THE MENTAL DEFECTIVE IN THE ARMY*

BY

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It is vital to success in military operations that commanding officers should know the limitations and weaknesses of the units they employ no less than their numerical and physical strength. Mental defectives constitute such a point of weakness, a matter which is the more important because it is often not recognized till too late. This paper discusses the evidence that mental defectives are a hindrance to a modern army, easy and quick methods of detecting them, and recommendations for removing the more serious cases of defect at an early stage.

The Defective a Hindrance to the Unit

The mental defective differs from the normal person in that he is less able to meet new situations, is backward in learning, has less foresight and therefore does not appreciate the risks he is bringing on himself and others, has less initiative, and is slower in thought and action. In the Army of to-day, in which complicated machines are increasingly used, speed in action is essential both to success in battle and to the safety of the unit; the soldier must have more initiative and a better understanding of technical apparatus than were needed in former wars. The bow-and-arrow was simpler than the flintlock, which is a toy beside the machine-gun. The mental defective who can only master the rifle is at a disadvantage compared with those who can handle, clean, and maintain more complicated weapons, and he cannot in an emergency give them enough support.

Mental defectives are slow learners, and therefore hold back the training of normal men. The lower the mental age the more difficult they are to train. In my experience all those of a mental age of up to 7 years 11 months are untrainable; 86% of those with a mental age of 8 years, 58% of 9 years, 33% of 10 years, 28% of 11 years (see Chart).

Case A.—This man was notified by the National Service Recruiting Board to be "slow mentally and illiterate"; on account of this he was placed in Grade II. As he was untrainable he was sent to me for examination six months after joining up. His mental age was 5½ years. He told me he had been a sentry for five months. When asked about this, he said that he couldn't fire a gun and was generally terrified of being left alone in the dark. He had been put to guarding a gun site. In peacetime he could practically get no work. He had held two jobs in seventeen and a half years, and had been out of employment for fifteen years of this time.

Case B.—A man in the Royal Engineers was frequently crimed for petty offences, such as changing his billet without permission, arriving late on duty, etc. He seemed unable to realize that he had broken regulations, though he had been in the Forces for eighteen months; it was apparently impossible to train him as a soldier. His mental age was 6 years.

Case C.—This man wept copiously as soon as we began to talk. His medical officer said he was asocial and was shunned by

his comrades. He was untrainable after five months in the Army and was useless even for fatigues. He was very worried about leaving his six children, as his wife was going to have another soon. He was illiterate, and his mental age was 4½. He did not know whom the war was against—in fact, he was not aware that there was a war on.

It would not have been difficult to discern that these men would never make soldiers if those responsible for their acceptance had been aware that mental deficiency was a definite hindrance to military efficiency.

The mental defective unable to cope with his new environment is more prone to report sick for small and varied ailments. In a series of 100 cases sent to me for examination for mental deficiency 42% were chronically sick. Most were not seriously or even moderately ill.

Case D.—A man aged 23, six months in the Royal Artillery, complained of pains in the feet and of inability to march or drill. He had been to an orthopaedic specialist, who could find no reason for the pains, but reported that he had double pes cavus; spectacles, which he said did not suit him, had been provided, and he had been to a dermatologist for ichthyosis. He had had his appendix removed in a general hospital, and later it was found that there was sugar in his urine. He had attended an open-air school and was physically frail. The N.S.R.B. placed him in Grade II. During performance tests he was described as a "lethargic twiddler," and on the Terman test he had a mental age of 9½ years. His physical and mental conditions were degenerate and under-developed. Most of his six months of Army life had been "under the doctor."

R.M.O.s commonly report that it is the dull, inefficient soldiers who turn up most regularly at sick parades, that many of their ailments are quite trivial, and that "the defectives use their illness to get out of their difficulties." It would perhaps throw a broader light on the problem to say that when the defective is bewildered in his new environment his attention turns to his own bodily sensations, rather hypochondriacally, in the hope that the M.O. will supply a comforting bottle of medicine and suspend him from perplexing duty. If at the same time he is ordered to the sick bay then so much the better; for many defectives, when children, needed and received more parental care than normal youngsters. Being nursed is something they both know and enjoy. Such behaviour, however, lowers the morale of the unit and rouses resentment among those who are also struggling to adapt themselves to their new environment and to hold back their personal claims and troubles in the common struggle of war.

