

this the whole answer, for it does not explain the success of strapping plus early movement. He suggests that active use improves the circulation, so that tissue metabolism and repair are enhanced and extravasated blood and serum are mechanically expressed from the injured part; the swelling and stiffness produced by stasis are thus quickly reduced.

Special Articles

NEUROSIS AND INTELLIGENCE

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It is often maintained that there is a correlation between neurosis and intelligence, and even between specific syndromes, such as hysteria, and intellectual level. Thus Hollingworth (1920, 1931), who applied mental tests to several hundred soldiers with neurotic and other mental and nervous disorders, found that "except for the psychasthenic group, all the classifications of 'psychoneurosis' fall definitely below the mental level of the average recruit." Similar results were obtained by Tendler (1923), who found a median mental age of 12.0 in sixty civilian neurotics, compared with a mental age of 14.3 in normal controls. Hollingworth found that among his subjects the psychasthenic were superior in intelligence to the neurasthenic, and those in turn to the hysterics. He interpreted these results as giving support to Rivers's hypothesis (1918) that the more psychical symptoms tend to occur mainly among the intelligent and the more physical symptoms mainly among the dull. Tendler's results did not bear out Hollingworth's findings, the hysterics obtaining higher scores than either of the other two groups. It has been suggested that this discrepancy may have been due to the fact that Tendler excluded illiterate subjects from his sample. The results reported by Michaels and Schilling (1936) from their work on psychoneurotics did not support the hypothesis that neurotics are on the average less intelligent than normal people. They used both the Binet and the Porteus tests, and found that the sample of neurotics tested showed an average Binet mental age of 15.0 years, and a Porteus mental age of 14.5 years.

In view of these conflicting results, and partly because of the frequent criticisms of the Binet test in connexion with the testing of neurotic adults (Wells and Kelley 1920, Piotrowski 1937, Krugman 1939), the average scores are here published of some 3000 neurotic men and women in the progressive matrices test of intelligence which is given as a routine test to all incoming patients at Mill Hill Emergency Hospital. This is a perceptual test of intelligence, which divides subjects into five grades, containing respectively 5%, 20%, 50%, 20% and 5% of the total population (Raven 1941, 1942). The most intelligent 5% of the population are in grade I, the least intelligent 5% in grade V.

In table I are set out the numbers of cases in each of the eight diagnostic groups in use at the hospital, the percentages they form of the total population examined, and the average matrices grades of the subgroups and

of the whole groups. In general, the men are very slightly below average, while the women are even more slightly above average.¹ This difference between the sexes, although statistically significant, is probably due to external causes (differential selection, &c.) unconnected with neurosis. The fact that the men are very slightly below average in intelligence is also probably due to selection rather than to any connexion between neurosis and low intelligence; it must be remembered that the hospital deals exclusively with NCOs and other ranks, while the (usually more intelligent) officers are dealt with elsewhere. Thus our analysis does not cover a true sample of the whole population, and a deviation of the kind under discussion was only to be expected.

Our results regarding the relation between intelligence and neurosis are in direct opposition to those of Hollingworth (1920) and Tendler (1923). One way in which a reconciliation might be effected is suggested by Babcock (1941), who found that "the lower intelligence of neurotics . . . is caused by weakness in the efficiency phase of mental organisation rather than in ability to abstract and reason" (p. 256). If we accept her thesis that "efficiency of mental functioning is a significant factor which is distinct from level of intelligence" (p. 277), and her demonstration that extremes of neuroticism are related to very low efficiency scores (1940), then

TABLE I—RESULTS OF PROGRESSIVE MATRICES TEST IN EIGHT GROUPS OF NEUROTIC PATIENTS

Diagnosis	No. of cases		Percentages		Matrices grades	
	M	F	M	F	M	F
Anxiety:						
acute severe ...	131	9	5.0	2.1	3.09	3.00
acute mild ...	409	65	15.5	14.8	3.09	2.95
chronic ...	759	53	28.7	12.1	3.01	2.62
Hysteria:						
conversion ...	478	90	18.1	20.5	3.27	3.23
dysmnestic ...	103	19	3.9	4.3	3.10	2.42
Psychopathic personality	206	56	7.8	12.8	3.00	3.11
Depression:						
reactive ...	469	117	17.3	26.7	3.03	2.87
endogenous ...	91	30	3.4	6.8	3.04	2.97
Totals ...	2646	439	3.08	2.95

it becomes possible to argue that the tests used by Hollingworth and Tendler were of "efficiency," while the test used in this investigation was of "level of intelligence."² While the concept of "efficiency" is by no means clear, the evidence for some such division as Babcock suggests is rather strong, and her hypothesis might well be adopted as a basis for further research. The results reported in this paper are compatible with

1. In dealing with the results of women, the difficulty arises that the test has only been properly standardised on men. I understand that no great differences between the sexes have become apparent, and that therefore it is probably legitimate to compare the scores of the women included in this survey with the standards derived from male samples. It should, however, be borne in mind that results reported for women are subject to modification if any sex-differences should be found in the general population.
2. The matrices test is a timeless test, and thus fulfils one essential condition of Babcock's requirements for a test of "level" as opposed to "efficiency."

