A Memorandum

UPON

HEART AFFECTIONS IN SOLDIERS,

WITH SPECIAL REFERENCE TO PROGNOSIS OF
"IRRITABLE HEART."

BY

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THE Military Hospital, Hampstead, of 200 beds has been set aside for the admission and treatment of soldiers suffering from heart affections, and more especially for observations upon those who present a particular group of symptoms. This group of symptoms is frequently indicated by classing the patients as sufferers from "irritable heart," a term less comprehensive than "soldier's heart," yet more comprehensive than "D.A.H." (disorderly heart action). It may be well at the outset to define more exactly the type of affection to which we intend to apply the term "irritable heart" in the following paragraphs. We use it to describe those patients in whom few or none of the graver signs of heart affection can be detected, but in whom there is complaint of breathlessness, palpitation, giddiness, or actual fainting, easy exhaustion, and precordial pain in varying degree; symptoms arising for the most part under exertion or exaggerated by it. At the same time we shall deal briefly with other and more frankly cardiac maladies, reciting our recent experiences. Our present purpose is especially to describe our method of dealing with soldiers in our attempt to sort them into various categories of fitness or unfitness for duty. We shall illustrate our remarks from three fully-equipped and independent services of 50 beds, and confine ourselves to patients who have passed through our hands during the first three months of our work, and have left the hospital. These patients number 251.

FIRST SIFTING.

(By Physical Examination.)

Of these 251 patients, 113 were discharged from the army within a few weeks of their admission, and these fall into four categories:

1. Mitral stenosis	...	...	...	...	31
2. Mitral stenosis and aortic disease	...	...	...	...	7
3. Aortic disease	...	...	...	...	22
4. Myocardial disease with or without enlargement, and with or without mitral incompetence	...	...	...	...	53

113

The first three categories require little comment; these patients all presented unmistakable signs of grave structural alterations in the heart. The fourth category is less clearly defined, and comprises:

(a) A number of patients in whom there was unmistakable and considerable enlargement of the heart with or without mitral incompetence. In estimating enlargement we have been guided by percussion and by the outermost point of pulsation. Diffusion of the impulse to one or more rib spaces, or an impulse or percussion border $\frac{1}{2}$ or $\frac{3}{4}$ in. from the midline,* are not regarded as sufficient grounds for discharge if they occur alone, and especially is this the case in men who are heavily built, or in whom the heart action is rapid during the examination.

(b) Patients in whom there are grave disorders of the heart's action, with or without enlargement of the organ. These are rare, the most notable examples being those in whom gross irregularity is constant from hour to hour and from day to day, and in whom the irregularity is accompanied by rapidity of the heart's action while the subject is at rest. They are examples of fibrillation of the auricles. A very few patients have been discharged as

unfit in whom heart-block has been discovered by instrumental examination. There are two further forms of irregular heart action which we encounter in a large proportion of our patients. The first is *extra-systolic irregularity*, giving rise to intermittent pulse or simple groupings of the pulse beats, and an irregularity which may be identified when respiration is deepened, for it then consists of a waxing of pulse-rate during the inspiratory period and a waning during expiration. These two forms of irregularity are easy to identify by ordinary methods of examination, and when identified should not, in our opinion, influence the category in which the patient is placed or the question of discharge. All patients who present them are dealt with as though such signs were absent, attention being centred upon the remaining signs and symptoms.

(c) A high percentage of the fourth group is formed by patients in whom a systolic murmur is audible at the apex. When this murmur is harsh in quality and well conducted to the axilla and is at the same time associated with (a) an exaggerated first heart sound and accentuated or reduplicated second pulmonic sound, (b) a thrill, (y) a history of recent rheumatic fever or of two or more attacks of rheumatic fever, (d) severity and persistence of symptoms, it is considered, with its associations, a sufficient ground for discharge. Standing by itself, a systolic murmur at the apex is not considered to be a sufficient ground for discharge, whatever the character of the murmur; in our experience many men who present this sign are capable of a great deal, if not of full and continued effort.