To frequent illness we may add clumsiness. A sergeant-instructor told me that it was the 20% whom he found most difficult to teach to drive who had the most accidents. Allowing for a few "accident-prone" (who are not always hard to teach), many of these slow learners and clumsy drivers were probably defectives.

* Based on a paper read to a meeting of the British Psychological Society at Nottingham, April 19, 1941.

Sample of Military Defectives

In a series of 100 mentally defective soldiers seen consecutively, 80% had mental ages of from 9 to 11, and 14% of from 5 to 8 years (see Chart). This distribution is not typical of the scatter of mental defectives in the population. It would be satisfactory to believe that the low- and medium-grade feeble-minded had been kept out by the recruiting boards; but that they are kept out is more probably due to the working of the Mental Deficiency Acts, 1913-38, for the majority of those whose mental age is 8 or less cannot support themselves at all and are in institutions, on licence, under guardianship, or notified to the local mental deficiency authority, and are therefore exempt under the National Service (Armed Forces) Act, 1939, Section 11 (f).

It will be noted that while more men with mental ages of 9 and 10 were useless to the Army than those with mental ages of 11 and 12, yet there are fewer of them in the general population. These men of 11 and 12 mental age are "military defectives" even more than they are "civilian defectives," since they cannot adapt themselves to such new and complicated duties as a modern army requires them to perform. In civilian life they could choose their occupations; if unable to do their allotted tasks they did not thereby endanger the lives of their companions and would change to work which was more congenial, and which gave them a sense of achievement rather than of frustration.

The above-mentioned 100 men were asked to furnish particulars of their various employments and the time they worked on them. From these times was compiled the following table, to which unemployment time has been added.

	Years		Years
Out of work	241	Shop assistants	46
General labouring ..	193	Delivery (mainly coal and milk roundsmen) ..	30
Coal-mining	153	Army and Navy Regulars ..	24
Machine feeding	104	Hand-truck pushers ..	23
Pedlar; hawkers	74	Window-cleaning	17
Painter	73	Other occupations	91
Farm-hand	71		
Odd jobs (unemployed about 50% of time)	60		

Totals: Employment 959 years; Unemployment, 241 years.

Counting their potential working time as 1,200 years, these 100 men had been out of work about 20% of this—i.e., 241 years. It might engage the curiosity of M.O.s of units to find out whether their mental defectives do not spend a like proportion of their time in the Army on the sick list. The above list does not indicate the character of the work actually done—in the coal-mines, for instance, the men are mainly employed on the less skilled jobs—but it does show how they are occupied in a free market. In the Army, where duties are allotted and have to be carried out without much time for instruction, the defectives break down on the job. Men who are of so little use to the community in time of peace should not be allowed to hinder an army during wartime.

Analysing the reasons why these 100 men were sent for a psychiatric opinion, it was found that 50% were regarded by their M.O. or C.O. as untrainable; 25% were apparently stable before enlistment but broke down and were sent to hospital suffering from a psychiatric complaint which manifested itself after enlistment, the commonest symptoms being those of conversion hysteria and anxiety; 43% were unstable before enlistment, and their discharge was recommended on grounds of continued temperamental instability; 42% were regularly reporting sick or had some psychoneurotic ailment—i.e., over a half of them had more than one of these reasons for being sent for investigation.

In the light of the above figures it will not be a surprise that in an investigation of 904 consecutive cases admitted

to a special centre for neurosis and measured by the progressive matrices 33% came from the lowest 10% taken into the Army. This would suggest that one way of re-

Graph showing proportion of mentally defective soldiers breaking down, sick, unstable, or untrainable at various mental ages (100 cases).

ducing the incidence of neurosis in the Army is to keep out the mental defectives, who, though in a minority numerically, constitute a major problem.

