Summary

The pressure and constitution of the C.S.F. have been studied in relation to the clinical condition in 85 cases of recent closed head injury.

The C.S.F. pressure bears little relation to the state of consciousness, but in conscious patients a raised pressure is usually accompanied by headache. The C.S.F. pressure may fall steadily even when a space-occupying lesion is present.

The degree of consciousness is not related directly to the amount of blood present in the C.S.F.; it depends rather on the site of origin of the blood.

The importance of a differential white cell count and a culture on a blood-stained C.S.F. is emphasized. If these are not done the presence of subarachnoid bleeding may mask an infective meningitis.

A lymphocytosis in the C.S.F. may be present for three to four weeks after a severe head injury.

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"NIGHT-BLINDNESS"—A PSYCHO-PHYSIOLOGICAL STUDY

BY

E. WITTKOWER, M.D., L.R.C.P.Ed.

Physician and Halley Stewart Research Fellow, Tavistock Clinic, London; Visiting Research Psychiatrist, E.M.S.

AND

T. F. RODGER, B.Sc., M.B., M.R.C.P.Ed., D.P.M.

Major, R.A.M.C.; Specialist in Psychological Medicine

IN COLLABORATION WITH

G. I. SCOTT, M.A., M.B., F.R.C.S.Ed.

Major, R.A.M.C.; Ophthalmic Specialist

AND

B. SEMEONOFF, M.A., B.Ed., Ph.D.

Lecturer in Psychology, University of Edinburgh

Night-blindness has been defined as a disturbance of light perception resulting in a difficulty and occasionally an inability to adapt the faculty of vision to very faint illumination (Jeghers, 1937). Figures as to its incidence in the average population under peacetime conditions are not available. Minor degrees of it are fairly common (Maitra and Harris, 1937; Jeans and Zentmire, 1934, 1936; Schuck and Miller, 1938). It is said to be commoner in the under-nourished poorer classes than in the well-fed well-to-do classes (Jeghers). During the war of 1914-18 numerous cases of night-blindness were reported in the armies of the various belligerent countries:

French Army: Bourdier (1916), Truc (1916), Bussy (1916-17), Frenkel (1916-17), Aubaret (1917), Landolt (1917). Belgian Army: Weekers (1916), Danis (1918). Rumanian Army: Savo Goiu (1922). Serbian Army: Néchitch (1918). British Army: Smith (1921), Derby (1921). American Army: De Schweinitz (1921). German Army: Augstein (1915), Best (1915), Braunschweig (1915), Feilchenfeld (1915), Paul (1915), Wessely (1915), Wietfeldt (1915), Zade (1915), Birch-Hirschfeld (1916), Elschmig (1916), Gelenczér (1916), Junius (1916), Löhlein (1916), Rauch (1916), Uhthoff (1916), Wolffberg (1916), Hübener (1917), Koeppe (1917), Wohlfarth (1917), Hillemanns (1918), Hölscher (1918), Meyer (1918), Sattler (1918), Schieck (1918), Wiese (1918), Jess (1921).

Towards the end of that war cases of night-blindness were seen in increasing numbers in the German Army, and

the problem is again presenting itself there (Fillat, 1940; Hofe and Glees, 1940). Its significance for both the combatant and the non-combatant arms of the Services is obvious. It impairs the efficiency of the soldier: sufferers from this malady are unfit for night guards, night driving, and night fighting. In the darkness they are likely to inflict serious injury on themselves or to damage Army property.

