guinea-pigs. The following table supplies some details of this interesting group:

Serial No.	X-ray Report	Bacteriological Report	History
37	Scattered calcification; right apex	Positive gastric culture	Pain in chest 15 months ago; did not go to bed. Otherwise had always been well
73	Evidence of old Tb. infection in the lungs; nothing suggesting anything recent	Positive sputum culture	Haemoptysis; sanatorium treatment; fistula in ano
137	Suspicious area in right infraclavicular region, radiating from hilum. Defer	Positive gastric culture	Clear personal and family history
167	Small calcified nodules in apex of left upper lobe. No evidence of activity, and remainder of lungs normal	Positive sputum culture	Three years in sanatoria. "Short of breath"
225	Small calcified nodules at left apex. No definite evidence of activity	"	"Dry" pleurisy 15 years ago; was not laid up. Otherwise always well
247	Localized Tb. infiltration at left apex; one very small nodule in first interspace area; a little calcification evident. Suggest bacteriological examination	"	Haemoptysis in 1930. Sanatorium for five months in 1932. Father died of pulmonary Tb.
250	Very slight Tb. lesions; both apices. Partly calcified. Suggest bacteriological examination	"	Personal and family history clear
251	Slight infiltration in apical region of right upper lobe. Left lower probably Tb. Suggest bacteriological examination	"	Suspected of pulmonary Tb. in 1939. Sister died of phthisis
302	All tuberculous lesions of right upper lobe quiescent. For bacteriological examination	Positive gastric culture	Served in war of 1914-18. "Pulmonary fibrosis"
307	Exaggerated lung markings in right chest. ? upper respiratory infection and delayed resolution of acute process	Acid-fast bacilli in smear of sputum	Clinical and family history clear

It may fairly be represented that although the figure for the proportion of bacteriological confirmations of x-ray diagnosis is high, particularly in Group I, in which it reached 54% among 152 men designated subjects of active pulmonary tuberculosis on radiological evidence, it is of necessity an under-estimate. As has been indicated, the men pass the laboratory way but once, and it is only in exceptional instances that repeat examinations are feasible. Were it possible again to comb through those men for whom a negative bacteriological finding has been recorded it is more than probable that the tubercle bacillus would be uncovered in some of them.

Group III

There remain three men to be placed in a third group because no x-ray evidence of pulmonary tuberculosis was apparent.

Serial No.	X-ray Report	Bacteriological Report	History
238	Lungs clear; pass	Positive sputum culture	Father died of pulmonary Tb. 12 months ago. Two cousins have been in sanatoria
253	Pass	"	Pleurisy 4 months ago. Brother rejected as active Tb.
255	No sign Tb.; pass	Positive gastric culture	Personal and family history clear

That the above three cultures were those of genuine and virulent tubercle bacilli was proved in each instance by guinea-pig inoculation.

In the case of No. 253 it has been ascertained that he was sent for examination in mistake for his brother, who was summarily rejected by the radiologists. No. 253, however, gave a history of pleurisy, and from a second sample of sputum acid-fast bacilli were again cultivated. That No. 238 and No. 255 presented themselves for bacteriological examination must have been fortuitous in

view of the x-ray reports with regard to them, and three such unanticipated bacteriological results are startling, and are provocative of reflection.

Conclusion

The work will be continued in 1941, and the present communication, as a preliminary report, is limited to a statement of objectives, underlying principles, methods, and progress results. Temptation to comment on the vexed question of the radiological estimation of activity, and to discuss risks of error due to the appearance of chromogenic acid-fast bacilli other than true tubercle bacilli in cultures, must be resisted in view of wartime exigency regarding space.

It is submitted, however, that the results obtained to date establish beyond criticism the prescience of the policy which instituted the radiological survey of the Second Australian Imperial Force.

The work which I have endeavoured to outline is sponsored by the National Health and Medical Research Council of Australia, by whom a research grant has been allotted for its continuance.

I have already expressed appreciation of the encouraging interest of Major-General R. M. Downes and the cordial co-operation of Colonel C. Gordon Shaw. Other officers who have done much to facilitate the inquiry are Lieut.-Colonel E. L. Cooper, Lieut.-Colonel L. M. Routh, Major Douglas Galbraith, and Captain N. T. Bull. As Officer-in-Charge, X-ray Department, Southern Command, Captain Bull has maintained a happy liaison between the x-ray service and the bacteriological laboratory. My technical assistant, Mr. H. Weir, is bringing to the work an enthusiasm and a devotion to duty which are beyond praise.