Duration of Service before Mental Defect is Detected

When we remember that mental defectives by their slow-wittedness hinder the training of normal men and break down easily themselves, we become curious regarding the time that elapses before their defect is detected or it is realized that, in spite of painstaking endeavour, they may be untrainable. It may therefore be instructive to examine the following table showing the length of Army service of 100 mentally defective soldiers sent for examination.

Under 1 week	1	9-12 months	7
1-2 weeks	6	12-15 "	5
2-4 "	4	15-18 "	3
1-3 months	19	18-24 "	3
3-6 "	26	Over 2 years	4
6-9 "	22	(3, 4, 4½, 5½ years)	

These figures should be examined in relation to the stages of training. Though the work is relatively easy in the first three months, 30% showed clearly that they could not stay the course. During the next six months the soldier has to learn to handle more complicated weapons and to carry out military exercises which call for a greater amount of self-reliance in the face of complexity and uncertainty. It is therefore not surprising that 78% of the defectives examined had failed before they were ready for active service.

Aids in Spotting the Defective

The defective has, on the whole, a different school and work history from that of the normal soldier. Though no one would diagnose a defective on that history alone, the following points will help those who are uncertain whether to send a given case for an opinion to the psychiatrists attached to the recruiting boards or, if already enlisted, to the Command or E.M.S. psychiatrist.

There is generally one standard (form, class) for each year of the child's elementary-school life (7 to 13 years), corresponding with Standards I to VII. In the past, and therefore affecting the older soldiers, boys went up to a higher standard only if they passed the necessary test. Therefore when we find that a soldier did not reach one of the top three standards we may suspect mental defect.

In more recent years there has been a general tendency to avoid the inclusion in the same form of larger or older children among those who are less mature; the aim was to prevent deterioration of character and development

through the temptation to bully the younger ones. This was accomplished in two ways. In one the child was promoted yearly, and therefore left the school in the top standard. Defective soldiers educated on this principle will often admit that they were unable to keep up with their fellows and were therefore at the bottom of the class, or that their promotion was due to their age or size and not to their abilities. In the second way the schools were organized along the lines suggested by the Hadow Report—Standards V, VI, and VII being called Forms I, II, and III. These forms were subdivided into “streams” A, B, and C (also D in larger schools, only A and B in smaller). These “streams” generally represent ability: the dull children go in the C stream (and D in the larger schools) and the cleverer in the A stream. Exceptionally, the forms are subdivided according to the type of work done—e.g., A: commercial; B: technical (trades), etc.; so that dull and clever “commercials” would be in Form IIIA, and the B stream would include boys with, say, high mechanical ability.

Illiterate soldiers, and those very nearly so, are almost invariably mentally defective, unless there is clear reason for illiteracy—e.g., lack of schooling; those who attended special schools are generally defective from a military standpoint, and many who went to open-air schools are dull and defective (or, if not, should have special investigation on grounds of doubtful physical health). Soldiers from secondary or technical schools and colleges are unlikely to be mentally defective unless they were fee-paying scholars in a school without an entrance examination, when they may be defective.

The following table shows the standards from which 100 mentally defective soldiers left school compared with those from which 100 psychoneurotic soldiers left. It shows that of those who left in Standard IV or lower 5.3 : 1 (32 : 6) and of those from Standard V or lower 3.4 : 1 (54 : 16) were mentally defective.

	100 Mental Defectives	100 Psychoneurotics
Standard II		
III		
IV	54% { 3 } 32%	16% { 1 } 6%
V (or Form I)	12	10
VI (or Form II)	17	5
VII (or Form III)	22	27
VIII (or Ex-VII)	19	29
No schooling	12	18
Didn't know	3	7
Schools with unorthodox class numbering	3	2
College	1	1

Work Histories

Mental defectives often show characteristic features in their work histories.

(a) *Employability*.—The more defective a man the less likely is it that he can be employed usefully; therefore among those with long periods of unemployment will be found large numbers of mental defectives. Unless the nature of his work or local or other conditions are the cause, a period of unemployment of over three years at any time in a fit man's career should lead to a suspicion of mental deficiency or other mental trouble. If his unemployed time exceeds his employed time the same suspicion should be held.

