(a) He should avoid reading war news in the papers, journals, and books. In conversation the war should be avoided. Cutting off all war news in this way is of distinct service. Also he should not discuss his symptoms with others and the symptoms of other patients should not be related to him.

(b) He should direct his thoughts to a new subject, or to a subject not associated with war, and best of all to some new occupation.

(c) The occupation should be one requiring some thought, and he should apply himself very closely to this occupation.

(d) The occupation should be one which is very interesting to him, and which is likely to become more interesting as it is continued.

(e) If the occupation is one which can, after a time, be carried out mechanically without thinking, then the patient is liable to wander back to his old thoughts about the war, whilst he is doing work. It is then often useful to vary the occupation, so that closer application will be needed. Thus, if after spending much time in netting, he finds that he no longer requires to think about the work, he may change to fretwork, or some other work, so that closer application will be necessary.

Suitable Occupations.

The occupation most suitable will vary with different cases. The following may be mentioned:

Games, such as draughts, dominoes, cards (especially patience, which the patient can play alone), billiards, zigsaw puzzles, etc.

Hand occupations, netting, fretwork, wood-carving, "poker work," sewing, knitting and needlework, rush work, raffia work, basket work. Netting mats is often very suitable. Handwork in the ward, bandage rolling, knife cleaning, etc., may be useful.

The study of French or foreign languages in some cases may be tried if he is interested in the language, and finds that he is not wearied by it. Drawing, painting, pen painting, photography, music, typewriting, may be of service.

Later, when he is stronger, gardening and outdoor games, field work, grass cutting, motor wagon driving, etc., are suitable. Driving a motor wagon or transport is very suitable if the patient is interested in it, and some patients will find it of much service. The driving of a motor wagon requires close application; it may be interesting to the man, and the calls for attention are so varied that his thoughts are fixed more or less on the work in hand. He is also out in the open air, and great physical fatigue is avoided.

The occupations must be interesting to the patient, and his attention must be kept to them very closely; hence the most suitable kind of occupation will vary much in different cases; one patient will be interested in netting mats, the next will find it irksome. He should therefore be allowed to take up one or two of the most interesting. He should sell his work if possible, so that he may have the pleasure of earning money; if wealthy, the money may be given to some charitable institution.

Games are useful at first, but very soon most of the time should be devoted to occupations. Later work in the Army Service or Motor Transport Corps or munition work may be suitable. The patient may improve rapidly if he is transferred to some occupation in England in which he becomes deeply interested and has no further risk of shell shock—such as the training of cadets, training in the machine gun section, etc.

SUMMARY.

To recapitulate, the important points which I desire to emphasize in the treatment suggested in this article are:

1. All *anxiety* and fear of further exposure to similar risks to life, and anxiety from other causes, should be removed if possible, and the patient should be definitely told that he will certainly recover.

2. The *sleep treatment* is very useful. At first hypnotic drugs may be given both at night and during the day for a short time; so that the patient may sleep all night and, for a few days, also during part of the daytime.

3. He should *cease thinking* of the war and his experiences. This may be brought about (a) at first by the sleep during part of the daytime as well as during the night as just described, and by occupation whenever he is awake; (b) afterwards he should be kept asleep all night (by drugs); but during the day the drugs should be discontinued and he should be kept fully *occupied* in a suitable way.

4. As regards the kind of occupation:

(a) A new subject or one not associated with his war experience is desirable.

(b) *Very close application* to the work in hand is important.

(c) The occupation should be one requiring thought, and if the patient finds, after continuing it for some time, that it can be done mechanically, the occupation should be changed or altered so that thought is required.

(d) It should be one *very interesting* to the patient, and one which will become more interesting.

Many other methods of treatment have been tried and recommended, but I have not attempted any review of the literature of the subject, and have only considered the treatment which, from my own observations, has appeared suitable. In many of the severe cases recovery is very slow, but I think the line of treatment suggested will be found of much service.

THE RED BLOOD CELL COUNT AND HAEMOGLOBIN CONTENT OF THE BLOOD IN DISORDERED ACTION OF THE HEART.

BY

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(Under the direction of the Medical Research Committee.)

THE accompanying table of estimations sets out the results of the examination of fifteen patients at Hampstead Military Hospital. These were unselected cases of D.A.H. (disordered action of the heart) of all degrees of severity; that is to say, they exhibited the group of symptoms associated with this nomenclature, in varying degree. None of the patients had been "gassed," and none exhibited unusual symptoms, such as nocturnal dyspnoea.