TABLE II—PERCENTAGES OF NEUROTIC PATIENTS SHOWING INTELLIGENCE ABOVE AVERAGE, AVERAGE, OR BELOW AVERAGE

Diagnosis	MALES			FEMALES		
	Above av.	Average	Below av.	Above av.	Average	Below av.
Anxiety—						
Acute severe ...	25.9 ± 3.8	43.5 ± 4.3	30.5 ± 4.0	33.3 ± 15.7	33.3 ± 15.7	33.3 ± 15.7
Acute mild ...	26.4 ± 2.2	41.6 ± 2.4	32.0 ± 2.3	32.4 ± 5.8	40.0 ± 6.1	27.7 ± 5.6
Chronic ...	26.9 ± 1.6	42.3 ± 1.8	30.8 ± 1.6	41.5 ± 6.8	45.3 ± 6.8	13.2 ± 4.6
Hysteria—						
Conversion ...	21.1 ± 1.9	40.8 ± 2.2	38.0 ± 2.2	25.5 ± 4.6	35.6 ± 5.0	38.9 ± 5.1
Dysmnestic ...	25.3 ± 4.3	40.8 ± 4.8	33.9 ± 4.7	47.4 ± 11.5	47.4 ± 11.5	5.3 ± 5.1
Psychopathic personality	31.0 ± 3.2	37.3 ± 3.4	31.5 ± 3.2	30.3 ± 6.1	30.4 ± 6.1	39.3 ± 6.5
Depression—						
Reactive ...	26.0 ± 2.0	43.1 ± 2.3	30.9 ± 2.1	29.1 ± 4.2	48.7 ± 4.6	22.2 ± 3.8
Endogenous ...	33.0 ± 4.9	29.7 ± 4.8	37.4 ± 5.1	36.7 ± 8.8	33.3 ± 8.7	30.0 ± 8.4
Whole series	26.1 ± 0.9	41.2 ± 1.0	32.7 ± 0.9	31.9 ± 2.2	40.6 ± 2.3	27.6 ± 2.1

her view. We are thus led to conclude that neurotics do not, on the average, differ from normal people in their intellectual level; any intellectual inferiority that may be found is due to a weakness in their "efficiency of mental functioning."

It will be seen that, among both men and women, conversion hysterics are on the average distinctly less intelligent than other neurotics, while dysmnesic hysterics are on the whole of average intelligence, or slightly above average. Patients suffering from chronic anxiety are on the average more intelligent than other neurotics; this is true of men and women alike. Patients suffering from acute anxiety are about average. These trends, as far as they go, seem to bear out Rivers's hypothesis, and support Hollingworth's results. The fact that psychopathic personalities show on the average the highest intelligence among men, while among the women they are the second dullest group, may be significant only in so far as it throws some light on the bases of diagnosis adopted by the respective psychiatrists. More than that our data do not enable us to say.

Table II shows the percentages of cases falling into grades I and II (above average intelligence), grade III (average intelligence), and grades IV and V (below average intelligence), separately for the two sexes and for the eight diagnostic groups. With these percentages are given in each case the standard errors, to show the statistical significance of the results. These errors are comparatively small for the men, because of the rather large numbers involved; they are a good deal larger for the women.

The exact distribution of the 2646 male and 439 female cases on the five-point matrices scale is shown in greater detail in the figure for men and women separately. Also included in this figure for purposes of comparison, is a histogram giving the intelligence gradings for 3665 non-neurotic army conscripts (Raven 1941). This diagram brings out the same point as

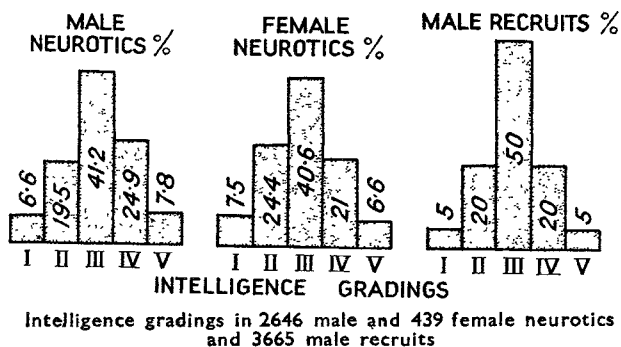


table II. While on the average the intelligence of neurotic men and women is neither considerably above nor considerably below that of non-neurotic men and women, the curve of distribution is distinctly platykurtic for the neurotics, as compared with the mesokurtic type of curve found with normal subjects. In other words, among the neurotics tested there were far less cases of average intelligence (grade III) than one would have expected, and far more cases of either high or low intelligence. For both men and women, we find only about 40% in grade III, while we should expect approximately 50%; this difference is statistically significant beyond any possible doubt. Similarly, instead of 25% in grades I and II, 31.9% of the women are in these grades, and instead of 25% in grades IV and V, 32.7% of the men are in these grades. These differences are also statistically significant.