(b) *Unrequerative Work*.—Defectives will often work for a wage that a normal man would regard as too low a one on which to live. Wages of £1 a week or less in the country or £1 10s. or less in town, or keep and 10s. or less in town, or 5s. or less in the country, would come into this category.

(c) *Types of Occupation*.—Certain types are favoured by defectives; they include such as: Ice-cream vendor, sandwich-man, handing round bills, odd-job man, newspaper vendor (street-corner), rag-and-bone man, door minder, scrap metal collector, tea masher, errand man, street sweeper or sweeper-up in works, cinema attendant (outside). The holding of any one of these jobs

does not in itself constitute a pointer to mental deficiency or to mental disorder, but if a man holds a succession of them and does not rise above them though employment is available, or if he sinks to these levels after holding better posts for brief periods, then mental defect should be suspected.

Since these pointers are not aids to diagnosis, it is immaterial at this stage whether they indicate mental defect, severe neurosis, or mental degeneration: the differential diagnosis introduces other factors which need not be discussed here. It may also be noted that the pointers may be used by physicians who have not had special experience in mental deficiency, or even by their clerks.

American Experience

The problem of mental deficiency among soldiers is not new to military medicine, though it is sometimes neglected. During the war of 1914-18 the American Army introduced intelligence tests at the registration of recruits. The standard for rejection was “a mentality not exceeding that of a child aged 8 years”; for it was considered that below this level the “degree of incompetency was so profound that the individual, whatever his race or surroundings, could not be counted on to take care of himself.” In spite of so low a standard, 1.2% of all men registered were prevented from joining that Army on grounds of mental defect. As a result of these tests only 0.2% of men admitted into the Army had to be discharged later as defectives because of their inability to train into useful soldiers. If the distribution of intelligence in America is comparable to ours in Great Britain the rejection of 1.4% for mental deficiency suggests that the Army in fact considered as defective men with a higher level of intelligence than 8 mental age years—perhaps 9 years. The increased use of mechanized units, and the necessity for speed of action and co-operation between scattered formations, leads me to conclude that in the majority of cases a mental age of 11 or less makes a man unfit to play a useful part in a fighting unit.

It would certainly, in the long run, prove an economy of effort to institute tests for intelligence during the recruiting examination of all persons. As such are not yet provided, the hints given above may prove of assistance.

Where the Defective is Useful

Much has been said about the defective's hindrance to efficiency; about his constituting a risk, his waste of Army time and equipment, and his clumsiness; and about turning or keeping him out: all this, while true, should not obscure the fact that, of 1,200 years which the 100 men might have worked, they did, in fact, between them put in 959 of gainful if fitful toil. Because they are mentally defective they cannot adapt themselves to new situations or acquire skill in fresh directions, but they can often do simple repetitive work and fill “blind-alley” jobs without hurt to their pride, and without boredom or injury to their ambition. It would therefore seem prudent in the national interest to put these men to such tasks as they can fulfil in civil life, where their defect will prove less of a hindrance.

According to the wording of the Registration for Employment Order, 1941, those exempted from the need to register for military service under the National Service (Armed Forces) Act, Section 11 (f)—such as notified mental defectives—are also exempt from registering under that Order. This arrangement makes it difficult for such men as are notified to the local mental deficiency authority to do work of national importance that may well be within their capabilities. If this Order were amended men unfit to be soldiers yet fit to do labouring or machine-feeding in a munition works could make their contribution to the national effort.

Recommendations

1. Those with a mental age of less than 10 years should be prevented at the recruiting boards from joining the Army or, if already enlisted, should be discharged.

2. Since those with mental ages between 10 and 12 are often unstable, break down more than the normal under active service conditions, and frequently report sick, they should be sent to a labour corps and receive special consideration at the end of three months' service. Due allowance for a fall in intelligence due to age should be made in the case of older soldiers (I allow a drop of 1 year of mental age for each decade after 25 years in computing the mean score for average older men).

3. To arrive at a rough assessment of the mental age the progressive matrices tests could be used; but the method of assessment is not so important, though there are several reasonably reliable methods. What is really important is that some systematic attempt should be made to eliminate the defectives.