Apart from congenital and hereditary night-blindness various views on the aetiology of this disorder have been put forward. It has been attributed to: (1) diseases of the eye (advanced myopia, choroidoretinitis, retinal detachment, optic neuritis, glaucoma, etc.); (2) overexposure to strong light and glare; (3) defective nutrition; (4) toxæmia (diseases of the liver, alcoholism); and (5) great fatigue. The most commonly accepted and, indeed, widely advertised view is that it is due to vitamin A deficiency (Jeghers, 1937; Sweet and K'ang, Frandsen, 1935). This view is regarded as so well established that dark-adaptation tests have been used as a criterion and a quantitative indicator of vitamin A deficiency. Many authors state that patients with night-blindness are often found to be nervous, irritable, and depressed (Duke-Elder, 1932; Elschmig, 1916; Park, 1935; Paul, 1915; Weekers, 1916; etc.). A few writers believe that every night-blind patient is a malingerer (Derby, 1921; Feilchenfeld, 1915; Smith, 1921), a view which has been emphatically repudiated by others (Fillat, 1940). Most authors have recognized and separated a group of cases labelled as nervous or hysterical night-blindness. The neurotic implications of night-blindness have been discussed by Culpin (1940), but so far as is known to us no attempt at a systematic study of the personalities concerned has as yet been undertaken. Everyday experience shows that anxious individuals object more than others to going out in the black-out. Coming out into the street, they cling like frightened children to others and ask for their support. These considerations and the idea that anxiety may be related in some way to dark adaptation prompted us to undertake the following study.

Material: Method of Examination

Biographical studies were made of 52 soldiers complaining of night-blindness who either were sent to us without selection by the eye department or were referred direct to us because of psychological disorders. Their ages at the time of examination were from 19 to 50; 39 of them were under 30 (9 had suffered from night-blindness since childhood, 16 for several years; 13 noted difficulty in seeing in the dark for the first time when the black-out started, and 14 in the course of the war). Four were Regulars, 5 Territorials, 12 volunteers, and 31 conscripts; 43 were privates, 8 N.C.O.s, and 1 an officer. The patients, so far as was possible, were examined ophthalmologically by Major Scott, eye specialist at a military hospital, and were tested for their dark adaptation by Dr. Semeonoff of the psychological department, University of Edinburgh.

Findings

Symptomatology.—All the patients examined suffered from severe night-blindness and stated that they were unable to find their way about in the dark without help from others; they often gave a dramatic description of how, with their arms stretched out in front of them, they groped their way in the dark or clung to their wives, mothers, or comrades. Several of them, unable to see in the dark, had met with serious accidents or had damaged Army or Air Force property—e.g., vehicles.

In association with their night-blindness they often complained of other eye symptoms, such as photophobia, blurring of sight, black spots or floating blobs in front of the eyes, aching or beating sensation in the eyeballs, quivering

of the eyes, etc. Previous spells of complete blindness were reported by 4. Headaches described as shooting or stabbing were complained of by 20, and fits of giddiness, dizziness, or fainting fits by 11; 12 reported symptoms suggestive of effort syndrome, and 10 suffered from rheumatism. Most of the men ate the ordinary Army food and therefore had plenty of vitamins in their diet. Dyspeptics numbered 9, and only in these could the possibility of a reduced vitamin A intake be admitted.

Ophthalmic Examination

At the eye department of a military hospital 42 cases were examined. For purposes of analysis these cases have been divided into five groups, and the results may be summarized as follows:

Group I (13 Cases).—In all of these cases the ocular findings were completely negative, apart from the fact that two of the men exhibited "tubular" fields of vision (although they had no difficulty in orientating themselves in daylight) of the type which one meets in "hysterical" subjects. The fundi were normal in all of these cases. In none was there any ocular cause for the symptom of night-blindness.

GROUP I.—Summary of Clinical Findings

Case	Unaided Vision	Corrected Vision	Refraction	Fundi	Peripheral Fields of Vision
W. C.	R. 6/6 L. 6/6 Only admits	—	No appreciable error	Normal	Normal
R. W. M.	R. 6/18 L. 6/24 Only admits	—	No error	"	Small "tubular" fields
G. A.	R. 6/18 L. 6/18 R. 6/6— L. 6/6—	—	"	"	Normal
A. M.	R. 6/6— L. 6/6—	—	"	"	"
Sgt. B.	R. 6/6— L. 6/6—	—	"	"	"
J. E.	R. 6/6— L. 6/6—	—	"	"	"
J. T.	R. 6/6— L. 6/6—	—	"	"	"
S. M.	R. 6/6— L. 6/6—	—	"	"	"
J. S.	R. 6/6— L. 6/6—	—	"	"	"
H. C. V.	R. 6/6— L. 6/6—	—	"	"	"
B. K.	R. 6/6— L. 6/6—	—	"	"	"
B.	R. 6/6— L. 6/6—	—	"	"	"
N.	Only admits R. 6/36 L. 6/60	—	"	"	Gross contraction. Only admitted small "tubular" fields

Group II (6 Cases).—These men were "one-eyed" for all practical purposes. In two cases one eye had been removed in earlier life, while in the other four the vision of one eye was grossly defective as the result of trauma, inflammation, or amblyopia ex anopsia. In all six cases the good eye was normal, and showed no ocular cause for the night-blindness.

