m%; F+%; and the D%. The sheltered employment group shows the greater

mean in the d%.

(d) A comparison of the first average group and the second average group. Here again, the difference is one of occupational and educational level. The second average group has the superior educational level, and it includes professional and clerical workers as well as unskilled or semi-skilled workers. The first average group is composed of unskilled or semi-skilled workers only. The second average group is superior to the first in four tests of intelligence, the total intelligence score, and the R variable. The first average group is superior in the Maze test, the D%, and the FC%. Thus it would appear here that a superior educational background leads to greater productivity in the performance of the Rorschach test.

(e) A comparison of the 40 maladjusted unskilled or semi-skilled workers, and the 40 average unskilled or semi-skilled workers. The maladjusted group is superior to the average group in one test of intelligence, that is, the repetition of digits backwards. Features of Rorschach performance to be found in the maladjusted group are, a preoccupation with colour stimuli, and the over-emphasis of minute details. The average individual shows conformity and adaptivity of the thought processes, the choice of obvious facts and good form responses, and the use of the imagination.

(f) A comparison of the 20 maladjusted members of the clerical and professional occupational levels, and the 20 average members of the clerical and professional occupational levels. In the intelligence tests, only one significant difference is to be found, and that is in the repetition of digits, in which the average group is superior to the maladjusted group. In the Rorschach test, the maladjusted group shows a tendency for greater productivity in the performance of the test, the over-emphasis of minute, and often trivial details, and a preoccupation with the effective stimuli. The average group shows a greater capacity in facing

situation as a whole, and also in the constructive use of the imagination.

(g) A comparison of the total maladjusted group and the total average group. In the intelligence test battery, the most significant difference occurs in the Maze test. The average group is superior to the maladjusted group in this instance. The implications of Maze performance are discussed in the initial investigation, and also in connection with the factorial analysis in the main investigation. The Rorschach results reveal the maladjusted individual to be less capable of adaptivity and conformity of thought and perception than the average individual. The maladjusted group also shows a greater preoccupation with affective stimuli, and is inclined to be governed by the emotions rather than the intellect. The maladjusted individual is also inclined to pay more attention to minor details, and is more productive in the performance of this test than the average individual. The average individual is superior in the use of the creative imagination. In considering the FM score, it was found that the average group is superior to the maladjusted group, and for this reason, a revised interpretation of the FM variable is suggested. For the purpose of this investigation, the FM response is defined as one in which movement is projected on to an animal percept. One interpretative value of FM is that it is an avoidance reaction which causes the projection of human movement on to animals rather than humans, and thus implies emotional immaturity. In this instance, however, the FM score may be regarded as being a combination of the selection of animal responses and the projection of movement on to those responses. The A responses are measures of adaptivity and of stereotyped thought processes. Movement responses suggest the use of the imagination. Thus the superior FM score of the average group may be interpreted as being an indication of

the greater degree of stereotyped adaptive perception and fantasy activity to be found in that group.

The FC% is interpreted as a measure of affective stimula- bility as well as being a measure of the more adaptive form of emotional reactivity. The occurrence of a greater mean FC% in the maladjusted group does not necessarily imply a greater capacity for emotional adaptivity in the maladjusted individual. The FC% should be considered in conjunction with the other colour responses, and it is then found that the maladjusted group has the greater mean C(sum)% and C(pure)%, the latter being a measure of the unadaptive or uncontrolled affects. Therefore, the FC% is regarded as being a measure of emotional reactivity. In considering the C+CF: FC ratio, it was found that the greater number of cases occurs in the $C+CF < FC$ category in both the maladjusted and the average groups. But on the other hand, the maladjusted group shows a greater percentage of $C+CF > FC$ ratios than the average group. The following results emerged from a consideration of the significant ratios.

The M:C ratio reveals a tendency on the part of the average group towards the introversive balance, whereas the maladjusted group shows a greater tendency towards extratensiveness.

The FM:m: C'½c ratio reveals that the maladjusted group is heading away from extratensiveness towards introversiveness and ambiequality, and that the average group is heading away from extratensiveness and ambiequality towards introversiveness.

In the A%:H% ratio it is found that a greater percentage of $A% < H%$ ratios and $A%=H%$ ratios occur in the maladjusted group, and that a greater percentage of $A% > H%$ ratios occurs in the average group. The normal A%:H% ratio is 2:1. The SX:XS ratio reveals that when oppositional tendencies are present in the maladjusted group they are directed

against the self most frequently. In both groups, the direction of the oppositional tendencies on to the external environment occurs most infrequently. In both groups, the W%:M% ratio reveals that the balance of weight falls on the W% most frequently. The emphasis of the M% occurs more frequently in the maladjusted group than in the average group. It implies the existence of too much fantasy, and an insufficient number of W responses with which to stabilise the M responses.