(d) Rare cases with severe cardiac pain, radiating to the arm.

The signs to which we attach little or no value in this first sifting of cases it may be well to tabulate; they are:

1. Extra-systolic or respiratory irregularity.
2. Acceleration of the heart's action.
3. Diffusion of the heart's impulse.
4. Jerky impulse.
5. Short soft systolic murmur at apex.
6. Systolic murmurs in the aortic or pulmonic region.

In the first sifting we discharge, for the reasons stated, some 35 to 40 per cent. of our patients. It will be evident that we carry over to our second sifting some patients who must ultimately be discharged as suffering from organic heart disease. The total proportion of discharge in first and second siftings as organic heart affections amounts to 45 per cent. The remaining 55 per cent. we class as cases of "irritable heart"; in an unknown percentage of these early structural changes no doubt exist, but it is for the present convenient to place all soldiers in whom no positive evidence of serious organic heart lesions can be found in the category named.

SECOND SIFTING.

(By Continuous and Special Observation.)

In our second sifting we are dealing with 60 to 65 per cent. of our original admissions; in the main there are patients in whom no clear signs of organic heart disease are discoverable, these are the patients to whom we apply the term "irritable heart"; in small part they are patients whose class for the moment is doubtful, but who eventually will be returned in the group of organic heart disease. Continuous observation reduces the percentage to 55. We are now left solely with cases of "irritable heart"—that is to say, with patients who have symptoms, but in whom no sign which we regard as a trustworthy sign of organic heart mischief can be discerned, either at the first or at subsequent examinations. It is in respect of these patients that disagreement as to subsequent fitness for service is likely to arise; and at an early stage we found it impossible to arrive at satisfactory conclusions from physical examination or consideration of the history. Consequently we have instituted a series of test exercises upon which all such patients are placed.

The exercises adopted are a selection from the code of army exercises. These offer many advantages; they are directed by a sergeant-major instructor thoroughly conversant with them, and in a position to maintain discipline amongst the men; they are in large measure familiar to the men; they are exercises which many of the men will be called upon to undertake who return to their dépôts.

* Measurements which are equivalent to the nipple line in most subjects.

They are supplemented by route marches, in light or full kit.

Exercise Table A¹⁵ (Fifteen Minutes).

Heels raise, feet close.
Head backward bend.
Hips firm, arms bend, arms upward stretch.
Trunk turning (with feet closed).
Foot sideways place.
Trunk bending sideways.
Trunk forward bend.

Exercise Table C¹⁵ (Fifteen Minutes).

Heel raising and knee bending quickly.
One arm upward, one arm downward stretch.
Foot placing sideways.
Trunk bending sideways.
Trunk backward bend.
Trunk forward bend.
Slow march.

Exercise D³⁰ (Thirty Minutes).

Heels raise, knees bend, arm stretching sideways.
Head backward bend.
Arm swinging upward.
Trunk turning quickly.
Foot placing sideways.
Leg raising forward.
Trunk bending sideways quickly.
Lying on the back down, leg raising.

Exercise Table B¹⁵ (Fifteen Minutes).

Heels raise and knees bend.
Arms sideways stretch, one arm upward, one arm downward stretch.
Trunk turning (feet apart).
Feet close and full open.
Trunk bending sideways.
Slow march.

Exercise Table C¹⁵ (Fifteen Minutes). Second Part.

Arms forward bend.
Trunk turning.
Knee raising.
On the hands down.
Quick march.
Knee raising quick mark time.
Slow march.

On the hands down, arms bend.
Trunk forward bend, arm stretching sideways.
Knee raising quick march.
On alternate feet hop.
Upward jumping.
Slow march.
Arm raising sideways, upward, sideways, downward.