GROUP II.—Summary of Clinical Findings

Case	Unaided Vision	Remarks	Refraction	Fundi	Peripheral Fields of Vision
A. V.	R. < 6/60 L. 6/9—	Corneal scarring right eye	No error left eye	Normal left eye	Normal left eye
Be.	R. "P.L." L. 6/6—	Detachment of retina right eye	"	"	" "
H. T.	R. Nil L. 6/9+	Right eye enucleated	Very little error	"	" "
D. L.	R. "P.L." L. 6/6—	Old penetrating injury, right eye	No error left eye	"	" "
Ba.	R. 6/9 L. Nil	Left eye enucleated	Practically no error right eye	Normal right eye	Normal right eye
M.	R. 6/6 L. < 6/60	Left eye amblyopic ex anopsia	No error right eye	Normal	" "

Group III (11 Cases).—These cases all showed slight errors of refraction, but all had good vision with glasses, and fair vision

without glasses. The fundi were normal in ten of the cases; the remaining one showed a small area of infective choroiditis in one eye. The peripheral fields of vision were normal in all except one patient, who admitted to possessing only a small tubular field in both eyes. In no case was there any ocular cause for night-blindness.

GROUP III.—Summary of Clinical Findings

Case	Unaided Vision	Corrected Vision	Refraction (Axis of Cylinder omitted in Each Case)	Fundi	Peripheral Fields of Vision
H. D.	Only admits R. < 6/60 L. < 6/60	Only admits R. < 6/60 L. < 6/60	R. +1.75 L. +1.75	Normal	Only admits small "tubular" fields
T. C.	R. 6/18 L. 6/36 R. 6/9— L. 6/9	R. 6/6— L. 6/9— R. 6/9— L. 6/9	Moderate hypermetropia Slight error; small congenital lens opacity right eye	"	Normal
R. W.	R. 6/18 L. 6/36	R. 6/9 L. 6/12	R. +2.0 L. +1.5/+2.75	"	"
W. S.	R. 6/24 L. 6/24	R. 6/9 L. 6/18—	Moderate hypermetropia	"	"
A. Mc.	R. 6/60 L. < 6/60	R. 6/6— L. 6/9—	R. -1.0/-1.25 L. -2.75/-1.5	"	"
E. S.	R. 6/18 L. < 6/60	R. 6/12+ L. 6/24+	Very little error	Choroiditis, left eye	Normal right eye
W. M.	R. 6/18 L. 6/12	R. 6/9 L. 6/9	Low myopic astigmatism	Normal	Normal
D.	Only admits R. 6/18 L. 6/18	Only admits R. 6/12 L. 6/12	Low degree of astigmatism	"	"
T.	R. 6/5 L. < 6/60	R. 6/5 L. < 6/60	R. +3.0 L. high myopia (amblyopic)	Normal right eye	Normal right eye
H. C.	R. 6/12— L. 6/18+	R. 6/9 L. 6/12+	Moderate astigmatism	Normal	Normal

Group IV (11 Cases).—All of these cases showed moderately high errors of refraction. In five the vision was good when corrected with glasses, which were being worn at the time of examination. Three men had marked amblyopia in one eye, the good eye being normal apart from the error of refraction. Two men had defective vision for which there was no ocular cause, and one of these had typical "hysterical" fields of vision. In ten of the cases the fundi of both eyes were seen to be normal; in one case, which showed a complicated cataract in one eye, the fundus in this eye could not be seen, but the fundus of the other eye was observed to be normal. One of the men in this group had considerable corneal scarring in both eyes, but with vision equal to 6/18 partly and 6/24; this was the only case which showed any ocular defect that one could say might cause a certain amount of difficulty in seeing in dim light.