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THE BLOOD PLATELETS AND SPLENIC EXTRACTS

BY

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In 1938 Troland and Lee reported the presence of a platelet-reducing principle in acetone extracts of spleens from patients with thrombopenic purpura; when given intravenously to rabbits these extracts lowered the count of the circulating platelets. Torrioli and Puddu (1938) then drew attention to earlier work by themselves and others in this field. They had found that aqueous extracts both of normal spleens and of spleens from patients with thrombopenic purpura contained a factor which was capable of inhibiting the development of megakaryocytes when given in small doses but damaged them in larger doses. These workers also succeeded in producing a fall in the circulating platelets in the rabbit by intravenous injection of an aqueous extract of a normal spleen.

Several workers have attempted to confirm the results obtained by Troland and Lee. Major and Weber (1939) obtained negative results with two spleens from cases of thrombopenic purpura. Pohle and Meyer (1939) made spleen extracts from three cases of thrombopenic purpura, with completely negative results. Using spleens from two such cases, Hodge and Strong (1939) were equally unsuccessful. All these workers used acetone extracts. Hobson and Wits (1940) obtained a fall of platelets in the rabbit with an acetone extract of the spleen from one case of thrombopenic purpura. They also prepared acetone and

saline extracts of normal spleens: the acetone extract was inactive, but the saline extract reduced the platelet count when given intravenously in a large dose.

Rubegni (1940) discusses the work of Defrise, who modified the technique of Troland and Lee by a further extraction with ether and obtained positive results with the spleen removed from an ill-defined case of haemorrhagic disease. Rubegni made acetone extracts from fresh calf's spleen, liver, and muscle, and administered them intravenously to rabbits. The splenic extracts produced in most cases a fall in platelet count of about 50%; the liver extracts were also followed by a decrease in platelets, though less than that produced by the splenic extracts; muscle extracts caused no change. Rubegni did not succeed in keeping a rabbit's platelets low by repeated injections, though this had been done by Troland and Lee.

It appears from the literature that the platelets of the rabbit may fall when extracts of spleen are administered intravenously. This effect is inconstant, and it is by no means limited to spleens obtained from patients with thrombopenic purpura; it may also occur with extracts of normal spleens and liver.

Experimental Methods

The objects of the following experiments were, first, to compare the effect of different types of extract of the spleen and the tissues used as controls; and, secondly, to see if any depression of the platelets resulted if the injections were not given intravenously.

Extracts were made from post-mortem material, sheep spleens removed directly after killing, and three spleens removed at operation from patients with thrombopenic purpura. Acetone extracts were prepared as described by Troland and Lee, and alcohol extracts by a similar technique. Saline or aqueous extracts were made by mincing the spleen and extracting in the cold for twenty-four or forty-eight hours, then centrifuging. When saline extracts were kept several days for repeated injections they were covered with toluene and shaken periodically. These extracts were usually made up so that 1 c.cm. of the final extract corresponded roughly to 1 gramme of spleen. Another extract was prepared by treating finely minced spleen with anhydrous sodium sulphate at 37° C., separating the supernatant fluid, and then removing as much of the sodium sulphate as possible; 170 grammes of spleen was used, and the resulting extract, made up to 5 c.cm., was given to one rat. Pressed juice from spleen was also tried. Another spleen was allowed to autolyse under toluene; but this preparation was too toxic, and the rats receiving it died.

The extracts have in most cases been given by the intraperitoneal route to rats, the rest intravenously to rabbits. The rats weighed 0.3 to 0.4 kg. and the rabbits about 1.5 kg. The platelet counts were made by a direct method (Lempert, 1935). Counts were made on the day before injection, again immediately before injection, and then several times in the twenty-four hours following injection; none of the changes observed persisted more than twenty-four hours. Rat platelet counts usually gave figures between 500,000 and 900,000 per c.mm. in blood obtained from the tail after warming. With rabbits the counts were lower. In all, 56 rats and 14 rabbits received injections, the animals being used once only. As controls, pairs of rats were given intraperitoneal injections of 10 c.cm. of sterile Ringer-Locke solution, a 10% suspension of human red cells, and a saline extract of muscle; the rats receiving Ringer's solution showed a rise in platelets of 15%, the others no change or a slight fall. The degree of accuracy in counting is not high, and I do not regard alterations of the order of 20% as having much significance.