As far as they go, these results disprove the belief that neurosis is directly correlated with low intelligence, and rather support the view, often voiced by psychologists and psychiatrists, that it is people of over-average intelligence, as well as people of under-average intelligence, who are likely to become maladjusted to their environment and develop a neurosis, while the average person is less likely to become maladjusted.

One or two minor points arise from the findings. It has often been maintained that depressed and anxious patients are not likely to do themselves justice on an intelligence test, because of their self-centred attitude and lack of interest in the outer world. The figures on the whole do not support this view: depressed and

anxious patients are just about average, as compared with the other patients. This is true of both men and women.

It will be seen from the tables that male patients are more often diagnosed as "anxiety" cases (50% compared with 25% for women), while women are more often diagnosed as "depression" cases (33% compared with 21% for men). It should not be concluded that these figures necessarily indicate any genuine sex-difference; most likely they are due to differential selection of cases referred to the hospital, and to different criteria employed by the psychiatrists at the hospital.

SUMMARY

The records of some 3000 male and female neurotic Service patients (NCOs and other ranks) at the Mill Hill Emergency Hospital on the progressive matrices test of intelligence have been analysed.

The neurotic group tested is on the average neither more nor less intelligent than comparable non-neurotic groups.

Taken in conjunction with previous results, this finding supports the view that the lower intelligence of neurotics is caused by a weakness in the efficiency of mental functioning, rather than by their inability to abstract and reason.

Conversion hysterics are on the average less intelligent than other neurotics, while dysmnesic hysterics are on the whole of average intelligence.

Patients suffering from chronic anxiety are on the average more intelligent than other neurotics.

The distribution of scores in the neurotic groups is distinctly abnormal (platykurtic); there are far fewer cases of average intelligence, and more cases of above-average and below-average intelligence than would be found in a comparable sample of the normal population.

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REFERENCES

- Babcock, H. (1940) *Amer. J. Orthopsychiat.* **10**, 3. (1941) *Time and the Mind*, Boston.
 Hollingworth, H. L. (1920) *Psychology of Functional Neuroses*, New York. (1931) *Abnormal Psychology*, London.
 Krugman, M. (1939) *J. educ. Psychol.* **30**, 594.
 Michaels, J. M. and Schilling, M. E. (1936) *Amer. J. Orthopsychiat.* **6**, 7.
 Piotrowski, Z. (1937) *Psychiat. Quart.* **11**, 623.
 Raven, T. C. (1941) *Brit. J. med. Psychol.* **19**, 137; (1942) *Lancet*, *i*, 115.
 Rivers, W. H. R. (1918) *Ment. Hyg. Concord.* **2**, 513.
 Tendler, A. D. (1923) *Arch. Psychol.* No. 60.
 Wells, F. L. and Kelley, C. M. (1920) *Amer. J. Insan.* **77**, 17.

ASSOCIATION OF PORT HEALTH AUTHORITIES

On Sept. 3 this association held its autumn meeting at Glasgow, where it was able to study the arrangements for the health and welfare of the Merchant Navy described by Sir Alexander Macgregor in a memorandum reviewed in these columns on June 26, p. 807. After a welcome by the Lord Provost, the association heard addresses on port welfare (Colonel Hugh Campbell), hospital facilities for merchant seamen (Dr. A. D. Briggs), medical services for merchant seamen (Dr. Alexander Hutchison), and medical arrangements for dockers in ports (Dr. George Buchanan). These were followed by a discussion summed up by Sir Alexander Macgregor. The general conclusion reached was that although the war has given a much-needed impetus to provision for the health and welfare of seamen, which in practice at the principal ports now works reasonably well, it ought not to be left to chance to decide whether such provision continues and is improved after the war. It should be given priority in postwar planning so as to be stabilised as an integral part of the mercantile marine. The association was glad to hear from Dr. M. T. Morgan that one of its detailed recommendations—namely, the training of sick-bay stewards for the Merchant Navy—is now being considered.

At the business meeting Alderman W. E. Copeland, the president, referred to the recent resignation of Dr. Greenwood Wilson (Cardiff) from the hon. secretaryship, and expressed appreciation of his excellent service during seven years' tenure of the position. A presentation is to be made to Dr. Wilson at some convenient time.