The C+CF: FC ratio reveals the occurrence of a greater percentage of $C+CF > FC$ ratios in the maladjusted group. The average group shows a greater percentage of $C+CF = FC$ ratios than the maladjusted group. In both groups, the greater number of cases occurs in the $C+CF < FC$ category. Having compared the total maladjusted group and the total average group, the two groups were combined, and thirteen variables, (including the biserial correlation of each variable with 'normality - abnormality'), were selected and intercorrelated. Five factors were extracted from the correlation matrix. They are

1. Social adjustment. This indicates adaptivity and conformity of thought and perception. It is the capacity to think along the lines accepted by other individuals. This factor is a distinguishing feature of the average group.
2. Affective feeling tone or sensitivity. This is a feature of the maladjusted group, as indicated by the responsiveness to colour. It is a measure of the extent to which the individual is governed by the emotions rather than the intellect.
3. Perceptual discrimination. This factor is a characteristic of the average group, and reveals a refinement of the thought processes and ability to discriminate in the choice of percepts. It is a form of selective adaptivity.

4. Fantasy activity. This factor is concerned with the use of the creative imagination. It is a feature of the average group, as measured by the FM%.

5. The fifth factor is concerned with refinements within the category of the colour responses. It is concerned with emotional reactivity, but the emphasis is placed on the combination of colour with form.

In comparing the socio-economic background of the groups, it was found that, in every case, the educational level of the average groups is superior to that of the maladjusted group, and a hypothesis was formulated as to the significance of this feature. One or other of two possible interpretations may be applied. The lower educational level of the maladjusted group may be caused by the existence of maladjustment in the individual during the school years. Thus the individual begins
with/....

a weakness which forms the basis for the occurrence of maladjustments at a later stage. Or else, the lower educational level of the maladjusted group, (irrespective of the possible causes of such a low educational level), will result in a lack of opportunity to learn and to receive occupational training, and this in turn will lead to the occurrence of job and personality maladjustments when the individual enters a wage-earning occupation. In other words, a lower educational level either is caused by the previous existence of maladjustments, or else it is a causative factor in work maladjustment.

The comparison of the groups revealed also that the average age of the maladjusted worker is higher than that of the average worker. Thus, the maladjusted worker tends to be the older worker. This indicates that a work failure will not occur immediately upon the entrance of the individual into uncongenial employment. As time passes, the manifestations of maladjustment are reinforced until they become habits of behaviour, and eventually this will necessitate the withdrawal of the individual from employment in the open labour market.

The investigation is based on the assumption that there are three causative factors in work maladjustment, and that they are closely interrelated and cannot be separated from one another, although each has its own problems of cause and effect. The factors are

- (i) a maladjusted personality;
- (ii) a specialized job disability; and
- (iii) a faulty physical condition which gives rise to personality and job maladjustments.

It has been suggested that a low school educational level, which results in a lack of specialized job training, is at

the basis of work maladjustment. Thus, a lack of aptitude for a specific job is related to the incidence of maladjustment in the work situation. However, it is impossible to generalise from the findings of the present investigation as to whether work maladjustment causes personality maladjustment, or whether personality maladjustment is the cause of work maladjustment.

In considering features of temperament and intelligence, it was found that the inferiority of the maladjusted group is one of perception, emotion, and imagination. The maladjusted individual is unable to recognise and interpret common stimuli of everyday existence. It is an inability to think along the lines accepted by other individuals. The maladjusted individual is deficient in selective adaptivity and in social adjustment. The work situation involves social interaction, and therefore a lack of social adjustment will reflect itself in work maladjustment. In addition, the maladjusted individual is lacking in the use of creative imagination, and is inclined to be governed by the emotions rather than the intellect.

It must be emphasised that these findings are derived from a survey of a comparatively limited sample of the population. Thus, any conclusions that are reached are valid only in considering groups such as those selected for the purpose of the present investigation, and employing methods and measures of investigation similar to those described above. The investigation also serves to indicate the efficacy of the selected measures in disclosing maladjustments in the individual. The value is twofold, in that the measures may be employed usefully in detecting and extricating the maladjusted individual from the work situation before a work failure occurs; and they are useful also in denoting deviations from the norm that are to be found in various clinical groups.

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