4. Since some people will raise an objection to the idea of "weeding out" defectives it should always be stressed that the task is to keep certain less gifted members of the population at jobs in which they are stable and in which they can be of most use to the national effort.

Summary

The mental defective in the Army—slow to learn, prone to breakdown, a misfit and potential danger—is discussed. Aids in spotting the defective are given. It is pointed out that, though a hindrance in the Army, he may be put to useful work in civil life in wartime. Recommendations are made for handling the problem.

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HYPOPROTHROMBINAEMIA AND AVITAMINOSIS-K IN MAN

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The control of haemorrhage in man is dependent on the "protective" reaction of the vascular tree to trauma and on the ability of the blood to coagulate normally. Although the former defence mechanism is not at all clearly understood, recent studies have demonstrated the validity of the so-called classical theory of blood coagulation (Eagle, 1939), and the majority of workers in this field now subscribe to Schmidt's (1895) original hypothesis, concisely expressed by the following equations:

Despite the fact that very little is known of the chemical nature of any of the organic constituents of the plasma, which react together to form a blood clot, clinical and experimental studies by chemists, biologists, and physicians during the past five years have provided a sound basis for the diagnosis and treatment of previously obscure haemorrhagic diseases. This advance in knowledge is in the first place due to the recent development of methods for the estimation of blood-prothrombin levels (Quick and others, 1935; Brinkhous and others, 1938; Dam and Glavind,

1938), which are more specific than those previously used (Howell, 1914); and, secondly, because Dam and his co-workers in Copenhagen were able to demonstrate that a fat-soluble substance, vitamin K, could restore the marked hypoprothrombinaemia and control the haemorrhagic tendency of experimental dietary "haemophilia" in chickens (Dam and others, 1936).

It is the purpose of this communication to discuss some of the clinical aspects of hypoprothrombinaemia and avitaminosis-K in man in the light of recent knowledge and as a result of personal observation of 178 patients in the Boston City Hospital during the past two years. The majority of these patients suffered from haemorrhagic manifestations and all were suspected of having a diminished blood-prothrombin concentration. Consequently their blood-prothrombin concentration levels were measured by

FIG. 1.—The relation between the prothrombin percentage of human plasma and the Quick prothrombin time in the presence of excess tissue thromboplastin, giving a Quick prothrombin time of 25 seconds for normal control plasma.

Quick's method. The test measures the time taken for a sample of citrated plasma to coagulate, after recalcification, in the presence of an excess of tissue thromboplastin, as compared with the time taken for a sample of normal citrated plasma to clot when treated in the same way. Conversion of these "times" to blood-prothrombin concentration are made by reference to a curve (Fig. 1) constructed according to the method of Kark and Lozner (1939).

The Quick test is extremely simple, and the recent introduction of a stable thromboplastin (Souter and Kark, 1940), requiring only the addition of distilled water before use, would seem to remove the one serious obstacle to the performance of the test in the physician's office, and also enables it to be performed with greater ease elsewhere. The Quick test is performed as follows:

4.5 c.cm. of blood is taken into a saline-washed syringe by means of a clean venepuncture, and mixed with 0.5 c.cm. of 2.5% solution of sodium citrate in a centrifuge tube. The blood is spun at 1,500 r.p.m. for five minutes and the plasma drawn off. The test must be performed on this plasma within the next six hours.

Thromboplastin is prepared by stripping the brain of a freshly killed rabbit of blood vessels and meninges and washing it in tap-water. The brain is then macerated, spread thinly on plate-glass, and dried in an oven at 37° C. for twenty-four to forty-eight hours. To each 0.5 gramme of this dried material 5 c.cm. of a 0.85% solution of sodium chloride is slowly added and thoroughly mixed into a thin paste. The paste is incubated for fifteen minutes in a water-bath at 56° C. and then centrifuged at 2,000 r.p.m. for five minutes. The upper layer of opalescent fluid in the centrifuge tube is used as a source of thromboplastin and retains its activity for from two to four days when kept in the ice-box.