The individual exercises are grouped under the headings A¹⁵, B¹⁵, C¹⁵ (first part), C (second part), each of which occupies fifteen minutes, and under D³⁰ which occupies thirty minutes. The exercises are taken daily and in favourable instances a patient moves to a higher grade exercise after three or four days. The patient moves from A¹⁵ to B¹⁵ to C¹⁵, to AB* (thirty minutes) to BC (thirty minutes) to C³⁰ (both parts), and finally to D³⁰. Thus he passes through seven groups of exercises, in a scale of ascending severity. D³⁰ is eventually taken in combination with route marches of four or more miles without pack, with light pack, or in full marching order.

At first all the medical officers of the hospital attended the drills and watched small groups of patients through them, making observations upon heart-rate and respiratory-rate and comparing objective signs of distress with the patients' subjective symptoms. Eventually we found this to be unnecessary, and at present we only examine patients immediately after they first take a new exercise, or when they specially report themselves or are reported. Our patients gradually class themselves according to the highest grades of exercise which are borne without distress, and in estimating fitness for duty we are finally and chiefly guided by these tests. The appearance of a man coming from drill—his expression, his colour, his breathing, and excessive heart-rate (140 to 160), are invaluable objective clues to his tolerance of the exercise, and he is put forward or back, or maintained on his exercise after due consideration of these signs and his statement of his symptoms upon the exercises.

That a man's *observed* capacity to accomplish work of a given order is the only dependable test of such capacity would seem self-evident; yet it is the experience that medical officers rely more upon physical signs obtained while the subject is at rest. We are convinced that, with few exceptions, a final sorting cannot be accomplished efficiently in this manner. After the first sifting, which eliminates manifest organic heart cases, exercises alone serve our purpose. In selecting a candidate for a post as typist, it is not by questionings, it is not by examining the configuration of the hands or the electrical responses of the muscles that the desired knowledge of deftness and accuracy in working is to be obtained. The decisive test

is an exercise upon the machine which will be used. It is true that specific anatomical defects may divulge incapacity; it is equally true, on the one hand, that anatomical imperfections do not necessarily unfit, and, on the other hand, that seeming anatomical perfection is no criterion of manipulative power or skill. The heart provides no exception from these clearly sound propositions. A large percentage of our patients are discharged on the first physical examination; in a larger percentage we are compelled to fall back upon exercises. A few cases of irritable heart may be discharged at an early date because they present a persistently high respiratory-rate.

It has been our special endeavour to find some relatively simple and quick test which will eliminate the unfit, and for this purpose we have made elaborate observations upon pulse-rate, blood pressure, and respiratory-rate under various conditions of posture and exercise. We have taken numerous instrumental records, polygraphic and electro-cardiographic; we have also noted such physical signs as basal murmurs, jerky impulse, extended impulse, various alterations of the heart sounds and signs of vaso-motor instability; with a solitary exception, we find these to be of no value in gauging the grade of exercise which will ultimately be tolerated or readily be borne. The solitary exception is the rate at which the pulse falls when it is accelerated by a brief exercise. If a patient walks smartly down a flight of twenty steps, along a short corridor, and up the same flight of steps, and the pulse subsequently fails to reach its original level within two minutes, that patient will but rarely reach a high-grade exercise. But quick recovery of pulse-rate is no criterion of ultimate fitness.

We return many patients with minor physical signs as fit for duty in different capacities, and our decisions in these cases have been arrived at after testing their capacity by the direct method. Many go back to duty with systolic murmurs at base or apex. It is our daily habit to place men with these signs on exercises; many of them are capable of undertaking the higher grade exercises for long periods. The exercise system has taught us not to be uneasy in submitting heart cases to exercise tests; in a four months' experience no patient has shown serious symptoms during the progress of his exercises. Immunity from accident we attribute to the first sifting and to our habits of cautiously advancing the grade of exercise, and of limiting the progress of exercises in men who *show* distress. Subjective distress is insufficient for evident reasons; objective distress is to be obtained, and men on exercises should be under close observation.