GROUP IV.—Summary of Clinical Findings

Case	Unaided Vision	Corrected Vision	Refraction (Axis of Cylinder omitted in Each Case)	Fundi	Peripheral Fields of Vision
S. B.	No record	No record	Irregular astigmatism	Normal	Normal
J. F.	R. 6/18— L. 6/24	R. 6/18— L. 6/24	Irregular astigmatism (corneal scarring)	"	"
W. C.	R. "P.L." L. 4/60	Only admits L. 4/60	L. +1.5/+4.0 (cataract right eye)	Normal left eye	Normal left eye
W. W.	R. 6/36 L. < 6/60 R. < 6/60 L. < 6/60	R. 6/12— L. 6/18 R. < 6/60 L. 6/12—	R. +0.5/-3.5 L. -2.75 R. +6.0/+3.0 L. +6.0/+2.0	Normal	Normal
H.	R. < 6/60 L. < 6/60	R. 6/9— L. 6/9—	R. -2.5/-0.75 L. -2.0/+0.75	"	Normal
A.	R. < 6/60 L. < 6/60	Only admits R. 6/36 L. 6/24	R. -3.25/-4.0 L. -2.0/-4.0	"	"
R.	R. < 6/60 L. < 6/60	Only admits R. 6/18— L. 6/18—	R. -3.5/-1.0 L. -3.5/-4.0	"	Small "tubular" fields
F.	R. 6/24 L. 6/60	R. 6/6 L. 6/18	Moderately high astigmatism	"	Normal
K.	R. 6/36 L. 6/6—	R. 6/36 L. 6/6—	L. +6.0/+2.0	"	Normal left eye (right eye amblyopic)
P. P.	R. < 6/60 L. < 6/60	Only admits R. 6/36 L. 6/60	R. -1.75/-1.25 L. -1.5/-0.75	"	Typical "hysterical" fields

Group V (1 Case).—This man showed degenerative choroido-retinitis involving the peripheral parts of both fundi. The case was diagnosed as one of "retinitis pigmentosa," although in some respects the appearances were atypical. The night-blindness was, however, undoubtedly due to organic disease of the choroid and retina in this case.

GROUP V.—Summary of Clinical Findings

Case	Unaided Vision	Corrected Vision	Refraction	Fundi	Peripheral Fields of Vision
W.S.	R. 6/6— L. 6/60	—	No error	Degenerative choroido-retinitis both eyes	"Ring scotoma" right eye Marked traction left eye

Summary of Findings

1. In 41 of the 42 cases examined there was no ocular cause for the night-blindness. One man had corneal scarring that might perhaps cause a certain amount of difficulty in seeing in dim light, but only one case showed disease of the eye sufficient to cause true "night-blindness."

2. In no case was there any suggestion of xerosis of the conjunctiva or of the corneal epithelium.

The further significance of these findings will be discussed later in this paper.

Dark-adaptation Examination

Of the 52 cases studied 40 were tested for dark adaptation in the George Combe Psychological Laboratory, University of Edinburgh. The instrument used was the Nagel adaptometer (Nagel, 1907), and the method of testing as described elsewhere (Semeonoff, 1941). Since it was felt that the results obtained with this instrument might be influenced by general intelligence, the men were tested with Group A of the Herring revision of the Binet-Simon test. In two cases the eye condition made it impossible to apply this test, although these men were able to take the test of dark adaptation.

By way of control a group of 33 soldiers, chosen at random, was tested for dark adaptation and intelligence in the same way as the night-blind group. Certain features of the two groups are compared in the following table.

Comparison of Night-blind and Control Groups

	Night-blind Group (40 Cases)	Control Group (33 Cases)
Age :		
Highest	50	44
Median	27	25
Lowest	19	18
Intelligence (raw scores) :		
Highest	36	38
Median	25	30
Lowest	14	21
No. with post-elementary education (any type)	6	14

It will be seen that the groups are not quite identical in respect of age, education, or intelligence, and, moreover, a high proportion of the control group had various visual abnormalities. Three, indeed, mentioned that they experienced considerable difficulty in night vision. The control group must be regarded as a fairly random sample of Army personnel rather than as a group of "normals."