The haemoglobin was estimated by Haldane's haemoglobinometer. The percentage was taken as the mean of two observations, one at a dilution which caused the tints to match, and the other at a further dilution which caused the specimen to be slightly paler than the standard tint. This tends rather to overestimate than to underestimate the percentage. The red cell count was made in a Zeiss-Thoma counting chamber, which was estimated by micrometer measurement to err (if at all) on the shallow side; it would not, therefore, tend to yield excessive estimations.

Two specimens of blood were taken from a puncture in the ear of a patient in separate pipettes at the same sitting; 160 squares of the counting chamber were counted from each specimen, and the average of these two estimations was taken as the true blood count.

The observations were made between the hours of 10 and 12 in the morning on the patients who had taken no exercise and who had remained indoors. This series of observations was made in March and early April during an exceptionally cold and severe spell of weather.

The average number of red cells is commonly given as about 5,000,000 per c.cm. in males, but there does not appear to be any complete agreement on this point. A rise normally takes place after exercise and at certain stages of digestion. The count also varies with age, and, according to von Limbeck,¹ this variation is considerable; thus he gives the average count between 19½ and 22 years as 5,600,000, 25 to 30 years as 5,340,000. A very high average count was found by P. W. Hawk² in a number of healthy young athletes in training—that is, 5,600,000 immediately before exercise.

Case.	Age.	Red Cells.	Haemoglobin.	Colour Index.	Remarks.
			Per cent.		
1	31	6,600,000	97.5	0.74	Severe D.A.H.
2	36	6,465,000	99	0.76	Severe D.A.H.
3	26	6,275,000	99	0.79	Mild D.A.H.
4	24	6,135,000	93	0.76	Moderate D.A.H.
5	24	6,065,000	100	0.82	Severe D.A.H.
6	—	5,960,000	89.5	0.75	Chronic mild D.A.H.
7	27	5,915,000	91	0.76	Chronic severe D.A.H.
8	19	5,900,000	97	0.82	Severe D.A.H.
9	18	5,867,000	90	0.76	Chronic moderate D.A.H.
10	32	5,675,000	91	0.84	Severe D.A.H.
11	31	5,552,000	—	—	Moderate D.A.H.
12	25	5,526,000	92.5	0.83	Mild D.A.H.
13	27	5,495,000	89.5	0.81	Mild D.A.H.
14	34	5,110,000	92	0.9	Chronic mild D.A.H.
15	32	4,892,000	87	0.89	Severe D.A.H.

The average of the fifteen patients suffering from D.A.H. was 5,837,000, which is quite in excess of anything previously observed in healthy individuals, and is the more remarkable in view of the fact that these men were invalids, who had for the greater part spent a considerable time in hospital before the estimation was made. The average age of these patients was 28 years. One-third of these patients had a count of over 5,000,000, and more than one half (53 per cent.) had a count of 5,900,000 or over.

The haemoglobin content was for the most part below the normal 100 per cent., the average being 93.4 per cent. (ranging from 87 per cent. to 100 per cent.). Relatively to the number of red cells the haemoglobin content was low, the average colour index being 0.8.

The cases have been roughly described in the table according as they are severe or mild, chronic, or otherwise, and it is evident that no relationship can be established between these particulars and the red cell count. It is apparent that a high blood count may be found in a patient, such as Case 6, able to undertake a half-hour's physical drill and march three miles without pronounced discomfort, and that a low count may occur in a patient, such as Case 15, readily distressed and only able to undergo mild resistance exercises.

The leucocytes were not counted in this series of cases. The existence of a leucocytosis in cases of D.A.H. has been established and described by Mrs. Briscoe.³

Multiple observations made at intervals on other individuals indicate a degree of variability in the count, but this is a matter that requires further investigation; amplification of these observations is evidently desirable in other respects, but, my work having been interrupted, I publish these records as they stand.

It does not appear possible in the present state of our knowledge of the pathology of D.A.H. to suggest the significance of this polyerythrocythaemic condition.

REFERENCES.

¹ *Eines Klinische Pathologie des Blutes*, Jena, 1893. ² *Amer. Journ. Physiol.*, 1904, vol. x, p. 384. ³ Report on Cases of Soldier's Heart, Medical Research Committee, 1917.

THE first meeting of the Spanish National Medical Congress will be held at Madrid in April, 1918 (21st to 26th). The work will be divided among seventeen sections. The president is Professor Ramón y Cajal, well known as the author of works of the highest importance on the structure of the brain and spinal cord. In the summer of the present year he published an autobiography under the title of *Recuerdos de mi Vida* (Recollections of My Life). Santiago Ramón y Cajal was born in 1852, and studied at Saragossa, where his father was professor of anatomy. After graduating in 1873, he served as an army medical officer in Cuba. In 1881 he was appointed Professor of Anatomy at Valencia; in 1886 he became Professor of Histology at Barcelona; and in 1892 he was called to the corresponding chair at Madrid.