Men who improve and progress to the highest exercises and carry them out without distress for several weeks in conjunction with route marches, are boarded as fit for duty in army categories (a) or (b) according to circumstance. Men who improve less, whose progress is slower, and who tolerate the highest grade exercises less perfectly are boarded under army categories (c) and (d). Those who show continued distress on lower grade exercises are discharged as unfit. Working in this fashion our discharges amongst 138 cases of "irritable heart" have been approximately:

	Per Cent.
(a) Duty	18
(b) Light duty and likely to be fit for service overseas within three months	23
(c) Light duty, and not likely to be fit for service overseas within three months or requiring special medical treatment	6
(d) Service at home, but unlikely ever to be fit for service overseas	17
Permanently unfit	36

The system adopted is relatively quick in its sorting. The average stay of "irritable heart" cases in other hospitals has been three and a half months† before they came to us. The average stay of irritable heart cases at Hampstead is two months.

Tabulating our patients under the army categories under which they are boarded, several facts of interest are brought to light.

* The objects of combining exercise groups in this fashion is first to decrease the work of the instructor (thus the three classes A, B, and AB together occupy thirty minutes), and secondly, to use throughout the whole system relatively few exercises, so that they may be readily acquired and thoroughly learnt.

† We would emphasize this fact; for it means that a great deal of sifting has occurred before our cases come to us. For this and others reasons we are of opinion that the cases of irritable heart with which we deal are relatively severe instances of the affection.

A Table of 138 Irritable Heart Cases.

Class of Discharge.	Number of Patients.	Average Age.	Seen Foreign Service.	Seen Home Service only.	Chorea or Rheumatic Fever.	No Chorea or Rheumatic Fever.	Usual Duration of Symptoms.	Average Stay in Other Hospitals.	Average Stay at Hampstead.
Categories:									
a	25	25	21	4	0	25	1-6 mths.	Months 3	Months 1½
b	31	26	25	6	0	31	4-12 mths.	4	2½
c	9	26	5	4	4	5	1-3 yrs.	3½	2
d	24	29	19	5	7	17		3	2½
Permanently unfit	49	25	30	19	16	33	Several years	4	2

The proportion of favourable results is highest amongst men who have broken down in health on active service. Men who develop their symptoms while training at home are distinctly unfavourable subjects.

The prevalence of rheumatic or choreic history amongst cases of "irritable heart" is too high to be a matter of coincidence (19 per cent.); it suggests the presence of early rheumatic heart lesions in many of these soldiers. Patients in whom there is such a history rarely reach the higher grade exercises, though their physical signs do not noticeably differ from the remainder. The majority have to be discharged as permanently unfit; a few are returned to duty in categories c and d.

A striking feature of the table is the relation between the duration of the symptoms and subsequent events; 46 per cent. of irritable heart cases give, on careful inquiry, a history of symptoms dating back prior to enlistment. The longer the history the worse the prognosis; patients in whom the history is of years' standing make little progress; those soldiers are most likely to return to duty in whom the history is of a few months' duration.

THE EXERCISES AS A THERAPEUTIC MEASURE.

The exercises have an undoubted value as a therapeutic measure. Improvement of the symptoms, objective and subjective, is in many patients rapid and conspicuous. Physically and mentally the men benefit. Some improvement is the rule in most of our patients. Many other remedies have been resorted to, and none has proved efficient, to our knowledge. In agreement with other observers we find confinement to bed and lack of occupation to be detrimental. If circumstances permit, we propose to publish further memoranda† on this subject in the future. For the present we are content to record our chief conclusions—namely, that in sorting patients for discharge as permanently unfit, or in returning them as fit for duty in the several categories of the Army Order, a system of graduated exercises is the only reliable means at our disposal when patients with clear signs of serious heart affections have been eliminated; and such a system is also of distinct therapeutic value.

* The figures of our tables are somewhat but not greatly misleading in this respect, for a history of rheumatic fever or chorea has been taken into account in a number of cases when considering the question of discharge.

† A number of independent researches are being carried out at the hospital; they are inquiries bearing upon the causation of the affection, and inquiries into the effects of remedies; many of these are progressing to completion, and we hope to publish our observations in the near future.

THE estate left by the late Dr. John B. Murphy of Chicago is valued at 1,125,000 dollars (£225,000), of which £200,000 is in real estate.