The testing technique and treatment of results were briefly as follows. A period of forty minutes' dark adaptation followed ten minutes' preliminary light adaptation to a white surface of about 40 foot-candles illumination. During dark adaptation, readings of threshold intensity were taken at intervals, usually of five minutes. Sensitivity was measured in terms of logarithms of reciprocals of successive threshold values, zero corresponding to the maximum intensity of the adaptometer. Curves based on these sensitivity values were drawn, and smoothed in such a way as to eliminate or at least minimize the effects of accidental or other irregularities. Different measures of amount and rate

of dark adaptation were derived from these curves, and it eventually appeared that, although these were almost interchangeable, the most reliable single measure was the maximum sensitivity attained during the test period, as shown by the course of the smoothed curve.

It must be noted that actual sensitivity to light under conditions of low illumination was being tested, and not ability to discriminate detail under these conditions. The latter, as Ferree and Rand (1938) point out, is by no means the same thing as the former, and is probably of greater significance in the ability to "see in the dark." Nevertheless, pure sensitivity to light may be assumed to be more closely associated with the actual physiochemical processes which take place in the retina, and which would therefore be more directly affected by nutritional causes, assuming that these could be operative.

The distribution of dark-adaptation measures for the two groups is given in Fig. 1. Average figures are: night-blind cases, 2.6; control group, 3.6.

FIG. 1.—Distribution of dark-adaptation measures. A+ = 4.0 and over—high normal. A = 3.5–3.9—low normal. B = 2.5–3.4—subnormal. C = 1.5–2.4—defective. D = below 1.5—grossly defective.

It is necessary also to consider the possible effect of extraneous influences, such as those of age and intelligence, though the small numbers in each group reduce the reliability of any conclusions. Ferree *et al.* (1935, 1938) have shown that power of dark adaptation decreases with age, though the effect is more notable for discrimination of detail than for actual sensitivity to light. In the present control group a high negative correlation between age and sensitivity was found (-0.78 ± 0.049), though this was strongly influenced by two cases of men over 40 who were the only "C" and "D" patients in this group. In the night-blind group, on the contrary, a non-significant positive correlation was found ($+0.27 \pm 0.099$). As regards intelligence, positive correlations with dark adaptation were found for both groups (controls, $+0.46 \pm 0.094$; night-blinds, $+0.31 \pm 0.099$). Since intercorrelations of sub-tests for the two groups suggested that the Herring revision presented a virtually different situation for neurotic and normal subjects, it was felt that general educational level might prove a truer basis for comparison, particularly since the proportion of control cases with any sort of post-elementary education was much higher than in the night-blind group. The average dark-adaptation measure of the six night-blind men of this type was identical with that of the whole group (2.6); in the control group, which included fourteen such cases, the average was slightly higher (3.9, as against 3.6 for the whole control group).

The general conclusion seems to be that among normal persons higher intelligence and educational level and lower age are associated with superior dark adaptation, while for "night-blind" cases such influences are wholly or in part obscured by other factors.

Psychiatric Examination

On psychiatric examination the soldiers studied were found to be psychologically abnormal far beyond the range of individual differences in the average population. In fact most of them, quite apart from their night-blindness, were unfit for military service because of their psychological abnormalities and disorders.

Nature and Degree of Psychological Disorder

Using a modified Culpin scale, the patients were divided into four grades according to the degree of their psychological disorder :

0. No obvious psychological disorder.
1. Minor psychological abnormalities not sufficient to interfere with an ordinary mode of life.
2. Psychological disorders interfering with activities but not incapacitating.
3. Psychological disorders temporarily or permanently incapacitating.

The grading was exclusively based on psychiatric findings, and the night-blindness itself was not taken into account. Grade 0 was absent in the series : 9 patients were classified as Grade 1, 12 as Grade 2, and 31 as Grade 3.