Extracts of Normal Spleen

Six rats received acetone extracts of human spleen, the dose varying from 5 to 15 c.cm. The greatest subsequent change from the level just before injection was a fall of 35%, but in another rat a larger dose of the same extract caused no reduction in platelets. The other injections were followed by falls of 16% or less.

Six rats received alcoholic extracts of human spleen in doses of 5 to 15 c.cm. The extract given to two of them was toxic, and they died; injection of the other extract was followed by changes in the platelet count varying from a rise of 11% to a fall of 28% without relation to the size of the dose.

Six rats were given Ringer's extract of normal human spleen in doses of 5 to 15 c.cm. Here the changes in platelet count varied from an increase of 12% to a decrease of 25% independently of the dose.

Four rats were given 10 to 15 c.cm. of an aqueous extract prepared from a human spleen dehydrated with alcohol, dried, and powdered before extraction. There was no effect on the platelet count. Two rats were given 10 c.cm. of saline extract of fresh sheep spleen without effect on the platelets. Two more rats received 10 c.cm. of pressed spleen juice: no change resulted in one; the other showed a rise of 17%. The sodium sulphate extract did not alter the platelet count.

In order to determine whether repeated injections might depress the platelet count, one group of 6 rats received four injections, each of 10 c.cm., of saline extract of fresh sheep spleen, given over a period of nine days. Platelet counts were made on the day before the first injection, several times during the course, and for two days after the last injection. Only one rat showed any appreciable change, and that was a transient elevation of 40%. Four other rats received repeated injections of acetone extract of fresh sheep spleen, counts being made in the same way. No significant changes were observed.

Extracts given Intravenously

Normal saline extracts of muscle, liver, and sheep spleen were given intravenously to rabbits in 20-c.cm. doses. Two rabbits receiving splenic extract showed falls of 27 and 29%; two receiving liver extract showed falls of 25 and 38%; muscle extract caused a fall of 50%.

Extracts of Thrombopenic Spleens

Three such spleens were available. The first was from a woman of 27 with purpura of acute onset, characterized by severe haemorrhage, a greatly prolonged bleeding-time, and a platelet count below 10,000. No drug or medicine had been taken by the patient. The other two spleens were from chronic cases of the disease, one being removed during an interval and the other during an active phase. Each spleen was divided into halves, and acetone and saline extracts were prepared. The residue from the saline extract was subjected to further extraction with alcohol. These extracts were prepared aseptically, and each was injected into both rats and rabbits.

When given to rats intraperitoneally in 10-c.cm. doses none of the extracts caused any significant change in the platelet count. One rat received four injections of a saline extract on alternative days without a decrease in platelets. The acetone extracts were given intravenously to rabbits in doses of 25 to 45 c.cm. and caused falls of 15 to 35% in the platelet count; in the same doses the saline extracts produced falls of 23 to 28%. In all cases the falls appeared within a few hours of injection and the counts had returned to their previous level within twenty-four hours.

Discussion

These results show that none of the extracts tested, whether from normal spleen or thrombopenic spleen, contains a thrombopenic principle in quantity sufficient to be demonstrated by intraperitoneal injection into rats. The occasional falls recorded are not large enough to be significant and did not occur in other rats receiving the same extract. Repeated injections have been no more successful in reducing the platelet count. When the extracts were given intravenously to rabbits the results were rather different. Some lowering of the platelet count was produced by all the extracts used—the least by an acetone extract of thrombopenic spleen, the greatest by a saline extract of muscle. This suggests that tissue extracts given intravenously may lower the platelet count, but it does not support the view that there is a specific thrombopenic factor in splenic extracts.

All the reports dealing with the existence of such a factor, except those of Torrioli and Puddu (1934) on its effect on the megakaryocyte in marrow culture, are based on the results of intravenous injection. Many non-specific agents—for example, heterologous red cells or serum, peptone, and suspensions of micro-organisms or inert particles—are capable of causing a considerable reduction in platelets when given intravenously (Tocantins, 1938), and there is no reason why these comparatively crude extracts of the spleen should be put in a special category. It is also worth noting that a splenic extract has been reported as causing a thrombocytosis when given subcutaneously (Haenlein and Schliephake, 1935) and that an anti-spleen serum produces thrombopenia (Bedson and Johnston, 1925). The evidence for the existence of a specific thrombopenic principle in splenic extracts is therefore unconvincing.