ACUTE TUBERCULOUS BRONCHOPNEUMONIA WITH PNEUMOTHORAX, SECONDARY TO TUBERCULOSIS OF THE PERI- BRONCHIAL LYMPH NODES.

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THE following case is reported because it illustrates the relation of certain more chronic tuberculous lesions to acute tuberculous pneumonia, and the relation of the latter to pneumothorax.

Pte. J. G., aged 18, was admitted at midnight on January 26th, 1917, with a diagnosis on his field medical card of "incipient trench feet."

Previous History.—He had been a farm worker. During his last few days at the front he had had a cough and pain in the right chest; in the ambulance train this pain was quite sharp.

Clinical Aspect.—The feet were slightly swollen and tender but nowhere was the skin broken. The temperature was normal on admission, and the pulse was 92; the respirations were not rapid, and he made no complaints referable to his chest. He was able to sit up in bed and wash himself, appeared perfectly comfortable, and soon dropped off to sleep. At 4 a.m. (January 27th) he awoke suddenly with very severe pain in the right side of the chest and upper abdomen. He was extremely dyspnoeic and cyanosed. The respirations were 40, the movements of the chest were very shallow, the pulse 132, and the temperature 102.6°; it was 105° a few hours later.

He was almost immediately transferred to the "pneumonia hut," where there is an abundance of fresh air. The apex beat of the heart could be seen in the fifth interspace 14.5 cm. to the left of the middle line, and on percussion the right border was found 2.5 cm. to the left of the left border of the sternum. The heart sounds were clear and no murmurs were heard. The right side of the chest did not move. Tactile fremitus was much decreased over the right lower axilla and base, and at the base behind there was an area of flatness extending upwards for about five inches. Above this in front the percussion note was hyper-resonant. Over the areas of the middle and lower lobes the breath sounds were amphoric, and accompanied by tinkling sounds; over the upper lobe in front the respiratory murmur could scarcely be made out. The amphoric breathing was transmitted to the left of the sternum, and was marked at the level of the second costal cartilage. On the right side, behind, the breath sounds were poorly heard. The *bruit d'airain* was heard over the right chest, and the succussion splash was readily made out. On the left side there was no dullness, but the respiratory murmur was harsh, although nowhere "blowing."

A diagnosis of right-sided pneumothorax was now made, and this was thought to have been caused by the rupture of a tuberculous cavity in the lung. Pneumonia also was thought to be present. A very grave view of the case was taken, but the patient held out until February 2nd. The course of the disease was not without interest.

January 27th: A small amount of fluid was withdrawn from the right base. January 28th: The temperature was 104°, respirations 32, pulse 118. Blood was seen in the sputum. January 29th: Temperature 99.5°, respirations 32, pulse 120. The amphoric breathing was not heard so high up on the right side of the chest, but above this there were numerous rhonchi. No change in the position of the heart was made out, so the pneumothorax was thought not to be "valvular" in nature. January 30th: Temperature 99°, respirations 30, pulse 124. The patient became slightly delirious and was much cyanosed. The upper level of flatness in the right thorax had apparently not changed. The amphoric breathing was still distant and heard on the right side only over a small area close to the lower end of the sternum. Over the right upper lobe the respiratory murmur was inaudible. February 1st: Temperature 97°, respirations 36, pulse 100. There was no blood in the sputum. The patient was not so cyanosed and his pulse was stronger. The apex beat was seen at a point 10.5 cm. from the middle line—that is, a little nearer its normal position. The amphoric breathing at the pulmonary cartilage was not so pronounced. Although there was still pain in the right chest, it was thought that the pneumothorax was decreasing. Over the left upper lobe the breath sounds were still harsh, and numerous moist râles were heard. February 2nd: The patient was again very cyanosed, with much wheezing, and was unconscious most of the time. No blood in the sputum. The apex beat was in the same position as on the previous day. The amphoric breathing was again heard higher up on the right side of the chest and at the base of the heart to the left of the sternum. Still no increase in the area of flatness was observed. Sharp moist râles were heard over the left upper lobe, with prolonged expiration. Numerous bubbling râles were heard in the left axilla. It was thought that the patient had tuberculosis of both lungs. Temperature subnormal, respirations 40 to 48, pulse 120. He died at midnight of cardiac failure.

I am indebted to Major Lawrence J. Rhea, C.A.M.C.,