While fully aware of the very limited value of psychiatric labels, we nevertheless tried to classify the patients according to their psychiatric diagnoses. In doing this Grade 1 was left out of consideration for obvious reasons. Of the 43 patients classified as Grades 2 and 3, 14 suffered from acute and 13 from chronic anxiety states—i.e., more than half of the total of 52 were anxiety states—8 were cases of conversion hysteria, 4 were cases of depression, and 3 were psychopathic personalities of the schizoid or of the over-aggressive type. One patient was unclassifiable. These are some illustrative examples :

Grade 1.—A soldier aged 34, unaggressive and averse to mischief as a child, has always been very shy and prone to blushing. Until he was 16 he stuttered very badly, and he still has a slight impediment of speech.

Grade 2: Chronic Anxiety State.—A soldier aged 28 complains of sleeplessness. He does not feel sure of himself and has always worried unduly about his work and his duties. He believes that other people stare at him and pass remarks about him. He has always been unaggressive, over-compliant, timid, afraid of darkness and of being hurt, and has been unduly concerned about his eyesight. Until the age of 14 he was a stutterer ; he is still a nail-biter and prone to bed-wetting. He is unduly attached to his mother, and if she is taken ill he feels ill himself.

Grade 3: Acute Anxiety State.—An extremely efficient R.S.M. aged 44 had an acute nervous breakdown after a period of over-work, and one day, marching at the head of a column, he collapsed. Afterwards he felt very anxious, for no reason known to him. He could not travel unless there was a corridor in the train by which to get out. He felt unable to go to the pictures unless he was seated near the exit. Every time he had a hair-cut he wanted to get out of the chair. He felt better when in company but, on the other hand, he dreaded meeting people. He also suffered from palpitation, dizzy spells, breathlessness, sleeplessness, and a feeling of exhaustion.

Conversion Hysteria.—A soldier aged 24 developed a peculiar disturbance of gait after an accident. He felt that his left leg was giving way, and he constantly stumbled. While he was in hospital for an examination of this disorder, which was found to be hysterical in origin, he suddenly felt unable to rise when seated and also lost his voice.

Depression.—A sergeant aged 43, feeling rather tired, went on leave. On return to his unit the tiredness persisted and he became very irritable. He suffered from headache and sleeplessness, was afraid of giving orders and of meeting people, and had difficulty in making decisions. He carried on his duties until, three months afterwards, he broke down completely, became very depressed, did not care if he were killed in air raids, and "howled like a kid" for no definite reason. He had no confidence in himself, felt that he was no use for the Army, and wanted to get out of it.

Personality Types

Correlation and mathematical evaluation of childhood characteristics carried out on these patients, according to

a method previously described, enabled us to delineate certain personality types.

The majority of the men were of an over-dependent type ; a minority were ostentatiously independent. At the one end of the scale are individuals who have kept up a dependent childlike attitude even in adult life ; they are perpetual children. Towards the centre of the scale there are men with strong feminine tendencies, more or less successfully concealed ; they present merely a façade of masculinity. At the other extreme are men who have a compulsive and clearly reactive and over-compensatory need to demonstrate their masculinity to everyone and anyone ; they succeed in being regarded as he-men.