Summary

A series of extracts from normal spleens and from three cases of thrombopenic purpura have been prepared, and were injected into rats and rabbits. No evidence of the existence of a specific thrombopenic factor was found, and it is suggested that the positive results of a few other workers may have been due to non-specific reactions to intravenous injections.

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EVALUATION OF HYSTERICAL SYMPTOMS IN SERVICE PATIENTS

BY

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Since the outbreak of war the Navy has been working under conditions of continuously severe stress, and the personnel has been increased by the introduction of many conscripted recruits. Mainly among these men, and among reservists recalled from their civilian jobs and from home life to the rigorous conditions of the Service in wartime, a certain number of hysterical reactions have inevitably occurred. It has already been shown, both in the last war (Beaton, 1920) and in this (Curran and Mallinson, 1941), that the incidence of hysteria as a primary diagnosis is not high in naval psychiatry.

The committee on head injuries of the Medical Research Council (private information, unpublished) has defined hysteria as "a condition in which mental and physical symptoms not of organic origin are produced and maintained by motives never fully conscious, directed at some real or fancied gain to be derived from these symptoms." In addition to a definition it is necessary, for clinical purposes, to have criteria which will help to reduce the very varied manifestations of hysteria to an ordered symptomatology, to minimize subjective and impressionistic judgments, and to cut short philosophical speculation about fully and incompletely conscious motives. The Services make demands on their medical officers

which call for special criteria of prognosis and recovery. The disappearance of symptoms is not enough; a reasonable assurance of future reliability and freedom from relapse under war stress is required. If this assurance cannot be given, discharge from the Service is called for, even though recovery may be adequate from the point of view of civilian life. It must also be remembered that a successful hysterical "escape," if the motive is even dimly present in consciousness, will permanently reduce the social efficiency of the individual by facilitating a recurrence in the face of subsequent difficulties, and within the Service it will impair morale by inviting imitation by others.

The long and unbroken period of active service which the Navy has undergone is offered as the reason for giving a short account of a classification, derived from clinical and aetiological considerations, which has been found of practical value in the treatment and disposal of patients showing a hysterical reaction. On discharge from hospital a patient may (i) return to full duty, (ii) return to modified duty in accordance with psychiatric advice, or (iii) be invalided from the Service. The reactions are classified as follows: (1) simple hysterical dissociation; (2) hysterical prolongation; (3) hysterical exaggeration; (4) hysterical simulation; (5) hysterical "complications" of an underlying disorder.

1. Simple Hysterical Dissociation

This group, in which the symptoms arise without any conscious motive and without other signs of psychiatric disorder, includes both (a) those cases in which there is little or no lapse of time or period of meditation after the precipitating physical or mental trauma, and (b) those which follow a long period of stress or conflict.

(a) As an example of the former one may cite the instantaneous paralysis of a limb which sometimes accompanies a relatively slight flesh wound. In such cases, if the hysterical dissociation is uncomplicated by any other disorder and psychiatric treatment is given early, the prognosis for return to duty should be good. Acute cases of this type, however, are rarely seen in our unit, which is analogous to a military base hospital. Where the removal of the hysterical symptoms releases much anxiety the prognosis depends upon the intensity of the objective signs of anxiety (see "5. Hysterical Complications").

(b) The following is an example of the latter type of reaction.

Case 1.—A stoker who joined the Navy two years ago was admitted following a hysterical fugue. He had an amnesia for the whole period since he joined the Service, but he showed no anxiety or other psychiatric disorder. In the course of investigation and treatment it materialized that he had joined the Navy primarily because a girl to whom he was attached admired the uniform. Shortly afterwards this girl gave him up and he became attached to another girl of a rather higher social standing. He had for long been pre-occupied with the idea that he would never earn enough money in the Navy to justify his proposing marriage to this girl. This conflict gave rise to hysterical dissociation only after many months. The Service prognosis of such cases must be more guarded because the psychopathical mechanisms which produce the symptoms have often been operative long enough to impair the stability and adaptability of the personality. In other words, the longer a conflict persists before it is "resolved" by a flight into hysterical dissociation the more difficult it will probably be to get the patient to face up to the less pleasant alternative.

2. Hysterical Prolongation

Here the symptoms arise on a basis of previous organic or psychological disorder in association with a greater or less degree of consciousness of motive. Typical instances are the hysterical persistence of headache in patients convalescent from head injury and of tremor following acute