It has long been felt by the medical profession in the United States that the establishment of a standard examining body for the whole country is desirable. That feeling led in 1915 to the formation of the National Board of Examiners, the purpose of which is to establish a standard of examination and certification of graduates in medicine for the licence to practise. The board is to consist of the surgeons-general of the army, navy, and public health services, one representative from each of the Government services, three representatives from the State examining boards, and six members chosen from the profession. The head quarters of the board are to be at Washington.

NOTE ON AN ANTENATAL OR PREGNANCY CLINIC AT THE EDINBURGH ROYAL MATERNITY HOSPITAL.

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SINCE it would appear that in some minds doubts have arisen regarding the value of antenatal or pregnancy clinics, and of a differentiated prematernity department in connexion with or included in a maternity hospital, it may be well simply to describe such a clinic and demonstrate its relations with the maternity hospital and prematernity department.

Some objection has been taken to the word "antenatal." It has been stated to be a comparatively new and an objectionable word, compounded of an adverb and an adjective. Sir James Murray, however, in the *New English Dictionary*, lists it, has no criticism to make upon it, and does not even indicate it (in 1888) as "not-naturalized." Further, the word has been used by authors of repute. Thus Shelley, in 1817, in his poetical fragment *Prince Athanase*, wrote:

Some said that he was mad, others believed
That memories of an antenatal life
Made this, where now he dwelt, a penal hell.

Kingsley, too, in 1848, referred to "heaven, my spirit's antenatal home"; and Farrar in 1879 in his *Life of St. Paul*, spoke of the "antenatal predilection for Israel and detestation of Esau." None of these men would be refused a claim to the title of a literary man, but De Quincey is admitted by all to be a prince amongst the writers of English prose, and he penned the following passage: "All necessity for supposing immediate impressions made upon our understandings by God or other supernatural, or antenatal, or connatal, agencies, is idle and romantic." When, therefore, in 1892 I employed the word "antenatal" in the phrase "antenatal pathology," as a convenient and suitable designation for the department of scientific medicine which should contain all the morbid states found in existence before birth, it appears that I was following the example of the poet, the novelist, the divine, and the justly admired man of letters. I could, of course, have called it the department of teratology, of fetal pathology, and of morbid heredity; but I was looking for a comprehensive name under which to group all the pathological developments of the life before birth, and I am inclined to maintain that I found it. Its extension, first to antenatal hygiene, then to antenatal treatment, and latterly to antenatal clinics could hardly have been stayed by me even had I desired to lay an arresting hand on it; but surely no one can possess an intelligence so curiously mis-orientated as to imagine that antenatal clinics for expectant mothers mean opportunities for the examination of these mothers before their birth. An antenatal clinic is concerned with the investigation of the health or sickness of the antenatal life within the mother as well as with the health or disease of the mother herself, both of which are of course intimately bound up with the unborn infant's wellbeing. At the same time, I am unwilling to differ from any man on so microscopical a matter, and if there is a general desire that these clinics should be termed "pregnancy," "prematurity," or even "gestational," I shall be ready to join in calling them so; but the terms "antenatal pathology" and "antenatal hygiene" are too useful and too well established to be sacrificed for the sake of pedantic purism. As a matter of fact, I have myself employed "pregnancy clinics" now and again as a convenient, if rather ungraceful, synonym.

The particular antenatal clinic which is here to be described was held in the Edinburgh Royal Maternity Hospital on July 25th, 1916. In conducting it I was assisted by two resident medical officers (one of whom is qualified), and by two sisters, one of whom holds the diploma of the C.M.B., and has had an extended experience in dealing with pregnancy cases both inside and outside the hospital. On this day there were fifteen patients in attendance, and this was above the average (between eight and nine) for July. It turned out that one of the women, an albuminuric case, had formerly been in the hospital, but was not now pregnant; and she was dealt with as a puerperal patient. Fourteen pregnancies were therefore left to be investigated.

In each case the urine was tested, the past history