1. OVER-DEPENDENT TYPE

Of the total of 52 soldiers 27 were of the over-dependent type. The majority were either delicate in health or had been definitely ailing as children. A fair number lost their father in early life and grew up in purely female surroundings. In others admiration for their father, whose physique or mental outlook represented their much-envied ideal, was mingled with a dread of his sternness or violence. Being delicate in health, they were often doted upon by their over-anxious and over-solicitous mothers, to whom many of them were grossly over-attached. Undue dependence on their mothers often extended into adolescence or even adult life. Many of them are still nicknamed "Mummy's pet" or "Mummy's darling" in the family circle. Some, on the other hand, felt or actually were unwanted, were neglected or ill-treated, and had in consequence a lifelong craving for love and affection. Any display of affection to one of their siblings roused undue resentment and jealousy in them. Most of them stated that they were unfit for games, and, at any rate, afraid of getting hurt ; they preferred indoor activities to outdoor rough-and-tumble. Some were definitely lazy and liked best lying about or hanging about in the house. Some were helpless as children, constantly falling and getting cuts and stitches. Many of them took a great delight in girlish activities, such as washing dishes, scrubbing, and dusting (sometimes even in adult life). "Mother often said I should have been a girl," several of the patients said. They had little inclination to associate with other children at all and, if they did, they preferred girls' company. "Boys are too rough for me," they often stated. Certainly not entirely accounted for by their physical ill-health, most of them lacked aggressiveness. If they were attacked they burst into tears and ran home for their mother's or their strong brother's protection. Extreme cases endured even tormenting by other children without any attempt at retaliation or protest. One of the patients allowed himself to be rolled in the mud by other children and did not even take the trouble to remove the dirt. Smarting from such humiliations, they indulged in fantasies of strength and power, often modelled upon their strong fathers and brothers, but their actual efforts were weak and often pathetic. Most of them were timid, shy, and self-conscious. They were subject to numerous morbid fears and other nervous symptoms.

Six of the patients maintained their childhood characteristics practically unchanged in adult life. They were unhappy creatures, a burden to those around them, unemployable and useless members of the community. Seven others were poor workers, clumsy and unintelligent, and handicapped by their morbid fears. They were shiftless in their occupations, were frequently dismissed, and had long spells of unemployment. Eleven did moderately well, and four even excelled in their occupations, but their ostentatious zeal, zest, and over-conscientiousness were clearly anxiety-motivated, and gave way to complete passivity once they came up against serious and apparently insuperable difficulties. One of these, an N.C.O., had distinguished himself in numerous examinations and in the execution of his duties, but he broke down during the war of 1914-18 after severe shelling, and again in this war when his unit was about to be sent to France. Two men, after a completely passive attitude in childhood, went through a phase of great audacity and over-aggressiveness in adolescence and adult life, only to fall back again into a state of complete passivity when eventually they broke down. Over two-thirds of the men in this group are of a retiring disposition in their social contacts ;

they are quiet, unassuming, unaggressive, tender-hearted people who prefer long walks alone in the country to being at parties or in crowds, where, without justification, they feel that everybody is looking at them or passing remarks about them. Even if they appear well adjusted, they are timid anxious individuals, unduly dependent on and swayed by the opinion of others. Whatever they do is carefully weighed up beforehand, because of their preoccupation with potential adverse consequences. Some are shy in front of women or are even terrified of contact with them. Others state quite frankly that they feel more at home in their company. "Girls understand me better than boys," several said. If they marry they choose a sisterly or maternal type of woman who looks after them. They are meek and docile husbands, and if their wives are domineering, or even if they are unfaithful, they submit without protest. As might be expected, with very few exceptions they are poor soldiers. They are isolated in their units and often the butt of their comrades.

2. OSTENTATIOUSLY INDEPENDENT TYPE

This group comprises 12 patients, basically similar in structure to, though superficially just the reverse of, the first group. They adopt an active, energetic, masculine attitude towards life, but the ostentatious nature of their conduct and behaviour bears the stamp of its reactive over-compensatory origin. Vaguely aware of their inherent passive feminine trends, they have to show the world how tough they are, for fear of being found out.

They were usually robust as children, mixed easily and liked parties, whose "life and soul" they were anxious to be. They were good organizers, always ready to assume leadership. They liked to be in the forefront of everything, were involved in any mischief that was going, and were often the leaders of the local gang. They were stubborn and cheeky at home, and argumentative and quarrelsome with other children if these did not fall in with their views and arrangements. Like the members of the first group they indulged in grandiose fantasies, but in contrast they put them into action. They were fond of taking risks, excelled in sports and games, and, in general, "liked to show off brute strength," as one of the patients put it. They liked fighting for the fun of it, and prided themselves on having acquired such nicknames as "Tiger" or "Champ." Many of them, however, realized that this was not their real nature: behind a façade of self-assertiveness they were shy and diffident. They blushed easily, and joking insinuations implying their possession of girlish characteristics upset them unduly. A few fainted easily if it came to actual fighting, and almost all of them shamefacedly admitted they had always been subject to numerous morbid fears.

Half of them, in whom self-driving ambition and wish to show off prevailed, made a success in life before their breakdown. One of them, anxious to demonstrate his heroism, joined "the toughest tramp-ship company afloat." The others were either lazy good-for-nothing loafers or got into trouble because of their aggressiveness. Strange as it may appear, this group includes the only female member of the series. Grossly over-attached to her mother from early childhood onwards, she "went for" her drunken father on many occasions. Afterwards, in the face of many hardships, she tried to live up to her very high and rigid Spartan ideals. She joined the A.T.S. at the outbreak of war, and became severely depressed after her father's death through enemy action.

Their main characteristics fit these men well for soldiering. A few have distinguished themselves by their bravery; four who were poor soldiers were either inefficient from the start or became involved in disciplinary difficulties.

3. MIXED REACTION TYPES

The remaining 13 patients showed no predominance of their dependent or independent tendencies. They have certain characteristics in common with both preceding groups without falling into either of them. This group includes individuals who, struggling against a constitutional handicap, tried more or less successfully to emulate their strong brothers and fathers; chronically anxious individuals who somehow managed to master their morbid fears; apparently fearless individuals with deep-seated conflicts over aggressiveness; and solitary individuals without manifest social anxiety. Three patients of this group showed only minor personality deviations which approximated very closely to the normal.

(To be concluded. References will be given with Part II)

THROMBOSIS IN ARTERIOSCLEROSIS OF THE EXTREMITIES

BY

E. D. TELFORD, B.Chir., F.R.C.S.

Emeritus Professor of Surgery, University of Manchester

AND

H. T. SIMMONS, M.D., Ch.M., F.R.C.S.

Research Fellow, Manchester Royal Infirmary

(From the Neurovascular Clinic, Manchester Royal Infirmary)

At 25 years of age the arterial tree is seen at its best, and from this time onwards signs of wear and tear begin to appear. The downward course is slow and insidious, and the extent of the changes seems to depend more upon inherited quality of the arterial wall than upon any other single factor. Nature, however, possesses immense reserves, and, in general, the stiffened wall and reduced calibre give rise to no significant symptoms, though they no doubt play a part in the loss of bodily strength and mental alertness in later years.

In those arteriosclerotic patients in whom the embarrassment of the peripheral circulation of the limbs becomes serious the first signs of trouble are usually a persistent coldness of the extremities and an arresting cramp in the calf or foot on exertion (intermittent claudication). The walking distance gradually lessens; colour changes appear, at first rubor and later cyanosis. Finally, severe and continuous rest pain in the dusky digits is ominous of impending gangrene.

There are, however, other cases of arteriosclerosis in which serious consequences descend like a bolt from the blue in patients who have had no previous warning of any defect in their peripheral circulation. These accidents appear to result from a sudden thrombosis, and when one thinks how commonplace is thrombosis of the cerebral or coronary arteries it is not surprising that similar catastrophes should occur in the arteries of the limbs. During the last few years we have studied 19 cases in which sudden thrombosis of arteriosclerotic arteries has occurred, and we have watched the course of these patients over long periods. Of the 19 patients 16 were men and 3 women. The lower limb was affected in 17 cases and the upper in 2. The average age was 53, which indicates that thrombosis of the arteries of the limbs happens at a relatively early age in a patient who, already arteriosclerotic, is still capable of considerable muscular effort.

Symptoms

In most of our cases the attack has developed during a spell of active exertion—e.g., cycling uphill, climbing the gangway of a ship, pulling on a rope—and in one instance the trouble followed immediately on a fall from a lorry.

The first symptom is a sudden pain of crippling severity, usually in the calf. On examination the foot is found to be cold and waxy, and no pulsation can be felt. The acute pain usually abates and the limb then presents the well-known signs of arterial embarrassment; it is cold, shows rubor in the dependent position, and all active movement is sharply limited by the onset of severe cramp in the calf or foot, often within a few yards. Very gradually—it may be several weeks—the condition improves as some collateral circulation slowly comes into play, but recovery is always far from complete; some degree of claudication, cold, and rubor persists. Gangrene is not common, and